Egg Producers Federation of New Zealand Inc Code Of Practice

(Includes requirements for Risk Management Programmes)

Contributors

This Code of Practice was developed by representatives of the industry, regulators and verifiers drawn from the following organisations:

Egg Producers Federation of New Zealand Inc.

NEW ZEALAND FOOD SAFETY AUTHORITY

Te Pou Oranga Kai O Aotearoa

NB: The New Zealand Food Safety Authority (NZFSA) was set up on 1 July 2002, and includes the food safety functions from both the Ministry of Health and the Ministry of Agriculture and Forestry (MAF). The NZFSA is a semi-autonomous body attached to MAF.

Notice of Copyright

Important Disclaimer

This publication is not a legal interpretation of the Animal Products Act 1999 or the Animal Products (Ancillary and Transitional Provisions) Act 1999. Nor is it produced for the purpose of giving professional advice of any nature.

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Review of Code of Practice

This Code of Practice was up to date at time of going to print. Sections referring to legislation may become out of date in between reviews of this Code. Egg producers are responsible for keeping up to date with changes to legislation and for updating or amending their risk management programmes to bring them into line with legislative changes where necessary.

The Egg Producers Federation of New Zealand Inc. is responsible for maintaining this document to reflect new knowledge, technological changes etc. They must ensure that relevant regulatory authorities are consulted in any review process to ensure that the Code of Practice continues to meet regulatory requirements.

The coordinator welcomes suggestions for alterations, deletions or additions to this template, to improve it or make it more suited to industry needs. Suggestions should be sent to the coordinator on the form on Page iii, together with reasons for the change and any relevant data.

The coordinator of this Code of Practice is:

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Egg Producers Federation Inc.
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Suggestions for Change: Egg Producers Federation of New Zealand Inc.'s Code of Practice

Name **Organisation** **Address** **Email** **Phone** **Facsimile**	
Section	**Suggested Improvements**
Signature	**Date**

Amendment Record

Amendments do not become part of this Code of Practice until they have been authorised by the Executive Director, Egg Producers Federation of New Zealand Inc., and issued with an amendment form. Amendments to this Code of Practice will be given a consecutive version number and dated.

Amendments to the Code of Practice can be identified by the version number and date issued in the header of each page.

Please ensure that all amendments are inserted, obsolete pages are removed and the record below is completed.

Version No:	Date	Entered by:

Contents

Chapter 1:

Introduction

1.1 Purpose of this Code of Practice

As professionals in the industry egg producers have a legal and moral responsibility to:

- **Protect their customers**
- **Protect their businesses**

Lack of control of hazards and other risk factors can affect businesses and result in:

- **Loss of earnings**
- **Legal action**
- **Unemployment**
- **Loss of reputation**

The Animal Products Act 1999 requires egg producers to have a risk management programme (RMP) to control hazards and other risk factors so that shell eggs are fit for their intended purpose. The RMP must cover their primary processing operations (from the laying farm through to packing of shell eggs).

Once registered, an egg producer's RMP is a legally binding document that the egg producer must follow – otherwise they will be operating outside of the law.

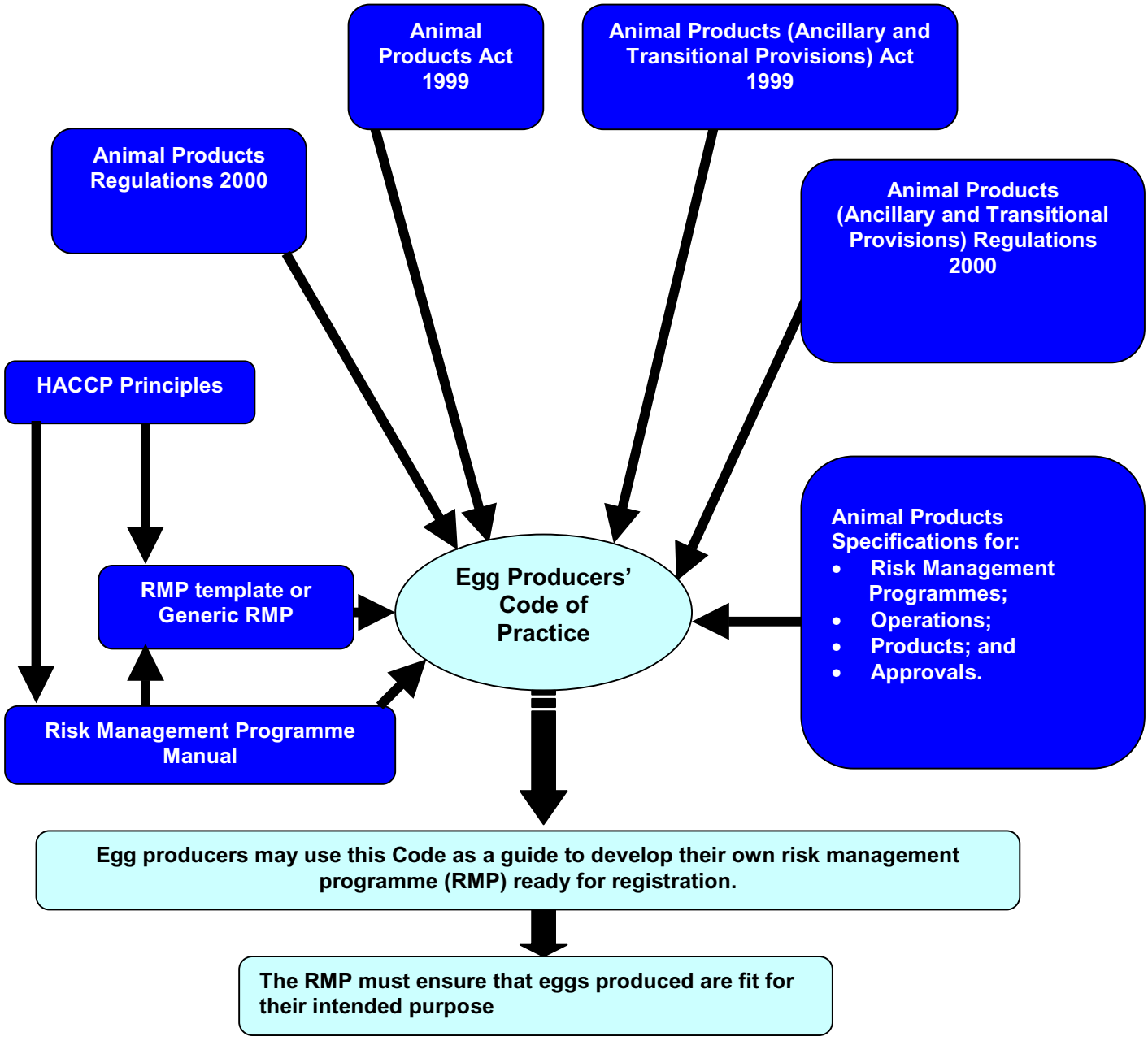
This Code of Practice has been developed to provide a "one-stop-shop" with all of the information needed to assist an egg producer to set up their own RMP. Resources used to develop this Code are shown in the diagram on the next page. This Code incorporates industry agreed practices to meet the regulatory requirements for shell eggs. It has been based on the principles of HACCP (Hazard Analysis and Critical Control Point), which is the internationally recognised method for the control of hazards.

Using this Code of Practice is recommended by the Egg Producers Federation and the New Zealand Food Safety Authority. Alternative approaches are acceptable so long as regulatory requirements are met. Egg producers that do not use the Code of Practice will have to demonstrate that their RMP is equivalent to this and achieves similar product outcomes.

When developing their RMP, the egg producer should consider whether there are any additional hazards and other risk factors specific to their operation which are not covered by the Code. For this reason each egg producer should use the Code as a starting point but alter it so that it addresses all of their hazards and other risk factors for all of their operations.

If any part of the Code of Practice is referred to from the RMP then this referenced part becomes part of the legally binding RMP. The total RMP including the incorporated or referenced parts of the Code, will be subject to audit / external verification.

Resources that have been used to develop this Code of Practice:



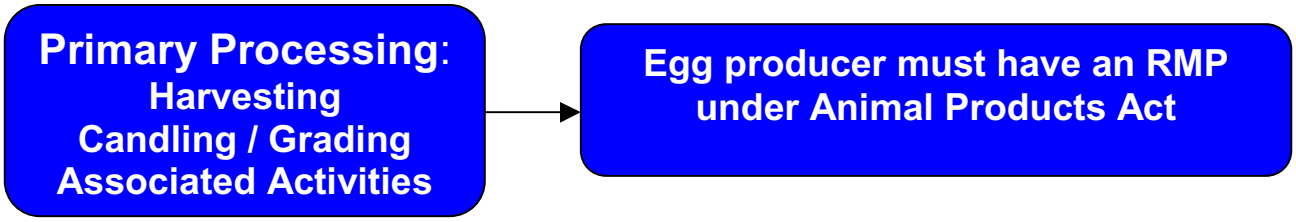
1.2 Scope of Animal Products Act 1999 as it applies to Eggs

1.2.1 Primary Processing

The Animal Products Act applies to all egg producers that are performing 'primary processing' of avian eggs from layer hens (Gallus domesticus); or any other bird species, including quail, geese, ducks, ostriches, and emus into products intended for human or animal consumption.

Primary processing includes harvesting and candling of those eggs and associated processes (as described in section 1.3). All egg producers MUST have a risk management programme for their primary processing.

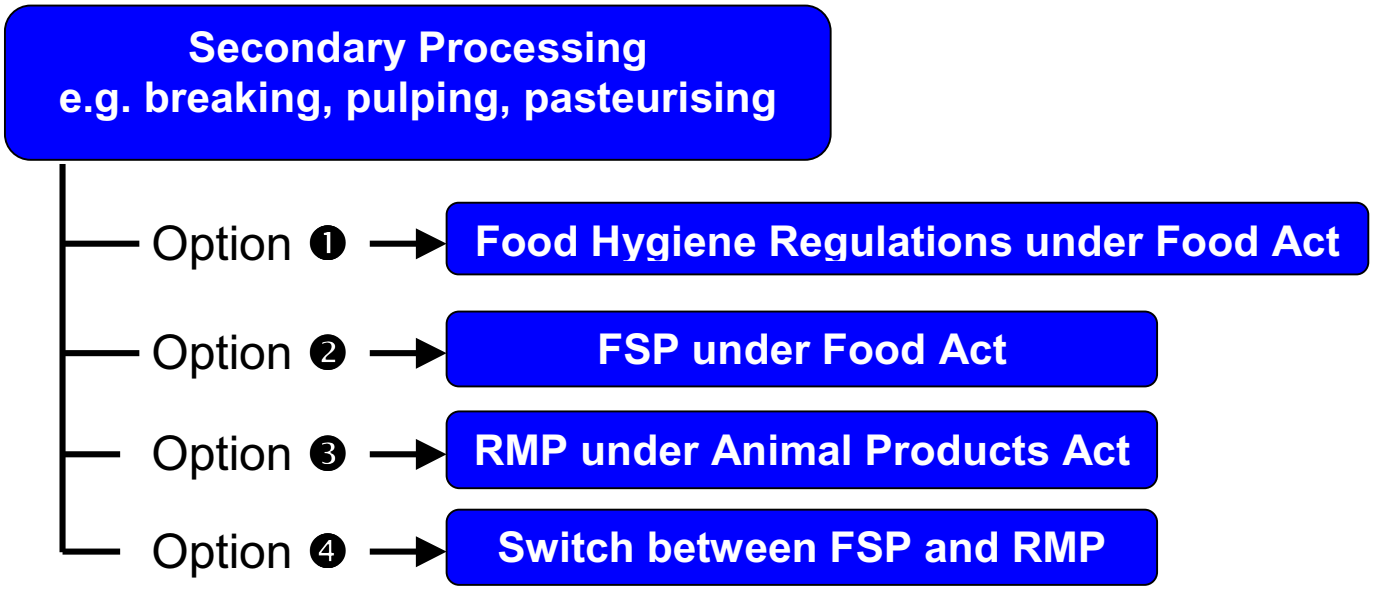
"Candling" means the testing of eggs for freshness, fertility, or defects by use of light, electronic means, or any other commercially accepted means.



1.2.2 Secondary Processing

An egg producer that performs secondary processing of eggs has a number of regulatory options for this part of their process as shown in the bullets and diagram below. They can operate under:

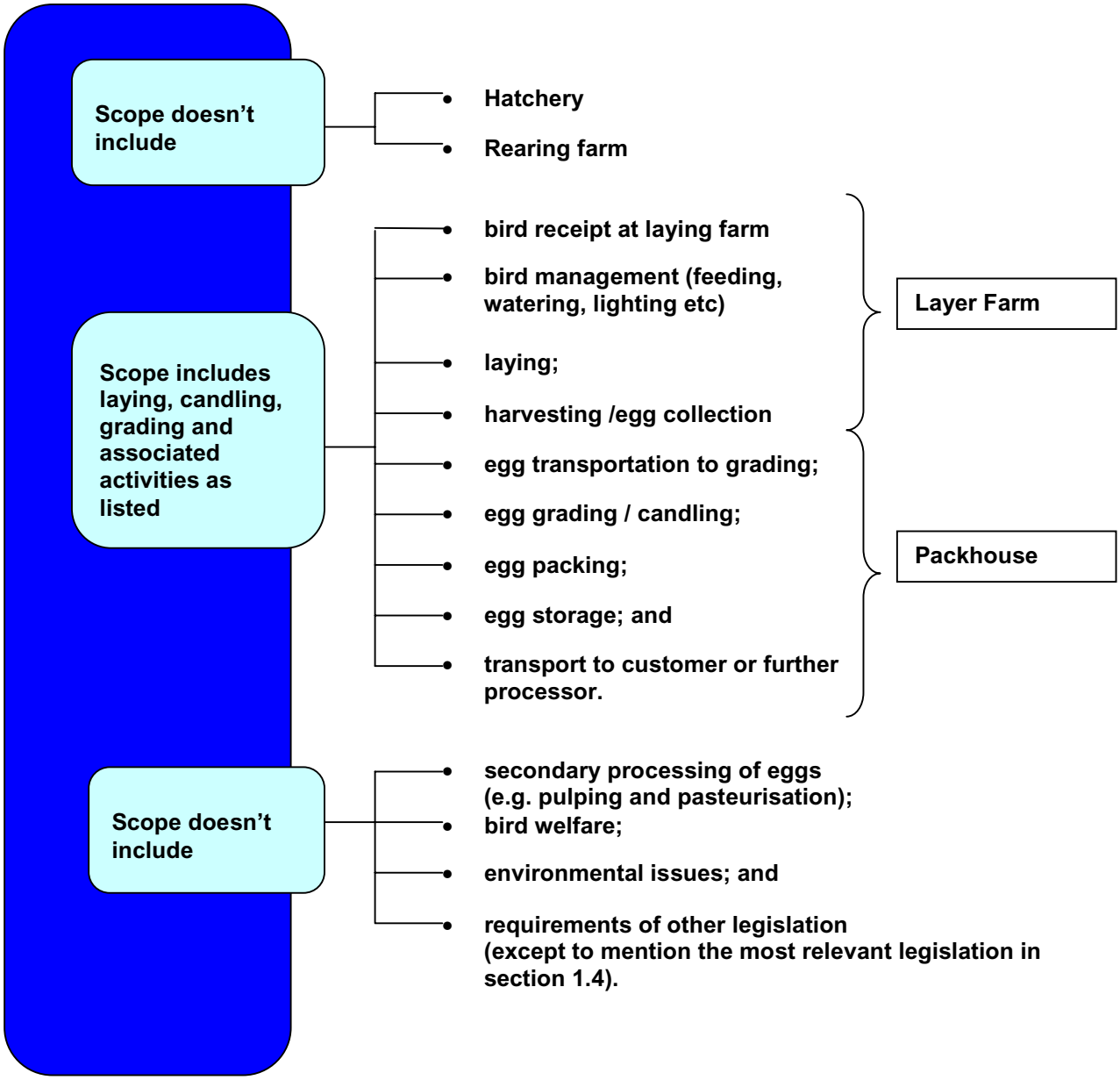
1. **the current Food Hygiene Regulations (FHR) under the Food Act, or**
2. **a Food Safety Programme (FSP) under the Food Act, or**
3. **a Risk Management Programme (RMP) under the Animal Products Act, or**
4. **options 2 and 3 as appropriate (known as "switching").**



1.3 Scope of this Code of Practice

This Code Of Practice covers primary processing of shell eggs and other egg products that are intended for human or animal consumption.

It's scope is clarified below.



1.4 Other Legislation

Despite having a risk management programme, the egg producer is still expected to comply with all other relevant legislation. These will not be covered in this Code of Practice except where directly relevant to the risk management programme. Egg producers are responsible for ensuring that they are familiar with and comply with all legislation.

1.4.1 List of Legislation Relevant to Egg Producers

Legislation that is likely to be relevant to egg producers includes (but is not limited to) the following Acts and their associated regulations and specifications:

- **Agricultural Compounds and Veterinary Medicines Act 1997.**
- **Animal Products Act 1999**
- **Animal Products (Ancillary and Transitional Provisions Act) 1999**
- **Animal Welfare Act 1999**
- **Commerce Act 1986**
- **Consumer Guarantees Act 1993**
- **Fair Trading Act 1986**
- **Food Act 1981**
- **Food Regulations and Standards Made under the Food Act 1981:**
  Food Regulations 1984,
  New Zealand Food Standard 1996,
  The New Zealand (Mandatory) Food Standard 1997 (Prescribed Foods),
  The New Zealand (Maximum Residue Limits of Agricultural Compounds) Mandatory Food Standard 1999
  The Food Hygiene Regulations 1974
  Dietary Supplements Regulations 1985.
- **Hazardous Substances and New Organisms Act (HSNO) Act 1996**
- **Health Act 1956**
- **Medicines Act 1981**
- **Resource Management Act 1991**

1.4.2 The Joint Food Standards Setting System between Australia and New Zealand – a Joint Food Code in the near future

Food Standards Australia New Zealand (FSANZ, formerly ANZFA) is based on a partnership between the Australian and New Zealand governments, and is responsible for developing, varying, and reviewing food standards for food available in Australia and New Zealand. [web site: www.anzfa.gov.au}

In December 1995, the Australian and New Zealand governments signed a treaty to establish a "System for the Development of Joint Food Standards". The Food Standards Treaty established the joint food standards setting system and came into force on July 1996. The underlying aims of the joint system are to consider the needs of both New Zealand and Australia, to protect the public health of both countries, and reduce unnecessary barriers to trade. This has resulted in a joint Australian New Zealand "Food Standards Code".

A number of areas are outside the scope of the joint system and are covered under the New Zealand food standards setting process:

- **Maximum residue limits of agricultural compounds in foods**
- **Food hygiene and food safety provisions**
- **Export requirements relating to third country trade**
- **Dietary supplements (likely to be covered under future healthcare and therapeutic products legislation).**

Dual food standards will apply until the "Food Standards Code" is introduced (December 2002).

The Australian Food Standards Code is an alternative to most of the Food Regulations 1984. Under the joint food standards setting system with Australia, food sold in New Zealand must fully comply with either the Australian Food Standards Code or the Food Regulations 1984.

During the transitional phase before the "Food Standards Code" becomes the sole food Code applying in New Zealand and Australia, food manufacturers/importers will have the option of complying with the Food Regulations 1984, the Australian Food Standards Code, or the "Food Standards Code", but not a combination of these.

Additionally, under the Trans-Tasman Mutual Recognition Act 1997 (TTMRA) food produced in New Zealand or imported into New Zealand that meets New Zealand's legal requirements, may also be sold in Australia and vice versa. There are some exceptions. For example, high-risk foods listed in either country require certification or testing before being permitted entry (peanuts, soft cheeses, molluscs).

Legislation can purchased from:

- **Bennetts, Commerce House, 360 Queen Street, Auckland. Ph (09) 377 3496 Fax (09) 377 3497**
- **Whitcoulls, Shop 42 Centre Place, PO Box 928, Hamilton. Ph (07) 839 6305 fax (07) 834 3520**
- **Bennetts on Broadway, PO Box 138, Palmerston North. Ph (o6) 358 3009 Fax (06) 358 2836**
- **Bennetts Government Book Shop, PO Box 5334, Wellington. Ph (040 499 3433 Fax (04) 499 3375**
- **Whitcoulls Cashel Street, Private bag, Christchurch. Ph (03) 379 7142 Fax (03) 377 2529**
- **Whitcoulls George Street, PO Box 1104, Dunedin. Ph (03) 477 8294 Fax (03) 477 7869**

The Australian Food Standards Code and the "Food Standards Code" are available for viewing at:

- **FSANZ web site: www.anzfa.gov.au**
- **Depository libraries throughout New Zealand.**

The Australian Food Standards Code may be purchased from:
The Information Officer, FSANZ, PO Box 10559, The Terrace, Wellington. Ph (04) 473 9942, Fax (04) 473 9855.

1.5 Other Information

Further information is available from NZFSA's web site or can be purchased as hard copies (See 1.5.2).

1.5.1 NZFSA's Web Site

The following information is on NZFSA's web site at www.nzfsa.govt.nz/animalproducts/

- **Bulletins**
- **Manuals/Guides:**
  - **Exporters Guide**
  - **Risk Management Programme Manual**
- **Overseas Market Access Requirements**
- **Amendments**
- **Registers and Lists;**
  - **Risk Management Programmes Register**
  - **Transport Operators List**
- **Application Forms;**
  - **Exporter Registration – Application Form AP1**
  - **Identification numbers**
  - **Registration of Risk Management Programme – Application Form AP4**
- **Legislation:**
  - **Acts**
  - **Regulations;**
  - **Notices (Specifications); and**
  - **Orders**
- **Policy Statements**
- **Glossary of terms;**
- **Frequently asked questions (FAQs);**
- **Discussion Documents**
- **Brochures**
- **Letters to affected parties.**

The following information is on MAF's web site at the listed addresses:

Guides to Hazard Analysis Critical Control Point (HACCP) systems in the Meat Industry at: www.nzfsa.govt.nz/meatdoc/meatman/haccp/

Guides to Hazard Analysis Critical Control Point (HACCP) systems in the Seafood Industry at: www.nzfsa.govt.nz/standards/seafood/guidelines/haccp/

Even though these have been written for other food industries they may assist egg producers in the application of HACCP principles.

To be able to read PDF files you need to have Adobe Acrobat Reader. If you haven't got it follow the instructions below:

Get Adobe Acrobat Reader from http://www.adobe.com/products/acrobat/readstep.html .

Click on "Get Acrobat Reader Free" at bottom of page.

Follow on screen instructions. When it asks if you want to use the file from its current location or download it select download. Save it to the place that it suggests – but write this down so you can find it later if necessary.

Once the file is downloaded you need to install it by:

1. **Double-clicking the newly downloaded file (that's why you need to now where it is).**
2. **Following the instructions on your screen.**

If there is a failure at any point during the installation of Acrobat Reader, the installer performs a complete uninstall. For this reason, it is important not to close the installer application by clicking its close box in the upper right corner of the background window after clicking the "Thank You" dialog box that appears at the end of the installation. If you wait for a second or two, the installer will automatically close the background windows after the installation is complete.

1.5.2 Hard Copies

The documents described in section 1.5.1 are also available through Manor House Press Ltd, phone 04 568 6071 or 04 568 89 14. Ask for a quote first as may be expensive for one off jobs.

1.6 Hazards and Other Risk Factors

Refer to Appendix C: Technical Annex for a detailed discussion of hazards and other risk factors.

Refer to the tables at the end of the Annex for a summary of the hazards and other risk factors that are dealt with in this Code of Practice.

There are four types of hazards and other risk factors:

- **Hazards to Human Health**
- **Hazards to Animal Health**
- **Risks to Wholesomeness**
- **Risks from False or Misleading Labelling**

1.6.1 Hazards to human health

There are 3 types of hazards:

- **B** = Biological hazards, e.g. pathogenic (harmful) bacteria
- **C** = Chemical hazards, e.g. chemical residues from pesticides
- **P** = Physical hazards, e.g. metal, glass

In New Zealand it is common for shell eggs to be eaten raw or only lightly cooked (either as an ingredient in another food, or on their own) so biological hazards are of particular concern.

Bacteria are the most likely biological hazard relevant to eggs. They can:

- **multiply in eggs that are not kept at the correct temperature.**
- **survive in eggs if the cooking process is not thorough.**
- **produce toxins in eggs held at the wrong temperature (and most toxins won't be destroyed by cooking).**

New Zealand is fortunate that the most common egg-borne bacterium that causes illness overseas, *Salmonella enteritidis* phage type 4, has not been detected in New Zealand eggs. In New Zealand it is other types of Salmonella and some environmental bacteria that need the most attention.

Chemical hazards are most often due to incorrect use of chemicals.

Physical hazards are unlikely to be a problem for shell eggs as they are protected by the shell.

There are 3 sources of hazards:

Inputs, e.g. raw materials, ingredients, packaging

Process, e.g. metal from machinery

Other sources, e.g. people, internal environment, pests

1.6.2 Hazards to animal health

Biological, chemical and physical hazards to animal health are likely to be similar to the ones identified as hazards to human health.

The 3 sources of hazards mentioned above will also apply here.

Eggs that are intended for animal consumption may have higher initial bacterial counts than other eggs. It is also likely that less care will be taken with this product (e.g. it may not be subject to chilled storage and may be held in containers that are open to the environment) so bacteria could be introduced and/or grow to higher numbers than in other eggs.

There is however insufficient data at present to establish the impact that this has on animal health.

1.6.3 Risks to Wholesomeness

Wholesomeness, in relation to any regulated animal product, is defined in the Animal products Act 1999 to mean that: "the product does not contain or have attached to it, enclosed with it, or in contact with it anything that is offensive, or whose presence would be unexpected or unusual in product of that description".

1.6.4 Risks from false or misleading labelling

There are two possible ways that false or misleading labels can occur:

Incorrect label design **or** **Eggs in pack do not match label**

1.7 Seven HACCP Principles

The analysis and control of hazards must be based on the principles of the Hazard Analysis and Critical Control Point (HACCP) system. It is optional to use this approach for the other risk factors (risks to wholesomeness and risks from false or misleading labelling). There are seven principles:

1. Conduct a hazard analysis
2. Determine the Critical Control Points (CCPs)
3. Establish critical limit(s)

- Examine all your processes.
- Identify what hazards are likely to harm your customer and where they may occur.
- Identify the steps in the process where you must control the hazard.
- Define what is acceptable and what is unacceptable.

PLAN IT

4. Establish a system to monitor control of the CCPs
5. Establish the corrective action to be taken when monitoring indicates that a particular CCP is not under control

- Use the system to regularly check that the identified hazards are prevented, eliminated or reduced to acceptable levels.
- Identify the person(s) responsible for this task.
- When these checks indicate that there may be a potential problem immediate action must be taken to prevent unsafe food reaching the consumer.

USE IT

6. Establish procedures for verification to confirm that the HACCP system is working effectively
7. Establish documentation concerning all procedures and records appropriate to these principles and their application

- You will need to show that your controls are working both on a short term basis (daily) and in the longer term (1-3 monthly).
- Keep up to date and maintain simple record of the checks and action taken.
- Prove that it works to yourself / your regulatory body's accredited verifier and your customer.

PROVE IT

Chapter 2:

How to develop an RMP

2.1 Introduction

2.1.1 How to use this Code of Practice

This Code Of Practice has been organised in a manner to help egg producers to develop RMPs:

Chapter 2
How to develop an RMP

This chapter lists the components that must be in an RMP (refer to 2.1.2) and then briefly covers relevant theory and requirements for each of these components.

Chapter 3
Example RMP for a Laying Farm

This chapter gives examples of each component as it applies to a layer farm RMP.

Chapter 4
Example RMP for a Grading Facility / Packhouse

This chapter gives examples of each component as it applies to a packhouse RMP.

Appendices

These appendices give definitions, abbreviations and technical information to help egg producers understand requirements. Contains blank forms and records that the egg producer can use when developing their RMP (if they haven't already got something suitable).

The diagram on the next page shows the interrelationship between various sections in the Code of Practice. It may be easier to understand each component by looking at the theory, example and blank forms together.

2.1.2 RMP Components

The following components must be included in an RMP:

Refers to section number on left of page

Refer to:	Theory	Layer farm example	Packhouse example	Forms	Records
Management authorities and responsibilities	2.2	3.2	4.2	D2	
Scope	2.3	3.3	4.3	D3	
Product description and intended purpose	2.4	3.4	4.4	D4	
Fitness for intended purpose = product outcomes for hazards and other risk factors: ❑ Hazards to human health ❑ Hazards to animal health ❑ Risks to wholesomeness ❑ Risks from false or misleading labelling	2.5	3.5	4.5	D5	
Process / operation description	2.6	3.6	4.6	D6	
Identification, Analysis and Control of hazards and other risk factors from inputs	2.7	3.7	4.7	D7	
Identification, Analysis and Control of hazards and other risk factors from other sources	2.8	3.8	4.8	D8	E
Identification, Analysis and Control of hazards and other risk factors from the process	2.9	3.9	4.9	D9	E
Operational authorities and responsibilities	2.10	3.10	4.10	D10	E
Generic corrective action procedure	2.11	3.11	4.11	D11	
Recall procedures	2.12	3.12	4.12	D12	
Operator verification	2.13	3.13	4.13	D13	
External verification	2.14	3.14	4.14	D14	
Documentation and record-keeping	2.15	3.15	4.15	D15	

2.2 Management Authorities and Responsibilities

The egg producer must document the management authorities and responsibilities for the RMP.

For examples refer to:
3.2 = layer farm
4.2 = packhouse

The following table lists the details expected for this RMP component and, where necessary, gives further guidance.

	Guidance
Business Name:	
Business Operator's Full Legal Name	**The legal name of the "Operator" is likely to be the name of:** • **a Company (Note: details must exactly match those registered with The Companies Office),** • **a Partnership, or** • **a Sole Trader.**
Business Identifier	**The business identifier is a code chosen by the egg producer. It:** • **must not be the same as an exporter ID operating from the same premises, and** • **must be a number or a number/letter combination of:** **- at least 3 and not more than 10 characters;** **- at least one character as a number;** **- no leading zeros.**
Business Address:	
Postal Address (If different from the business address):	
Registered Company Address (If different from the business address)	**For a company this must be the same as the address that is registered with the Companies Office.**
Email Address:	
Phone Number	
Fax Number	
Day to Day Manager of RMP	**Person, position or designation responsible for ensuring that the RMP is implemented as written and for maintaining the RMP in accordance with regulatory requirements.**
Deputy for Day to Day Manager of RMP	**Person, position or designation responsible for covering when day-to-day manager is absent.**

Appropriate training should be given to the following people so that they understand the importance of their role and can carry out their responsibilities effectively:

- **the "Operator",**
- **the day-to-day manager, and**
- **the deputy for the day-to-day manager.**

2.3 Scope of the risk management programme

The egg producer must document the scope of the RMP and describe its physical boundaries.

Refer to section 1.2 for a description of the difference between primary and secondary processing.

All primary processing operations must be covered by an RMP[1]. It is up to the egg producer whether or not they include any secondary processing in the RMP.

Other processes that are associated with primary processing may also be covered in the RMP. When deciding whether to include these "associated" processes the producer should consider how much interaction there is between them and the primary processing.
e.g. if a rearing shed or feedmill was on the same site as the primary process and had common staff who routinely worked in both areas then these would be considered to be associated and should be included in their entirety in the Risk Management Programme. If however they were basically 'stand alone' then they can just be treated as inputs into the Risk Management Programme.

Not every egg producer will have all of the processes that are covered in this Code of Practice. They may only have a layer farm and not a packhouse, or vice versa. They may have extra processes and choose to include them in the RMP. It is important that each egg producer makes up their own list of processes included in their own operation.

An egg producer's RMP may be developed either as a stand-alone programme for each:
- **type of animal material or product;**
- **type of process or operation;**
- **premises or place;**

or as part of a larger RMP relating to one or more materials, products, processes, operations, places or premises.

If the egg producer chooses to group products, processes, operations, places or premises into one programme then some components of the programme may need to be documented more than once to explain any differences, e.g. where hazards vary slightly with each operation. The operator should include different product outcomes for individual premises (but all outcomes must be validated).

An egg producer may have only one RMP or may split their operation into multiple RMPs – but each RMP will need to be validated, evaluated, registered, maintained and externally verified. The egg producer should consider the cost implications as well as the practicalities of maintaining multiple RMPs.

This Code of Practice has been developed with examples of 2 RMPs to cover an egg producer's operation:
- **One for the layer farm(s); and**
- **One for the packhouse.**

If an egg producer chooses to have one RMP for both operations then they can combine the two examples, delete any unnecessary repetition and develop their RMP from there.

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[1] **If an egg producer has other animal products that leave their operation then they will need to meet any requirements under the Animal Products Act for those products, e.g. If end of lay hens are sent for processing into meat products then the egg producer is not the primary processor so doesn't need an RMP for this operation. Instead, they will be treated as a poultry supplier and must have a Whole Flock Health Scheme and submit Supplier Declarations as required by the Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000.**

For examples refer to:
3.3 = layer farm
4.3 = packhouse

The following table lists the details expected for this RMP component and, where necessary, gives further guidance.

	Guidance
Business Name:	
The Type Of Premises	This is likely to be one of: • A layer farm or farms, • A packhouse, or • One or more layer farms and packhouse.
Animal materials	This should include all animal materials going into the RMP
Animal products	This should include any products coming out of the RMP that are intended for: • human consumption and • animal consumption.
Location	For each risk management programme the egg producer must describe the location (address) and the physical boundaries of the RMP. If any transport is included in the RMP then the vehicles must be listed within the scope.
Start of RMP	
Processes	
End of RMP	
Risk Factors Covered	Make it clear which of the following are covered by the RMP and which are not, and if not why: • Hazards to Animal Health • Hazards to Human Health • Risks to Wholesomeness • Risks From False or Misleading Labelling

The egg producer must describe the physical boundaries of the programme. This is normally done by using a simple site plan that show the relevant buildings and outside areas. The egg producer then clarifies the areas that are included in the RMP, usually by outlining, highlighting or shading the site plan as appropriate.

Animal Products (RMP Specification) Notice 2000, Clause:

5. Boundaries of a risk management programme –

(1) The physical boundaries of the place covered by a risk management programme must be specified in that programme.

(2) A risk management programme applies to all animal material, animal product, operations, associated things and other sources of potential risk factors within the physical boundaries of the programme.

2.4 Product description and intended purpose

The egg producer must document the description of each by-product, product or group of products that comes out of the RMP, and is intended for human or animal consumption.

Some operations will have multiple products, e.g. normal shell eggs and floor eggs (not relevant to caged operations). Some operations will only have one product e.g. those with automatic egg collectors where all eggs go straight to grading facility without prior sorting.

For examples refer to:
3.4 = layer farm
4.4 = packhouse

Animal Products (RMP Specification) Notice 2000, Clause:

6. Animal material and animal product description

The operator must document, within the risk management programme –

(a) the product name or type and intended purpose (including the intended use and intended consumer) of each animal product or group of similar products, produced under that programme; and

(b) a description of the animal material outputs under that programme.

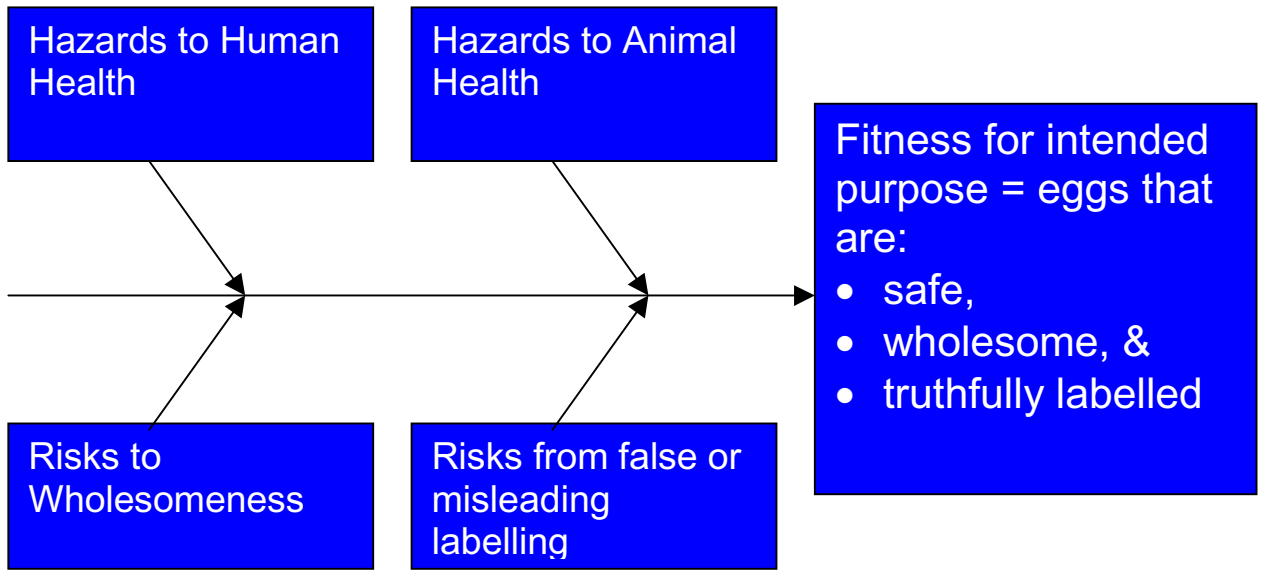
The following table lists the details expected for this component and where necessary gives further guidance.

		Guidance
Mandatory	Product Name	
	Product Description	Characteristics that help to differentiate between the different products
	Intended Use	Whether the product will be sold for use as is, or for further processing or some other end use.
	Intended Consumer	Human and/ or animal consumption with further details as appropriate .
Optional	Shelf Life	How long the product can be held before use and still maintain its safety and wholesomeness.
	Labelling	e.g. With refrigeration guidelines, Use by date, Size, Claims re free range, barn or organic.
	Packaging	
	Where it is to be sold	e.g. retail, wholesale, route trade etc
	Storage and Transport Conditions	Conditions that should be maintained in order to meet the shelf life claimed, e.g. Refrigeration at or below 15°C

2.5 Product outcomes

The egg producer must document the product outcomes for each by-product, product or group of products that comes out of the RMP, and is intended for human or animal consumption.

Products must be fit for their intended purpose as defined in product outcomes for the relevant risk factors.



Animal Products (RMP Specification) Notice 2000, Clause:

7. Fitness for purpose

(1) For each animal product, or group of similar animal products produced under a risk management programme, the operator must document within the programme, the expected outcomes for fitness for intended purpose, for each of the following risk factors defined in the Act, as applicable -

- ***(a) risks from hazards to animal or human health; and***
- ***(b) risks from false or misleading labelling; and***
- ***(c) risks to the wholesomeness of animal material or animal product.***

(2) For any animal material leaving a risk management programme, the operator must record the expected outcomes for suitability for processing, for the applicable risk factors described in subclause (1) (a)-(c).

(3) Outcomes in relation to animal material and animal product must -

- ***(a) meet all relevant animal product regulations and specifications, and***
- ***(b) where no regulations or specifications exist, contain adequate justification for the outcomes; and***
- ***(c) be measurable; and***
- ***(d) be appropriate and achievable.***

Appendix C: Technical Annex summarises the justification for the risk factors that have been selected to have product outcomes in the examples given in chapters 3 and 4.

Everyone could have a different interpretation of what this means, so the industry has had input into the examples of acceptable product outcomes used in this Code of Practice.

Product outcomes are not necessary for reject eggs as these eggs are dumped at the layer farm and will not be used for human or animal consumption.

Animal Products (RMP Specification) Notice 2000, Clause:

8. Actions when outcomes not met

(1) A risk management programme must describe the actions the operator will take if the outcomes specified in the risk management programme in accordance with clause 7 are not met.

(2) The operator must document in the risk management programme a generic corrective action procedure in accordance with clauses 12 and 13.

For examples refer to:
3.5 = layer farm
4.5 = packhouse

The following table lists the details expected for this RMP component and, where necessary, gives further guidance. In the examples in chapters 3 and 4 there is an additional column at the left to sort the hazards into biological, chemical and physical categories.

Hazard or other risk factor	Aim of RMP	Example Product outcomes	Key Control Measures	Response if outcome not met
Only need to include those that are reasonably likely to occur and that can be controlled. There should be information to justify which ones are identified.	e.g. to prevent, minimise or reduce hazard or other risk factor to acceptable levels.	Product outcomes must be developed for each product or product group and must: • meet all relevant animal product regulations and specifications, and • where no regulations or specifications exist, contain adequate justification for the outcomes; and • be measurable; and • be appropriate and achievable. Where it is not practical for a risk factor to be measured within the RMP the operator may put "level not yet defined" for the outcome so long as key control measures are identified.	This covers the Critical Control Points (CCPs) and other controls within the process or supporting systems that make the most difference to the level of hazard or other risk factor that is present in the product.	This should cover: • restoration of control, product disposition (where relevant) and • what will be done to prevent the problem from happening again (including an investigation of why problem happened).

2.5.1 Product outcomes for hazards to human health

These must cover biological, chemical and physical hazards that can be controlled by the egg producer.

Animal Products Regulation 2000, Clause 6:

Animal product to be free of certain hazards, objects, materials, and substances--
(1) Taking into consideration its intended use, animal product must be free from—
(a) biological, chemical, and physical hazards in amounts that may be directly or indirectly harmful to humans or animals:
(b) extraneous objects, material, and substances of a kind not expected to be in animal product that is prepared or packed for trade in accordance with good trade practices:
(c) animal material in amounts that may be directly or indirectly harmful to humans and animals for which the animal product is intended.

Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000[2], Clause:

105 Application of clauses 106 and 107
Clauses 106 and 107 apply to operators of primary processing premises who process avian eggs for human consumption.

106 General requirements
The operator must ensure that layer flocks producing eggs for processing are subject to and comply with a whole flock health scheme designed to ensure that hazards associated with eggs which are likely to affect human health are identified and managed in an appropriate manner.

107 Shell eggs
(1) Eggs that are intended to be traded in the shell must —
(a) be visibly clean; and
(b) have no cracks that are visible on candling (or equivalent) unless they have been treated by a process that destroys pathogenic organisms; and
(c) have no evidence of embryo development, or putrefaction, and no significant blood clots; and
(d) not have been incubated; and
(e) be handled and stored under conditions that minimise condensation on the surface of the eggs.
(2) Any primary processing of eggs intended to be traded in the shell that compromises the integrity of the shell, must be minimised.

FSANZ Food Standards Code: Standard 2.2.2: Egg and Egg Products

This Standard provides definitions for egg and egg products. Processing requirements for egg products and requirements relating to the sale of cracked eggs are included in this Standard and Standard 1.6.2.

1 Interpretation ***In this Code -***
egg ***means the reproductive body in shells obtained from any avian species, the shell being free from visible cracks, faecal matter, soil or other foreign matter.***

egg products ***means the content of egg, as part or whole, in liquid, frozen or dried form.***

[2] **This is likely to be deleted or to simply refer to the FSANZ Food Standards Code, Standard 2.2.2.**

visible cracks ***includes cracks visible by candling.***

2 Processing of egg products

(1) Subject to subclause (2), egg products must be pasteurised or undergo an equivalent treatment so that the egg product meets the microbiological criteria specified in Standard 1.6.1.[3]

(2) Subclause (1) does not apply to the non-retail sale of egg products used in a food which is pasteurised or undergoes an equivalent treatment so that the egg product used in the food meets the microbiological criteria specified in Standard 1.6.1.

3 Sale of cracked eggs
(1) Cracked eggs must not be made available for retail sale or for catering purposes.
(2) Cracked eggs sold for non-retail must be pasteurised or have undergone an equivalent treatment[4] so that the egg product meets the microbiological criteria specified in Standard 1.6.1.

Editorial Note:
Standard 1.2.3 requires unpasteurised egg and egg products to be labelled with an advisory statement that the product is unpasteurised.

2.5.2 Product outcomes for risks to wholesomeness

These must cover problems that customers will find offensive or unexpected in product of that type. It is worth reviewing customer complaints to see what should be included in this category.

2.5.3 Product outcomes for risks from false or misleading labelling

Animal Products Regulation 2000, Clause 8:

Animal product not to be associated with false or misleading representation--
Animal product must not be associated with a false or misleading representation of any kind concerning its--
(a) fitness for intended purpose:
(b) nature:
(c) origin:
(d) composition:
(e) ingredients or other constituents:
(f) proportion of ingredients or other constituents.

Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000, Clause:

[3] **Standard 1.6.1 includes mandatory sampling plans, used to sample lots or consignments of nominated foods or classes of foods, and the criteria for determining when a lot or consignment of food poses a risk to human health and therefore should not be offered for sale, or further used in the preparation of food for sale. The criteria for eggs is given below.**

n = the minimum number of sample units which must be examined from a lot of food
c =the maximum allowable number of defective sample units as specified in Column 4 of the Schedule.
m = the acceptable microbiological level in a sample unit.
M = the level when exceeded in one or more samples that would cause the lot to be rejected.

Food	Micro-organism	n	c	m	M
Pasteurised egg products (or equivalent treatment)	Salmonella/25g	5	0	0	0

[4] **For their own protection, it is strongly recommended that egg producers only sell cracked eggs to those operators that have documented evidence that they have validated their processes to show that they can consistently meet the requirements of Standard 1.6.1.**

32 Labelling

(1) Labelling must be provided on transportation outers and must state —
(a) the animal material or animal product name or description; and
(b) storage directions, where necessary to maintain the animal material as suitable for processing or animal product as fit for intended purpose; and
(c) lot identification (except that this requirement is optional if the application of lot identification to the retail packaging is a mandatory requirement under other legislation and that legislation is complied with); and
(d) in the case of fish or fish product, the scientific name of the fish (as specified in Schedule 4 or as approved by the Director-General).

(2) Mandatory labelling must be clear, legible, indelible, and use terms that are commonly used in the English language.

(3) In the case of the transportation outers used for the transportation of unpackaged bulk materials that cannot practicably be labelled, the information specified in subclause (1) may be contained within the accompanying documentation.

(4) The transportation outer of animal material or animal product that is not intended for human consumption but has the appearance of, or could be mistaken for, animal material or animal product that is intended for human consumption, must be labelled to clearly indicate that the animal material or animal product it contains is not intended for human consumption.

(5) If the status of an animal material's suitability for processing, or the fitness for intended purpose of the animal product changes, and the animal material or animal product has been labelled, this labelling must be amended to reflect the new status prior to its release for trade.

The outcomes should also cover the claims that are made on the label with respect to caged, barn, free range or organic eggs.

2.5.4 Product outcomes for hazards to animal health

There is currently insufficient information to set scientifically-based product outcomes for this. Until such information becomes available, these product outcomes may be set based on process capability, customer requirements or on the product outcomes used for human health. There must be a product outcome requiring clear labelling of products intended for animal consumption so that they are not confused with products for human consumption.

2.5.5 Review of product outcomes

All product outcomes should be reviewed after hazard and other risk factor analysis to confirm that they are appropriate and achievable.

2.5.6 Other outcomes

An egg producer may wish to set other outcomes to meet customer requirements; (e.g. for supermarkets) and their own business needs. These outcomes are over and above regulatory requirements. If the egg producer includes them in the RMP they will be subject to validation, evaluation and verification just like the rest of the RMP. This could cause unnecessary complexity and added costs so it is recommended that they are not included in the RMP unless there are other benefits from doing this.

2.6 Process description

The egg producer must document the processes that are included within the scope of the RMP (as described in section 2.2.)

The easiest way to document this is using process a flow diagram. The start and end point of the process may be different to the example given on the next page.

In cases where the egg producer does not cover all of the processes from laying to packing then the RMP only covers the operations that are under the egg producer's control.

If other operations, e.g. hatcheries, rearing farms and /or feedmills have been incorporated into the RMP then process flow diagrams will also need to be drawn for these operations.

Animal Products (RMP Specification) Notice 2000, Clause:

9. Describing the process or operation

Every process or operation carried out under a risk management programme must be documented by the operator within the programme, including –

(a) any input relevant to the suitability for processing of animal material or fitness for purpose of animal product; and

(b) the main activities in the process or operation; and

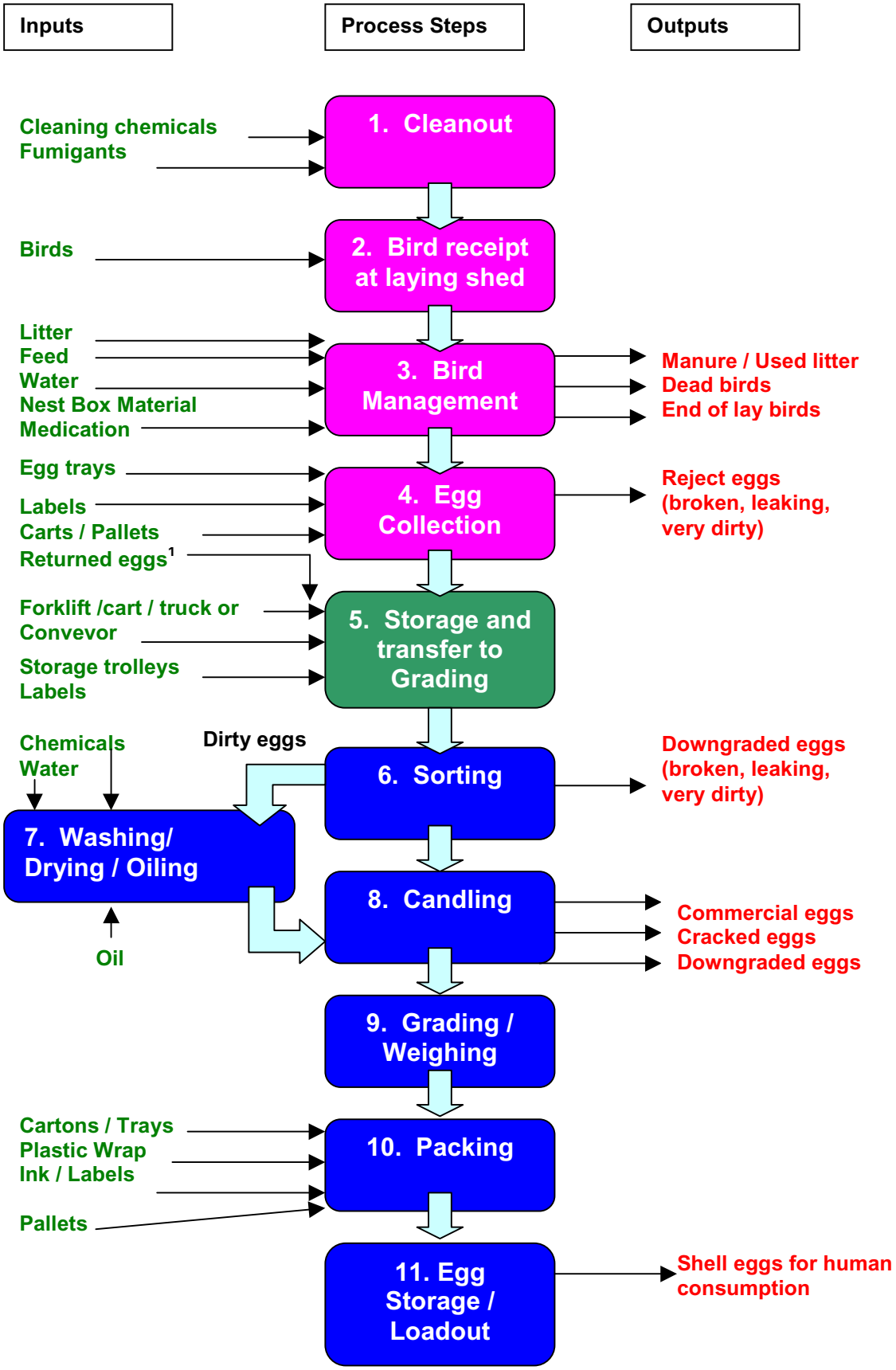
(c) all outputs of the risk management programme.

The following table lists the details expected for this component and where necessary gives further guidance.

	Guidance
Inputs	**This should include all raw materials (eggs), packaging, processing aids, returned eggs etc.** **NB: The "inputs" shown in the diagram on the next page include other items that impact indirectly on the egg and are more correctly "other sources" of hazards/risk factors. They have however been included in the diagram under "inputs" to show the most likely place where they impact on the process.**
Process steps	**This should include the first step from the defined starting point of the RMP and each subsequent step until the end of the RMP. If there are processes that flow into, or out of, the main process flow, then this should also be shown.**
Outputs	**This should include all products leaving the RMP irrespective of whether they are intended to go to:** • **Another RMP or to secondary processing** • **Human Consumption** • **Animal Consumption** • **Waste**

The description is likely to vary with each RMP so the example that is given on the next page will need to be adapted to accurately reflect the egg producer's actual scope of operations. This has been done in the examples that are referred to below.

For examples refer to:
3.6 = layer farm
4.6 = packhouse



[1] If there are any returned eggs or rework, amend diagram to show any extra relevant steps.

2.7 Identification, Analysis and Control of Hazards and Other Risk Factors From Inputs

The egg producer must document:

- **the hazards and other risk factors that are reasonably likely to be associated with each input, and**
- **how each identified hazard or other risk factor is controlled by the RMP.**

Refer to Section 1.6 for an introduction to hazards and other risk factors

Refer to Appendix C: Technical Annex for a detailed discussion of hazards and other risk factors

Animal Products (RMP Specification) Notice 2000, Clause:[5]

10. Identification and analysis of hazards

(1) The hazard analysis required under section 17(3) of the Act must be documented in the risk management programme.

(2) Uncontrolled hazards must be clearly documented in the risk management programme.

11. Control of hazards

(1) For all controls, the operator must have documented procedures which will ensure compliance with the appropriate specifications, good hygienic practice and any other requirements described in the risk management programme including -

- ***(a) any monitoring procedures that are to be applied; and***
- ***(b) any corrective action procedures that will be applied in the event of loss of control, including—***
  - ***(i) how control will be restored; and***
  - ***(ii) how any affected animal material and animal product will be controlled or disposed of; and***
  - ***(iii) any measures to be taken to prevent reoccurrence of the loss of control; and***
- ***(c) any ongoing operator verification procedures.***

(2) In addition to subclause (1), the operator must document the following in relation to each identified critical control point within the risk management programme -

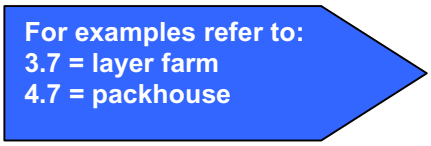
- ***(a) the critical control point, and the justification for its identification; and***
- ***(b) the critical limits to be met and the justification for those limits.***

Start by considering the hazards and other risk factors, and the possible controls that have been identified in the Summary tables in Appendix C: Technical Annex, section 13.

For each input, except water, with identified hazards or risk factors go through the analysis in 2.7.1 to 2.7.5. We do not expect people to identify Critical Control Points (CCPs) in association with these inputs.

For water go to 2.7.6.

[5] This specification also applies to identification and analysis of hazards associated with the process steps and other sources.



2.7.1 Name the Input

e.g. raw material, ingredient, packaging etc.

2.7.2 Document the Relevant Hazards or Other Risk Factors

Refer to Appendix C: Technical Annex, section 13 and select the hazards and other risk factors that are reasonably likely to occur and are relevant to the input. Add in any additional hazards or other risk factors that are associated with the inputs that are specific to your own operation.

2.7.3 Develop Supplier Requirements

It is sensible to get the supplier to eliminate or minimise the hazards and other risk factors as much as possible. Do this by setting requirements that they must meet.

Regulatory Requirements
Include any relevant regulatory requirements (from Regulations or Specifications).
Operator-Defined Requirements
Include any relevant requirements of your own. You may get ideas from this Code of Practice.

Discuss these requirements with your supplier and get their agreement to meet them.

2.7.4 Document the Egg Producer's Procedures to Check the Supplier has Met Above Requirements and to Control Input Until It is Used

Procedures must cover controls, monitoring, corrective action and operator verification in sufficient detail to enable the hazards and other risk factors to be controlled adequately. The following details are recommended.

Monitoring Procedures

- **Who is responsible for doing the monitoring;**
- **What is going to be done;**
- **How is the monitoring to be carried out;**
- **When is it to be done, i.e. frequency;**
- **How the observations are to be recorded.**

Corrective action procedures:

- **Who is responsible for taking corrective action;**
- **How control is to be restored;**
- **If product is involved, how control and disposition of non-conforming product is to be managed;**
- **What action is to be taken to prevent the problem from happening again;**
- **What escalating response is available if preventative action fails;**
- **How the above actions are to be recorded.**

Operator verification procedures:

These procedures must cover internal verification of the effectiveness and compliance with above procedures. Document:

- **Who is responsible for it**
- **How it is done**
- **When it is to be done**
- **The follow-up action to be taken when non-compliance occurs**
- **What is to be recorded.**

In some cases it may be possible to reduce these details into a table. In other cases more detailed procedures will be required, e.g. for a Whole Flock Health Scheme or a Pest Control System. Common sense should be applied when deciding on the level of detail needed.

2.7.5 Record-keeping

Records are expected for all monitoring, corrective action and operator verification activities. The actual records that contain these details should be identified here.

2.7.6 Identification and Control of Risk Factors From Inputs – Water

The egg producer must document how they meet the Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000 requirements for water.

There are a number of different options available to the operator for controlling water.

The Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000, clause 3 states:

"potable water means water that —

(a) in relation to water supplied by an independent supplier (including a public or private supplier), is of a standard administered by the independent supplier under the Health Act 1956 and any regulations made under that Act; or

(b) in relation to water supplied by the operator solely for the use of the operator (such as bore water, rainwater, surface water, or ground water), —

(i) is of a standard equivalent to that referred to in paragraph (a), as determined by the operator based on an analysis of hazards and other risk factors; or

(ii) complies with the requirements in Schedule 1; or

(c) meets the requirements of the current "Meat Division Circulars 86/3/2: Surveillance of Potable Water in Meat and Game Export Premises" issued by the Ministry."

The Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000, clauses 8, 9 and 11 – 14 state:

"8 Water coming into contact with animal material or animal product

(1) Water (including ice and steam) that comes into direct contact or indirect contact with animal material or animal product must be potable water, or clean seawater at the point of use.

(2) Despite subclause (1), the operator may use an alternative water quality standard as determined by the operator provided —

(a) the water quality standard is determined by an analysis of hazards and other risk factors; and

(b) the suitability for processing of animal material or fitness for intended purpose of animal product is not adversely affected.

(3) Subclauses (1) and (2) do not apply to water used for live animals, or to water used for washing bivalve molluscan shellfish prior to depuration, or for depuration, or for wet storage.

(4) The water used for activities relating to bivalve molluscan shellfish referred to in subclause (3) must comply with the requirements in the shellfish regulated control scheme.

9 Water not coming into contact with animal material or animal product

(1) Water that does not come into direct contact or indirect contact with animal material or animal product must meet the requirements of clause 8, or may meet an alternative non-contact water quality standard.

(2) If an alternative non-contact water quality standard is used, the appropriate standard must be determined by the operator —

(a) by an analysis of hazards and other risk factors; and

(b) taking into consideration the intended use of the water.

11 Requirement for reticulation management plan

(1) The operator must implement a reticulation management plan for potable water used within a premises or place, (including its use on fishing vessels), where the water is supplied by an independent supplier.

(2) The reticulation management plan must include —

(a) systems to ensure that reticulation of water throughout the premises or place is not adversely affected and that the intended water quality is delivered at point of use; and

(b) systems to ensure that there is no unintentional mixing of water of different standards; and

(c) an action plan with appropriate sanitation procedures to be implemented in the event of non-compliance with the reticulation management plan.

12 Requirement for water management plan

(1) The operator must implement a water management plan for water described in clause 8 if —

(a) water is supplied by an independent supplier and is subjected to any treatment by the operator; or

(b) water is supplied by the operator solely for the operator's use; or

(c) an alternative water quality standard as described in clause 8(2) is used; or

(d) clean seawater is used in a land based premises or place.

(2) The water management plan must include —

(a) any additional treatments —

(i) as required by the operator supplying potable water or using clean seawater in a land based premises or place; or

(ii) in the case of an alternative water quality standard, as determined through the analysis of hazards and other risk factors; and

(b) the water quality standard (including criteria) as determined through an analysis of hazards and other risk factors; and

(c) a water sampling and testing programme; and

(d) an action plan in the event of non-compliance with the water management plan; and

(e) the requirements of the reticulation management plan described in clause 11(2).

13 Water analyses

(1) Water analyses used to demonstrate compliance with clause 12 must be performed by a MILAB laboratory registered for the required analyses, or a laboratory with persons who are accredited as signatories for the required analyses.

(2) The operator must ensure that the training of water samplers is undertaken by a laboratory referred to in subclause (1).

(3) Subclause (1) does not apply to chlorine, pH or turbidity measurements, which are performed by a suitably skilled person using documented test methodologies (including calibration procedures) and/or calibrated equipment.

14 Non-complying water

(1) This clause applies only to water to which clause 8 applies.

(2) If potable water supplied by an independent supplier is used, and the independent supplier advises the operator that the water is not fit for drinking without additional treatment, or the operator has reason to believe that the water is not fit for use, and the operator has no other means described in the risk management programme to ensure the water is potable at the point of use, all operations involving that water must cease.

(3) If water used is supplied by the operator, or is of an alternative water quality standard that has been determined under clause 8(2), or is clean seawater used in a land based premises or place, and the operator fails to comply with any of the requirements of the water management plan (including corrective actions), and has no other means described in the risk management programme to ensure the water meets the original standard at the point of use, all operations involving that water must cease."

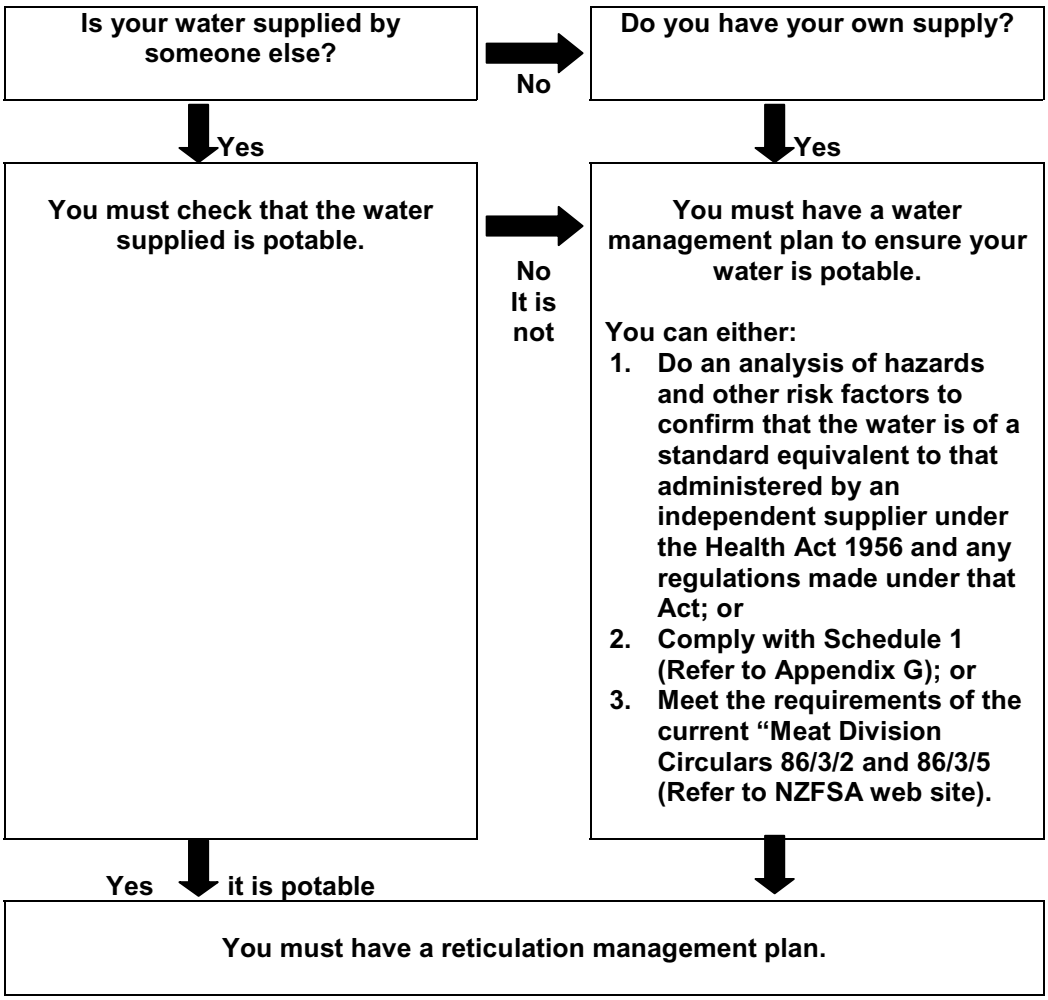
Under the above specifications:

- **any water that contacts the egg must be "potable.**
- **it is not mandatory for hen's drinking water to be "potable".**

In contrast the Animal Welfare Code does require hen's drinking water to be "potable".

For simplicity in this Code of Practice we have chosen to ensure that all water on the laying farm and at the Packhouse is "potable".

In summary, the way that an egg producer needs to control water safety depends on whether they have their own supply or if they get water off someone else (e.g. the local Council).



If you have a combination of supplies you will have to meet the requirements for each one.

Record which potability options you have chosen for each of your water supplies. The following table lists the details expected for this component and where necessary gives further guidance.

	Guidance
Water Supplier:	e.g.: • Independent supplier (local council) • egg producer
Water source:	Not necessary for independent supplies. Record details for any water supplied by egg producer: e.g.: • secure groundwater (bore) • surface water (spring, shallow well, lake, reservoir, stream) • roof
Water potability option:	e.g.: • Health Act 1956 • Analysis of hazards and other risk factors • Schedule 1 • Meat Circulars 86/3/2 and 86/3/5
Water Management Plan	Where it is necessary to have a water management plan as per Specification 12 on page 2-17 then state how you meet the Specification.
Water Reticulation Plan	State how you meet Specification 11 on page 2-17.
Records	State where to find the records showing that the chosen potability option has been met. e.g. Approved Supplier file in Manager's office with following details included: • Letter from independent supplier confirming they operate under Health Act 1956 – filed in Approved Supplier file. • Hazard and other risk factor analysis information. • Completed "Assessment of Water Supply Status Checklist" from Schedule 1. • Laboratory Test Reports confirming that Meat Circular requirements have been met.

2.8 Analysis / Control of Hazards and Other Risk Factors From Other Sources

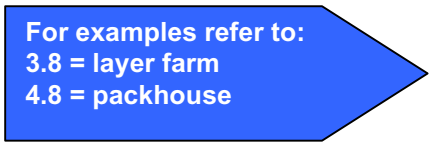
The egg producer must identify and document the hazards and other risk factors that are reasonably likely to be associated with sources other than the inputs and the process itself, e.g. with:

- **Chemicals;**
- **Pests;**
- **Internal environs, facilities and equipment;**
- **External environs; and.**
- **Personnel.**

The egg producer must document the application of the 7 HACCP principles to determine how to best control the identified hazards (using Critical Control Points (CCPs) or other controls).

The egg producer must document how the other risk factors that have been identified are controlled by the RMP. It is optional to apply the HACCP principles to these other risk factors.

For each source go through the analysis below.



2.8.1 Name the Source

2.8.2 Identify the Scope

Clarify what is included and what is not included in this analysis.

2.8.3 Develop Requirements

Regulatory Requirements
Include any relevant regulatory requirements (from Regulations or Specifications).
Operator-Defined Requirements
Include any relevant requirements of your own. You may get ideas from this Code of Practice.

2.8.4 Draw Process flow diagram[6]

Inputs	Process steps	Outputs

[6] Process flow diagrams are not always appropriate. Their use is optional.

2.8.5 Identify / Analyse Hazards and Other Risk Factors and Determine CCPs[7]

Refer to Appendix C: Technical Annex, section 13 and select the hazards and other risk factors that are reasonably likely to occur and are relevant to the source. Add any additional hazards or other risk factors that are associated with the input that are specific to your own operation.

Answer the questions in the following table after considering the written evidence (records) of the effectiveness of current controls you have in place (including any CCPs).
There are no CCPs where the relevant requirements are non-measurable.

			Q1: Is hazard reasonably likely to contact product?	**Q2:** Could the level of hazard exceed the measurable requirement?	**Q3:** Is there one or more new or improved controls that will achieve the measurable requirement?	**Q4:** Are there any other controls?
Hazard or Risk Factor reasonably likely to occur with each source[8]	**Current Control measures, e.g.** **GHP / GMP / CCP**	**Is there a relevant measurable requirement? (See 2.9.3)**	**If yes, go to Q2.** **If no, not a CCP. Go to next hazard or risk factor.**	**If yes, go to Q3.** **If no, not a CCP. Go to next hazard or risk factor.**	**If no, go to Q4.** **If yes set up CCP to meet measurable requirement and also go to Q4.**	**If yes, redesign / establish GMP/GHP to meet remaining requirements.** **If no, and no CCPs list as uncontrolled. Consider at process analysis.**

2.8.6 Determine Critical Limits

Determine critical limits for each CCP (see table below).

CCP No.	CCP	Critical Limits

For non-CCPs, establish criteria for controls, where necessary, within the relevant procedures.

It is a good idea to review the operator-defined requirements to ensure that they are still relevant after the analysis has been completed.

[7] If an egg producer is happy with the analysis in the relevant section of the COP then it is recommended that they just include a cross reference to that section rather than repeating the analysis in their RMP. The section that is cross referenced will become part of their RMP.
[8] An extra column may be inserted at the start of the table to further identify the sources of hazards.
Where there are no measurable outcomes the 4 right hand columns containing the questions should be deleted as these are related to CCP determination which is irrelevant in this situation.
Refer to 3.9.2.4 for an example where these variations have been used.

2.8.7 Document Procedures

Procedures must cover controls, monitoring, corrective action and operator verification in sufficient detail to enable the hazards and other risk factors to be controlled adequately. The following details are recommended.

Monitoring Procedures

- **Who is responsible for doing the monitoring;**
- **What is going to be done;**
- **How is the monitoring to be carried out;**
- **When is it to be done, i.e. frequency;**
- **How the observations are to be recorded.**

Corrective action procedures:

Cover the following key points when critical limits are not met at a CCP, or when general control measures are not being complied with:

- **Who is responsible for taking corrective action;**
- **How control is to be restored;**
- **If product is involved, how control and disposition of non-conforming product is to be managed;**
- **What action is to be taken to prevent the problem from happening again;**
- **What escalating response is available if preventative action fails;**
- **How the above actions are to be recorded.**

Operator verification procedures:

These procedures must cover internal verification of the effectiveness and compliance with above procedures. Document:

- **Who is responsible for verification**
- **How it is done**
- **When it is to be done**
- **The follow-up action to be taken when non-compliance occurs**
- **What is to be recorded.**

In some cases it may be possible to reduce these details into a table. In other cases more detailed procedures will be required, e.g. for a Whole Flock Health Scheme or a Pest Control System. Common sense should be applied when deciding on the level of detail needed.

2.8.8 Documentation and record-keeping

Documentation is expected for all steps in the application of the HACCP principles, as outlined above. This includes each CCP, where relevant, and all general controls.

Records are expected for all monitoring, corrective action and operator verification activities, both in relation to CCPs and general controls.

Note: **some control measures may be repeated in other supporting systems. If this occurs only one set of documentation and records is necessary for each control measure.**

2.9 Analysis / Control of Hazards and Other Risk Factors From the Process

The egg producer must identify and document the hazards and other risk factors that are reasonably likely to be associated with the process itself.

The egg producer must document the application of the 7 HACCP principles to determine how to best control the identified hazards (using Critical Control Points (CCPs) or other controls).

The egg producer must document how the other risk factors that have been identified are controlled by the RMP. It is optional to apply the HACCP principles to these other risk factors.

2.9.1 Analyse hazards and other risk factors at each process step

For examples refer to:
3.9 = layer farm
4.9 = packhouse

Refer back to 2.6 to get the process steps and their associated inputs. Enter these into the first two columns in the following table.
Then refer to 2.7 for the hazards and risk factors related to each input. Enter these into the third column in the following table.
When answering questions 1-3 consider the "unacceptable level" as that which exceeds the product outcomes set in 2.5.

				Q1. Could the risk factor be present in or on the eggs at unacceptable levels at this step?	Q2. Is there a control measure at this step that would prevent unacceptable levels of the risk factor or reduce it to acceptable levels?	Q3. Is there a control measure available at a previous step?		Q4: **Are there any other non-measurable controls?**
Process step	Input Name	Hazard or other risk factor associated with input	Hazards and other risk factors from process step, and potential impact of process step on existing hazards and other risk factors	Justify answer. If no not a CCP. Go to Q4. If yes, go to Q2 and Q3.	If no go to Q3. If yes, this step is a CCP. Go to Q4.	If yes, assign the previous step as a CCP	CCP No	If no, and no CCPs list as uncontrolled. If yes, redesign / establish general controls to meet outcomes.
1.								

2.9.2 Determine Critical Limits

Determine critical limits for each CCP (see table below).

CCP No.	CCP	Critical Limits

For other controls establish general criteria for control.

General Control Criteria

It is a good idea to review the measurable outcomes to ensure that they are still relevant after the analysis has been completed.

2.9.3 Document Procedures

Procedures must cover controls, monitoring, corrective action and operator verification in sufficient detail to enable the hazards and other risk factors to be controlled adequately. The following details are recommended.

Monitoring Procedures

- **Who is responsible for doing the monitoring;**
- **What is going to be done;**
- **How is the monitoring to be carried out;**
- **When is it to be done, i.e. frequency;**
- **How the observations are to be recorded.**

Corrective action procedures:

Cover the following key points when critical limits are not met at a CCP, or when general control measures are not being complied with:

- **Who is responsible for taking corrective action;**
- **How control is to be restored;**
- **If product is involved, how control and disposition of non-conforming product is to be managed;**
- **What action is to be taken to prevent the problem from happening again;**
- **What escalating response is available if preventative action fails;**
- **How the above actions are to be recorded.**

Operator verification procedures:

These procedures must cover internal verification of the effectiveness and compliance with above procedures. Document:

- **Who is responsible for verification**
- **How it is done**
- **When it is to be done**
- **The follow-up action to be taken when non-compliance occurs**
- **What is to be recorded.**

In some cases it may be possible to reduce these details into a table. In other cases more detailed procedures will be required, e.g. for a Whole Flock Health Scheme or a Pest Control System. Common sense should be applied when deciding on the level of detail needed.

2.9.4 Documentation and record-keeping

Documentation is expected for all steps in the application of the HACCP principles, as outlined above. This includes each CCP, where relevant, and all general controls.

Records are expected for all monitoring, corrective action and operator verification activities, both in relation to CCPs and general controls.

Note: **some control measures may be repeated in other supporting systems. If this occurs only one set of documentation and records is necessary for each control measure.**

2.10 Operational authorities and responsibilities

The egg producer must document in the RMP, who is responsible for monitoring, corrective action and operator verification activities.

2.10.1 Requirements

Animal Products (RMP Specification) Notice 2000, Clause:

14. Identities of responsible persons

The operator must document in the risk management programme the identity (either by position, designation or name) and responsibilities of all persons responsible for monitoring, corrective action, and operator verification activities.

For examples refer to:
3.10 = layer farm
4.10 = packhouse

2.10.2 Recommendations

It is important that all those who have responsibilities for all or part of the risk management programme understand the importance of their role. Appropriate training and supervision should be provided for each person.

HACCP training is recommended for all egg producers and / or the person in charge of their RMP. NZQA Unit Standards are currently under development for this and should be available shortly.

Specific "on the job" training should be given to those who have responsibilities under the RMP. This should include:

- **Brief introduction to the RMP as a whole and what it is for; and**
- **Familiarisation with relevant parts of the operator's RMP; and**
- **Explanation of what their specific responsibilities are and why they are important; and**
- **When and how to do each task and fill out the associated records; and**
- **What to do when things go wrong (corrective action).**

It is recommended that all training is recorded, no matter how informal it is.

2.11 Generic corrective action procedure

The egg producer must document in the RMP, a procedure for when something unforeseen goes wrong.

For examples refer to:
3.11 = layer farm
4.11 = packhouse

Animal Products (RMP Specification) Notice 2000, Clause:

13. Generic Corrective Action

(1) Non-complying animal material or animal product must be identified and retained separately under inventory control pending a full assessment by a suitably-skilled person (nominated by the egg producer), of the relevant processing records, animal material or animal product, to identify any potential risk factors.

(2) For the purposes of subclause (1), non-complying animal material or animal product means it is produced -
- ***(a) using a process or associated thing that deviates from the risk management programme; or***
- ***(b) not in compliance with the outcomes documented in the risk management programme; or***
- ***(c) where an unforeseen hazard or other risk factor arises; and***
- ***(d) when a specific corrective action has not been complied with or has not been identified in the risk management programme.***

(3) The suitably-skilled person must make a decision regarding the suitability for processing of the animal material, or the fitness for intended purpose of the animal product, and based on the assessment, ensure the appropriate disposition is carried out.

(4) The suitably skilled person must complete and sign a full report on the management of the non-compliance, including details of -
- ***(a) the deviation from the risk management programme, and the impact on any hazards or other risk factors present in the animal material or animal product; and***
- ***(b) the identification of the affected animal material or animal product; and***
- ***(c) any additional processing of the animal material or animal product; and***
- ***(d) the analyses made to reach the final decision; and***
- ***(e) the decision on the disposition of the animal material or animal product; and***
- ***(f) confirmation that the disposition of animal material or animal product has been carried out; and***
- ***(g) any actions taken to prevent recurrence of the non-compliance.***

(5) The egg producer must provide, as soon as practicable, the report prepared under (4) to MAF's Director-General or an animal product officer.

(6) The egg producer must bring to the attention of the accredited verifier at the next verification visit, any use of the generic corrective action procedure.

2.12 Recall Procedure

The egg producer must document in the RMP, their procedures for recall of animal product, where it is found to be unfit for intended purpose or not identified or labelled correctly.

There may be times when, despite the use of a risk management programme, non-conforming product is produced. If this is detected and corrected "in house", the operator is able to manage the situation using the normal non-conformance and corrective action systems. If however, some of the product has got out into the distribution chain or further, then it may be necessary to initiate a product recall to recover the product as quickly as possible, particularly to minimise the risk to human or animal health.

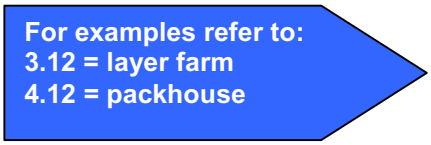
2.12.1 What must be in the recall system?

Animal Products (RMP Specification) Notice 2000, Clause:

26. Recall

The operator must notify the Director-General as soon as practicable when animal product is recalled because it is or may not be fit for its intended purpose.

The procedure should prompt the operator to notify the Director-General (attention Programme Manager Operations, Animal Products Group).



2.12.2 What should be in the recall system?

The following elements should be considered when establishing recall procedures:

- **a system to identify and trace all inputs, work-in-progress and final products;**
- **responsibilities and authorities for recalls;**
- **risk assessment and decision whether or not to recall;**
- **communication and documentation;**
- **product recovery and disposition;**
- **corrective and preventive action; and**
- **review of recall effectiveness.**

There are a number of guidance documents already available which may assist the operator to develop appropriate recall procedures. These include:

- **Recalls – Originally issued by Ministry Of Health as section 15 of their Food Administration Manual. Available from Processed Foods and Retail Sale Group, New Zealand Food Safety Authority, P O Box 2835, Wellington.**
- **Meat Industry Standards Council Circular 99/MISC/6: Recall Procedures for Meat and Meat Products. This is available at the Meat industry Association's web site at http://www.mia.co.nz/misc_circulars/99misc6.doc.**
- **Guidelines for Seafood Recall Programmes – issued by the Fishing Industry Inspection and Certification Council. This is available on the NZFSA web site at http://www.nzfsa.govt.nz/Standards/seafood/guidelines/index.htm**
- **Food Industry Recall Protocol – issued by the Food Standards Australia New Zealand (FSANZ, formerly ANZFA). This is available on the ANZFA web site at http://www.anzfa.gov.au/FoodRecall/.**

2.13 Operator Verification

The egg producer must document how they will validate and verify the effectiveness of the RMP.

Operator Verification includes both validation, revalidation and ongoing review and audit. The requirements are shown below.

For examples refer to:
3.13 = layer farm
4.13 = packhouse

Animal Products (RMP Specification) Notice 2000, Clause:

18. Validation

(1) The operator must -

(a) validate the risk management programme when it is first developed; and

(b) complete the validation of the registered risk management programme once the collection of data is completed in accordance with the protocol provided in subclause (3)(b); and

(c) re-validate the risk management programme when it is amended.

(2) The validation and re-validation activities described in subclause (1) must demonstrate -

(a) the documentation is complete and complies with the requirements of the Act and any relevant animal product regulations and specifications; and

(b) the risk management programme is capable of achieving its outcomes; and

(c) that, in the case where an amended risk management programme is implemented, it will consistently deliver the documented outcomes.

Clause (2):

(a) means checking that all RMP components are present and comply with legislation. If the RMP has been based on this Code of Practice this should be correct.

(b) means showing that the product outcomes are practical and reasonable. Again, If the RMP has been based on this Code of Practice this should be correct.

(c) requires the egg producer to collect data to prove that they meet the product outcomes. If it is not possible to complete this prior to registration the egg producer must develop a validation protocol explaining how this will be done after the RMP is registered and what will happen to the eggs produced during the validation period.

Animal Products (RMP Specification) Notice 2000, Clause:

24. Operator verification activities

(1) In addition to the specific validation procedure in clause 18, the operator must document a system in the risk management programme that covers all the components of operator verification including -

(a) the operator verification activities to be undertaken, their required frequency; and

(b) any actions to be undertaken when corrective actions are not effective; and

(c) any actions to be undertaken when the risk management programme is not effective including the generic corrective action procedure; and

(d) any recording and reporting requirements.

(2) All operator verification activities must be transparent and traceable, and undertaken by suitably skilled persons nominated by the operator.

2.14 External verification

(Sections 17 (4) of the Animal Products Act)

The egg producer must document their provisions for external verification activities and verifiers rights within the RMP.

2.14.1 What must be included in "Provision for Verification Activities and Verifier's Rights"

For examples refer to:
3.14 = layer farm
4.14= packhouse

Animal Products (RMP Specification) Notice 2000, Clause:

15. Verifiers' freedom and access to carry out verification functions

Risk management programmes must include provisions authorising accredited verifiers to have the freedom and access necessary to allow them to carry out verification functions and activities, including -

(a) having access to all parts of the premises or place and facilities within the physical boundaries of or relating to the risk management programme; and

(b) having access to all documentation, records and information relating to, or comprising, the risk management programme (including records held in electronic or other form); and

(c) having freedom to examine all things necessary and open any containers, packages and other associated things to inspect their contents; and

(d) having freedom to identify or mark any animal material, animal product, equipment, package, container or other associated thing; and

(e) having freedom to -

- ***(i) examine and take samples of any animal material, animal product or any other input, substance, or associated thing which has been, is, or may be in contact with, or in the vicinity of, any animal material or animal product; and***
- ***(ii) test, or analyse, or arrange for the testing, or analysis of such samples; and***
- ***(iii) order retention of raw materials including animal material, ingredients, animal products, packaging or equipment pending testing results and decisions on disposition; and***

(f) having authority where there may be significant risk to fitness for intended purpose of animal product or suitability for processing of animal material to detain any animal material and animal products or other relevant things in the event of non-compliance with the risk management programme; and

(g) having authority in cases of significant risk to fitness for intended purpose of animal product or suitability of animal material for processing to intervene and direct a temporary interruption of processing until the cause of the risk has been remedied.

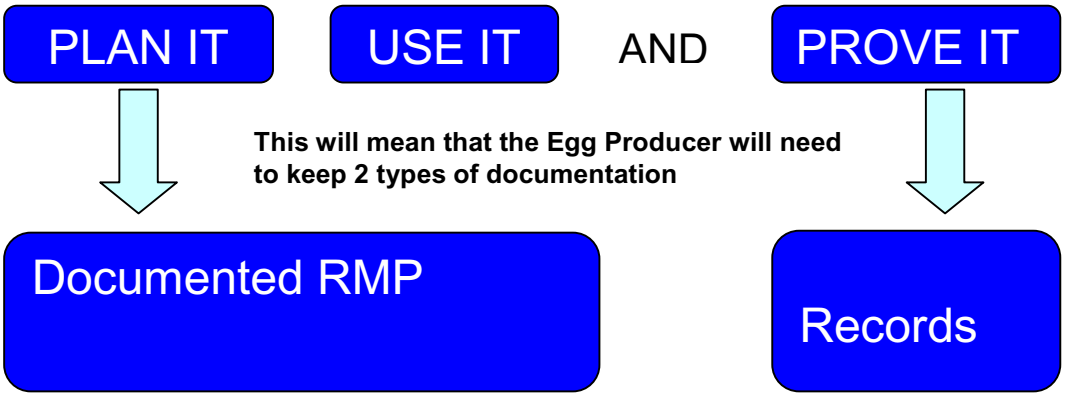
Each egg producer must also get the recognised verifying agency that is willing to be their verifier to provide confirmation of this in writing.

2.15 Documentation and record-keeping

The egg producer must document the RMP and keep records to show that it has been implemented effectively.

2.15.1 Overview

In order to be able to demonstrate that their risk management programme is effective at making eggs fit for their intended purpose an egg producer must:



2.15.2 What must be documented?

All components of the RMP must be documented in writing[9] and legible.

To check that this has been completed it is a good idea if the egg producer lists the documents that form their RMP. This will highlight the critical paperwork that must be maintained on an ongoing basis. The list will also assist the programme evaluator and verifier to audit your system.

There is flexibility in how the operator wishes to document the risk management programme. Documents such as a Code Of Practice, HACCP plan or other documented procedures may be referred to, in part or in full, rather than included in the same document as the rest of the programme. In such instances any references become part of the risk management programme, which is a legally binding document once registered. Those parts of the document not specifically referenced do not form part of the risk management programme. All documentation relevant to the risk management programme must be available for evaluators, verifiers and regulators, as necessary.

For examples refer to:
3.15 = layer farm
4.15 = packhouse

[9] In writing means printed, typewritten, or otherwise visibly represented, copied, or reproduced, including by fax or email or other electronic means.

2.15.3 What must be in the Document control System?

Animal Products (RMP Specification) Notice 2000, Clause:

16. Documentation and record keeping requirements

(1) Every document or part of a document that forms part of a risk management programme must

- ***(a) be legible; and***
- ***(b) be dated or marked to identify its version; and***
- ***(c) clearly indicate any changes made to the programme; and***
- ***(d) be identified as comprising part of the programme; and***
- ***(e) be signed, either directly or within the document control system, by the operator or the person shown on the register under section 19(b) of the Act as responsible for the day to day running of the programme; and***
- ***(f) be made available when required to any person with responsibilities under the programme.***

(2) The operator must ensure that the registered risk management programme and all reference material relating to the risk management programme is readily accessible, or can be retrieved and made available to accredited persons, animal product officers and the Director-General or persons authorised by the Director-General, within two working days of any request.

(3) The operator must have an effective document control system which includes recording updates and amendments to the registered risk management programme, including updates and amendments to cross-referenced documents and parts of cross-referenced documents that form part of the risk management programme.

(4) In relation to hard copies of a risk management programme under a document control system as required by subclause (3), the operator must ensure that -

- ***(a) one hard copy of any obsolete programme or obsolete part of a programme is archived in accordance with subclause (5); and***
- ***(b) all obsolete documents or parts of documents are removed as soon as practicable from all distribution points; and***
- ***(c) all relevant parts of the programme are replaced as soon as practicable after -***
  - ***(i) any update is made to the programme; and***
  - ***(ii) any amendment to the programme is registered under section 25 of the Act.***

(5) The operator must retain for 4 years one copy of all obsolete documents from a registered risk management programme and make it available to accredited persons, animal product officers and the Director-General and persons authorised by the Director-General, as required.

"Readily accessible" means that no matter where the documents are stored, they can be mailed, couriered, faxed, emailed or transferred by other means within the time period stated.

2.15.4 What records must be kept?

Animal Products (RMP Specification) Notice 2000, Clause:

17. Monitoring, corrective action and operator verification records

(1) The operator must include record keeping procedures as part of the risk management programme to ensure that all records necessary to demonstrate compliance with the programme are -

- ***(a) legible; and***
- ***(b) stored in a manner which protects the records from damage, deterioration or loss and ensures that they can be retrieved for at least 4 years; and***
- ***(c) in the case of electronic records, managed to ensure that all data is protected and preserved***

(2) Records relating to monitoring, corrective action and operator verification for the risk management programme, must include -

- ***(a) date and time of observation; and***
- ***(b) subject and description of observation; and***
- ***(c) any corrective action undertaken; and***
- ***(d) means to identify the observer and any person who undertook corrective action; and***
- ***(e) any other information required under the risk management programme as applicable.***

(3) Where monitoring and corrective action records for the risk management programme have been subject to operator verification, the signature or unique identifier of the operator verifier must be recorded on those records, or on records generated by the operator verification activities.

(4) The operator must make available to accredited persons, animal product officers, the Director-General and persons authorised by the Director-General, all records relevant to the operator verification, as required.

(5) The operator must as soon as practicable, provide any reports relevant to the operation of the risk management programme to the Director-General, as required.

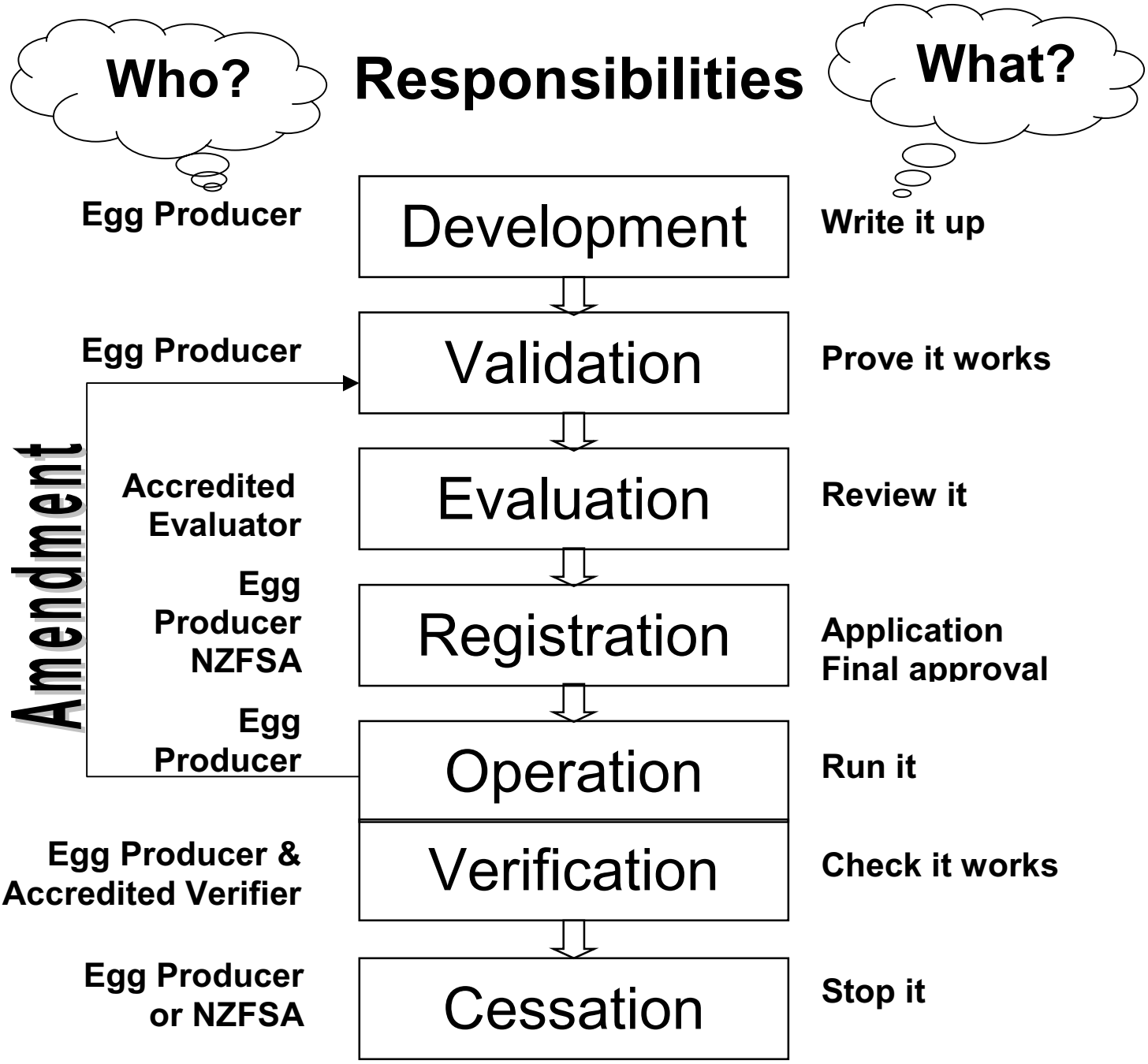
"Readily accessible" means that no matter where the documents are stored, they can be mailed, couriered, faxed, emailed or transferred by other means within 2 working days.

2.15.4.1 Electronic records

The person(s) entering the data should be identified according to systems developed for the protection of electronic records.

2.16 Registration and Ongoing Management of the RMP

RMP development has already been explained. The other steps to register the RMP and maintain it are shown in the diagram below. Each step is then explained briefly in the following sections of this Code of Practice. For more information refer to NZFSA's RMP Manual.



2.16.1 Validation

Before getting the RMP evaluated or registered, the egg producer needs to validate it (prove that it works). Refer to section 2.13 for more details.

2.16.2 Evaluation

Once the programme has been validated the egg producer must have it evaluated by an accredited evaluator. These people are listed on NZFSA's web site www.nzfsa.govt.nz/animalproducts/registers-lists/accredited-persons/index.htm . Otherwise ring NZFSA on 04 4632-500 to get a list of accredited evaluators sent to you. Make sure that you only look at evaluators from the list as there are also verifiers on the same list.

Animal Products (RMP Specification) Notice 2000, Clause:

19. Obtaining an evaluation report

The operator must ensure that the first on-site assessment made in relation to the evaluation, the evaluation report required under section 20(2)(b) of the Act and any supporting reports provided by technical experts or other accredited evaluators were carried out within the last six months prior to the date of application for registration of the risk management programme.

20. Evaluator endorsement of risk management programme

The operator must keep a copy of the risk management programme to which the evaluation report relates, and that copy or the outline documentation (required under clause 21) must be endorsed by the evaluator who signed the report by -

(a) electronic means acceptable to the Director-General; or

(b) initialling or signing each page of the hard copy of the risk management programme or any other means acceptable to the Director-General.

The egg producer must provide the evaluator with all of the documents that make up the RMP. The evaluator will conduct an on site visit and will review your programme to ensure that it is suitable for registration. If satisfied with the RMP, they must provide the egg producer with an evaluation report confirming this and they will endorse (sign) the RMP and the report.

2.16.3 Registration

The egg producer must apply to the Director-General (attention Programme Manager Operations, Animal Products Group), for registration of the RMP on the application form (AP4) before trading from any new operations, and before the end of the transition period for existing operations. The application form will prompt the egg producer to include all of the other information that will be required for registration of the RMP including:

- **a copy of an independent evaluation report (no more than 6 months old) on the risk management programme;**
- **the name of the recognised verifying agency that is willing to verify the registered risk management programme; and**
- **signed declarations as stated on the application form.**

A list of recognised verifying agencies will be available on the NZFSA web site www.nzfsa.govt.nz/animalproducts/ under the heading registers/lists.

All applications are to be accompanied by the prescribed fee. NZFSA will also require the egg producer to pay an assessment charge (calculated on an hourly basis) for the time involved in assessing any of the application.

Animal Products (RMP Specification) Notice 2000, Clause:

21: Documentation to be submitted with application for registration of RMP

(1) The operator must submit either the evaluator-endorsed risk management programme or the evaluator-endorsed outline documentation of the programme to the Director-General with every application for registration of a risk management programme.

2) The minimum outline documentation required to be submitted with an application for registration of a risk management programme is to include the matters required under section 17(1) of the Act, and -

(a) the name, position or designation of the person responsible for the day to day management of the programme, as nominated by the operator of the business; and

(b) the principal categories of processing and animal material; and

(c) the location and type of premises or place, and the physical boundaries of the programme; and

(d) the name of the recognised verifying agency, (or if appropriate in the case of a food safety programme registered as risk management programme under section 34 of the Act, the approved auditor under the Food Act 1981) that has indicated responsibility for the verification function under the programme; and

(e) the range of risk factors addressed; and

(f) the outcomes relating to animal material or animal product; and

(g) the description of each process covered by the programme; and

(h) the generic corrective action procedure; and

(i) the verifiers rights and provisions to enable verification activities to be undertaken; and

(j) the list of documents comprising the programme and their status at the time of registration, including the version and date of issue or other means of identifying their status; and

(k) the document control system.

(3) The operator must ensure that the outline of the risk management programme submitted to the Director-General accurately represents the programme at the time of application for registration.

(4) The operator must advise the Director-General in writing of any updates to the risk management programme since the evaluation report was prepared.

22. Copies required

Any applicant for registration of a risk management programme must provide the Director-General with three hard copies of the risk management programme or the outline documentation of the programme, or one electronic file of the risk management programme or the outline documentation in a form acceptable to the Director-General.

NZFSA recommends that egg producers submit 3 hard copies of the outline as described in clause (2) above.

If the application is found acceptable and a decision is made to register the RMP, the Director-General, will, as soon as practicable:

- **notify the operator in writing;**
- **provide both the operator and the recognised verifying agency with a copy of the registered RMP or the outline of the registered RMP;**
- **make an appropriate entry on the risk management programme register.**

2.16.3.1 Change of registration

The registered RMP applies only to the particular operator and premises or place specified in the programme. Changes will require a new registration process to be completed.

Change of Operator

Where the "operator" or the "operator's name" is the only change to a registered RMP, then application for registration (AP5), must be accompanied by appropriate declarations as outlined on the form. This includes a further declaration from the new operator that no other component of the RMP has been changed.

The following circumstances also will be treated as involving a change in the operator of a registered RMP, and so require registration of a new RMP:

- **a change in the name of a company ;**
- **a change in the (number of) members of a partnership; or**
- **the death, bankruptcy, receivership, or liquidation of the operator.**

Change in day-to-day Manager of a risk management programme

Animal Products (RMP Specification) Notice 2000, Clause:

23. Change in the day-to-day manager of a risk management programme

The operator must notify the Director-General in writing of any change to the name or position or designation of the person responsible for the day-to-day management of the risk management programme as soon as practicable.

The operator must notify the Director-General (attention Programme Manager Operations, Animal Products Group). This change does not require the RMP to be "amended" but the RMP must be updated to reflect the change.

Change in recognised verifying agency

Changes in the recognised verifying agency must be notified in writing to the Director-General (attention Programme Manager Operations, Animal Products Group) within 7 days. This change does not require the RMP to be "amended" but the RMP must be updated to reflect the change.

Change in premises or place

A change in the premises or place where the RMP will be operating is a major change so it will require a new application for registration of the RMP, using application form AP4. This requirement does not apply to mobile operations with RMPs that include systems to control risk factors introduced by a change in location.

2.16.4 Operation of the RMP

The operator of a registered risk management programme has the following duties:

- **to ensure that the operations of the animal product business do not contravene the relevant requirements of and under this Act, including the requirements set out in the RMP;**
- **to ensure that the RMP, is consistent with the requirements of regulations and specifications in force from time to time under this Act;**
- **to adequately implement and resource all operations under the programme, including provision for the instruction, competency, and supervision of staff to ensure the delivery of animal product that is fit for intended purpose;**
- **to ensure that all operations under the programme are commensurate with the capability and capacity of the premises or place, facilities, equipment, and staff to deliver animal product that is fit for intended purpose;**

- to give relevant accredited persons such freedom and access as will allow them to carry out their functions and activities under this Act, including verification functions and activities;
- to notify the Director-General (attention Programme Manager Operations, Animal Products Group), in advance where practicable, and otherwise as soon as possible, of any change in the operator's recognised verifying agency; and

Animal Products (RMP Specification) Notice 2000, Clause:

25. New hazards

The operator must notify the Director-General of any emerging, new or exotic biological hazards or new chemical hazards that come to the operator's notice in relation to the risk management programme as soon as practical after their discovery.

Whenever the Director-General is notified the correspondence should be addressed attention Programme Manager Operations, Animal Products Group.

2.16.5 Amendments to the risk management programme

The operator of a registered RMP must amend it, and apply for registration of the amendment, where any change, event or other matter means that it—
(a) Is no longer appropriate, or will no longer be appropriate to the animal material or product, processes, or premises or place covered by the programme; or
(b) Otherwise impacts, or will impact, on the fitness for intended purpose of the animal product concerned or the content of the RMP.

Animal Products (RMP Specification) Notice 2000, Clause:

28 Amendments to the risk management programme

(1) The following amendments require registration in accordance with section 25 of the Act -

- ***(a) major alterations to the processing facilities; and***
- ***(b) relocating processing operations to a new physical address (except where this is already permitted under the risk management programme); and***
- ***(c) processing animal material or animal product that is not covered by the risk management programme; and***
- ***(d) permanently ceasing to process a particular type of animal material or product; and***
- ***(e) process modifications that impact on the outcomes for animal material or animal product; and***
- ***(f) changes to outcomes or introduction of new outcomes for animal materials or animal products.***

(2) The operator must, when making an amendment, consider whether consequential amendments to other components of the risk management programme are necessary.

The registered RMP is a legally binding document. As such, if the operator alters the risk management programme without complying with the requirements for registration of any part that constitutes an amendment, the operator is not in compliance with the Animal Products Act 1999. Depending on the circumstances, this could result in suspension or de-registration of the RMP.

Where an amendment is necessary, "the operator must amend the RMP, and apply for registration of the amendment, before the event where the operator knows of the change in advance, and in all other cases must do so without unreasonable delay."

Some modifications may or may not fall into the category of an amendment. In such instances the operator should call on an accredited evaluator to make a judgement. The overriding consideration when making the judgement should be the "impact" of the change in relation to the achievement of the current stated product outcomes. If the change means that the current outcomes will not be achieved or need to be altered then the programme must be amended. The operator must retain all documentation relevant to the judgement so that the verifier can check that appropriate decisions have been made.

Registering an amendment is the same as for an RMP but uses application form AP6 (see section 6.2). If the application is found acceptable and a decision is made to register the amendment, the Director-General, will, as soon as practicable:

- **notify the operator in writing;**
- **where the amendment relates to future events or matters, specify the date or occasion on which the amendment will apply;**
- **provide both the operator and the recognised verifying agency with a copy of the registered amendment;**
- **make an appropriate entry on the risk management programme register.**

2.16.6 Updates of minor amendments to risk management programmes

(Section 26 of the Animal Products Act)

If the operator needs to make minor changes to the RMP he or she must decide whether or not they fall into the amendment category described above (where the amendment must be registered). If not, then the operator is responsible for ensuring that the minor amendments to the RMP are documented, identified by the document control system and made available to the verifier.

2.16.7 Review of the risk management programme

Animal Products (RMP Specification) Notice 2000, Clause:

29 Director-General review of the risk management programme

(1) A standard condition on initial registration is that the risk management programme must be reviewed by the Director-General within 3 years from the date of registration.

(2) After the first review, the Director-General will review the risk management programme, including minor amendments, every three years, or when specified in the conditions of registration by the Director-General.

The operator must apply for registration prior to the expiry of their risk management programme if they want to continue to operate.

2.16.8 Verification activities by an accredited verifier

(Sections 101 and 107 of the Animal Products Act)

Verification involves the ongoing checks that "accredited verifiers" will carry out periodically on a registered risk management programme. A list of recognised agencies and accredited verifiers will be available on the NZFSA web site: www.nzfsa.govt.nz/animalproducts/ under the heading registers and lists.

The accredited verifier, from the recognised agency, is to be contracted by the operator so contractual arrangements regarding payment for verification services are the operator's responsibility.

2.16.9 Responsibilities of Recognised Agencies and Accredited Verifiers

The verifier is responsible for undertaking all necessary verification activities in accordance with verification specifications issued by NZFSA.

The verifier is expected to review the different components of the registered risk management programme, including production records, to determine that ongoing operational activities comply with the documented programme and that the animal product is fit for its intended purpose.

Animal Products (RMP Specification) Notice 2000, Clause:

27 Responsibilities of Recognised Verifying Agencies and Accredited Verifiers

(1) All external verification activities of an accredited verifier must be transparent and traceable, and the results must be fully recorded and made available to the operator, and, as required, to the Director-General, animal product officer and any other person authorised by the Director-General.

(2) Accredited verifiers must notify the Director-General in writing, as soon as practicable, of all significant issues relating to the risk management programme, including -

- ***(a) when the business is operating outside the registration conditions of the programme; and***
- ***(b) when the business is operating outside the scope of the programme; and***
- ***(c) any repeated failure by the operator to apply the corrective actions set out in the programme, or as advised by the accredited verifier; and***
- ***(d) any significant concern about suitability for processing of animal material or fitness for intended purpose of animal product; and***
- ***(e) where the cumulative effect of updates necessitates the registration of an amendment to the risk management programme as provided in section 25 of the Act; and***
- ***(f) where the documented system is not effective in delivering the outcomes; and***
- ***(g) any interference with, or obstruction of the accredited verifier in carrying out verification activities; and***
- ***(h) where the operator has not notified the Director-General of an animal product recall in accordance with clause 26; and***
- ***(i) when the verifier is aware that a change of operator of a programme has not been notified to the Director-General as required under section 29 of the Act.***

(3) Recognised verification agencies must provide to the Director-General -

- ***(a) reports on specified issues or subjects on demand; and***
- ***(b) reports on actions taken with respect to any corrective action request issued to the recognised verifying agency by the Director-General or an animal product officer.***

The accredited verifier should notify the operator, in advance wherever possible, of the timing of routine visits. Unannounced visits may be made in cases of poor performance. The frequency of verification will depend on the effectiveness of the registered RMP (i.e. performance-based).

The following performance standards must be assessed at each verification visit:

- **registration status of the RMP;**
- **verification of compliance with the RMP;**
- **compliance with the Animal Products Act regime;**
- **completeness, accuracy, and timeliness of recording; and**
- **management of critical non-compliances (still to be defined).**

Export operations will still be subject to a separate "Performance-Based Verification" system.

NZFSA's Compliance Investigation Group will audit recognised verifying agencies and accredited verifiers to ensure that they are carrying out the verification function effectively.

2.16.10 Who does What?

Tasks	Responsibility:
Development	
• Development of the programme.	• Egg Producer
Validation	
• Validation of the programme	• Egg Producer
Evaluation	
• Contracting an evaluator to obtain recognition of the validity of the programme.	• Egg Producer
• Evaluating and reporting on the risk management programme's validity.	• Accredited evaluator
Registration	
• Naming the recognised verifying agency that has indicated its willingness to verify the registered risk management programme.	• Egg Producer
• Application for registration of the risk management programme.	• Egg Producer
• Registration of the risk management programme.	• Director-General
Operation	
• Contracting verification services to be used for verifying the registered risk management programme.	• Egg Producer
• Implementation of the programme.	• Egg Producer
• Specific operational duties.	• Egg Producer
• Operator verification	• Egg Producer
• External verification.	• Recognised Verifying Agency
• Application for amendments to registered risk management programme.	• Egg Producer
• Notification of minor amendments to the Director-General (attention Programme Manager Operations, Animal Products Group), as required.	• Egg Producer
Cessation	
• Surrender of the registration of the risk management programme	• Egg Producer
• Suspension of registration	• Director-General
• Deregistration	• Director-General

2.16.11 Costs

The operator is obliged to pay any fee incurred in association with the development, registration and ongoing operation of a risk management programme. Specific fees apply to:

- **application for registration of the RMP ($100);**
- **application to amend the registered RMP ($100);**
- **application to update the registered RMP ($100);**
- **application for registration of a food safety programme as a RMP ($100).**

NZFSA will also require the operator to pay an assessment charge (calculated on an hourly basis) for the time involved in assessing any of the above applications ($80/hour + GST).

The costs associated with evaluation and verification are the responsibility of the operator who must negotiate rates with their selected service provider.

Chapter 3:

How to develop an RMP for a Layer Farm

3.1 Introduction

This Chapter gives an example of each RMP component for a layer farm.

Most of the examples should be self-explanatory but if you find that they are not clear enough go to the corresponding section in Chapter 2 for further information on each component.

Forms have been provided in the appendices for the egg producer to copy and fill out to document their own RMP. Alternative formats that contain similar information are also acceptable.

Once you understand each example you should copy the corresponding form in Appendix D and use the example to guide you to fill out the form. Remember that where your operation differs from the example you should change it so that it accurately reflects what you do. The mandatory requirements must always be included in your RMP.

There may be times when you will need to write up things in more detail than is shown in the example. We have tried to make this clear in the appropriate places.

Start your RMP by filling out the title page on Appendix D section 1.

3.2 Management Authorities and Responsibilities

For theory refer to 2.2

For blank forms refer to appendix D section 2

Business Name:	Henrietta's Egg Company Ltd
Business Operator's Full Legal Name[1]:	Henrietta Eggnot
Business Identifier[2]:	Henegg1
Business Address:	29 Henry St, Henryville
Postal Address (If different from the business address):	PO Box 111 Henryville
Registered Company Address (If different from the business address)	N/A
Email Address:	Henrietta@eggs.co.nz
Phone Number	(01) 01010101
Fax Number	(01) 01010100

Person responsible for:	Name or title	Training received
Day to day management of RMP	Henrietta Eggnot	Egg Producer's Federation approved HACCP course, 3 day, 14-16/2/2000
Deputy for Day to Day Manager of RMP	Henry Eggnot	Egg Producer's Federation approved HACCP course, 3 day, 14-16/2/2000

[1] For a company this is just the company name, otherwise put in the Partnership name or name of the Sole Trader.
[2] Business Identifier must not be the same as an exporter ID operating from the same premises;
Must be a number or a number/letter combination of:
- at least 3 and not more than 10 characters;
- at least one character as a number;
- no leading zeros.

3.3 Scope of the risk management programme

For theory refer to 2.3

For blank forms refer to appendix D section 3

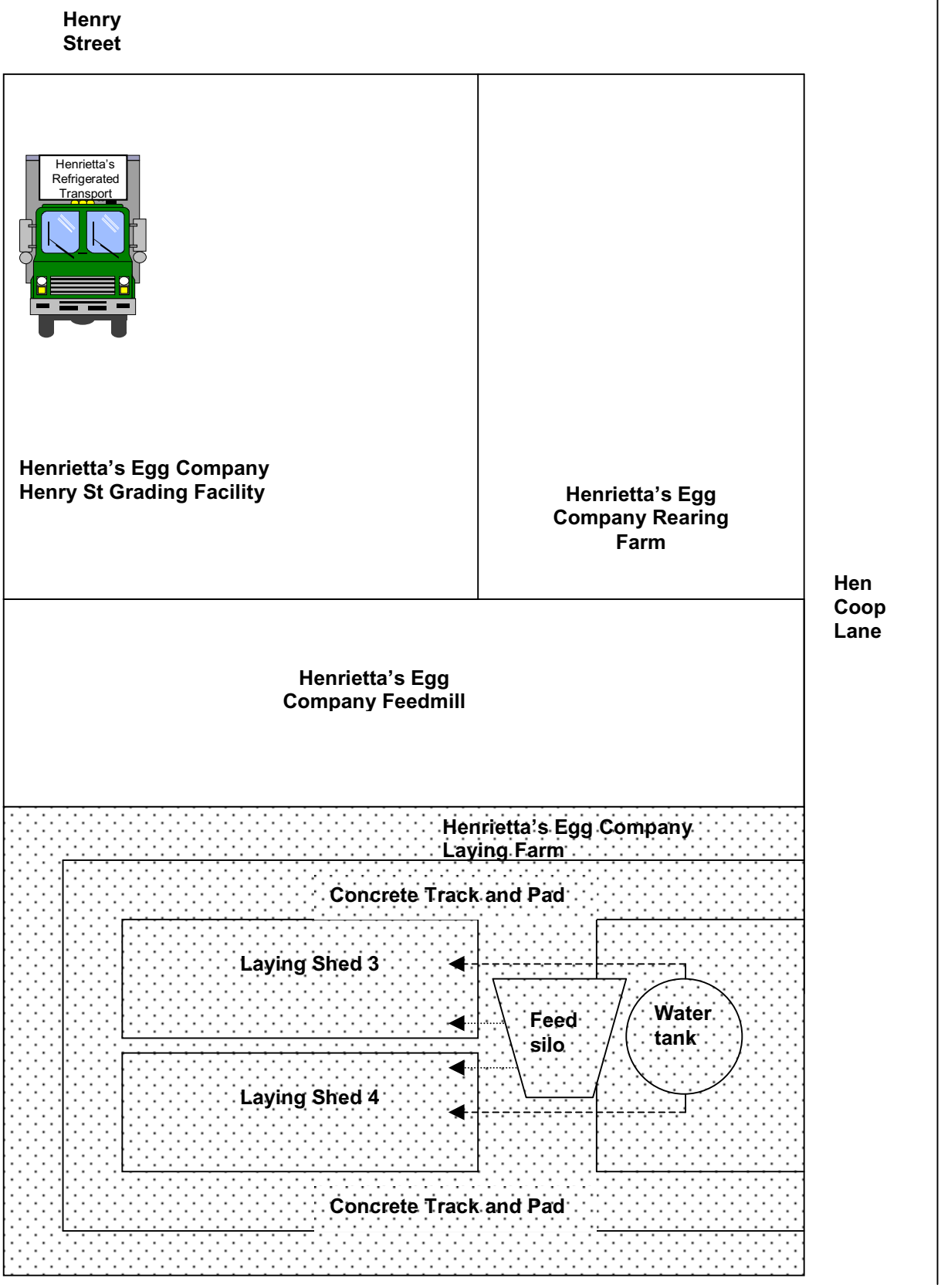
Business Name:	Henrietta's Egg Company Ltd
Type of Premises:	Layer Farm
Name of Animal Material:	Shell Eggs
Name of Animal Products[3]:	Clean Shell Eggs Dirty Eggs and / or Floor Eggs Eggs with Size/ Shape Abnormalities or Minor Defects
Location:	2 x Layer Farms: 29 Henry Street, Henryville Hen Coop Lane, RD2, Henryville Physical Boundaries – See site map on next page.
Start of RMP:	Cleanout of laying sheds ready for receipt of ready to lay birds
Processes:	Egg Production Egg Harvesting / Collection and Transportation to Grading Egg Storage
End of RMP:	Transfer of eggs to grading facility
Risk Factors Covered[4]:	Hazards to Animal Health Hazards to Human Health Risks to Wholesomeness Risks From False or Misleading Labelling

See next page for site diagram showing the physical boundaries of the RMP.

[3] This example RMP only covers the production of shell eggs and associated by-products. An assumption has been made that all other animal materials/products are to be dumped. If an egg producer intends to use these animal materials/products for human or animal consumption, (e.g. by sending end of lay hens for processing, or by sending animal material for rendering) then the relevant Animal Products Act requirements will need to be met.
[4] For any risk factors that are not covered this should be stated and a brief justification made.

Physical boundaries of Henrietta's Layer Farm RMP:

Shaded areas are included in the physical boundaries of the RMP. The grading facility, feedmill and rearing farms are run as separate operations and are not included in this RMP.



3.4 Product description and intended purpose

For theory refer to 2.4

For blank forms refer to appendix D section 4

Product Name[5]:	Clean Shell Eggs	Dirty Eggs and / or Floor Eggs	Eggs with Size/ Shape Abnormalities or Minor Defects	Reject Eggs (Go to waste so not further considered in the RMP)
Product Description:	• Clean • No visible cracks • No visible defects	Eggs that are soiled or have been laid on the floor. They are more likely to be contaminated with bacteria. They should have no visible cracks.	Eggs that have: • minor defects or • cracks with intact membrane	Not suitable for grading: • broken, • cracks with damaged membrane • very dirty or • other major defects.
Intended Uses:	To be graded then sold for any purpose.	To be washed and graded then sold for catering or further processing.	To be graded then sold for further processing (pasteurisation or equivalent[6]), or for animal consumption.	To be dumped.
Intended Consumer:	Human consumption - general public	Human consumption - general public	Human consumption - general public or animal consumption	N/a. (Not suitable for human or animal consumption).
Shelf Life From Date of Lay:	35 days	35 days	14 days	N/a
Labelling Instructions:	Date of lay Farm Shed	Date of lay Farm Shed Dirty / Floor Eggs	Date of lay Farm Shed Commercial Eggs	N/a
Packaging:	New cartons/trays Washed, sanitised, reused plastic trays Pallets or trolleys	New cartons/trays Washed, sanitised, reused plastic trays Pallets or trolleys	New cartons/trays Washed, sanitised, reused plastic trays Pallets or trolleys	Kept in bucket until dumped.
Where it is to be Sold:	Retail sale Wholesale Secondary processors Food Service	Retail sale Wholesale Secondary processors Food Service	Secondary processors or Farmers.	N/a
Storage and Distribution Conditions:	Refrigeration at or below 15°C	Refrigeration at or below 15°C	Refrigeration at or below 6°C[7]	N/a

[5] Above products are examples only. Some egg producers will not have all products (especially those with automatic egg collection systems that do not allow eggs to be sorted).
[6] This process should be validated to demonstrate effective control of pathogens.
[7] This temperature is based on current industry practice as identified by the Egg Producers Federation Working Group members.

3.5 Product outcomes for all eggs except reject eggs.[8]

For theory refer to 2.5

For blank forms refer to appendix D section 5

3.5.1 Hazards to Human Health

	Hazard or other risk factor	Aim of RMP	Example Product outcomes[9]	Key Control Measures[10]	Response if outcome not met
Biological:	B1 & B2: Salmonella and other enteric pathogens.	Minimise Salmonella and other enteric pathogens.	<u>Clean Shell Eggs:</u> Salmonella level – not yet defined.	• Dirty eggs and visibly cracked eggs are separated from these eggs. • Storage and transportation temperature not higher than 15°C.	• Rework eggs that are still on site to meet requirements. • Review refrigeration systems. • Notify packhouse about possible problems with eggs that have already left farm. • Review RMP. • Retrain staff.
			<u>Dirty and Floor Eggs:</u> Salmonella level – not yet defined.	• Visibly cracked eggs are separated from these eggs. • Storage and transportation temperature not higher than 15°C.	
			<u>Eggs with Size/ Shape Abnormalities or Minor Defects</u> Salmonella level – not yet defined.	• Eggs that do not have an intact membrane are separated from these eggs. • Storage and transportation temperature not higher than 6°C.	
			<u>All eggs:</u>	• Vaccination of layer hens with *MeganVac-1.* • Treatment of feed. • Biosecurity measures.	
Chemical:	C1 & C2: Chemical residues.	Minimise chemical residues in eggs.	<u>All eggs:</u> No chemical residues over Maximum Residue Limits[11].	No eggs supplied from hens on medication and during withholding period.	• Dump affected eggs. • Review RMP. • Retrain staff.
Physical:	None identified	N/a	N/a	N/a	N/a

[8] No product outcomes are necessary for reject eggs as these eggs are dumped at the layer farm and will not be used for human or animal consumption.
[9] Where it is not expected that a risk factor is to be measured within the RMP (as indicated by an approved Code of Practice or regulatory requirements), the operator may put "level not yet defined" for the outcome so long as key control measures are identified. Nevertheless, individual operators are encouraged to measure this risk factor and set a level for a product outcome where possible.
[10] Not all of these example control measures will suit all operations. E.g. those operations with automatic collection may not be able to separate eggs as implied here.
[11] This is not currently measured although controls are in place. NZFSA and the Egg Producers Federation are discussing setting up a monitoring programme.

3.5.2 Hazards to Animal Health

	Hazard or other risk factor	Aim of RMP	Example Product outcomes[12]	Key Control Measures[13]	Response if outcome not met
Biological:	B1 & B2: Salmonella and other enteric pathogens.	Minimise Salmonella and other enteric pathogens.	<u>Eggs with Size/ Shape Abnormalities or Minor Defects</u> Salmonella level – not yet defined.	• Eggs that do not have an intact membrane are separated from these eggs. • Storage and transportation temperature not higher than 6°C. • Vaccination of layer hens with *MeganVac-1.* • Treatment of feed. • Biosecurity measures.	• Dump affected eggs. • Review RMP. • Retrain staff.
Chemical:	C1 & C2: Chemical residues.	Minimise chemical residues in eggs.	<u>All eggs:</u> No chemical residues over Maximum Residue Limits[14].	No eggs supplied from hens on medication and during withholding period.	• Dump affected eggs. • Review RMP. • Retrain staff.
Physical:	None identified	N/a	N/a	N/a	N/a

[12] Where it is not expected that a risk factor is to be measured within the RMP (as indicated by an approved Code of Practice or regulatory requirements), the operator may put "level not yet defined" for the outcome so long as key control measures are identified. Nevertheless, individual operators are encouraged to measure this risk factor and set a level for a product outcome where possible.
[13] Not all of these example control measures will suit all operations. E.g. those operations with automatic collection may not be able to separate eggs as implied here.
[14] In the absence of any information specific to animals it has been assumed that the levels set for humans are also acceptable as default outcomes for animals. This is not currently measured although controls are in place. NZFSA and the Egg Producers Federation are discussing setting up a surveillance programme.

3.5.3 Risks to Wholesomeness

Hazard or other risk factor	Aim of RMP	Example Product outcomes[15]	Key Control Measures[16]	Response if outcome not met
W1: Blood or Meat spots	To eliminate defective eggs.	No product outcomes as this defect is uncontrolled at layer farm.	N/a	N/a
W2: Watery whites	To minimise defective eggs.	Less than 0.1% eggs have defect.	• Daily - collect and send all eggs to packhouse.	• Retrain staff.
W3: Roundworms in eggs	To minimise defective eggs.	Less than 0.1% eggs have roundworms.	• Free range hens are subject to a treatment programme for roundworms.	• Review treatment programme. • Retrain staff.
W4: Off odours and flavours	To minimise defective eggs.	Less than 0.1% eggs have defect.	• Daily - collect and send all eggs to packhouse..	• Retrain staff.
W5: Rotten eggs	To minimise defective eggs.	Less than 0.1% eggs have defect.	• Daily - collect and send all eggs to packhouse..	• Retrain staff.
W6: Pink or iridescent whites	To minimise defective eggs.	Less than 0.1% eggs have defect.	• Daily - collect and send all eggs to packhouse..	• Retrain staff.
W7: Eggs older than use by date	To minimise defective eggs.	Less than 0.1% eggs have defect.	• Daily - collect and send all eggs to packhouse..	• Retrain staff.
W8: Soft shells	To minimise defective eggs.	Less than 0.1% eggs have defect.	• Check feed composition.	• Send eggs to further process, pet food, animal feed or dump as appropriate.
W9: Mouldy eggs	To eliminate defective eggs.	No product outcomes as this defect is uncontrolled at layer farm.	N/a	N/a

[15] These outcomes are not currently measured within the layer farm RMP but feedback from the Packhouse may verify that acceptable levels are being achieved.
[16] Not all of these example control measures will suit all operations. E.g. those operations with automatic collection may not be able to separate eggs as implied here.

3.5.4 Risks From False or Misleading Labelling

Hazard or other risk factor	Aim of RMP	Example Product outcomes	Key Control Measures[17]	Response if outcome/ control measures not met
L1: Incorrect claims for free range, barn, caged or organic eggs L2: Incorrect date marking	To ensure correct labelling	All eggs must be true to label on packs, containers, pallets or trolleys that deliver them to the packhouse. All labelling of transportation outers must comply with Specification 32 of the Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000.	• Check of details on all new labels. • Check that correct label is in use whenever birds change. • Daily check that details on labels are correct.	• Relabel affected eggs or dump them. • Review RMP. • Retrain staff.

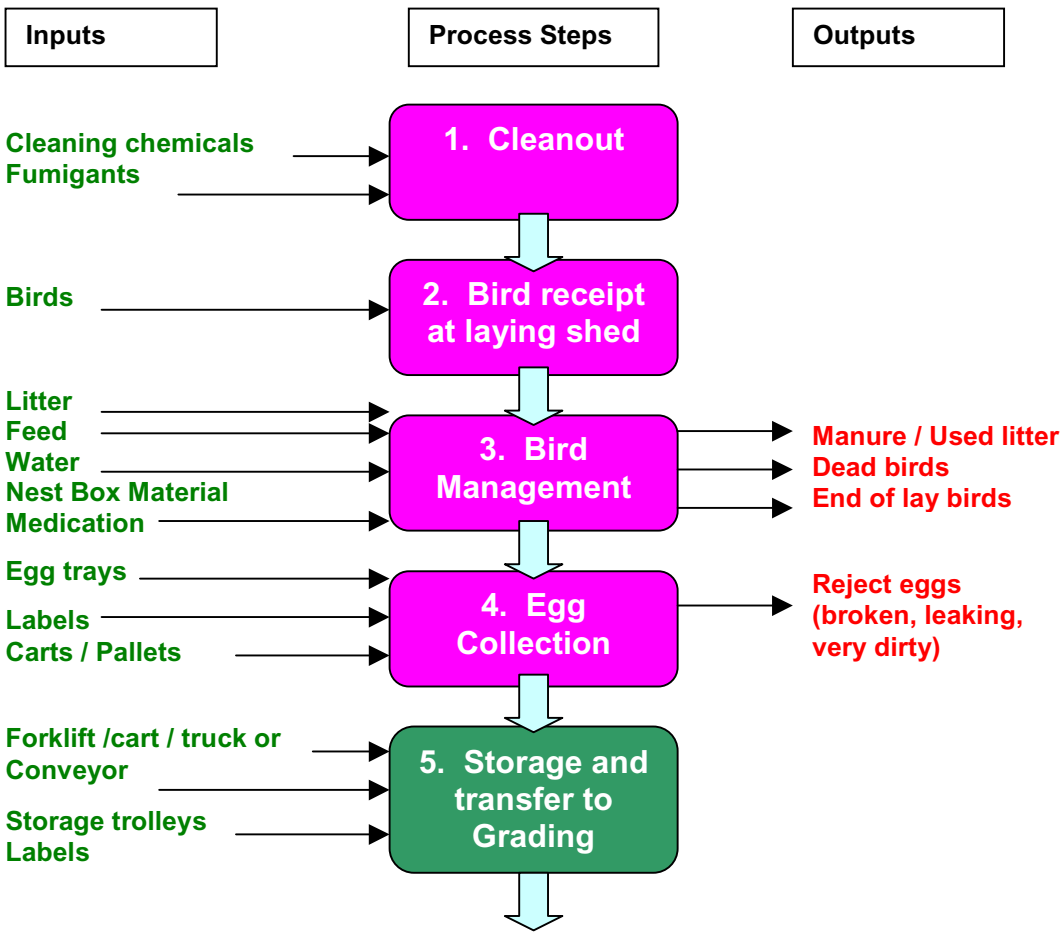
The product outcomes should be reviewed after hazard and other risk factor analysis to confirm that they are still appropriate and achievable.

[17] Not all of these example control measures will suit all operations. E.g. those operations with automatic collection may not be able to separate eggs as implied here.

3.6 Process description

For theory refer to 2.6

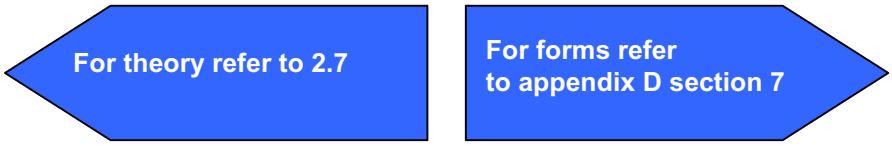
For blank forms refer to appendix D section 6



3.7 Identification, Analysis and Control of Hazards and Other Risk Factors From Inputs

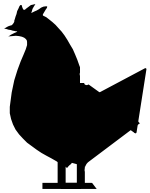
The following inputs are considered[18]:

- **Layer hens – see 3.7.1.**
- **Layer feed – refer to 3.7.2.**
- **Medication – refer to 3.7.3.**
- **Hen's Drinking water – Refer to 3.7.4**



3.7.1 Layer Hens

3.7.1.1 Hazards and Other Risk Factors



B1 = Salmonella species
B2 = Other enteric bacteria

3.7.1.2 Supplier[19] Requirements

Regulatory Requirements
1. Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000, 106: Layer flocks must be subject to and comply with a whole flock health scheme designed to ensure that hazards associated with eggs which are likely to affect human health are identified and managed in an appropriate manner.[20]
Operator-defined Requirements
2. Salmonella surveillance is to be done during rearing and laying phases: A foam or gauze drag swab per shed from a representative sample of cages or rearing area shall be taken once the birds reach 6 weeks of age, and again at 12-16 weeks of age (i.e. one environmental swab at each rearing 'stage').
3. Birds must have been reared in accordance with requirements for any claims re "free range", "barn" or "organic". Certification of these systems is optional.
4. Free range birds shall be subject to suitable treatment for roundworms.
5. Birds are to be managed in accordance with the Layer Farm Protocol issued by the Egg Producers Federation. See Appendix H.

[18] The other items shown as inputs in the flow diagram in section 3.6 are indirect inputs only and are covered by the "other sources" in the next section.

[19] Here the term "supplier" can be a bit ambiguous. The "supplier" of birds to the RMP may be:
- the egg producer themselves (if they also have the rearing farm under their control), or
- a hatchery or
- an independent rearing farm.

These requirements should be applied to the relevant party depending on the actual set up.

[20] Only the layer flock that is producing eggs must have a Whole Flock Health Scheme. In practical terms this means that the laying birds should also have been subject to a whole flock health scheme during the rearing phase as this will impact on the health of the bird at time of lay. If the rearing is done by an independent operator they should be treated as a supplier and required to comply with a whole flock health scheme. (This is the scenario used in the example given here). Alternatively if the rearing is under the control of the egg producer then one whole flock health scheme in the RMP covering the rearing and laying phases will be sufficient (Refer to 3.9 Step 3 for example).

3.7.1.3 Procedures to Check the Supplier has Met Above Requirements

The following control measures are the responsibility of the Layer Farm Supervisor:

Step	Control Measure	Monitoring	Corrective Action	Records
1. Order birds	Supplier to give declaration that: • birds were reared under a Whole Flock Health Scheme[21], • Salmonella was not detected from swabs taken at 6 weeks of age, and again at 12-16 weeks of age, • all birds meet requirements for relevant claims, e.g. free range, barn or organic, and • supplier abides by EPF's Rearing / Layer Farm Protocol (See Appendix H).	Check supplier's declarations with each delivery.	Do not place birds without declaration. Return to supplier.	Supplier declarations.

[21] **A whole flock health scheme would normally include the following requirements:**

Every premises shall maintain a register of suppliers who shall provide records containing evidence of the health status of the flock destined as layer hens. This should include:
(a) record of any medications or immunisations given to the flock (or individual birds) during entire growing period;
(b) records of feeding regimes;
(c) records from visits by company or independent veterinarian or competent person;
(d) records of blood tests or the results of other individual or flock diagnostic results that would establish and verify the health status of the individual/flock;
(e) records from *Salmonella* testing of the flock, and any other microbiological results performed on the flock;
(f) any other records that would help establish and verify the health status of the flock.

Evidence of the disease status of birds shall be either:
(a) in the form of records of an effective whole flock health scheme under the supervision of a competent person; or
(b) evidence provided by a competent person from inspections carried out at the farm of supply.

If the inspections suggest that layer hens display symptoms of a notifiable or exotic disease, the operator should contact MAF's Outbreak Response Services (0800-809-966) as soon as possible. Eggs from the affected layer hens should be withheld from trade.

VACCINATION FOR SALMONELLA

Vaccination of all flocks will be done at day old in the hatchery followed by a second vaccination at two–six (2-6) weeks of age and a third vaccination between thirteen - sixteen (13-16) weeks of age.

Per your veterinarian's prescription, use one-half dose per layer pullet (i.e. a 1000 dose vial vaccinates 2000 layer pullets, a 500 dose vial vaccinates 1000 layer pullets).

A coarse spray applies the first vaccination in the hatchery. The second and third vaccinations may be applied by either coarse spray or drinking water methods. *Note: Do not use chlorinated water as this kills the vaccine. Use unchlorinated, potable water. Add 'trim milk' to drinking water per instructions to neutralise any residual chlorine or disinfectant.*

Competencies for the competent person person performing the inspection could include:
(a) the ability to recognise the specific diseases and conditions affecting layer hens, and the ability to take appropriate action;
(b) the use, dosages, broad effects, and withholding periods for the animal remedies licenced for use with poultry, and the ability to administer the licence animal remedies as required clarification: under the supervision of the veterinarian or as stipulated on the licenced animal remedy's label;
(c) the development, maintenance, implementation and monitoring of quality systems for the production farm; and
(d) the importance of monitoring the production shed for microbial contaminants.

Apparently unhealthy birds shall not be sent to layer farms.

The layer farm operator shall ensure that:
(a) layer hens found dead on arrival shall be disposed of; and
(b) moribund, unhealthy or rejected birds shall not be accepted.

The welfare of birds shall be in accordance with the *'AWAC Code of Recommendations and Minimum Standards for the Welfare of Laying Hens* (November 1999, and any subsequent amendments).

Step	Control Measure	Monitoring	Corrective Action	Records
2. Receive birds	Birds to be apparently healthy on arrival. See below for further details.	Visual inspection on arrival.	Do not accept unhealthy birds. Record details on Supplier Declaration. Notify supplier. If necessary consult vet. Dead birds are to be burnt or buried.	Supplier declarations.

Criteria for Visual Inspection of Birds

Unhealthy birds include:

- **Dead and moribund birds.**
- **Deformed or damaged birds where the deformity or damage affects the ability of the bird to access or compete for feed and water, or that allows the bird to suffer more social stresses.**
- **Birds that are severely underweight or undersize (i.e. 25% under the average weight or size).**

Other signs:

- **Blood, or yellow coloured droppings. (Normal droppings should consist of a dark coloured central part (from rectum) and an off-white surrounding portion (from kidneys)).**
- **Pasting of vent.**
- **Any blood viewed in the flock.**
- **Excessive swelling of joints.**
- **Hock burn.**
- **No response to stimuli. e.g. whistles or claps.**
- **Breathing: mouth open, gasping, tail bobbing, blue coloration of beak/legs, clicking , wheezing, head shaking.**
- **Central nervous disorders: circling, lying on side, paralysis, spasms, or fits, inability to hold neck up.**
- **Bird stance: neck not extended, tail is down and ruffled feathers on back of neck.**
- **Body: swelling of the abdomen, breast blisters, injury/scratching.**
- **Eye: dull and flat, crusting/matting of material around eye, swelling, foaming.**
- **Beak: cracking, or splitting, or abnormal growth**

3.7.1.4 Operator verification

After each delivery of birds the Layer Farm Manager shall check and sign all supplier declarations. Any problems shall be noted on the relevant record with the details of the corrective action taken.

3.7.1.5 Records

Records have been identified in the table above. Examples of suitable records are given in Appendix E of this manual.

3.7.2 Layer Feed



3.7.2.1 Hazards or Other Risk Factors Affecting the Egg but Associated with Feed

B1 = Salmonella species
W1 = Blood or meat spots
W4 = Off odours and flavours
W8 = Soft shells

3.7.2.2 Supplier Requirements

Regulatory Requirements
N/a
Operator-defined Requirements
1. Requirements for the quality and composition of feed supplied to layer hens are mandated under the Agricultural Compounds and Veterinary Medicines Act 1997 through the MAF Director General approved New Zealand Code of Good Manufacturing Practice for Compound Feeds, Premixes and Dietary Supplements. **Layer feed must be produced by a feed mill operating in accordance with this Code.**
2. The following requirements controlling the receipt of raw materials, manufacturing of feed and prevention of product cross contamination, to promote the production of pathogen free poultry feed, must also be met. • **Exclusion of pathogens from inward raw materials is the most important control in producing poultry feed free from potentially pathogenic organisms such as Salmonella. Purchasing requirements and contracts for raw materials shall include the requirement that raw materials are Salmonella-negative.** • **The degree of reliance on destroying Salmonella during feed manufacture depends on the risk associated with raw material supplies, consequently controls within a feedmill are likely to vary. Controls may include heat treatment, pelleting, organic acid, segregated meal and pellet lines, addition of other Salmonella inhibitors, or a combination of these. At least one effective control point to destroy pathogens such as Salmonella in raw materials during feed manufacture shall be identified. The feedmill design and operation, and feed distribution methods, shall minimize the risk of such pathogens ending up in finished feed.** • **A documented system, including an appropriate vermin control programme, shall be in place to prevent contamination of finished feed.** • **A regular 'housekeeping' and cleaning documented procedure shall be in place. Any leaks or spillages shall be rectified as soon as possible. Vacuum cleaners and fans used within the feedmill shall be serviced and filters maintained as part of the cleaning procedure.** • **Designated trucks or trucks which have been thoroughly cleaned and disinfected shall be used to transport feed. Animal by-products should not be carried in trucks used to deliver feed.**
3. Vitamin A and K levels in feed to be set by Nutritionist.
4. Moisture level in feed at time of delivery is not to be above specified levels.

Operator-defined Requirements
5. Salmonella surveillance is done of feed ingredients and finished feed as follows: • **Testing to be carried out by a MILAB laboratory or one accredited to nationally or internationally recognised standards, such as ISO or IANZ.** • **An appropriate Salmonella testing programme for raw materials[22] shall be in place. Raw materials such as animal by-products and imported materials shall be tested at least monthly, with actual testing frequency related to product risk. Supplies of animal by-products from new sources should not be used until the Salmonella status has been determined. Every load/batch should be tested until a history of negative results over two months has been accumulated. Subsequently, one in four loads are to be sampled and tested for verification.** • **A weekly Salmonella testing program for finished feed[4] shall be in place. Each load/batch of finished feed may be pooled by product line and tested weekly, with collection at delivery point, or at an appropriate point, as noted in the documented sampling program.** • **A monthly Salmonella testing program for environmental samples[23], covering a series of feed-mill locations most likely to be contaminated, shall be in place.** • **A monthly Salmonella testing program for feed trucks[5] shall be in place.** • **Response procedures or action plans shall be in place in the event of receiving Salmonella-positive test results from any of the above tests.** • **The effectiveness of control measures shall be monitored and reviewed at regular intervals, comparing results from the incidence of Salmonella-positive samples in raw materials, finished products, and environmental sampling.**
6. If a raw material or finished feed sample tests Salmonella-positive: • **Supply from that source should be stopped where practical until the Salmonella status of the raw material supply has subsequently tested negative.** • **Each subsequent load/batch should be tested until a two month set of Salmonella-negative tests results has been received.** • **If applicable, written notification should be received from the supplier that corrective action and/or cleaning has been undertaken.**
7. If environmental or feed truck Salmonella-positive samples are returned, a thorough cleaning program is to be undertaken as per the documented response procedure. Action is likely to include removal of all surface dust and other material from the feedmill, and sanitisation using appropriate chemicals.
8. Feed shall be treated to destroy pathogenic organisms e.g. by pelletising using high temperature then crumbled, or by addition of Salcurb or other control agent.
9. Fish meal not to be used in feed in quantities that cause off flavours.
10. The feeding of household rubbish and offal is not permitted.

[22] Sampling Procedure for raw materials and finished feeds:
- **A minimum of five sub-samples from different parts of every delivery into or out of the feedmill shall be taken to form a 500g representative composite sample**
- **Sub-samples shall be taken by grain spear or grab sample**
- **All equipment to be sanitized between samples to avoid cross-contamination**
- **Equipment used, including sample bags, shall be stored in sealed, dust-free conditions.**
- **Samples should only be taken by management or trained personnel**

[23] Sampling Procedure for environmental samples and 'empty' truck samples:
- **Drag foam or gauze swab over the documented areas most likely to harbour Salmonella on a monthly basis**
- **Equipment used, including sample bags, shall be stored in sealed, dust-free conditions.**
- **Samples should only be taken by management or trained personnel**
- **Random Salmonella testing of environmental samples, and from empty trucks, shall be taken roughly on a monthly basis.**

3.7.2.3 Procedures

The following control measures are the responsibility of the Layer Farm Supervisor:

Step	Control Measure	Monitoring	Corrective Action	Records
1. Order feed	**Supplier gives declaration that they have met all of the operator-defined requirements described in 3.7.2.2.**	**Check supplier's declarations with each delivery.**	**Do not unload feed without declaration. Return to supplier.**	**Supplier declarations.**
2. Receive feed				
3. Transfer to layer farm	**Feed should be kept in closed containers on farms.**			

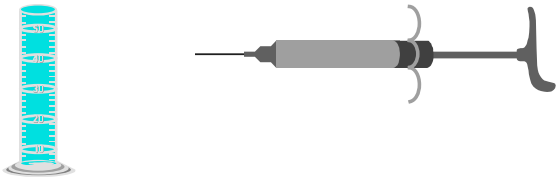
3.7.2.4 Operator verification

After each delivery of feed the Layer Farm Manager shall check and sign the supplier declarations. Any problems shall be noted on the relevant record with the details of the corrective action taken.

3.7.2.5 Records

An example of a suitable supplier declaration is given in Appendix E of this manual.

3.7.3 Medication



3.7.3.1 Hazards or Other Risk Factors Associated with Eggs Produced by Medicated Hens

C1 = Residues from veterinary medicines.

3.7.3.2 Supplier Requirements

Regulatory Requirements
1. All veterinary medicines must be licenced for their use by NZFSA's Agricultural Compounds and Veterinary Medicines Group. Refer to web site for details: http://www.nzfsa.govt.nz/cgi-bindb_search.cgi?setup_file=animal-rem-prod.setup.cgi
Operator-defined Requirements
None

3.7.3.3 Procedures

The following control measures are the responsibility of the Layer Farm Supervisor:

Step	Control Measure	Monitoring	Corrective Action	Records
1. Order veterinary medicines	**All veterinary medicines are licenced for their intended use by NZFSA.**	**Check supplier's evidence of licence.**	**Do not use unlicenced veterinary medicines. Return to supplier.**	**Approved supplier list.**
2. Receive veterinary medicines	**Confirm that veterinary medicines are clearly labelled and matches that ordered.**	**Visual inspection on arrival.**	**Do not use unlicenced veterinary medicines. Return to supplier.**	**Inwards goods docket.**
3. Store veterinary medicines	**Store in accordance with Manufacturer's instructions.**	**Monthly check**	**Correct problem. Retrain staff.**	**Chemical Use Record.**

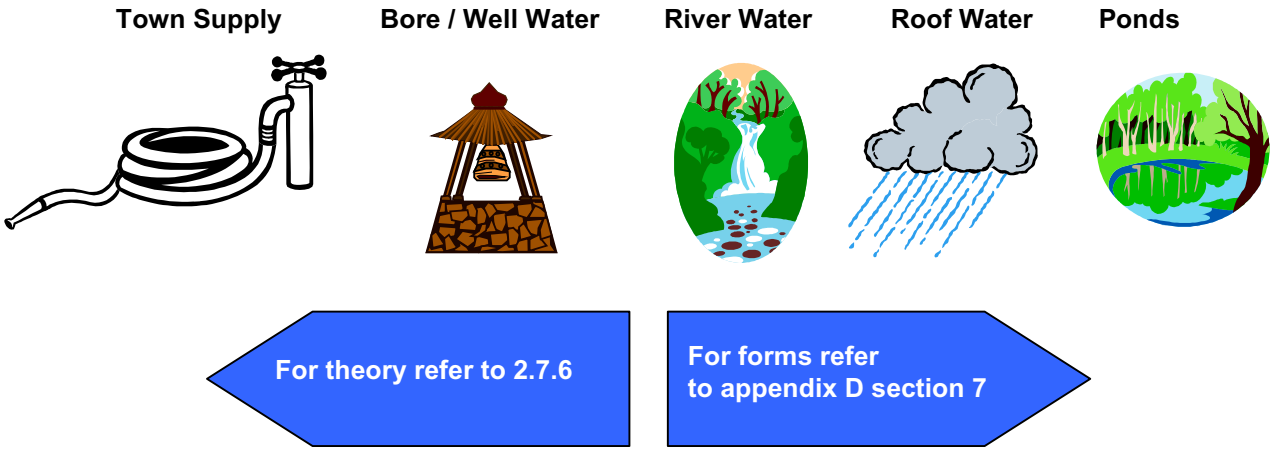
3.7.3.4 Operator verification

Once a month the Layer Farm Manager shall check and sign the inwards goods dockets for chemicals received that month (including veterinary medicines) and the Chemical Use Record. Any problems shall be noted on the relevant record with the details of the corrective action taken.

3.7.3.5 Records

An example of a suitable approved supplier list and Chemical Use Record is given in Appendix E of this manual.

3.7.4 Hen's Drinking Water



Water Supplier:	**Henrietta's Egg Company Ltd**
Water source:	**Surface water (stream)**
Water potability option:	**Schedule 1. Refer to 3.7.4.1 for details.**
Water Management Plan	**Refer to 3.7.4.2 for details.**
Water Reticulation Plan	**Refer to 3.7.4.3 for details.**
Records	**Approved Supplier file in Manager's office has a completed "Assessment of Water Supply Status Checklist" from Schedule 1.**

Table 1: Quality of Potable Water

Measurement	Criteria
faecal coliforms	must not be detectable in any 100 ml sample
Chlorine (when chlorinated)	not less than 0.2mg/l (ppm) free available chlorine with a minimum of 20 minutes contact time
pH (when chlorinated)	6.5 to 8
Turbidity	Should not routinely exceed 1 NTU, must not exceed 5 NTU

3.7.4.1 Checklist: Assessment of Water Supply Status

Part 1: SUPPLIER DETAILS		
Name of Operator: **Henrietta's Egg Company Ltd**	Type of Operation: **Egg Laying Farm**	Premises Address: **29 Henry St, Henryville**
Postal Address: **PO Box 111** **Henryville**	**Phone Number:** **Fax Number:** **Email Address:**	**(01) 01010101** **(01) 01010100** **Henrietta@eggs.co.nz**

Part 2: WATER SOURCE

Water Source – Indicate all sources intended to be used.

Secure groundwater (not under the influence of surface water) – Go to Part 3 ☐

Surface water (e.g. spring, well, river, stream, dam, lake, reservoir) – Go to Part 4 ☐

Roof water – Go to Part 5 ☐

Part 4: SURFACE WATER
(e.g. Spring, Shallow Well, Dam, Lake, Reservoir, Stream)

1. Management

(i) Describe the water source e.g. spring, well, stream, river, dam, reservoir etc. including name where appropriate.

Stream

(ii) Describe the soil type in the area of the water source e.g. coarse shingle, fine silt, clay etc.

Coarse shingle

	Yes	**No**
(iii) Has a microbiological test been done on this source within the last month?	❑	❑
(iv) Does the water satisfy the criteria in Table 1: Quality of Potable Water (See table on page 3-19, except for criteria relating to chlorine and pH)?	❑	❑?

Name the laboratory which did the test: _____

2. Criteria

(i) Are any of the following within 50 metres of the water source?

	Yes	No		Yes	No
Offal pit / soak hole	❑	❑	Septic tank / long-drop toilet	❑	❑
Animal effluent	❑	❑	Stock yards	❑	❑
Sumps	❑	❑	Land disposal site/refuse pit	❑	❑
Feed pad	❑	❑	Silage stack	❑	❑
Fuel tanks	❑	❑	Chemical preparation/storage	❑	❑
Timber treatment facility	❑	❑	Pesticide residues	❑	❑

(ii) Are there any known water quality problems (e.g. bacterial contamination, turbidity, corrosiveness, sediment, colour, smell, taste)?

(If Yes, specify)
*No*_____

(iii) Do any of the following factors present risks to the quality of the water?

	Yes	No
Spray drift	❑	❑
Nearby factories	❑	❑
Mining operations	❑	❑

(If Yes, specify what activity and how far away)

---

3. Intake and storage

	Yes	No
(i) Is any visible matter drawn up in the intake from the water source?	❑	❑
(ii) Are holding tanks used?	❑	❑
(iii) If Yes, are these tanks capable of holding more than or less than 1 days supply of water? (please circle answer)	More	Less
(iv) Is the outlet of the holding tank above or level with the base of the tank? (please circle answer)	Above	Level

4. Additional criteria for flowing water only i.e. rivers, streams, springs etc.	Yes	No
(i) Is there a plan for when the river/stream etc. floods?	❑	❑
(ii) Is effluent discharged less than 2 km upstream of the water intake? If Yes, state source: _____	❑	❑
(iii) If Yes, is effluent discharged less than 4 hours before water is taken from the source?	❑	❑
(iv) Do farmed animals have access to within 10m of the water intake?	❑	❑
(v) Is industrial or urban stormwater discharged to the source water upstream of the intake?	❑	❑

5. Additional criteria for enclosed surface waters only i.e. dams, lakes, reservoirs etc.	Yes	No
(i) Is the water accessible to farmed animals?	❑	❑
(ii) Is effluent discharged into the dam/lake/reservoir?	❑	❑
(iii) Is industrial or urban stormwater discharged into the dam/lake/reservoir?	❑	❑

6 Analysis

- **If the answers to the questions in section 1 are YES and to all questions in sections 2, 3, 4 & 5 are NO, then the water may be considered satisfactory.**
  Section 2 had a YES answer – Silage stack within 50 m.
- **If the answer to any question in section 1 is NO, then a microbiological test must be obtained and, where necessary, a corrective action plan must be designed and included in the water management plan to ensure the water meets the criteria in Table 1: Quality of Potable Water.**
- **If the answer to any question in section 2 is YES, then appropriate action must be taken to ensure potential hazards to human health are identified and, where necessary, a corrective action plan is designed and included in the water management plan to ensure the hazard(s) of concern is/are minimised.**
  Section 2 had a YES answer – Silage stack within 50 m. Silage stack has now been moved further away.
- **In relation to section 3, if visible debris is drawn up in the water intake at any time and if the holding tank capacity is such that water could settle for at least 24 hours before use and the water outlet from the tank is above the base of the tank so that debris can settle, then the facility may be considered satisfactory. If the facility is not considered satisfactory then a corrective action plan must be designed and included in the water management plan.**
- **If the answer to any question in sections 4 or 5 is YES, then appropriate action must be taken to ensure potential hazards to human health are identified and, where necessary, a corrective action plan is designed and included in the water management plan to ensure the hazard(s) of concern is/are minimised.**

3.7.4.2 Water Management Plan:

Why was your water unsatisfactory? (Get this from your earlier answers)	***Stream water = unsecured source.*** ***Silage stack too close.***
Is there a biological, chemical or physical hazard associated with this problem? If so what? (See next table for ideas).	***Yes - Could have harmful bacteria from silage contaminated by rodents and birds.*** ***Yes – could have residues from herbicides used to control gorse on property.***

	Hazards[24]	**Examples**
Biological hazards	**Harmful bacteria from the gut of humans, animals and birds.**	***E.coli*** ***Salmonella* species**
	Parasites	***Giardia*** ***Cryptosporidium***
Chemical hazards	**Chemical residues**	**Pesticides, herbicides, fumigants**
	Heavy Metals	**Mercury, cadmium, copper, lead, zinc, selenium, arsenic, chromium. manganese, antimony**
Physical hazards	**N/a**	**N/a**

What will you do to correct or control this problem/hazard? Consider removing the problem where possible or treatment e.g. chlorination, filtration. **You may need to ask for expert advice on this.**	***Have moved the silage stack.***

[24] **These hazards are summarised from those identified in MAF's generic model for potable water, May 1997.**

What water testing will you do? How often? What criteria must it meet?	***See table below***

Measurement	Criteria	Test frequency Secure water	Unsecure Water <2000 m^3/day	2000-10,000 m^3/day	>10,000 m^3/day
faecal coliforms	Must not be detectable in any 100 ml sample	Nil	1 test every month	1 test every 2 weeks	1 test every week
Chlorine (when chlorinated)	Not less than 0.2mg/l (ppm) free available chlorine with a minimum of 20 minutes contact time	Nil	1 test every month	1 test every 2 weeks	1 test every week
pH (when chlorinated)	6.5 to 8	Nil	1 test per month	1 test per 2 weeks	1 test per week
Turbidity	Should not routinely exceed 1 NTU, must not exceed 5 NTU	Nil	daily	daily	daily

What will you do if any of these criteria are not met? Consider extra treatment, further testing, alternative supply etc. You may need to ask an expert for help.	***Coli – further treatment – set up chlorination system. Chlorine and pH (if chlorinated due to coli problem) – increase testing frequency so problems detected earlier. Turbidity – ask for expert help.***
What lab does the micro tests?	***Lab X*** ***Secret St*** ***Henryville***
Are they MILAB accredited[25]? If so ask for letter confirming this. If not, find another lab which is.	***Yes***
Who are the water samplers and were they trained by the lab to take samples properly?	***Henrietta and Henry Eggnott*** ***Yes***

[25] MILAB is a laboratory accreditation programme run by NZFSA. See NZFSA web site: www.nzfsa.govt.nz/animalproducts/milab/index.htm or contact Programme Manager, Monitoring and Review for details (04, 4632500).

Who does the pH, chlorine and turbidity tests? Have they been trained?	**pH:** ***Henrietta and Henry Eggnott (both trained)*** **Chlorine:** ***Henrietta and Henry Eggnott (both trained)*** **Turbidity:** ***Henrietta and Henry Eggnott (both trained)***
What equipment/ test kit/ method is used for these tests? How is any equipment calibrated to make sure it is accurate (Refer to the manufacturer's instructions or supplier for details).	**pH:** ***pH meter calibrated and used in accordance with manufacturer's instructions.*** **Chlorine:** ***Lovibond comparator test used in accordance with manufacturer's instructions.*** **Turbidity:** ***Nephilometer, Method SMWW 2130A***
What test records do you have: for pH, chlorine and turbidity tests?	**Micro:** ***Lab report*** **pH:** ***See Record 3*** **Chlorine:** ***See Record 3*** **Turbidity:** ***See Record 3***

Note: If water is supplied by the operator, and the operator fails to comply with any of the requirements of the water management plan (shown on last 3 pages), and has no other means described in the risk management programme to ensure the water meets the original standard at the point of use, all operations involving that water must cease.

3.7.4.3 Water Reticulation Plan

Do you have a plan of the water pipes and tanks on your premises?	***Yes – refer to plan on wall of farm manager's office.***
Do you have more than one standard of water on your premises, e.g. potable water, and non-potable water – perhaps for fire fighting?	***No***
Do you have dead ends in your potable water pipes where water can stagnate?	***No***
Are your pipes in good condition, i.e. not rusting, not damaged?	***Yes***
If any of the above change what will you do?	***One or more of the following as appropriate:*** • **Increase water testing,** • **Replace pipes, or otherwise fix the problem,** • **Treat water before point of use.**

Note: These questions have been asked to ensure that the quality of the water coming in is maintained. Further identification and analysis of hazards and other risk factors is not required.

3.8 Identification, Analysis and Control of Hazards and Other Risk Factors From Other Sources

For theory refer to 2.8

For forms refer to appendix D section 8

3.8.1 Chemicals:

3.8.1.1 Scope

Chemicals used for cleaning, sanitation, fumigation, pest control, and lubricants; and any other chemicals used within the layer farm.

3.8.1.2 Requirements for the Operator

Regulatory Requirements
1. Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000, 21: Cleaning and fumigation chemicals to be labelled with the name or names of the approved maintenance compound as they appear in the list of approved maintenance compounds contained in NZFSA Manual 15 http://www.nzfsa.govt.nz/animalproducts/legislation/notices/m15-chem-schedule-all.pdf
Operator-defined Requirements
2. The access, handling and use of chemical compounds shall be under the supervision of trained personnel.
3. Chemical compounds shall only be used according to the directions of the manufacturer and subject to the conditions of the authorisation.

3.8.1.3 Process flow diagram

Inputs	Process steps	Outputs
Chemicals	1. Order chemicals	
	2. Receipt of chemicals	
	3. Bulk storage	
	4. Issue / transfer to layer farm	Empty containers
	5. Storage	
	6. Use chemicals	
	7. Unused chemical returned to storage	
	8. Disposal of empty containers	Empty containers

3.8.1.4 *Identify / Analyse Hazards and Other Risk Factors, and Determine CCPs*

			Q1: Is hazard reasonably likely to contact product?	**Q2:** Could the level of hazard exceed the measurable requirement?	**Q3:** Is there one or more new or improved controls that will achieve the measurable requirement?	**Q4:** Are there any other controls?
Hazard or Risk Factor	**Current Control measures, e.g.** **GHP / GMP** **CCPs**	**Is there a relevant measurable requirement?** **(See 3.8.1.2)?**	**If yes, go to Q2.** **If no, not a CCP. Go to next hazard or risk factor.**	**If yes, go to Q3.** **If no, not a CCP. Go to next hazard or risk factor.**	**If no, go to Q4.** **If yes set up CCP to meet measurable requirements and also go to Q4.**	**If yes, redesign / establish GMP/GHP to meet remaining requirements.** **If no, and no CCPs list as uncontrolled. Consider at process analysis.**
C2 Residues from chemicals used in shed cleaning, fumigation etc	None[26]	Yes – Appropriate use of approved chemicals	Yes	Yes	Yes **CCP 1**: Order chemicals. **CCP 2**: Use Chemicals	No.

3.8.1.5 *Critical limit determination*

Determine critical limits for each CCP (see table below).

CCP No.	CCP	Critical Limits
1	**Order chemicals**	**All ordered chemicals are approved for their intended use as per NZFSA Manual 15 http://www.nzfsa.govt.nz/animalproducts/legislation/notices/m15-chem-schedule-all.pdf**
2	**Use chemicals**	**Use correct approved chemical for intended use, in accordance with manufacturer's instructions.**

3.8.1.6 *Procedures*

The following control measures are the responsibility of the Layer Farm Supervisor:

Step	CCP or General Control	Critical Limit or General Criteria	Monitoring	Corrective Action	Records
1. Order chemicals	**CCP 1**	**All chemicals are approved for intended use as per Manual 15.**	**Check supplier's evidence of chemical approval.**	**Do not use unapproved chemicals. Return to supplier.**	**Approved supplier list.**
2. Receive chemicals	**GC**	**Confirm that chemical clearly labelled and matches that ordered.**	**Visual inspection on arrival.**	**Do not use unapproved chemicals. Return to supplier.**	**Inwards goods docket.**

[26] If Henrietta had good control measures already in place, (e.g. Only purchasing approved chemicals, and using them in accordance with manufacturer's instructions) then the answers to the questions would be different and a CCP would not be identified.

Step	CCP or General Control	Critical Limit or General Criteria	Monitoring	Corrective Action	Records
3. Bulk Storage	GC	Store in accordance with Manufacturer's instructions.	N/a	Correct problem. Retrain staff.	Back of Chemical Use Record.
4. Issue / transfer to layer farm					
5. Departmental storage	GC	Store in accordance with Manufacturer's instructions.	N/a	Correct problem. Retrain staff.	Back of Chemical Use Record.
6. Use chemicals	CCP 2	Use correct approved chemical for intended use, in accordance with manufacturer's instructions.	Record all chemicals used, date, what it was used for, quantity used and any dilutions.	Get expert advice if necessary.	Chemical Use Record.
7. Unused chemical returned to storage					
8. Disposal of empty containers	GC	Dispose in accordance with manufacturer's instructions. Do not reuse containers for other things.	N/a	Correct problem. Retrain staff.	Back of Chemical Use Record.

3.8.1.7 Operator verification

Once a month the Layer Farm Manager shall check and sign the inwards goods dockets for chemicals received that month and the Chemical Use Record. Any problems shall be noted on the relevant record with the details of the corrective action taken.

3.8.1.8 Records

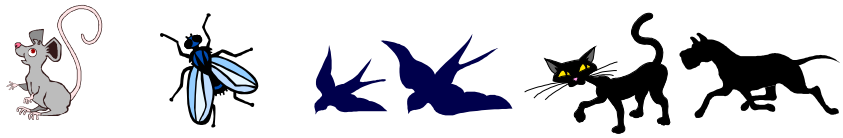
An example of a Chemical Use Record is given in Appendix E.

3.8.2 Pests

3.8.2.1 Scope

Includes pest control for all areas appropriate to the RMP, (including the production of animal product for animal consumption where relevant). It includes all relevant external and internal environs (stores, amenities and any other support areas).

Rodents Insects Birds Cats/dogs Stoats / Ferrets



3.8.2.2 Requirements for the Operator

Regulatory Requirements
1. Animal Products Regulations 2000, 11: Hygiene Of Processing Environment-- (1) All specified persons must establish and carry out effective procedures to-- (a) ensure appropriate and adequate maintenance, cleaning, and sanitation of processing premises, places, facilities, essential services, and equipment (including conveyances); and (b) manage waste; and (c) control pests.
2. Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000, 21: Approved maintenance compounds (pesticides) to be labelled with the name or names of the maintenance compound as so approved, or as they appear in the list of approved maintenance compounds contained in specifications.
Operator-defined Requirements
3. Pests must be excluded from the premises to the extent practicable.
4. Ongoing monitoring for infestation must occur. Where an infestation is detected it must be dealt with in a timely and effective manner.
5. Good hygienic practice must be used to avoid creating an environment conducive to pests.
6. Chemical, physical or biological measures used to minimise the access of pests to the product must not present a hazard. Where chemicals are used for this purpose, only approved chemicals as listed in NZFSA Manual 15 http://www.nzfsa.govt.nz/animalproducts/legislation/notices/m15-chem-schedule-all.pdf may be used where there is potential to contaminate the product. Directions and conditions for use must be followed.
7. Pest management system must be documented and records maintained.
8. All pesticides on a premises shall be listed in an inventory.
9. The access, handling and use of pesticides shall be under the supervision of trained personnel
10. Pesticides shall only be used according to the directions of the manufacturer and subject to the conditions of the authorisation
11. All practical steps shall be taken to ensure vermin cannot gain entry to poultry housing and feed sources. All sheds shall be wild bird proof.
12. Appropriate measures shall be taken to control vermin whilst birds are in sheds, and during depopulation and re-population.
13. There shall be a documented effective pest control system in place. Vermin includes any pests that may carry disease such as insects, rodents, wild birds and animals.

3.8.2.3 Process flow diagram

For chemical pesticides, refer to earlier example.

3.8.2.4 Identify and Analyse Hazards and Other Risk Factors

Sources of hazards	Hazards reasonably likely to occur with each source	Current Control measures	Is there a relevant measurable requirement?
Chemicals used for pest control	C2: Residues from cleaning, fumigation and pest control chemicals	Only purchase approved chemicals. Comply with conditions of approval and manufacturer's instructions for use.	Yes = See 3.8.1
Flies, cockroaches and other insects	B1: Salmonella and B2: Other enteric bacteria	External environs: Ground maintenance, e.g. foliage, grass Waste control Internal environs: Self closing doors Housekeeping programme Screens (windows/doors)	No
Rats and mice	B1: Salmonella and B2: Other enteric bacteria	External environs: Waste control Drain traps Bait stations (rodenticide) Internal environs Bait boxes Drain traps Housekeeping programme	No
Birds	B1: Salmonella and B2: Other enteric bacteria	External environs: Bird deterrents (noise makers, foliage removal) Waste management	No
Cats, dogs, stoats and ferrets	B1: Salmonella and B2: Other enteric bacteria	External environs: Fencing Traps Waste management	No

3.8.2.5 CCP Determination

There are no CCPs for the non-measurable requirements.

The CCP determination for measurable requirements for pest control chemicals has already been covered in 3.8.1.5.

3.8.2.6 Determine Critical Limits

Not applicable as the only CCP is associated with chemical control. This has already been covered in 3.8.1.6.

3.8.2.7 Procedures

Physical Controls

The following physical controls are used to prevent entry of pests into layer sheds and associated buildings:

- **self closing doors,**
- **drain screens,**
- **insect screens,**
- **wild bird deterrents (e.g. scarecrows, use of nylon lines to prevent landing on roosting areas),**
- **wild birds must be prevented entry to open style sheds.**

These controls shall be kept in place year round, even when sheds are empty. During cleanout, depopulation and re-population the doors may need to be left open to facilitate access to the shed. The time that this is the case shall be minimised.

All feed storage facilities shall be pest proof and waterproof.

Potable water storage facilities shall be pest proof. i.e. all tanks shall be enclosed with lids on.

Housekeeping / Maintenance

The area immediately surrounding the sheds shall be kept free of trees, long grass, and any other rubbish or debris that may attract or provide cover for pests.

All animals (eg cats and dogs) shall be denied access to any part of sheds or runs.

Dead birds shall be removed daily and placed in bin until disposal (burnt or buried).

Waste shall be enclosed in bins until removal.

Manure shall be removed from laying houses every month.

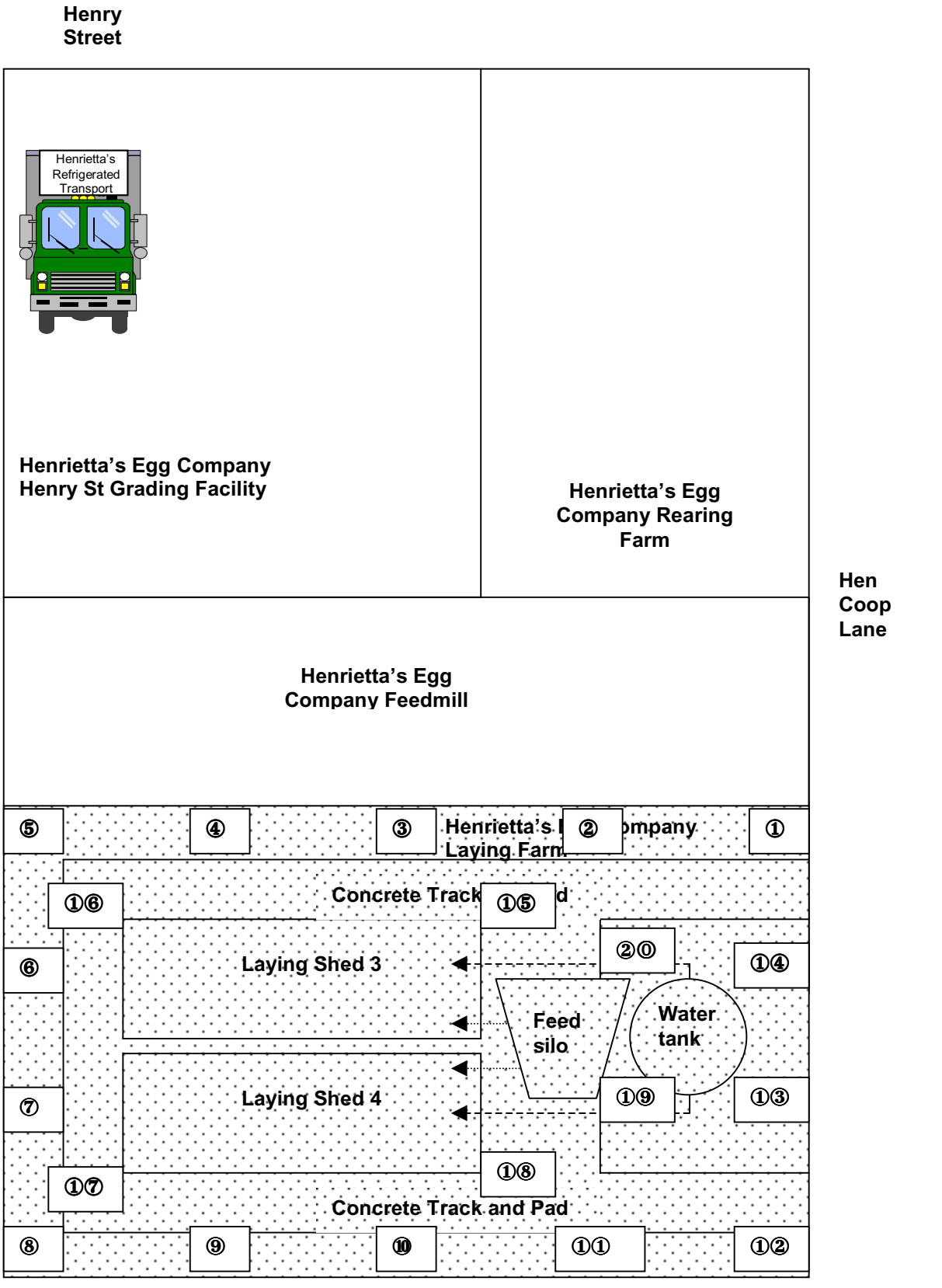
Any feed spillages shall be cleaned up as soon as they are noticed.

Pesticide System

Appropriate measures shall be taken to control pests whilst hens are housed in sheds and free ranged, and during depopulation and re-population. This includes:

- **Use of bait stations (they must be protected from access by hens). See site diagram showing their unique numbers and locations.**
- **Use of sticky fly-paper to capture insects.**
- **Use of insecticides – only when necessary.**
- **Use of a registered pest controller to regularly (weekly, fortnightly or monthly depending on performance) check the bait stations and take appropriate corrective action. Name of Pest Control Company = No Flies No Me Ltd. A copy of the company's Registration Certification is kept in the Approved Supplier File.**
- **Use of approved pest control chemicals as listed in NZFSA Manual 15 http://www.nzfsa.govt.nz/animalproducts/legislation/notices/m15-chem-schedule-all.pdf.**
- **Records shall show all pest control activities, dates, chemicals used, quantities, any evidence of pest activity and any corrective action taken.**

Shaded areas are included in the physical boundaries of the RMP. The grading facility, feedmill and rearing farms are run as separate operations and are not included in this RMP.



Monitoring

The Layer Farm Supervisor shall do a weekly inspection of the internal and external environment to check on the effectiveness of the physical controls and the housekeeping / maintenance system. Pest Control Record 2 shall be filled out for each inspection.

The monitoring of the pesticide system shall be done by the Pest Controller. Pest Control Record 1 shall be filled out each time monitoring is done.

Corrective Action

When the monitoring finds problems with the controls appropriate corrective action shall be taken. This may include fixing the physical controls, increasing housekeeping frequencies, retraining staff, increasing inspection frequency, increasing pest control points, changing pest control chemicals etc.

3.8.2.8 Records

The Pest Control record forms mentioned above can be found in Appendix E of this Code Of Practice.

3.8.2.9 Operator verification

Once a month the Layer Farm Manager shall check and sign the records for that month. Any problems shall be noted on the relevant record with the details of the corrective action taken.

3.8.3 Internal environs, facilities and equipment inside the shed

3.8.3.1 Scope

Includes the design, construction, maintenance, housekeeping and cleaning of layer shed (premises and equipment) appropriate to the RMP:

- **shed area,**
- **egg collection area, and**
- **any other support areas.**

Tools / Equipment | Nest box material | Dirty surfaces | Litter / Manure | Dead Birds | Reject Eggs | Trolleys/Trays Forklifts





3.8.3.2 Requirements for the Operator

Regulatory Requirements
1. Animal Products Regulations 2000, 10: Requirements for premises, places, facilities, equipment, and essential services:—All specified persons must ensure that the premises, places, facilities, equipment, and essential services for which they are responsible in relation to the processing of animal material or animal product are-- **(a) designed, constructed, and located to enable suitability of the animal material to be maintained, and the fitness for intended purpose of the animal product to be achieved and maintained, having regard to--** **(i) the animal material or animal product to be processed; and** **(ii) the nature of the processes involved; and** **(iii) the range of the animal products to be produced; and** **(b) operated to minimise and manage the exposure of animal material or animal product or associated things to risk factors, having regard to--** **(i) the animal material or animal product to be processed; and** **(ii) the operational capability and capacity of the premises or place, facilities, equipment, and essential services; and** **(iii) the range of animal products to be produced.**
2. Animal Products Regulations 2000, 11: Hygiene Of Processing Environment-- **(1) All specified persons must establish and carry out effective procedures to--** **(a) ensure appropriate and adequate maintenance, cleaning, and sanitation of processing premises, places, facilities, essential services, and equipment** **(including conveyances); and** **(b) manage waste; and** **(c) control pests.**
3. Animal Products Regulations 2000, 16 Packaging requirements for animal material and product-- All risk management programme operators, operators of animal material depots, and other categories of person specified in specifications for the purposes of this regulation must ensure that any packaging materials (including reusable packaging and inner and outer packaging of any kind) used for animal material, animal product, and associated things are designed, made, stored, and used in a manner that-- **(a) maintains the status of the animal material as suitable for use in processing; and** **(b) maintains the status of the animal product as fit for its intended purpose; and** **(c) minimises contamination of the animal material or animal product.**

Regulatory Requirements
4. Animal Products (Specifications for Products Intended for human Consumption) Notice 2000, 5: Design and construction. **(2) The facilities, equipment, and internal structures, that may affect the suitability for processing of animal material or the fitness for intended purpose of animal product, must be of sanitary design.**
5. Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000, 6: Facilities and equipment etc **(2) Cleaning and sanitation facilities, and equipment, must be provided to ensure that the hygiene of personnel, equipment and premises or place can be maintained so that the suitability for processing of animal material and the fitness for intended purpose of the animal product is not adversely affected.**
6. Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000, 19: Management of animal material or animal product not for human consumption **(1) Equipment or storage areas used to store or contain animal material that is not suitable for processing or animal product that is not fit for human consumption, but is suitable or fit for some other purpose, must —** **(a) be clearly identified; and** **(b) not be a source of contamination to other animal material or animal product that is intended for human consumption.** **(2) Animal material or animal product that is not suitable for processing or not fit for human consumption but is suitable or fit for some other purpose, must be kept under controlled conditions until adequately identified in a manner that will ensure that it will not be mistakenly or fraudulently released as suitable for processing or fit for human consumption.**
7. Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000, 20: Waste management **(1) For the purposes of this clause** waste **includes animal material and animal product which has been assessed by an examiner who meets the competency requirements of clause 25(1)(a), or an animal product officer, and has been adjudged unsuitable or unfit for any purpose, and is awaiting disposal.** **(2) Equipment, and storage areas, used to store or contain waste must —** **(a) be clearly identified; and** **(b) not be a source of contamination to other animal material or animal product.** **(3) Waste must be kept under controlled conditions until adequately identified in a manner that will ensure that it will not be mistakenly or fraudulently released as suitable for processing or fit for human consumption.** **(4) Waste must be disposed of by a method that ensures that it will not become a source of contamination to other animal material or animal product.**
8. Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000, 21: Approved maintenance compounds to be labelled. **All containers of approved maintenance compounds must be labelled with the name or names of the maintenance compound as so approved, or as they appear in the list of approved maintenance compounds contained in specifications.**
Operator-defined Requirements
9. Visual assessment of the internal environment (walls, ceilings, floors, drains, entrances etc.) shall verify the effectiveness of the cleaning programme.
10. All cleaning chemicals and maintenance compounds to be approved and to be used as per Approvals Manual /manufacturers requirements.
11. Maintenance activities and actions taken to correct sanitary defects shall be carried out so that contamination is minimal

3.8.3.3 Process flow diagram

For chemicals refer to 3.8.1.3.

3.8.3.4 Identify and Analyse Hazards and Other Risk Factors

Sources of hazards	Hazards reasonably likely to occur with each source	Current Control measures	Is there a relevant measurable requirement?
Introduction / spread of hazards from contaminated: • Tools/ equipment • Trolleys / trays • Forklifts etc • Nest box material • Litter • Manure • Dead birds • Reject eggs	B1: Salmonella species and B2: Enteric bacteria	Cleaning and sanitation of all tools, equipment, trolleys, trays and forklifts prior to bringing into shed from outside. Regular cleaning and sanitation of all equipment inside sheds.	No
		Regular changing of nest box material.	
		Changing litter after shed depopulation and cleanout.	
		Regular removal of manure.	
		Daily removal and disposal of dead birds.	
		Daily removal and disposal of reject eggs.	
Cleaning chemicals	C2: Residues from cleaning, fumigation and pest control chemicals	Only purchase approved chemicals. Comply with conditions of approval and manufacturer's instructions for use.	Yes = See 3.8.1

3.8.3.5 CCP determination

There are no CCPs for the non-measurable requirements. The only measurable requirements relate to chemical hazards that have already been addressed. See 3.8.1.5.

3.8.3.6 Critical limit determination

See 3.8.1.6 for chemicals.

3.8.3.7 Procedures

Facilities Criteria
Any sheds shall be waterproof. **Sheds shall be constructed of suitable materials that can be adequately cleaned and sanitised.** **The total shed floor shall be constructed of concrete or other suitable impervious material, except for sections under the cages for droppings.** **Dirt floors in permanent sheds are not acceptable even if slatted floors are installed.** **Wooden walkways and slats are acceptable in high rise sheds, but shall be able to be effectively cleaned and sanitised.** **Wooden or plastic slats are acceptable for mobile housing, provided they may be effectively cleaned and sanitised.**

Shed Housekeeping and Cleaning Criteria

The following cleaning program shall be used to maintain the sheds in a hygienic condition during lay:

- **Manure shall be removed at least twice from the layer house during the life of the hen, except for high rise sheds where all manure shall be removed at depopulation time. Manure when collected and removed off the site must be securely covered when transported to an approved destination.**
- **Dust and cobwebs shall be removed as necessary.**
- **Equipment used on the farm must go through the biosecurity process in the same manner as it is applied to individuals. Equipment must not be moved from shed to shed unless a total clean down and disinfection programme has been carried out.**
- **Egg collection belts in the shed must be dry-cleaned to a regular programme. The pre-grading egg conveyor belts must also be cleaned and sanitized to a regular programme. Should a positive test occur for salmonella then sanitizing must be weekly using Virkon or another approved chemical. The conditions for the use of Virkon are that before use all edible product and packaging material must be removed from the room. Following its use food surfaces must be thoroughly rinsed with potable water before production starts. There is a list of other approved chemicals on the following web site www.nzfsa.govt.nz/animalproducts/legislation/notices/m15-chem-scheule-all.pdf**
- **All egg contact equipment shall be dry cleaned weekly (brushed or vacuumed) and more frequently when there is visible soiling.**
- **All sheds should be swept down daily to keep dust levels down.**
- **The shed floors, ceilings and walls shall be dry cleaned monthly.**
- **Feed spillages are removed as soon as they occur**
- **Sheds that have had a positive flock must be cleaned and sanitised.**
- **Egg trays and egg trolleys must be cleaned and sanitized prior to their return to the farm site from the egg packing house.**

The following control measures are the responsibility of the Layer Farm Supervisor:

Area	General Control	Monitoring	Corrective Action	Records
1. Shed design and construction	See facilities criteria on previous page.	Check that all new sheds conform to the criteria prior to birds being placed in them.	Fix shed to meet requirements.	Use relevant criteria on previous pages and tick off each one checked. Add cover sheet with date, shed, person doing check, signature etc)
2. Shed maintenance	Shed to be maintained in state that meets criteria under 1 above.	Monthly shed inspection.	Correct problem. Retrain staff.	Monthly shed inspection record.
3. Shed housekeep-ing and cleaning	Shed shall be dry cleaned during laying periods so that any equipment that contacts the eggs is visibly clean.	Monthly shed inspection.	Correct problem. Retrain staff.	Monthly shed inspection record.
4. Litter	Change litter after shed depopulation and cleanout.	Check before placing birds.	Replace litter after cleaning shed.	Shed cleanout record
5. Manure	Regularly remove manure	Monthly shed inspection.	Correct problem. Retrain staff.	Monthly shed inspection record.
6. Nest Box Material	Regularly change nest box material and change when soiling is noticed.	Monitor at egg collection.	Replace material. Review frequency.	Daily Farm Record

Area	General Control	Monitoring	Corrective Action	Records
7. Tools / Equipment	Clean and sanitise all tools, equipment, trolleys, trays and forklifts prior to bringing into shed from outside.	Visual inspection before entry into shed.	Reclean.	Daily Farm Record
	Regularly clean and sanitation all tools and equipment inside sheds.	Monthly shed inspection.	Review cleaning frequency.	Monthly Shed Inspection Record
8. Waste disposal	Dead birds shall be removed from sheds daily, and buried, incinerated, composted, frozen, and/or otherwise removed from the farm.	Daily shed inspection	Correct problem. Retrain staff.	Daily Farm Record
	Dead birds shall never be available to domestic pets or vermin.	N/a	Correct problem. Retrain staff.	Daily Farm Record
	Remove and dispose of reject eggs daily.	N/a	Retrain staff.	Daily Farm Record
	All rubbish, liquid waste and shed washings shall be disposed of in an approved manner.	Monthly shed inspection	Correct problem. Retrain staff.	Monthly Shed Inspection Record
	Applicable personnel, equipment, and vehicles shall follow documented cleaning and sanitising procedures after disposal of dead birds and/or rubbish.	N/a	Retrain staff.	Daily Farm Record

3.8.3.8 Records

Examples of the above records can be found in Appendix E of this Code of Practice.

3.8.3.9 Operator verification

Once a month the Layer Farm Manager shall check and sign the records for that month. Any problems shall be noted on the relevant record with the details of the corrective action taken.

3.8.4 External environment

3.8.4.1 Scope

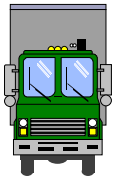
This is mainly relevant to free range birds as they are exposed to the environment whereas other bird types are not. This section may be omitted for birds that are confined inside.

Pests/ Wild birds

Ponds

Mud

Trucks/crates



3.8.4.2 Requirements for the Operator

Regulatory Requirements
1. Animal Products Regulations 2000, 17: Carriage and delivery requirements for animal material and product-- All persons engaged in the carriage and delivery of animal material or animal product must as far as practicable ensure that the means of carriage and delivery are designed, made, maintained, and operated to minimise contamination or deterioration of animal material or animal product.
Operator-defined Requirements
2. Free range hens shall be denied access to non-potable water sources.
3. The ground where free range hens can range should be free of chemicals in concentrations that could leave unacceptable levels of residues in the egg, e.g. DDT.
4. The surrounds of any shed entries shall be constructed to facilitate cleaning and sanitising.
5. All vehicles used to transport of end-of lay hens shall be cleaned and sanitised between journeys. Dirty vehicles, crates, and other equipment shall be refused access to the farm.
6. All vehicles and crates used for the transportation of pullets shall be cleaned and sanitised between batches of pullets, and between layer farms (ie applies when a pullet rearer supplies pullets from one batch to several layer farms).

3.8.4.3 Process flow diagram

N/a

3.8.4.4 Identify and Analyse Hazards and Other Risk Factors

Sources of hazards	Hazards reasonably likely to occur with each source	Current Control measures	Is there a relevant measurable requirement?
Access to non-potable water sources	**B1: Salmonella species B2: Enteric bacteria**	**Keep free range hens away from uncontrolled water sources.**	**No**
Access to contaminated areas	**B1: Salmonella species B2: Enteric bacteria C5: Chemical residues e.g. DDT[27]**	**Rotate free range area. Pest Control. Soil testing.**	**No Covered in 3.8.2. No – unacceptable level not known.**
Contaminated vehicles.	**B1: Salmonella species B2: Enteric bacteria**	**Cleaning and sanitising before entry to farm.**	**No**

[27] **Chemical issues are likely to be very site dependent and may not be relevant in some locations.**

3.8.4.5 CCP Determination

There are no CCPs for the non-measurable requirements.

3.8.4.6 Determine Critical Limits

There are no CCPs so there are no critical limits. For the non-CCP requirements see below.

Facilities Criteria
Sheds (except mobile housing) shall have a concrete pad at the ends, or other areas where manure accumulates during the removal process, to enable effective cleaning and sanitising at cleanout. **The main access area to each permanently situated shed shall be laid out in concrete or other material suitable for effective cleaning and sanitising.**

3.8.4.7 Procedures

Hazard	General Control	Monitoring	Corrective Action	Records
B1, B2 pathogens	**Rotate free range area so that birds are confined to a defined area which is maintained in good condition.**	**Daily check of condition of free range area.**	**Rotate more frequently.**	**Daily Farm Record**
	Keep birds away from non-potable water sources.	**N/a**		
	Sheds to meet requirements identified above.	**Check each new shed before use.**	**Correct problem.**	**Record problems on bottom of Daily Farm Record**
	All vehicles used for the transportation of end-of lay hens shall be cleaned and sanitised between journeys. Dirty vehicles, crates, and other equipment shall be refused access to the farm.	**Visual inspection at entry to farm.**	**Clean and sanitise again until visually clean.**	**Record problems on bottom of Daily Farm Record**
	All vehicles and crates used for the transportation of pullets shall be cleaned and sanitised between batches of pullets, and between layer farms (ie applies when a pullet rearer supplies pullets from one batch to several layer farms).	**Visual inspection at entry to farm.**	**Clean and sanitise again until visually clean.**	**Record problems on bottom of Daily Farm Record**
C5 Chemicals	**Uncontrolled.**			

3.8.4.8 Records

The record forms can be found in Appendix E of this Code Of Practice.

3.8.4.9 Operator verification

Once a month the Layer Farm Manager shall check and sign the records for that month. Any problems shall be noted on the relevant record with the details of the corrective action taken.

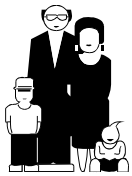
3.8.5 Personnel

3.8.5.1 Scope

Hygiene management for all people (managers, staff, visitors and contractors e.g. maintenance workers, cleaners etc) in all areas appropriate to the RMP. It includes external and internal environs (egg production areas, stores, amenities and any other support areas).

Manager **staff** **Repairmen / Visitors** **Customers**



3.8.5.2 Requirements for the Operator

Regulatory Requirements
1. Animal Products Regulations 2000, 12: Hygiene of persons whose presence or actions may result in contamination of animal material or animal product-- **All risk management programme operators, persons who transport animal material or animal product from the place or premises of a primary processor, and other categories of person specified in specifications for the purposes of this regulation must ensure that persons, including visitors, whose presence or actions, at any premises or place where animal material or product is processed, may result in contamination of animal material or animal product--** **(a) wear appropriate protective clothing, where necessary; and** **(b) follow an appropriate personal hygiene routine; and** **(c) behave in such a manner as may be necessary or desirable to minimise contamination to animal material, animal product, and associated things.**
2. Animal Products Regulations 2000, 13: Persons infected by or carriers of disease or illness to be excluded from working areas or from handling animal material or product-- **All specified persons must ensure that persons, including visitors, who are known to be, or suspected of being, infected by or a carrier of a disease or illness of public health concern (including a notifiable infectious disease listed in section A of Part 1 of the First Schedule of the Health Act 1956) that is likely to be transmitted through animal material, animal product, or associated things are precluded from--** **(a) working in areas where animal material or animal product is processed, if that may result in contamination of animal product; or** **(b) handling animal material, animal product, or associated things that may result in contamination of animal product.**
3. Animal Products (Specifications for Products Intended For Human Consumption) Notice 2000: 23 Health: **(1). The operator must take reasonable measures to ensure that a person (including any visitor or contractor) who is —** **(a) infected with, or a carrier of, an infectious disease in a communicable form as described in Section A, Part 1, of the First Schedule of the Health Act 1956; or** **(b) suffering from acute respiratory infection; or** **(c) suffering from boils, sores, infected wounds, or any other condition that cannot be adequately protected from becoming a source of contamination — does not work as a product handler or enter an area where he or she may adversely affect the suitability for processing of animal material or the fitness for intended purpose of animal product.**

Regulatory Requirements
(2). A product handler, or any other person who may affect the suitability for processing of animal material or fitness for intended purpose of animal product, after suffering from an illness described in subclause (1)(a) or (b), must provide a certificate from a registered medical practitioner confirming that the person is no longer likely to contaminate the animal material or animal product, prior to resumption of work in that role. **(3). A product handler, or any other person who may affect the suitability for processing of animal material or fitness for intended purpose of animal product, who suffers from a condition described in subclause (1)(c) must, before resuming work, be assessed by a suitably skilled person, nominated by the operator to confirm that the condition is no longer likely to contaminate the animal material or animal product, or that the handler or other person is adequately protected from being a source of contamination.**
Operator-defined Requirements
4. Minimise contamination of animal product by hazards originating from personnel, contractors, and visitors.

3.8.5.3 Process flow diagram

N/a

3.8.5.4 Identify / Analyse Hazards and Other Risk Factors, and Determine CCPs

Sources of hazards	Hazards reasonably likely to occur with each source	Current Control measures	Is there a relevant measurable requirement?
People carrying pathogens in gut	B1: Salmonella species B2: Enteric bacteria	Handwashing and sanitising programme. Hygiene training. People with diarrhoea excluded from working in food contact areas for 24 hours after problem clears up.	No
People carrying pathogens up nose	B3: *Staphylococcus aureus*	Hygiene training Handwashing and sanitising programme	No
Contaminated clothing / footwear	B1: Salmonella species B2: Enteric bacteria B3: *Staphylococcus aureus*	Laundry procedures Protective clothing programme Boot wash facilities Foot baths	No
Person with exposed boils / sores	B3: *Staphylococcus aureus*	Use of impervious gloves or covers OR Keeping personnel that fit the criteria in specification 23 (1) (c) away from product Assessment as required by specification 23 (3).	No

There are no CCPs for hazards with non-measurable requirements shown in the above table.

The CCP determination for the measurable requirements is shown in the following table.

			Q1: Is hazard reasonably likely to contact product?	**Q2:** Could the level of hazard exceed the measurable requirement?	**Q3:** Is there one or more new or improved controls that will achieve the measurable requirement?	**Q4:** Are there any other controls?
Hazard or Risk Factor	**Current Control measures, e.g. GHP / GMP / CCPs**	**Is there a relevant measurable requirement? (See 3.9.1.2)?**	**If yes, go to Q2. If no, not a CCP. Go to next hazard or risk factor.**	**If yes, go to Q3. If no, not a CCP. Go to next hazard or risk factor.**	**If no, go to Q4. If yes set up CCP to meet measurable requirements and also go to Q4.**	**If yes, redesign / establish GMP/GHP to meet remaining requirements. If no, and no CCPs list as uncontrolled. Consider at process analysis.**
Food handler carrying infectious disease B1: Salmonella species B2: Enteric bacteria B3: *Staphylococcus aureus*	None[28]	Yes – medical certificate available to state freedom from infectious disease	Yes	Yes	Yes – **CCP3** Send to doctor.	Keep personnel that fit the criteria in specification 23 (1) (a) or (b) away from product wherever possible.

3.8.5.5 Determine Critical Limits

Determine critical limits for each CCP (see table below).

CCP No.	CCP	Critical Limits
3	**Personnel who find out they have infectious disease to notify Manager. Get medical Certificate.**	**Infected personnel to be kept away from egg contact duties. Medical Certificate stating clearance to return to work to be viewed by Management prior to return to working in egg contact areas.**

Policy

Personnel shall be trained on:
- **personal hygiene as it relates to food handling,**
- **the requirement to notify manager if they find out they have an infectious disease as described in 4.8.4.2.**

This training shall be recorded. See 3.10.

Staff shall wear suitable clean outer protective clothing and footwear for collecting eggs and other tasks within the poultry housing facility. Staff engaged in shed duties shall not engage in grading room duties unless footwear and outer clothing has been changed, and hands washed/sanitised.

Outer protective clothing shall be laundered and sanitised to minimise contamination from soiled clothing. This usually means that laundering is done on a daily basis.

Between each shed on the same farm there shall be a change of boots, the use of plastic boot covers, or the use of an effective footbath. Footbaths must be at the entrance of all sheds and feed stores. Footbaths shall contain an approved disinfectant, and be changed daily and when visibly soiled.

[28] **If Henrietta had good control measures already in place, (e.g. Send ill staff to Doctor; obtain medical clearance before allowing return to work as food handler) then the answers to the questions would be different and a CCP would not be identified.**

Policy

When exiting from positive sheds there must be a change of boots and over clothing and a minimum of hand washing or full shower if possible.

Movement between sheds should always be from youngest to oldest birds. If there are positive or potentially positive flocks on site then movement must be from negative to positive flocks;

Food and drink and their containers are not allowed inside the production areas. Food and drink shall be consumed in a designated area away from such areas.

There shall be no smoking in any of the buildings containing birds, eggs or feed. A designated smoking/rest area away from these sections is acceptable, provided there is adequate ventilation.

Handwashing facilities shall be available. 'Wash your hands' signs should be displayed above all sinks and sanitising stations.

Personnel shall wash or sanitise their hands:
- **Before entering any production or packaging areas,**
- **Before handling eggs or egg products or packaging,**
- **After completing a messy function and/or handling waste,**
- **After visiting the toilet, and**
- **Whenever hands are soiled in any way.**

Staff shall not keep domestic poultry or other avian species at home.

All farm and shed entrances should be clearly marked to deter unauthorised entry. This is a key biosecurity procedure to ensure the risk of introducing and/or spreading disease is minimised.

Service personnel and other visitors entering a poultry shed shall complete a logbook, citing all poultry farms (or premises such as poultry hatcheries, egg packhouses or processing plants) visited in the past 24 hours. They shall wear change into clean suitable outer protective clothing and footwear prior to entering the poultry shed.

Anyone moving between poultry farms (or premises such as poultry hatcheries or egg packhouses) shall change into separate boots, change overalls and disposable hats, and wash hands.

3.8.5.6 Procedures

Hazard	General Control	Monitoring	Corrective Action	Records
People carrying pathogens in gut	All staff to wash hands prior to handling eggs.	Supervisor to check when in area.	Retrain staff. Warn repeat offenders.	Daily Farm Record.
	People with diarrhoea excluded from working with eggs for 24 hours after problem clears up.	N/a	Retrain staff.	Daily Farm Record.
People carrying pathogens up nose	All staff to wash hands prior to handling eggs.	Supervisor to check when in area.	Retrain staff. Warn repeat offenders.	Daily Farm Record.
Contaminated footwear	All people to use footbaths before entering barns. Sanitising footbaths to be changed daily or when soiled.	Supervisor to check when in area.	Retrain staff. Warn repeat offenders.	Daily Farm Record.

Hazard	General Control	Monitoring	Corrective Action	Records
B3: Contaminated clothing	**Clean protective clothing to be worn when handling eggs.**	**Supervisor to check when in area.**	**Retrain staff. Warn repeat offenders.**	**Daily Farm Record.**
B3: Food handler carrying infectious disease	**Medical Certificate stating clearance to return to work to be viewed by Manager prior to return to working in egg contact areas.**	**Manager to check.**	**Staff to work in other area or be sent home. Retrain staff. Warn repeat offenders.**	**Daily Farm Record.**
B3: Person with exposed boils / sores	**Cover with of impervious gloves or covers.**	**Supervisor to check covering.**	**Retrain staff. Warn repeat offenders.**	**Daily Farm Record.**

3.8.5.7 Records

The record forms can be found in Appendix E of this Code Of Practice.

3.8.5.8 Operator verification

Once a month the Layer Farm Manager shall check and sign the records for that month. Any problems shall be noted on the relevant record with the details of the corrective action taken.

3.9 Identification, Analysis and Control of Hazards and Other Risk Factors From the Process

3.9.1 Analyse hazards and other risk factors at each process step

For theory refer to 2.9, and Appendix C: Technical Annex.

For forms refer to appendix D section 9

Refer back to 3.6 to get the process steps and their associated inputs. Enter these into the first two columns in the following table. Then refer to 3.7 for the hazards and risk factors related to each input. Enter these into the third column in the following table. Add new info into fourth column. When answering questions 1-3 consider the "unacceptable level" as that defined in the product outcomes set in 3.5.

				Q1. Could the risk factor be present in or on the eggs at unacceptable levels at this step?	Q2. Is there a control measure at this step that would prevent unacceptable levels of the risk factor or reduce it to acceptable levels?	Q3. Is there a control measure available at a previous step?	Q4: **Are there any other non-measurable controls?**
Process step	Input Name	Hazard or other risk factor associated with input	**Hazards and other** risk factors **from p**rocess step**,** and potential impact of process step on existing **hazards and other** risk factors	Justify answer. If no not a CCP. Go to Q4. If yes, go to Q2.	If no go to Q3. If yes, this step is a CCP. Go to Q4.	If yes, assign the previous step as a CCP. Go to Q4. If no, not a CCP, go to Q4.	If no, and no CCPs list as uncontrolled**.** If yes, redesign / establish **general controls** to meet outcomes**.**
1. Cleanout	Cleaning, sanitising and fumigation chemicals	C2: Residues from chemicals used in sheds		No – already controlled. See 3.9.1.			No
	Litter	B1: Salmonella species and B2: Enteric bacteria		No –already controlled. See 3.9.3.			No
			B1: Salmonella species and B2: Enteric bacteria	No – shed is likely to be contamin-ated at depop-ulation but egg is not yet present.	Yes – **CCP4** – Proper shed cleanout – retrospectively assigned from steps 3 and 4.		No

				Q1. Could the risk factor be present in or on the eggs at unacceptable levels at this step?	Q2. Is there a control measure at this step that would prevent unacceptable levels of the risk factor or reduce it to acceptable levels?	Q3. Is there a control measure available at a previous step?	Q4: **Are there any other non-measurable controls?**
Process step	Input Name	Hazard or other risk factor associated with input	**Hazards and other** risk factors **from p**rocess step**,** and potential impact of process step on existing **hazards and other** risk factors	Justify answer. If no not a CCP. Go to Q4. If yes, go to Q2.	If no go to Q3. If yes, this step is a CCP. Go to Q4.	If yes, assign the previous step as a CCP. Go to Q4. If no, not a CCP, go to Q4.	If no, and no CCPs list as uncontrolled**.** If yes, redesign / establish **general controls** to meet outcomes**.**
2. Bird receipt at laying shed	Birds	B1: Salmonella species and B2: Enteric bacteria		No – already controlled. See 3.8.1.			N/a
		C1: Residues from unapproved veterinary medicines		No – already controlled. See 3.8.1.			N/a
3. Bird management	Feed	B1: Salmonella species and B2: Enteric bacteria		No – already controlled. See 3.8.2.			N/a
			B1 & B2: Feed could become contaminated by birds if feeder positioning permits[29].	Yes	No		Yes – Regular cleaning of feeders. Restriction in amount of feed delivered so it is all quickly eaten.
	Water	B1: Salmonella species and B2: Enteric bacteria		No – already controlled. See 3.8.4.			N/a
	Medication	C1: Residues from unapproved veterinary medicines		Yes	Yes – **CCP5** – dumping eggs from medicated hens for witholding period. **CCP6** = correct use of licenced veterinary medicines.		N/a

[29] **This is more likely to be relevant to free range and barn birds as most caged systems are designed to keep bird's faeces away from feed troughs / trays.**

Process step	Input Name	Hazard or other risk factor associated with input	**Hazards and other** risk factors **from p**rocess step**,** and potential impact of process step on existing **hazards and other** risk factors	Q1. Could the risk factor be present in or on the eggs at unacceptable levels at this step? Justify answer. If no not a CCP. Go to Q4. If yes, go to Q2.	Q2. Is there a control measure at this step that would prevent unacceptable levels of the risk factor or reduce it to acceptable levels? If no go to Q3. If yes, this step is a CCP. Go to Q4.	Q3. Is there a control measure available at a previous step? If yes, assign the previous step as a CCP. Go to Q4. If no, not a CCP, go to Q4.	Q4: **Are there any other non-measurable controls?** If no, and no CCPs list as uncontrolled**.** If yes, redesign / establish **general controls** to meet outcomes**.**
3. Bird management Continued			C1: Residues from veterinary medicines	No – already controlled. See 3.8.3.			No
	Nest box material	B1: Salmonella species B2: Enteric bacteria		No – already controlled. See 3.9.4.			N/a
	Shed and equipment	B1: Salmonella species B2: Enteric bacteria		Yes – if shed cleanout not done properly.	No	Yes – proper shed cleanout at step 1.	N/a
4. Egg collection	Egg trays / labels	B1: Salmonella species B2: Enteric bacteria		No – already controlled. See 3.9.3.			N/a
			L1: Incorrect claims through use of wrong label	Yes	Yes –**CCPL1** – [30]check all labels on all collection equipment before use.		No
			L2: Incorrect date marking	Yes	Yes –**CCPL2** – check all dates on all labels on collection equipment before use		No
	Carts pallets	B1: Salmonella species B2: Enteric bacteria		No – already controlled. See 3.9.3.			N/a

[30] **The numbering of CCPs for "other risk factors" has been coded by adding an "L" or "W" after "CCP". i.e. Labelling = CCPL, and Wholesomeness = CCPW.**

				Q1. Could the risk factor be present in or on the eggs at unacceptable levels at this step?	Q2. Is there a control measure at this step that would prevent unacceptable levels of the risk factor or reduce it to acceptable levels?	Q3. Is there a control measure available at a previous step?	Q4: **Are there any other non-measurable controls?**
Process step	Input Name	Hazard or other risk factor associated with input	**Hazards and other** risk factors **from p**rocess step**,** and potential impact of process step on existing **hazards and other** risk factors	Justify answer. If no not a CCP. Go to Q4. If yes, go to Q2.	If no go to Q3. If yes, this step is a CCP. Go to Q4.	If yes, assign the previous step as a CCP. Go to Q4. If no, not a CCP, go to Q4.	If no, and no CCPs list as uncontrolled**.** If yes, redesign / establish **general controls** to meet outcomes**.**
4. Egg collection, continued			B1: Salmonella species and B2: Enteric bacteria on outside of eggs	Yes	Yes: **CCP7**: Rejection of very dirty eggs **CCP8**: Separation of floor eggs **CCP9**: Separation of cracked eggs.		Yes - Frequent egg collection to minimise contamination.
	Shed and equipment	B1: Salmonella species B2: Enteric bacteria		Yes – if shed cleanout not done properly.	No	Yes – proper shed cleanout at step 1.	N/a
	Egg	W8: Soft shells		Yes	Yes – **CCPW1**: Rejection of eggs with soft shells.		
		W2: Watery whites W6: Pink or iridescent whites W5: Rotten eggs W4: Off odours and flavours W7: Eggs older than use by date	If collection is delayed the accuracy of shelf life claims may be compromised. If collection is delayed eggs are more likely to become grossly contaminated (especially free range and barn eggs).	Yes	No		Yes – All eggs collected and sent to packhouse daily.

				Q1. Could the risk factor be present in or on the eggs at unacceptable levels at this step?	Q2. Is there a control measure at this step that would prevent unacceptable levels of the risk factor or reduce it to acceptable levels?	Q3. Is there a control measure available at a previous step?	Q4: **Are there any other non-measurable controls?**
Process step	Input Name	Hazard or other risk factor associated with input	**Hazards and other** risk factors **from p**rocess step**,** and potential impact of process step on existing **hazards and other** risk factors	Justify answer. If no not a CCP. Go to Q4. If yes, go to Q2.	If no go to Q3. If yes, this step is a CCP. Go to Q4.	If yes, assign the previous step as a CCP. Go to Q4. If no, not a CCP, go to Q4.	If no, and no CCPs list as uncontrolled**.** If yes, redesign / establish **general controls** to meet outcomes**.**
5. Storage and transfer to grading	Foklift / Cart/ Truck or conveyor	B1: Salmonella species B2: Enteric bacteria		No – already controlled. See 3.9.3.			
	Trolleys / Labels	B1: Salmonella species B2: Enteric bacteria		No – already controlled. See 3.9.3.			
	Eggs	B1: Salmonella species B2: Enteric bacteria	Storage at high temperatures could permit growth of these bacteria.	Yes – especially free range eggs.	Yes – **CCP10** - Refrigeration at 15C or less.		

3.9.2 Determine Critical Limits

Determine critical limits for each CCP (see table below). The table summarises monitoring and corrective action of CCPs and other general controls. Not all CCPs identified in this Code of Practice will be applicable to all operations. Some operations may have additional CCPs.

CCP or General Control	Process Step	Hazard ID	Critical Limit or Process Criteria	Monitoring	Corrective Action (Includes retraining staff as necessary)	Records
CCP 4	1. Cleanout	B1 and B2	Proper shed cleanout: A foam or gauze drag swab per shed from a representative sample of cages or rearing area shall be negative for Salmonella prior to repopulating the shed with layers.	Lab results shall be checked prior to repopulating sheds.	Reclean sheds until tests are negative.	Lab Report
GC	2. Bird Receipt	N/a	Already covered in 3.8.1.			
CCP5	3. Bird Management	C1	All eggs from medicated hens to be dumped for entire witholding period.	Record number and location of medicated birds, and witholding period that was applied. Daily check of numbers of eggs dumped versus expected numbers.	Dump all suspect eggs.	Daily Farm Record.
CCP6			Veterinary medicines shall only be used according to the directions of the manufacturer and subject to the conditions of the licence.	Record all veterinary medicines used, date, what it was used for, and quantity used.	Retrain staff. If wrong medication used ensure eggs are dumped.	Chemical Use Record
GC		B1 and B2	Restriction in amount of feed delivered so it is all quickly eaten. Quantity depends on number of hens. To be defined by layer farm Supervisor.	Daily feed usage shall be checked versus expected volume.	Adjust feed quantity.	Daily Farm Record
GC			Regularly clean feeders.	Monthly check.	Review cleaning procedures.	Monthly Farm Record

CCP or General Control	Process Step	Hazard ID	Critical Limit or Process Criteria	Monitoring	Corrective Action (Includes retraining staff as necessary)	Records
CCPL 1	4. Egg Collection	L1	Claims on labels on all collection equipment 100% accurate.	Daily check.	Relabel collection equipment.	Daily Farm Record
CCPL 2		L2	Dates on all labels on collection equipment 100% accurate.	Daily check.	Relabel collection equipment.	Daily Farm Record
GC	4. Egg Collection (continued)	B1 and B2	Eggs must be collected at least every 24 hours to minimise contamination.	Daily check.	Review collection frequency.	Daily Farm Record
CCP 7			Rejection of very dirty eggs: All eggs with total soiling greater than a defined surface area[31] to be dumped.	Daily check.	Recheck eggs.	Daily Farm Record
CCP 8			100% of floor eggs to be separated from other eggs.	Daily check.	Recheck eggs.	Daily Farm Record
CCP 9			100% of eggs with cracks visible to the naked eye to be separated from other eggs.	Daily check.	Recheck eggs.	Daily Farm Record
CCPW 1		W8	100% of eggs with visibly soft shell to be dumped.	Daily check.	Recheck eggs. Retrain staff.	Daily Farm Record
GC		W2, 4, 5, 6, 7	Eggs must be collected at least every 24 hours.	Daily check.		Daily Farm Record
CCP10	5. Transfer to grading	B1 and B2	Temperature of storage and transfer facilities to be 15°C or less (6°C for cracked eggs with intact membranes), or transfer to be made within 2 hours of collection.	Daily check of temperature or holding time.	Check refrigeration equipment. Review collection frequency. Retrain staff.	Daily Farm Record

Note: It is a good idea to review the product outcomes to ensure that they are still relevant after the analysis has been completed.

Each product outcome and CCP must be validated to show that it can be achieved on an ongoing basis. This will require the collection and analysis of relevant data, e.g. production and control records. For more information on validation refer to 2.16.1 and 3.16.

[31] To be set by egg producer. To define the surface area use an actual size e.g. 1 square cm, or refer to something of known size, e.g. 5 or 10 cent coin (as appropriate).

General Controls – Step 1 = Cleanout

A single all-in, all-out batch system[32] is in operation for each shed or mobile housing unit for caged, barn and free range birds. (i.e. total depopulation of shed and any associated outdoor runs, clean-out, sanitising, and microbiological testing of each shed, prior to repopulation).

At the end of each flock, all birds should be removed from the shed as part of an 'all-in all-out' plan.

The following cleaning and disinfection program shall be used after depopulating sheds. Cleaning and sanitising shall be carried out on the sheds themselves and on all equipment used within the sheds (including cages/nest boxes, conveyors, feeders, drinkers, egg belts etc):

- **All manure and litter shall be removed at depopulation.**
- **After sheds are empty dust shed and equipment, including fan shafts and side vents, if installed. Remove all manure and/or litter etc. Wash outside first; if applicable remove fan cowls, fan ducts, side vents and silos. Sanitise with an approved disinfectant.**
- **Wash shed and equipment by wetting all surfaces with detergent at low pressure. Rinse off with fresh high-pressure water. Wash from the ceiling down, not forgetting vents, and finishing with the floor. Note that some systems (eg automated belt) may not be designed for wet cleaning, and should be cleaned appropriately using alternative methods.**
- **Remove old litter/manure from around the shed, then using fresh water hose down the door frames, doors, and concrete pad. When visibly clean, spray these surfaces with disinfectant.**
- **Clean equipment and any cages with detergent, wash any partitions, portable feeders, doors and stack inside. When all equipment is stacked inside, spray out the shed and contents with disinfectant.**
- **If applicable, use a compressor or vacuum cleaner to dust the switchboards, electric wiring etc in the service room. Clean service room.**
- **If applicable, ensure lunchrooms and changing areas are thoroughly clean.**
- **Clean all water tanks and filters, tanks with disinfectant solution and flush through lines, followed by clean water. Clean all drinker lines in the shed.**
- **Set up shed ready for chicks/pullets arrival. If applicable, ensure that the tractor is clean before spreading litter. Apply final disinfectant or fumigation.**
- **If a positive Salmonella sample was previously returned, spray outside of shed, concrete pads, silo surrounds, etc with sodium metabisulphide at 4.5 kg per 100 litres of water, or another recognised/approved product.**

A visual inspection and swab shall then take place. If any Salmonella positives found, the sheds shall be re-cleaned and sanitised until negative tests are returned and before any birds are placed.

General Controls – Step 2 = Receive Birds

Already covered in 3.8.1.

[32] This is the ideal situation. Where an egg producer does not have an "all in or all out" system then alternative means of cleanout must be described. As this is likely to be a reduced form of cleanout an increased frequency of surveillance for Salmonella would be expected.

General Controls – Step 3 = Bird Management (All Farm types)
Also known as our Whole Flock Health Scheme

All of this section applies to caged, barn, free range and organic farms unless stated otherwise.

BIOSECURITY:

Biosecurity (short for biological security) refers to management practices that protect flocks and eggs from disease-causing organisms. Contamination from organisms such as bacteria or viruses may be transferred via animals, improperly manufactured or stored feed, poor farm management and hygienic practices, and even people. Good biosecurity helps keep eggs clean, and hence suitable for human consumption, and protects birds from diseases which may result in reduced production and high bird mortality. It is widely recognised that good husbandry practices (including biosecurity) improve bird productivity and reduce the possibility of eggs harbouring disease.

No one wants to suffer the consequences of having a food-borne outbreak traced back to his or her farm. Both the industry's reputation and our farm's reputation could be irreparably damaged by an outbreak that resulted in serious illness or even death. Similarly, no one wants to experience a major poultry disease, or even worse, to be the source of a disease that is spread to other flocks. For these reasons we have put the following procedures in place.

WELFARE[33]:

Farmers have both legal and moral obligations to ensure the poultry under their care are provided with, as far as is practicable, the optimum conditions relating to:
- **the provision of food and water**
- **adequate fresh air supply**
- **thermal and physical comfort**
- **prevention of injury and diseases**
- **minimising fear and stress.**

The conditions under which the birds are kept shall comply with the 1999 edition of the Animal Welfare Advisory Committee Code of Recommendations and Minimum Standards for the Welfare of Layer Hens (AWAC Layer Hen Code) and/or any subsequent legislative requirement.

Adequate ventilation shall be provided to meet the fowls' living requirements and ensure the fowls' health is not adversely affected. Section 6.0 of AWAC Layer Hen Code states:
- **Ventilation is required at all times to provide fresh air. The accumulation of water vapour, heat, noxious gases and dust particles may cause discomfort or distress and predispose to the development of disease.**
- **The presence of ammonia is usually a reliable indicator of the build-up of noxious gases; it should not be allowed to exceed 20 parts per million of air measured at hen level in enclosed buildings without immediate corrective action being taken. (A level of 10 - 15 ppm of ammonia in the air can be detected by smell. An ammonia level of 25 - 35 ppm will cause eye and nasal irritation in humans.) Force ventilation may be required to meet these conditions.**

Force-ventilated sheds must have automatic alarm systems to warn of power failure. A back-up alarm system to warn of temperature increases in such sheds is also essential and should operate through an alternative circuit to the power failure alarm system. In force-ventilated sheds emergency ventilation provisions must be available.

Birds shall be protected from temperature extremes at all times. (i.e. less than 10°C and greater than 33°C, although chicks under brooders may require temps in excess of 33°C). Daily maximum and minimum shed temperatures shall be recorded.

[33] **Bird welfare does not have to be part of the RMP but the Appendix C: Technical Annex shows that birds are less likely to shed pathogens if they are not stressed so it has been included here.**

General Controls – Step 3 = Bird Management (All Farm types)
Also known as our Whole Flock Health Scheme

WATER AND FEED

A minimum twice-daily check shall be made on water and feed supplies in sheds to ensure systems are operating correctly.

SUPPLY OF HENS:

Henrietta's Egg Company Ltd shall maintain a register of suppliers of laying hens. They will be required to meet the requirements defined in section 3.7.1 of this Code.

BIRD HEALTH:

Henrietta's Egg Company Ltd will keep the following records of the health status of all birds destined as layer hens. This will include records of:

- **any medications or immunisations given to the flock (or individual birds);**
- **feeding regimes (to be recorded whenever there is a change);**
- **visits by company or independent veterinarian or competent person;**
- **blood tests or the results of other individual or flock diagnostic results that would establish and verify the health status of the individual/flock;**
- ***Salmonella* testing of the flock (at 6 weeks of age, and again at 12-16 weeks of age if not already done by the supplier, and where there is reason to believe that the flock status has changed);**
- **any other microbiological results from the flock;**
- **daily visual inspections to verify the health status of the flock (see 3.7.1 for ;**
- **problems identified and corrective actions taken as a result of any of the above activities.**

Sufficient lighting shall be provided to allow inspection of the birds, and to enable the birds to feed and drink. 10 lux at hen level is regarded as adequate light intensity.

Unhealthy birds include:

- **Dead and moribund birds.**
- **Deformed or damaged birds where the deformity or damage affects the ability of the bird to access or compete for feed and water, or that allows the bird to suffer more social stresses.**
- **Birds that are severely underweight or undersize (i.e. 25% under the average weight or size).**

Other signs:

- **Blood, or yellow coloured droppings. (Normal droppings should consist of a dark coloured central part (from rectum) and an off-white surrounding portion (from kidneys)).**
- **Pasting of vent.**
- **Any blood viewed in the flock.**
- **Excessive swelling of joints.**
- **Hock burn.**
- **No response to stimuli. e.g. whistles or claps.**
- **Breathing: mouth open, gasping, tail bobbing, blue coloration of beak/legs, clicking , wheezing, head shaking.**
- **Central nervous disorders: circling, lying on side, paralysis, spasms, or fits, inability to hold neck up.**
- **Bird stance: neck not extended, tail is down and ruffled feathers on back of neck.**
- **Body: swelling of the abdomen, breast blisters, injury/scratching.**
- **Eye: dull and flat, crusting/matting of material around eye, swelling, foaming.**
- **Beak: cracking, or splitting, or abnormal growth**

General Controls – Step 3 = Bird Management (All Farm types)
Also known as our Whole Flock Health Scheme

The Layer Farm manager is responsible for the Whole Flock Health Scheme and must be under the Supervision of a Competent person or must meet the following competency requirements as assessed by a Veterinarian experienced in poultry:

- **be able to recognise the specific diseases and conditions affecting layer hens, and the ability to take appropriate action;**
- **understands the use, dosages, broad effects, and withholding periods for the veterinary medicines licenced for use with poultry, and the ability to administer the licence veterinary medicines as required under the supervision of a veterinarian or as stipulated on the licenced animal remedy's label;**
- **be able to develop, maintain, implement and monitor quality systems for the production farm; and**
- **understands the importance of monitoring the production shed for microbial contaminants.**

Where medication is required, documented details of medications/vaccinations administered to the birds shall be retained. Details shall include:

- **Age of birds when medicated**
- **Date of medication**
- **Name of consulting technical/veterinary advisor**
- **Name of medication**
- **Reason the birds have been treated**
- **Withholding period for eggs, and other details relating to the drug as appropriate.**

If the inspections suggest that layer hens display symptoms of a notifiable or exotic disease, Henrietta's Egg Company Ltd will contact the Ministry of Agriculture and Forestry's Outbreak Response Services (0800-809-966) as soon as possible. Eggs from the affected layer hens will be withheld from trade.

VACCINATION FOR SALMONELLA

Vaccination of all flocks will be done at day old in the hatchery followed by a second vaccination at two–six (2-6) weeks of age and a third vaccination between thirteen - sixteen (13-16) weeks of age.

Per your veterinarian's prescription, use one-half dose per layer pullet (i.e. a 1000 dose vial vaccinates 2000 layer pullets, a 500 dose vial vaccinates 1000 layer pullets).

A coarse spray applies the first vaccination in the hatchery. The second and third vaccinations may be applied by either coarse spray or drinking water methods. *Note: Do not use chlorinated water as this kills the vaccine. Use unchlorinated, potable water. Add 'trim milk' to drinking water per instructions to neutralise any residual chlorine or disinfectant.*

SALMONELLA MONITORING

A foam or gauze drag swab per shed from a representative sample of cages, or nest boxes and shed surfaces shall be taken once birds reach 60-80 weeks, at least one week prior to depopulation, so Salmonella test results are received prior to cleaning, sanitising, and restocking cages. If flock is retained beyond 80 weeks of age, a further Salmonella test shall be taken at least one week prior to depopulation.

<u>Sampling Procedure for environmental samples, eg poultry housing areas:</u>
Foam or gauze swab dragged over the areas most likely to harbour Salmonella.
Equipment used, including sample bags, shall be stored in sealed, dust-free conditions.
Samples should only be taken by management or trained personnel.

General Controls – Step 3 = Bird Management (All Farm types) Also known as our Whole Flock Health Scheme

If Salmonella-positive samples are returned from these tests the Salmonella shall be serotyped, and a thorough cleaning programme is to be undertaken, as per the documented response procedure. This procedure is likely to include a thorough cleaning and sanitisation at depopulation, and retesting of the cleaned shed to achieve Salmonella-negative status prior to repopulation.

If a Salmonella enteriditis PT 4 is returned at any time the egg producer shall notify NZFSA and the Egg Producers Federation, and shall recall eggs from affected flocks. Eggs from affected flocks shall not be offered for sale. The affected flocks shall be quarantined and, if confirmatory tests are returned, immediate depopulation should follow.

All testing for Salmonella shall be undertaken by a laboratory accredited to nationally or internationally recognised standards, such as ISO or IANZ.

General Controls – Step 3 = Bird Management (Cage)

The current AWAC Layer Hen Code recommendations for stocking density for caged layers over 19 weeks old is a minimum of 450 cm^2 per bird.

General Controls – Step 3 = Bird Management (Barn)

Refer to earlier requirements for all farm types and in addition:

Birds shall not be caged after reaching point of lay. Birds shall remain within the shed during their laying period. Sheds for laying birds should contain feeders, drinkers, perching facilities, and nest boxes. Pullet sheds may not require the latter. Scratching and dusting areas shall be available within each shed, and be of sufficient size to allow use by all birds.

Ventilation of sheds should be managed to ensure thermal comfort, adequate fresh air, and high quality litter is maintained throughout. Manure and litter shall be kept dry.

Shavings and other material should be delivered as required, rather than stored on-site, to avoid contamination with pathogens.

Current AWAC Layer Hen Code recommendations for hens over 19 weeks of age include:

- **The stocking density in the shed shall not exceed 7-10 birds per m^2 for deep litter barn systems, and 10-14 birds per m^2 for slatted floor barn systems.**

Monitoring for parasitic and infectious diseases shall be undertaken and, where appropriate, treatments used to control or eradicate such disease before outbreaks cause ill health or mortality.

General Controls – Step 3 = Bird Management (Free Range)

Refer to earlier requirements for all farm types and in addition:

Birds shall have access to weatherproof sheds.

Sheds for laying birds should contain feeders, drinkers, perching facilities, and nest boxes. Pullet sheds may not require the latter.

Ventilation of sheds should be managed to ensure thermal comfort, adequate fresh air, and high quality litter is maintained throughout. Manure and litter shall be kept dry.

Shavings and other material should be delivered as required, rather than stored on-site, to avoid contamination with pathogens.

Monitoring for parasitic and infectious diseases shall be undertaken and, where appropriate, treatments used to control or eradicate such disease before outbreaks cause ill health or mortality. Treatment is likely to be necessary for roundworms.

Access to ponds, creeks, dams, and other water sources not provided by a controlled system of reticulation shall be denied.

Birds shall have access to open-air runs and sheds, and be protected from predators at all times. The runs should be sited on well-drained land, and shall be managed to avoid muddy conditions.

Permanently situated housing units require a minimum of three separate paddocks for rotational grazing. This outdoor area should be covered with palatable vegetation and provide adequate shade, and shall be kept free from any rubbish or debris. Birds shall not be kept on land that is contaminated with poisonous plants, chemicals, or other organisms that cause or carry disease to an extent that may seriously prejudice poultry health.

Shelter from sun and rain shall be available. Windbreaks should be provided in exposed areas.

Current AWAC Layer Hen Code recommendations include:

- **stocking density of the runs accessed by hens over 19 weeks of age shall not exceed 1 bird per 11m^2, which equates to 900 birds per hectare (ie 360 hens per acre).**
- **The stocking density of the shed shall not exceed 7-10 birds per m^2 of deep litter floor space, or 10-14 birds per m^2 of slatted floor space, or 13 birds per m^2 on framed perches.**

Bird nutrition should not be solely reliant on grass and naturally available food. Note the 1999 AWAC Layer Hen Code states in Appendix 2 that "appropriately formulated feed should be available at all times". This AWAC Code or its subsequent amendments must be complied with at all times.

General Controls – Step 4 = Egg Collection

Egg will be collected at least every 24 hours and more frequently where possible.

Eggs are to be put into new, or clean and sanitised trays, with the point of the egg facing downwards.

Reject eggs will be disposed of immediately and not put into collection trays with other eggs. Dirty eggs, floor eggs and cracked eggs should be put into separate clearly marked collection trays.

Eggs from alternative systems should be produced, collected, graded and packed on separate sites to eggs produced from caged hens.

General Controls – Step 4 = Egg Collection

Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000, 30: Packaging

(1) The composition and where appropriate, the conditions of use of packaging must —
- **(a) comply with the requirements specified in the current US Code of Federal Regulations, Title 21, Parts 170–199 (21 CFR 170–199), which applies equally to coatings and linings of containers and cartons where these are the direct product contact surface; or**
- **(b) comply with the requirements specified in the current "Australian Standard for Plastics Materials for Food Contact Use, Australian Standard AS2070–1999"; or**
- **(c) be determined by the operator to be suitable for use, based on an analysis of hazards and other risk factors from the packaging.**

(2) If compliance with this specification is achieved through meeting the requirements of subclause (1)(a) or (b), the risk management programme must state the full reference to the regulation, part, section or standard with which the packaging complies.

General Controls – Step 5 = Storage and Transfer to Processing

Animal Products Regulations 2000, 14: Required measuring equipment to be calibrated and function as intended--
(1) All specified persons must ensure that measuring equipment that is used to carry out a critical measurement is properly calibrated and functions as intended.
(2) In this regulation, "critical measurement" means a parameter identified as critical in any--
(a) specifications or regulated control scheme; or
(b) risk management programme, being a parameter of the nature of the parameters referred to in section 17(3)(c) of the Act in relation to points at which hazards of significance occur.

This means that temperature monitoring equipment is to be calibrated.

Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000, 28: Calibration and measuring equipment suitability

(1) Measuring equipment, such as scales, thermometers, pH meters, and flow meters (whether stand alone or forming part of a piece of equipment), that is used to provide critical measurements, must —
- **(a) have the accuracy, precision, and conditions of use appropriate to the task performed; and**
- **(b) be calibrated against a reference standard showing traceability of calibration to a national or international standard of measurement (where available), or (if no such standard exists) be calibrated on a basis that is documented in, or incorporated by reference into, the risk management programme; and**
- **(c) be uniquely identified to enable traceability of the calibrations and to identify calibration status.**

(2) Minimum frequencies of calibration must be specified in the risk management programme for each piece of measuring equipment used to provide critical measurements, or used as reference standards, taking into consideration the following (as appropriate) —
- **(a) the stability of the piece of equipment; and**
- **(b) the nature of the measurement; and**
- **(c) the manufacturer's instructions.**

(3) Safeguards must be in place to prevent unauthorised adjustments to the calibration of the measuring equipment, including movement of the equipment where this may invalidate the calibration.

Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000, 6: Facilities and equipment etc
(1) Temperature controlled rooms and equipment must be operated within their design capability and capacity, and must consistently deliver any temperature as required by this notice or as specified in the risk management programme (as the case may require).

General Controls – Step 5 = Storage and Transfer to Processing

There shall be clear, physical, and labelled segregation of eggs from each shed or flock at all times, to enable traceability on a per flock or shed basis. All containers of eggs shall be clearly identified with the name of egg producer, flock (ie shed), and date of lay.

Eggs produced from caged hens shall be kept clearly separate from eggs produced by hens from free range and barn systems at all times.

Eggs shall be transported to the grading room, or stored in cool rooms operated at or below 15°C, within 2 hours of collection. Cracked eggs are to be stored at or below 6°C. Cool-room temperature checks shall be made twice daily.

Eggs stored in cool-rooms on the farm shall be transported in clean enclosed vehicles, at or below 15°C, to an off-farm grading facility after a maximum of 4 days, and subsequently graded. Date of lay is recorded to help establish use by dates.

A cleaning program shall be in place for all vehicles, trolleys, trays, and belts, conveyors etc used to transport eggs to the grading room either on or off-farm.

3.9.3 Operator verification

Once a week the Layer Farm Manager shall check the records relating to all CCPs and confirm that they are implemented effectively and where necessary appropriate corrective action has been taken and recorded. The Layer Farm Manager shall sign the records that have been checked.

Once a month the Layer Farm Manager shall check 10% of the records relating to all other control measures and confirm that they are implemented effectively and where necessary appropriate corrective action has been taken and recorded. The Layer Farm Manager shall sign the records that have been checked.

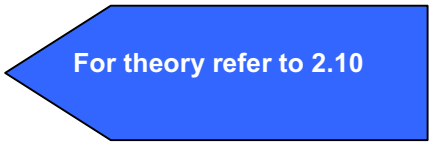
3.9.4 Documentation and record-keeping[34]

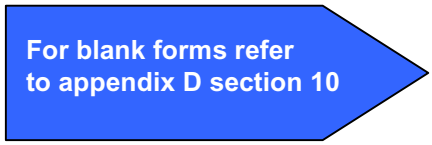
Documentation is expected for all steps in the application of the HACCP principles, as outlined above. This includes each CCP, where relevant, and all general controls.
Records are expected for all monitoring, corrective action and operator verification activities, both in relation to CCPs and all general controls.

The record forms can be found in Appendix E of this Code of Practice.

[34] Some control measures may be repeated in other supporting systems. If this occurs only one set of documentation and records is necessary for each control measure.

3.10 Operational Authorities and Responsibilities





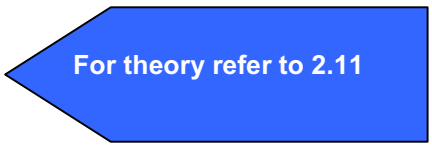
The following responsibilities and authorities should be allocated for the risk management programme:

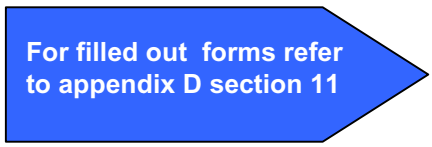
Person responsible for:	Name or title or designation[35]	Training received
CCP1 - 10	Joe Eggbert / Jane Eggbert / Jim Eggleton	On job training by Henrietta Eggnot, 17/18/2/2000
CCPL1 - 2	Joe Eggbert / Jane Eggbert / Jim Eggleton	On job training by Henrietta Eggnot, 17/18/2/2000
CCPW1	Joe Eggbert / Jane Eggbert / Jim Eggleton	On job training by Henrietta Eggnot, 17/18/2/2000
Monitoring	Henry Eggnot	On job training by previous operator, 17/18/2/2000
Corrective action	Henry Eggnot	On job training by Henrietta Eggnot, 17/18/2/2000
Operator Verification	Henrietta Eggnot	EPF approved HACCP course, 3 day, 14-16/2/2000
Vaccination of Hens	Henry Eggnot	Training by Pacific Vet

Detailed training records are kept in the Layer Farm Manager's Office. Records that can be used for this are given in Appendix E.

[35] If the person is likely to change it is more sensible to put the title or designation so that this section won't need updating.

3.11 Generic corrective action procedure[36]

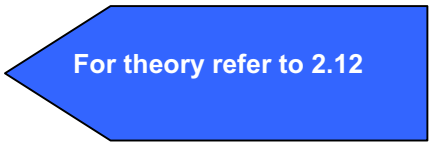


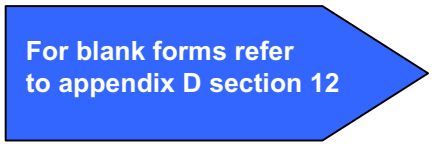


When to use it:	When non-complying animal material or animal product is produced - • using a process or associated thing that deviates from the risk management programme; or • not in compliance with the outcomes documented in the risk management programme; or • where an unforeseen hazard or other risk factor arises; and • when a specific corrective action has not been complied with or has not been identified in the risk management programme.
Inventory control	Non-complying animal material or animal product must be identified and retained separately under inventory control pending a full assessment by a suitably-skilled person (nominated by the egg producer).
Procedure	The suitably skilled person shall: • review the relevant processing records, animal material or animal product, to identify any potential risk factors. • make a decision regarding the suitability for processing of the animal material, or the fitness for intended purpose of the animal product, and • ensure the appropriate disposition is carried out.
Reporting	The suitably skilled person must complete and sign a full report on the management of the non-compliance, including details of - • the deviation from the risk management programme, and the impact on any hazards or other risk factors present in the animal material or animal product; and • the identification of the affected animal material or animal product; and • any additional processing of the animal material or animal product; and • the analyses made to reach the final decision; and • the decision on the disposition of the animal material or animal product; and • confirmation that the disposition of animal material or animal product has been carried out; and • any actions taken to prevent recurrence of the non-compliance. The egg producer must provide the report, as soon as practicable, to MAF's Director-General or an animal product officer.
Verification	The egg producer must bring to the attention of the accredited verifier at the next verification visit, any use of the generic corrective action procedure.

[36] An alternative to including this procedure in the RMP is to just cross reference to Specifications 12 and 13 of the Animal Products (Risk Management Programme Specifications) Notice 2000.

3.12 Recall Procedure





Responsibility / Authority:	• Henrietta Eggnot is totally responsible for the control of any recalls and has the authority to co-opt staff members from normal duties to participate in recall activities. In Henrietta's absence the second in charge shall assume these authorities and responsibilities until Henrietta is available.
Identification and traceability:	• All eggs shall be traceable from the laying farm and shed to the grading facility[37].
Risk assessment and decision on whether or not to recall.	• Henrietta has the authority to decide whether or not a recall is necessary. This will depend on her assessment of the risk to customers/consumers. She may choose to consult with relevant regulatory authorities or food safety experts prior to making this decision. • The Director-General of MAF must be notified if any recall goes ahead.
Communication and documentation	• All recall communications are to be approved by Henrietta Eggnot. No one else is to contact ANYONE outside of the company with respect to the recall without her knowledge and agreement. Media statements are only to be made by Henrietta. • Henrietta shall keep a diary of all communications including the date, time, contact person, summary of discussion, agreed actions, due dates etc. • To speed up communication most urgent correspondence will be done by phone. All correspondence must be confirmed in writing. • All records relevant to the recall shall be collected and filed by Henrietta in a "Recall File".
Product Recovery / Disposition	• Henrietta Eggnot is responsible for discovering how much suspect product is subject to recall and monitoring the progress on locating this product. A product recovery tree shall be used to record these details. • Henrietta is also responsible for deciding on the disposition of any recalled product. This may be by dumping, further processing, regrading etc as appropriate.
Corrective / preventive action	• Once the suspect product has been located and dealt with, the cause of the problem shall be investigated and appropriate actions taken to prevent a recurrence of the problem.
Review of recall effectiveness	• Once all of the above steps have been completed Henrietta shall involve all relevant people in a review of the recall. This shall consider how well each of the steps were performed and what improvements could be made. A final report shall be compiled. If necessary a copy of this shall be sent to relevant regulatory authorities and/or customers to inform them of the outcome of the recall.

[37] Some egg producers may wish to be able to trace eggs back to specific flocks or sheds within a farm. This is basically a commercial decision. The better the traceability the smaller any recall is likely to be if there is a problem.

3.13 Operator Verification

For theory refer to 2.13

For blank forms refer to appendix D section 13

Validation:	**Henrietta Eggnot has partially validated this RMP. Refer to 3.16 for further information.**
Routine Verification:	**Routine operator verification of each RMP component has already been described in the documentation of each component.**
Audit:	**In addition to the above verification activities, once a month the Layer Farm Manager shall select an RMP component and shall audit it to ensure that it is implemented effectively. The audit shall check that:** • **staff understand the requirements and are following procedures correctly,** • **monitoring and appropriate corrective action is occurring, and** • **records are being correctly and accurately filled out.** **Each time a component is audited the Layer Farm Manager shall write a brief report outlining the component audited, findings and any corrective action taken as a result of the findings. These reports will be filed in the Layer Farm Manager's filing cabinet.** **The Manager shall sign the records for that month. Any problems shall be noted on the relevant record with the details of the corrective action taken.**
Ongoing Review:	**The Layer Farm Manager shall also review the whole RMP:** • **at least once a year, and** • **when the operation changes and** • **when problems arise.** **If necessary the Manager shall ensure that the RMP is updated; or amended, revalidated, re-evaluated and re-registered.**

3.14 External verification[38]

For theory refer to 2.14

For filled out form refer to appendix D section 14

Policy on Verifier's Rights

Henrietta's Egg Company Ltd is committed to the implementation and maintenance of its risk management programme and will ensure that its risk management programme is verified by an accredited verifier at the frequency stipulated by NZFSA. The accredited verifier shall have the freedom and access necessary to allow them to carry out verification functions and activities, including -:

(a) having access to all parts of the premises or place and facilities within the physical boundaries of or relating to the risk management programme; and

(b) having access to all documentation, records and information relating to, or comprising, the risk management programme (including records held in electronic or other form); and

(c) having freedom to examine all things necessary and open any containers, packages and other associated things to inspect their contents; and

(d) having freedom to identify or mark any animal material, animal product, equipment, package, container or other associated thing; and

(e) having freedom to -

(i) examine and take samples of any animal material, animal product or any other input, substance, or associated thing which has been, is, or may be in contact with, or in the vicinity of, any animal material or animal product; and

(ii) test, or analyse, or arrange for the testing, or analysis of such samples; and

(iii) order retention of raw materials including animal material, ingredients, animal products, packaging or equipment pending testing results and decisions on disposition; and

(f) having authority where there may be significant risk to fitness for intended purpose of animal product or suitability for processing of animal material to detain any animal material and animal products or other relevant things in the event of non-compliance with the risk management programme; and

(g) having authority in cases of significant risk to fitness for intended purpose of animal product or suitability of animal material for processing to intervene and direct a temporary interruption of processing until the cause of the risk has been remedied.

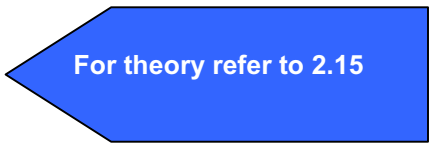
Signed by: *Henrietta Eggnot*

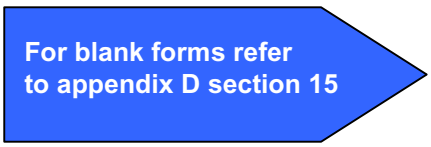
Date:

A letter from the nominated verification agency is attached confirming their willingness to carry out verification of the RMP. (Egg producer is to attach the letter here).

[38] An alternative to including this procedure in the RMP is to just cross reference to Specification 15 of the Animal Products (Risk Management Programme Specifications) Notice 2000.

3.15 Documentation and record-keeping





3.15.1 Document Control System

RMP Documents	**All RMP documents:** • **are typed,** • **are listed on the RMP document list, (See next page)** • **have a date and version on each page,** • **are authorised before issue by the Operator of the RMP by signing the RMP document list after it has been updated to reflect the changes.**
Availability	**The registered RMP and all reference material relating to it must be readily accessible to:** • **all those who have responsibilities under the RMP. This is achieved by having a copy of the RMP at the following distribution points:** **- Layer Farm Manager's Office** **- Staffroom.** • **accredited persons, animal product officers and the Director-General or persons authorised by the Director-General, within two working days of any request.**
Updates and Amendments	**Whenever one or more page(s) of a document is changed:** • **the date and version number of the each altered page shall be updated,** • **a line shall be placed in the margin to show where the changes have been made,** • **details of the page, date and version number shall be recorded on the RMP document list,** • **the updated RMP document list shall be authorised by the RMP Operator,** • **if the change constitutes an amendment to the RMP as defined in Section 25 of the Animal Products Act it shall be validated, evaluated and registered prior to implementing the change,** • **on implementation of the change, all copies of the relevant pages of the RMP shall be replaced as soon as possible.**
Obsolete Documents	• **All obsolete documents or parts of documents are removed as soon as practicable from all distribution points (which are listed under availability heading above).** • **One hard copy of any obsolete part of the RMP is archived for 4 years and made available to accredited persons, animal product officers and the Director-General and persons authorised by the Director-General, as required.**

3.15.2 List of documents making up the RMP

RMP component	Programme / Document Name[39]	Version / Issue	Date	Reference (to pages / sections etc)	Viewed by Evaluator
Title Page	F-RMP-1				
Management Authorities and Responsibilities	F-RMP-2				
Scope of RMP	F-RMP-3				
Product Description and Intended Purpose	F-RMP-4				
Product Outcomes	F-RMP-5				
Process description	F-RMP-6				
Identification, Analysis and Control of Hazards and Other Risks Factors from Inputs	F-RMP-7				
Identification, Analysis and Control of Hazards and Other Risks Factors from Other Sources	F-RMP-8				
Identification, Analysis and Control of Hazards and Other Risks Factors from The Process	F-RMP-9				
Operational Authorities and Responsibilities	F-RMP-10				
Generic Corrective Action Procedure	F-RMP-11				
Recall Procedure	F-RMP-12				
Operator Verification	F-RMP-13				
External Verification	F-RMP-14				
Documentation and Record-Keeping	F-RMP-15				
Validation Protocol	F-RMP-16				
Signed by *Henrietta Eggnott* (Operator)		Signed by (Evaluator)			
Operator's name in full: Henrietta Eggnott		Evaluator's name in full			
Date: 10/9/01		Date:			

[39] The numbers given in this column have been chosen to represent the Farm's RMP (F-RMP) with a number for each different section or RMP component. Alternative numbering systems are equally acceptable.

3.15.3 Record Control System

RMP Records	**Records shall be kept to demonstrate compliance to the RMP. This includes monitoring, corrective action and operator verification records for CCPs and other controls.**
Details to be recorded	**All RMP records must be legible and must include the following details:** • **date and time of observation; and** • **subject and description of observation; and** • **any corrective action undertaken; and** • **means to identify the observer and any person who undertook corrective action; and** • **any other information required under the risk management programme as applicable.** **Electronic records must show the person who entered the data on them unless access to them is password protected.** **Where monitoring and corrective action records for the risk management programme have been subject to operator verification, the signature or unique identifier of the operator verifier must be recorded on those records, or on records generated by the operator verification activities.**
Availability	**All RMP records must be readily accessible and made available to accredited persons, animal product officers, the Director-General and persons authorised by the Director-General, all records relevant to the operator verification, as required.**
Archiving	**All RMP records will be stored for at least 4 years as follows:** • **Manual records in cardboard box files in the Farm Manager's office.** • **Electronic records on clearly labelled floppy disks in a disk storage unit in the Farm Manager's office.**

3.16 Validation Protocol

Henrietta Eggnott has checked that the RMP documentation is complete. Refer to Validation Report (see Appendix E).

The following protocol explains how product outcomes will be validated by demonstrating that:
a) each Product Outcome is achieved on a consistent basis.
b) each CCP achieves or contributes to the achievement of the relevant Product Outcome:
c) other controls meet regulatory requirements or contribute to the achievement of the relevant Product Outcome.

Product Disposition: All eggs produced during the validation period will be either processed or rejected according to the documented procedures in this RMP.

3.16.1 Hazards to Human Health

Hazard or other risk factor	Example Product outcomes	Key Control Measures[40]	Proposed Validation
B1 & B2: Salmonella and other enteric pathogens.	Clean Shell Eggs: Salmonella level – not yet defined.	• CCP7: Rejection of very dirty eggs: All eggs with total soiling greater than a defined surface area[41] to be dumped. • CCP8: 100% of floor eggs to be separated from other eggs. • CCP9: 100% of eggs with cracks visible to the naked eye to be separated from other eggs. Those with broken membranes to be dumped.	Records of performance for 10 working days for CCP 7, 8 and 9. NB: Need to clarify how much dirt is tolerable? How many eggs are checked? How many are affected?
		• CCP10: Temperature of storage and transfer facilities to be 15C or less, or transfer to be made within 2 hours of collection.	Temperature records of storage and transfer facilities for 10 working days. All readings to be below limits.
	Dirty and Floor Eggs: Salmonella level – not yet defined.	• CCP9: As above. • CCP10:As above	As above.

[40] Not all of these example control measures will suit all operations. E.g. those operations with automatic collection may not be able to separate eggs as implied here.
[41] To be set by egg producer. To define the surface area use an actual size e.g. 1 square cm, or refer to something of known size, e.g. 5 or 10 cent coin (as appropriate).

Hazard or other risk factor	Example Product outcomes	Key Control Measures[40]	Proposed Validation
B1 & B2: Salmonella and other enteric pathogens.	Eggs with Size/ Shape Abnormalities or Minor Defects Salmonella level – not yet defined.	• Eggs that do not have an intact membrane are separated from these eggs. • CCP10 as above but with limit of 6°C.	As above.
	All eggs:	• Vaccination of layer hens with *MeganVac-1.*	Records for one delivery show that suppliers are meeting requirements.
		• Treatment of feed.	Records for one delivery show that suppliers are meeting requirements.
		• CCP4: Shed cleanout.	Salmonella not detected on swabs after cleanout from: • at least one previous shed cleanout (if any) or • prior to new operation starting up, or • at next cleanout.
		• CCP 3: Personnel with infectious diseases to get medical clearance before handling product	Training records show that employees and managers have had awareness training for these requirements. Check that there is a procedure for recording medical clearances received.
C1 & C2: Chemical residues.	All eggs: No chemical residues over Maximum Residue Limits	CCP5: All eggs from medicated hens to be dumped for entire witholding period.	1. Show how all eggs from treated birds are identified. 2. Show how eggs will be segregated and dumped. 3. Explain how the withholding period is identified, recorded and checked. 4. Review records of medication. 5. Prove effectiveness of 1-4 above using: • Historical records, or • validate at next medication, or • set up trial to prove capability.
		CCP6: Veterinary medicines shall only be used according to the directions of the manufacturer and subject to the conditions of the licence.	One check that all veterinary medicines on site are licensed by NZFSA's Agricultural Compounds and Veterinary Medicines group. One check that veterinary medicine has been used in accordance with licence.
		CCP 1: Order chemicals used on farm	One check that all chemicals currently on site or on order have appropriate approval under NZFSA Manual 15 http://www.nzfsa.govt.nz/animalproducts/legislation/notices/m15-chem-schedule-all.pdf.

Hazard or other risk factor	Example Product outcomes	Key Control Measures[40]	Proposed Validation
C1 & C2: Chemical residues.	<u>All eggs:</u> No chemical residues over Maximum Residue Limits	CCP 2: Use chemicals correctly	One check that the correct chemical is used in the correct area (as per NZFSA approval) and in accordance with the manufacturer's instructions, e.g. amount, contact time, method of application.

3.16.2 Hazards to Animal Health

Hazard or other risk factor	Example Product outcomes[42]	Key Control Measures[43]	Proposed Validation
B1 & B2: Salmonella and other enteric pathogens.	<u>Eggs with Size/ Shape Abnormalities or Minor Defects</u> Salmonella level – not yet defined.	• Eggs that do not have an intact membrane are separated from these eggs. • Storage and transportation temperature not higher than 6°C. • Vaccination of layer hens with *MeganVac-1.* • Treatment of feed. • Biosecurity measures.	• As for human health.
C1 & C2: Chemical residues.	<u>All eggs:</u> No chemical residues over Maximum Residue Limits[44].	• As for human health.	• As for human health.

[42] Where it is not expected that a risk factor is to be measured within the RMP (as indicated by an approved Code of Practice or regulatory requirements), the operator may put "level not yet defined" for the outcome so long as key control measures are identified. Nevertheless, individual operators are encouraged to measure this risk factor and set a level for a product outcome where possible.
[43] Not all of these example control measures will suit all operations. E.g. those operations with automatic collection may not be able to separate eggs as implied here.
[44] In the absence of any information specific to animals it has been assumed that the levels set for humans are also acceptable as default outcomes for animals. This is not currently measured although controls are in place. NZFSA and the Egg Producers Federation are discussing setting up a surveillance programme.

3.16.3 Risks to Wholesomeness

Hazard or other risk factor	Example Product outcomes[45]	Key Control Measures[46]	Proposed Validation
W1: Blood or Meat spots	No product outcomes as this defect is uncontrolled at layer farm.	N/a	N/a
W2: Watery whites	Less than 0.1% eggs have defect.	• Daily - collect and send all eggs to packhouse. • CCP 8: Transfer within 2 hours or storage at 15C or less	Delivery times or storage temperature records for 10 days of operation.
W3: Roundworms in eggs	Less than 0.1% eggs have roundworms.	• Free range hens are subject to a treatment programme for roundworms.	Check that treatment programme has been established. Review treatment records to confirm that treatment has been given in accordance with programme. Feedback from packhouse.
W4: Off odours and flavours	Less than 0.1% eggs have defect.	• As for W2	As for W2
W5: Rotten eggs	Less than 0.1% eggs have defect.	• As for W2	As for W2
W6: Pink or iridescent whites	Less than 0.1% eggs have defect.	• As for W2	As for W2
W7: Eggs older than use by date	Less than 0.1% eggs have defect.	• As for W2	As for W2
W8: Soft shells	Less than 0.1% eggs have defect.	• Check feed composition. • CCP W1: Eggs with visibly soft shell to be dumped	Feedback from packhouse. Records of performance: • Historical performance for existing operations • Actual performance for new operations.
W9: Mouldy eggs	No product outcomes as this defect is uncontrolled at layer farm.	N/a	N/a

[45] These outcomes are not currently measured within the layer farm RMP but feedback from the Packhouse may verify that acceptable levels are being achieved.
[46] Not all of these example control measures will suit all operations. E.g. those operations with automatic collection may not be able to separate eggs as implied here.

3.16.4 Risks From False or Misleading Labelling

Hazard or other risk factor	Example Product outcomes	Key Control Measures[47]	Proposed Validation
L1: Incorrect claims for free range, barn, caged or organic eggs	All eggs must be true to label on packs, containers, pallets or trolleys that deliver them to the packhouse. All labelling of transportation outers must comply with Specification 32 of the Animal Products (Specifications for Products Intended for Human Consumption) Notice 2002.	CCP L1 Claims on labels CCP L2 Dates on Labels	For each claim type: do one check that label claims made accurately reflect the egg production system. Show how labels with different types of claims are controlled so that they are applied to the correct eggs.
L2: Incorrect date marking			Where dating is applied show how use by dates are determined and relate this to actual egg collection frequency. Demonstrate accuracy of dates on one day's production.

Once the proposed validation has been completed the results will be summarised in the Validation Report and all raw data shall be made available to the evaluator.

[47] Not all of these example control measures will suit all operations. E.g. those operations with automatic collection may not be able to separate eggs as implied here.

Chapter 4:

How to develop an RMP for an Egg Packhouse

4.1 Introduction

This Chapter gives an example of each RMP component for a packhouse.

Most of the examples should be self-explanatory but if you find that they are not clear enough go to the corresponding section in Chapter 2 for further information on each component.

Forms have been provided in the appendices for the egg producer to copy and fill out to document their own RMP. Alternative formats that contain similar information are also acceptable.

Once you understand each example you should copy the corresponding form in Appendix D and use the example to guide you to fill out the form. Remember that where your operation differs from the example you should change it so that it accurately reflects what you do. The mandatory requirements must always be included in your RMP.

There may be times when you will need to write up things in more detail than is shown in the example. We have tried to make this clear in the appropriate places.

Start your RMP by filling out the title page on Appendix D section 1.

4.2 Management Authorities and Responsibilities

For theory refer to 2.2

For blank forms refer to appendix D section 2

Business Name:	**Henrietta's Egg Company Ltd**
Business Operator's Full Legal Name[1]:	**Henrietta Eggnot**
Business Identifier[2]:	**Henegg1**
Business Address:	**29 Henry St, Henryville**
Postal Address (If different from the business address):	**PO Box 111 Henryville**
Registered Company Address (If different from the business address)	**N/A**
Email Address:	**Henrietta@eggs.co.nz**
Phone Number	**(01) 01010101**
Fax Number	**(01) 01010100**

Person responsible for:	Name or title	Training received
Day to day management of RMP	Henrietta Eggnot	Egg Producer's Federation approved HACCP course, 3 day, 14-16/2/2000
Deputy for Day to Day Manager of RMP	Henry Eggnot	Egg Producer's Federation approved HACCP course, 3 day, 14-16/2/2000

[1] For a company this is just the company name, otherwise put in the Partnership name or name of the Sole Trader.
[2] Business Identifier must not be the same as an exporter ID operating from the same premises;
Must be a number or a number/letter combination of:
- at least 3 and not more than 10 characters;
- at least one character as a number;
- no leading zeros.

4.3 Scope of the risk management programme

For theory refer to 2.3

For blank forms refer to appendix D section 3

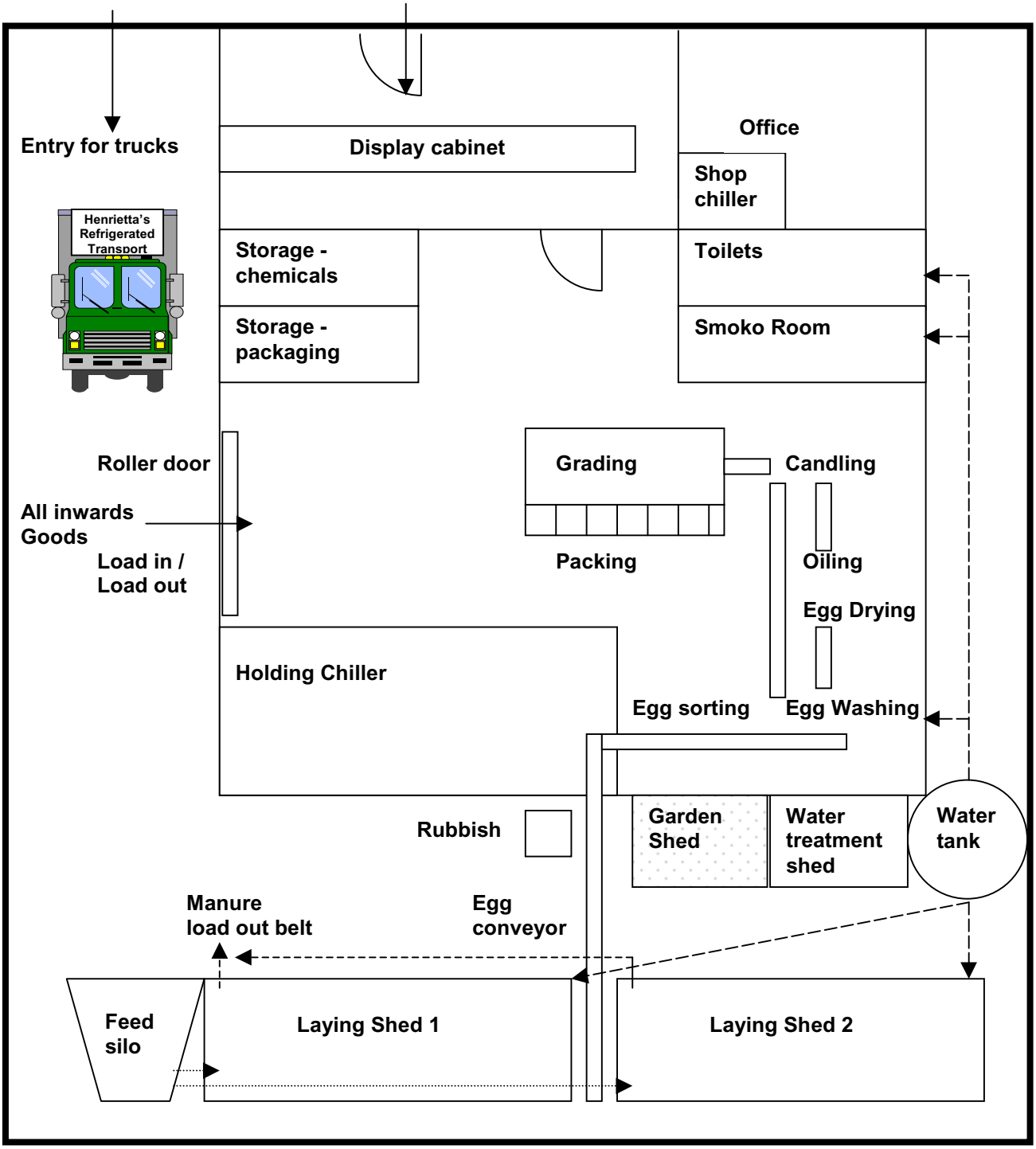
Business Name:	Henrietta's Egg Company Ltd
Type of Premises:	Egg Packhouse
Name of Animal Material:	Shell Eggs
Name of Animal Products:	A grade shell eggs Commercial eggs Cracked eggs Downgraded eggs
Location:	Grading Facility: 29 Henry Street, Henryville Physical Boundaries – See site map on next page.
Start of RMP:	Receipt of eggs at grading facility
Processes:	Egg Storage Egg Grading / Candling Egg Packing Egg Storage Transportation to Market
End of RMP:	Arrival at wholesale or retail sale or secondary processing
Risk Factors Covered[3]:	Hazards to Animal Health Hazards to Human Health Risks to Wholesomeness Risks From False or Misleading Labelling

For each risk management programme the egg producer must describe the physical boundaries of the programme. An example of how this can be done is given on the following page.

[3] For any risk factors that are not covered this should be stated and a brief justification made.

Example of one way to show Physical Boundaries:

All items inside the dark line (which represents the land boundaries) are included in the risk management programme except the garden shed - see shaded building.



4.4 Product description and intended purpose

For theory refer to 2.4

For blank forms refer to appendix D section 4

Product Name[4]:	A Grade Shell Eggs	Commercial Eggs	Cracked Eggs	Downgraded Eggs (Go to waste so not further considered in the RMP)
Product Description:	Clean No visible cracks No internal defects	Clean No visible cracks May have minor defects	Clean With visible cracks but intact membrane May have minor defects	Does not meet requirements of other grades.
Intended Uses:	To be sold for any purpose.	To be sold for catering or further processing.	To be sold only for further processing (pasteurisation or equivalent[5]) or for animal food.	To be dumped.
Intended Consumer:	Human consumption – general public	Human consumption - general public	Human consumption - general public or Animal consumption	N/a. (Not suitable for human or animal consumption).
Shelf Life from Date of Lay:	35 days	35 days	14 days	N/a
Labelling Instructions:	Refrigeration guidelines	Refrigeration guidelines	Refrigeration guidelines	Labelled as “downgraded”
Packaging	New cartons/trays Washed, sanitised, reused plastic trays Pallet wrap Pallets	New cartons/trays Washed, sanitised, reused plastic trays Pallet wrap Pallets	New cartons/trays Washed, sanitised, reused plastic trays Pallet wrap Pallets	Kept in bucket until dumping.
Where it is to be Sold:	Retail sale Wholesale Secondary processors Food Service	Retail sale Wholesale Secondary processors Food Service	Further processors	N/a
Storage and Distribution Conditions:	Refrigeration at or below 15°C	Refrigeration at or below 15°C	Refrigeration at or below 6°C[6]	N/a

[4] Above products are examples only. Some egg producers will have different products.
[5] This process should be validated to demonstrate effective control of pathogens.
[6] This temperature is based on current industry practice as identified by the Egg Producers Federation Working Group members. Egg producers may need to set different temperatures depending on the further processor’s ability to reduce pathogens to acceptable levels.

4.5 Product outcomes for all eggs except downgraded eggs[7]

For theory refer to 2.5

For blank forms refer to appendix D section 5

4.5.1 Hazards to Human Health

	Hazard or other risk factor	Aim of RMP	Example Product outcomes[8]	Key Control Measures[9]	Response if outcome not met
Biological:	**B1 & B2: Salmonella and other enteric pathogens.**	**Minimise Salmonella and other enteric pathogens.** **Meet Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000, 107.**	**A Grade Eggs:** Salmonella not detected in 25g from a weekly composite sample of A grade shell eggs.	• Dirty eggs and visibly cracked eggs are separated from these eggs. • Storage and transportation temperature not higher than 15°C.	• Increase test frequency. Divert eggs from known positive flocks to further processing with a bactericidal control point. • Rework eggs that are still on site to meet requirements. • Review refrigeration systems. • Notify Laying Farm of issues that may relate to them. • Review packhouse RMP. • Retrain staff.
			Commercial Eggs: Salmonella level – not yet defined.	• Visibly cracked eggs are separated from these eggs. • No dry cleaning of eggs. • All dirty eggs and floor eggs to be washed in accordance with the ICMSF guidelines on pageC-51 of Appendix C: Technical Annex. • Storage and transportation temperature not higher than 15°C.	
			Cracked Eggs: Salmonella level – not yet defined.	• All eggs that do not have an intact membrane are separated from these eggs. • All eggs with cracks visible on candling but intact membranes are labelled for further processing or animal consumption. • Storage and transportation temperature not higher than 6°C.	

[7] No product outcomes are necessary for downgraded eggs as these eggs are dumped at the packhouse and will not be used for human or animal consumption.
[8] Where it is not expected that a risk factor is to be measured within the RMP (as indicated by an approved Code of Practice or regulatory requirements), the operator may put "level not yet defined" for the outcome so long as key control measures are identified. Nevertheless, individual operators are encouraged to measure this risk factor and set a level for a product outcome where possible.
[9] Not all of these example control measures will suit all operations.

	Hazard or other risk factor	Aim of RMP	Example Product outcomes[8]	Key Control Measures[9]	Response if outcome not met
Chemical:	C3: Residues from egg washing chemicals	Minimise chemical residues in eggs.	<u>All eggs:</u> No chemical residues over Maximum Residue Limits[10].	Approved chemicals used in accordance with instructions.	• Dump affected eggs. • Review RMP. • Retrain staff.
	C4: Residues from egg oiling chemicals				
Physical:	None identified	N/a	N/a	N/a	N/a

4.5.2 Hazards to Animal Health

	Hazard or other risk factor	Aim of RMP	Example Product outcomes[11]	Key Control Measures[12]	Response if outcomes not met
Biological:	B1 & B2: Salmonella and other enteric pathogens.	Minimise Salmonella and other enteric pathogens.	<u>Cracked Eggs:</u> Salmonella level – not yet defined.	• All eggs that do not have an intact membrane are separated from these eggs. • All eggs with cracks visible on candling but intact membranes are labelled for further processing or animal consumption. • Storage and transportation temperature not higher than 6°C.	• Rework eggs that are still on site to meet requirements. • Review refrigeration systems. • Notify Laying Farm of issues that may relate to them. • Review packhouse RMP. • Retrain staff.
Chemical:	C3 & C4: Chemical residues.	Minimise chemical residues in eggs.	<u>All eggs:</u> No chemical residues over Maximum Residue Limits[13].	No eggs supplied from hens on medication and during withholding period.	• Dump affected eggs. • Review RMP. • Retrain staff.
Physical:	None identified	N/a	N/a	N/a	N/a

[10] This is not currently measured although controls are in place. NZFSA and the Egg Producers Federation are discussing setting up a monitoring programme.
[11] Where it is not expected that a risk factor is to be measured within the RMP (as indicated by an approved Code of Practice or regulatory requirements), the operator may put "level not yet defined" for the outcome so long as key control measures are identified. Nevertheless, individual operators are encouraged to measure this risk factor and set a level for a product outcome where possible.
[12] Not all of these example control measures will suit all operations. E.g. those operations with automatic collection may not be able to separate eggs as implied here.
[13] This is not currently measured although controls are in place. NZFSA and the Egg Producers Federation are discussing setting up a monitoring programme.

4.5.3 Risks to Wholesomeness

Hazard or other risk factor	Aim of RMP	Example Product outcomes	Key Control Measures[14]	Response if outcome not met
W1: Blood or Meat spots	Meet Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000, 107, (1) (c) and (d).	Less than 0.1% eggs have defect.	• Defective eggs are removed at candling.	• Recandle eggs • Dump affected eggs. • Review RMP. • Retrain staff.
W2: Watery whites	To minimise defective eggs.	Less than 0.1% eggs have defect.	• All eggs processed at packhouse as soon as possible after receipt. • Transportation and storage temperature not higher than 15°C.	• Improve stock rotation. • Fix refrigeration. • Retrain staff.
W3: Roundworms in eggs	To minimise defective eggs.	Less than 0.1% eggs have roundworms.	• Uncontrolled in this RMP. Controlled on farm.	• Dump eggs • Notify laying farm
W4: Off odours and flavours	To minimise defective eggs.	Less than 0.1% eggs have defect.	• All eggs processed at packhouse as soon as possible after receipt. • Transportation and storage temperature not higher than 15°C.	• Improve stock rotation. • Fix refrigeration. • Retrain staff.
W5: Rotten eggs	To minimise defective eggs.	Less than 0.1% eggs have defect.	• All eggs processed at packhouse as soon as possible after receipt. • Transportation and storage temperature not higher than 15°C.	• Improve stock rotation. • Fix refrigeration. • Retrain staff.

[14] Not all of these example control measures will suit all operations. E.g. those operations with automatic collection may not be able to separate eggs as implied here.

Hazard or other risk factor	Aim of RMP	Example Product outcomes	Key Control Measures[14]	Response if outcome not met
W6: Pink or iridescent whites	To minimise defective eggs.	Less than 0.1% eggs have defect.	• All eggs processed at packhouse as soon as possible after receipt. • Transportation and storage temperature not higher than 15°C.	• Improve stock rotation. • Fix refrigeration. • Retrain staff.
W7: Eggs older than use by date	To minimise defective eggs.	Less than 0.1% eggs have defect.	• All eggs processed at packhouse as soon as possible after receipt. • Transportation and storage temperature not higher than 15°C.	• Improve stock rotation. • Fix refrigeration. • Retrain staff.
W8: Soft shells	To minimise defective eggs.	Less than 0.1% eggs have defect.	• Defective eggs are removed at candling..	• Send eggs to further process, pet food, animal feed or dump as appropriate. • Notify layer farm.
W9: Mouldy eggs	To eliminate defective eggs.	Less than 0.1% eggs have defect.	• Cleaning of storage rooms / chillers.	• Retrain staff. • Clean storage / chillers with approved mould preventative chemical.

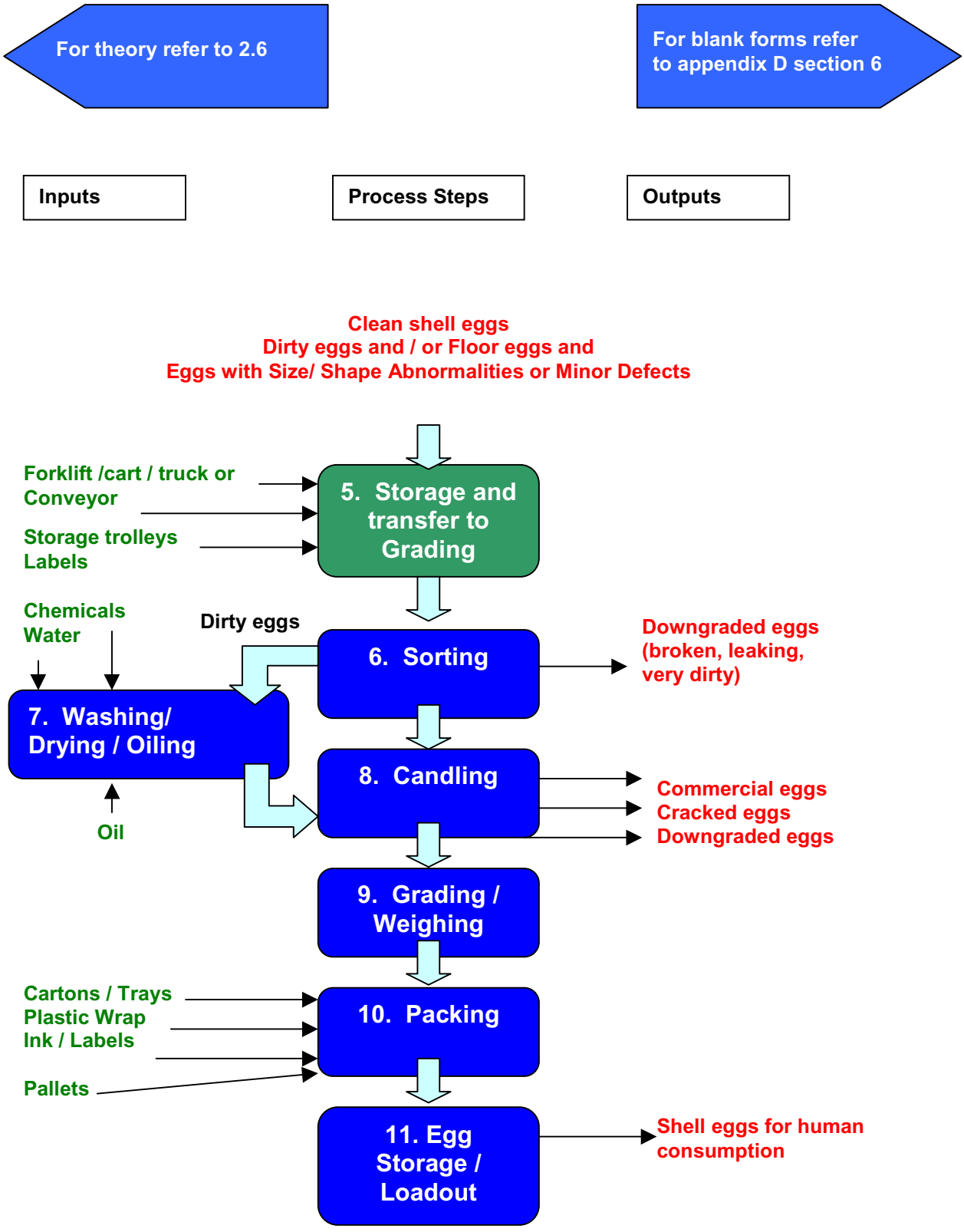
4.5.4 Risks From False or Misleading Labelling

Hazard or other risk factor	Aim of RMP	Example Product outcomes	Key Control Measures[15]	Response if outcome not met
L1: Incorrect claims for free range, barn, caged or organic eggs	To minimise incorrect labelling	All eggs must be true to label on packs, outers or units leaving the packhouse. All labelling of transportation outers must comply with Specification 32 of the Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000.	• Each proof of a new label / carton checked for accuracy prior to order. • Each batch of labels / cartons checked for accuracy on receipt. • Labels / cartons checked at start up and on change over of each layer farm/shed. • 100% traceability and segregation from layer shed to packed eggs or only one type of egg accepted at each packhouse.	• Relabel affected eggs or dump them. • Review RMP. • Retrain staff.
L2: Incorrect date marking				• Relabel affected eggs or dump them. • Review RMP. • Retrain staff.

The product outcomes should be reviewed after hazard and other risk factor analysis to confirm that they are still appropriate and achievable.

[15] Not all of these example control measures will suit all operations. E.g. those operations with automatic collection may not be able to separate eggs as implied here.

4.6 Process description



4.7 Analysis / Control of Hazards and Other Risk Factors From Inputs

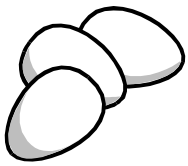
The following inputs are considered below:

- **Eggs**
- **Processing Aids**
- **Product Contact Packaging**

For theory refer to 2.7

For forms refer to appendix D section 7

4.7.1 Eggs



4.7.1.1 Hazards and other risk factors

B1 = Salmonella Species
B2 = Other enteric bacteria
B3 = *Staphylococcus* / *Streptococcus species*
B4 = *Listeria monocytogenes*
C1 = Residues from animal remedies e.g. antibiotics
C2 = Residues from chemicals used in shed cleaning and fumigation
W1 = Blood or meat spots
W2 = Watery whites
W3 = Roundworms in eggs
W4 = Off odours and flavours
W5 = Rotten eggs
W6 = Pink or iridescent egg whites.
W7 = Eggs that are older than their use by date.
W8 = Soft shells.
W9 = Mouldy eggs
L1 = Incorrect Claims
L2 = Incorrect Date

4.7.1.2 Supplier Requirements

Regulatory Requirements
1. Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000, 106: The operator must ensure that layer flocks producing eggs for processing are subject to and comply with a whole flock health scheme designed to ensure that hazards associated with eggs which are likely to affect human health are identified and managed in an appropriate manner.

Regulatory Requirements
2. Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000, 107: Eggs that are intended to be traded in the shell must — **(a) be visibly clean; and** **(b) have no cracks that are visible on candling (or equivalent) unless they have been treated by a process that destroys pathogenic organisms; and** **(c) have no evidence of embryo development, or putrefaction, and no significant blood clots; and** **(d) not have been incubated; and** **(e) be handled and stored under conditions that minimise condensation on the surface of the eggs.**
3. Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000, 107: Any primary processing of eggs intended to be traded in the shell that compromises the integrity of the shell, must be minimised.

Operator-defined Requirements
4. The following eggs must be rejected at the farm and not delivered to the packhouse: • **Very dirty eggs (soiled area over the size of 20 cent coin), and** • **Visibly cracked eggs.**
5. The following categories of eggs must be collected, kept and delivered in separate containers: • **Good eggs** • **Floor eggs or slightly soiled eggs** • **Eggs that are unusual shapes or sizes or have minor defects.**
6. Each egg collection and delivery unit shall be labelled with: • **Farm** • **Shed** • **Date of Lay** • **Egg grade (as above)** • **Egg type (caged, barn, free range or organic).**

4.7.1.3 Procedures

The following control measures are the responsibility of the Packhouse Supervisor:

Step	Control Measure	Monitoring	Corrective Action	Records
1. Order eggs	**Supplier to give declaration that layer hens were kept under a Whole Flock Health Scheme and all eggs meet requirements for requirements 2-6 above.**	**Check supplier's declarations with each delivery.**	**Do not pack eggs without declaration. Return to supplier.**	**Supplier declarations.**
2. Receive eggs	**Confirm that declaration matches eggs delivered.**	**Visual inspection on arrival.**	**Do not pack eggs. Return to supplier.**	**Inwards goods docket.**
3. Store eggs	**Cracked eggs at 6°C or less. All other eggs at 15°C or less.**	**N/a**	**Correct problem. Retrain staff.**	

4.7.1.4 Operator verification

The Packhouse Manager shall check and sign the records for 10% of the egg deliveries. Any problems shall be noted on the relevant record with the details of the corrective action taken.

4.7.1.5 Records

An example of a suitable supplier declaration is given in Appendix E of this manual.

4.7.2 Processing Aids / Other Inputs

Wash water chemicals

Oil for sealing shell

4.7.2.1 Hazards

C3 = Residues from chemicals used in egg washing
C4 = Residues from chemicals used in egg oiling

4.7.2.2 Supplier Requirements

Regulatory Requirements
1. Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000, 17: The identity and purity of additives, processing aids, vitamins, minerals, and other added nutrients must comply with — • **the current Australian Food Standards Code 1992, Standard A11 "Specifications for identity and purity of food additives, processing aids, vitamins, minerals and other added nutrients"; or** • **regulation 245(6) of the Food Regulations 1984 (SR 1984/262) (which relates to identity and purity of additives).**
Operator-defined Requirements
2. Chemicals used for egg washing or oiling are to be food grade.

4.7.2.3 Procedures

The following control measures are the responsibility of the Packhouse Supervisor:

Step	Control Measure	Monitoring	Corrective Action	Records
1. Order chemicals	All chemicals are approved for their intended use as per the above Food Regulations.	Check supplier's evidence of chemical approval.	Do not use unapproved chemicals. Return to supplier.	Approved supplier list.
2. Receive chemicals	Confirm that chemical clearly labelled and matches that ordered.	Visual inspection on arrival.	Do not use unapproved chemicals. Return to supplier.	Inwards goods docket.
3. Storage	Store in accordance with Manufacturer's instructions.	N/a	Correct problem. Retrain staff.	Back of Chemical Use Record.

Step	Control Measure	Monitoring	Corrective Action	Records
4. Use chemicals	**Use correct approved chemical for intended use, in accordance with manufacturer's instructions.**	**Record all chemicals used, date, what it was used for, quantity used and any dilutions.**	**Get expert advice if necessary.**	**Chemical Use Record.**
5. Unused chemical returned to storage				
6. Disposal of empty containers	**Dispose in accordance with manufacturer's instructions. Do not reuse containers for other things.**	**N/a**	**Correct problem. Retrain staff.**	**Back of Chemical Use Record.**

4.7.2.4 Operator verification

After each delivery of chemicals the Packhouse Manager shall check and sign the records. Any problems shall be noted on the relevant record with the details of the corrective action taken.

4.7.2.5 Records

An example of a suitable supplier declaration is given in Appendix E of this manual.

4.7.3 Product Contact Packaging

Labels **Egg collection trays** **Egg cartons** **Egg trays** **Shrink wrap**

4.7.3.1 Hazards or other risk factors

L1 = Incorrect Claims

4.7.3.2 Supplier Requirements

Regulatory Requirements
1. Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000, 30: The composition and, the conditions of use of packaging must — **(a) comply with the requirements specified in the current US Code of Federal Regulations, Title 21, Parts 170–199 (21 CFR 170–199), which applies equally to coatings and linings of containers and cartons where these are the direct product contact surface; or** **(b) comply with the requirements specified in the current "Australian Standard for Plastics Materials for Food Contact Use, Australian Standard AS2070–1999"; or** **(c) be determined by the operator to be suitable for use, based on an analysis of hazards and other risk factors from the packaging.**
2. If compliance with the above requirement is achieved through meeting subclause (1)(a) or (b), the risk management programme must state the full reference to the regulation, part, section or standard with which the packaging complies.
Supplier Requirements
3. No claims shall be printed on product contact packaging unless this has been specifically ordered.
4. Wording on any claims must be as specified in the order.
5. Product contact packaging shall not be recycled.

4.7.3.3 Procedures

The following control measures are the responsibility of the Packhouse Supervisor:

Step	Control Measure	Monitoring	Corrective Action	Records
1. Order packaging	**All printing on packaging to be specified in the order.**	**Check proof or example prior to placing order.**	**Do not use packaging with false claims. Return to supplier.**	**Purchase order**
	All packaging to conform to requirement 1 above.	**Check prior to order.**	**Do not use packaging which does not meet requirement. Return to supplier.**	**Purchase order**
2. Receive packaging	**Confirm that any claims match order.**	**Visual inspection on arrival.**	**Do not use packaging with false claims. Return to supplier.**	**Inwards goods docket.**
3. Storage	**Store in clean, dry area. Protect from contamination.**	**N/a**	**Correct problem. Retrain staff.**	
4. Use packaging	**Confirm that any claims match product.**	**Visual inspection before use.**	**Do not use incorrect packaging.**	

4.7.3.4 Operator verification

After each delivery of chemicals the Packhouse Manager shall check and sign the records. Any problems shall be noted on the relevant record with the details of the corrective action taken.

4.7.3.5 Records

An example of a suitable supplier declaration is given in Appendix E of this manual.

4.8 Analysis / Control of Hazards and Other Risk Factors From Other Sources

For theory refer to 2.8

For forms refer to appendix D section 8

4.8.1 Chemicals:

4.8.1.1 Scope

Chemicals used for cleaning, sanitation, fumigation, pest control, and lubricants; and any other chemicals used within the packhouse.

4.8.1.2 Requirements for the Operator

Regulatory Requirements
1. Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000, 21: Cleaning and fumigation chemicals to be labelled with the name or names of the approved maintenance compound as they appear in the list of approved maintenance compounds contained in NZFSA Manual 15 http://www.nzfsa.govt.nz/animalproducts/legislation/notices/m15-chem-schedule-all.pdf
Operator-defined Requirements
2. The access, handling and use of chemical compounds shall be under the supervision of trained personnel.
3. Chemical compounds shall only be used according to the directions of the manufacturer and subject to the conditions of the authorisation.

4.8.1.3 Process flow diagram

Inputs	Process steps	Outputs
Chemicals	1. Order chemicals	
	2. Receipt of chemicals	
	3. Storage	
	4. Use chemicals	
	5. Unused chemical returned to storage	
	6. Disposal of empty containers	Empty containers

4.8.1.4 Identify and Analyse Hazards and Other Risk Factors, and Determine CCPs

			Q1: Is hazard reasonably likely to contact product?	**Q2:** Could the level of hazard exceed the measurable requirement?	**Q3:** Is there one or more new or improved controls that will achieve the measurable requirement?	**Q4:** Are there any other controls?
Hazard or Risk Factor	**Current Control measures, e.g. GHP / GMP CCPs**	**Is there a relevant measurable requirement (See 4.8.1.2)?**	**If yes, go to Q2. If no, not a CCP. Go to next hazard or risk factor.**	**If yes, go to Q3. If no, not a CCP. Go to next hazard or risk factor.**	**If no, go to Q4. If yes set up CCP to meet measurable requirements and also go to Q4.**	**If yes, redesign / establish GMP/GHP to meet remaining requirements. If no, and no CCPs list as uncontrolled. Consider at process analysis.**
C2 Residues from chemicals used in shed cleaning, fumigation etc	None[16]	Yes – Appropriate use of approved chemicals	Yes	Yes	Yes **CCP 1**: Order chemicals. **CCP 2**: Use Chemicals	No.

4.8.1.5 Critical limit determination

Determine critical limits for each CCP (see table below).

CCP No.	CCP	Critical Limits
1	**Order chemicals**	**All chemicals are approved for their intended use as per NZFSA Manual 15 http://www.nzfsa.govt.nz/animalproducts/legislation/notices/m15-chem-schedule-all.pdf**
2	**Use chemicals**	**Use correct approved chemical for intended use, in accordance with manufacturer's instructions.**

4.8.1.6 Procedures

The following control measures are the responsibility of the Packhouse Supervisor:

Step	CCP or General Control	Critical Limit or General Criteria	Monitoring	Corrective Action	Records
1. Order chemicals	**CCP 1**	**All chemicals are approved for intended use as per Manual 15.**	**Check supplier's evidence of chemical approval.**	**Do not use unapproved chemicals. Return to supplier.**	**Approved supplier list.**
2. Receive chemicals	**GC**	**Confirm that chemical clearly labelled and matches that ordered.**	**Visual inspection on arrival.**	**Do not use unapproved chemicals. Return to supplier.**	**Inwards goods docket.**

[16] **If Henrietta had good control measures already in place, (e.g. Only purchasing approved chemicals, and using them in accordance with manufacturer's instructions) then the answers to the questions would be different and a CCP would not be identified.**

Step	CCP or General Control	Critical Limit or General Criteria	Monitoring	Corrective Action	Records
3. Storage	GC	Store in accordance with Manufacturer's instructions.	N/a	Correct problem. Retrain staff.	Back of Chemical Use Record.
4. Use chemicals	CCP 2	Use correct approved chemical for intended use, in accordance with manufacturer's instructions.	Record all chemicals used, date, what it was used for, quantity used and any dilutions.	Get expert advice if necessary.	Chemical Use Record.
5. Unused chemical returned to storage					
6. Disposal of empty containers	GC	Dispose in accordance with manufacturer's instructions. Do not reuse containers for other things.	N/a	Correct problem. Retrain staff.	Back of Chemical Use Record.

4.8.1.7 Operator verification

Once a month the Packhouse Manager shall check and sign the inwards goods dockets for chemicals received that month and the Chemical Use Record. Any problems shall be noted on the relevant record with the details of the corrective action taken.

4.8.1.8 Records

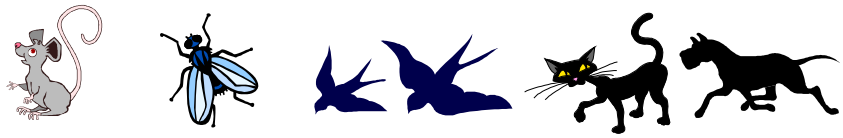
An example of a Chemical Use Record is given in Appendix E.

4.8.2 Pests

4.8.2.1 Scope

Includes pest control for all areas appropriate to the RMP, (including the production of animal product for animal consumption where relevant). It includes all relevant external and internal environs (stores, amenities and any other support areas).

Rodents **Insects** **Birds** **Cats/dogs** **Stoats / Ferrets**



4.8.2.2 Requirements for the Operator

Regulatory Requirements
1. Animal Products Regulations 2000, 11: Hygiene Of Processing Environment-- (1) All specified persons must establish and carry out effective procedures to-- (a) ensure appropriate and adequate maintenance, cleaning, and sanitation of processing premises, places, facilities, essential services, and equipment (including conveyances); and (b) manage waste; and (c) control pests.
2. Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000, 21: Approved maintenance compounds (pesticides) to be labelled with the name or names of the maintenance compound as so approved, or as they appear in the list of approved maintenance compounds contained in NZFSA Manual 15 http://www.nzfsa.govt.nz/animalproducts/legislation/notices/m15-chem-schedule-all.pdf.
Operator-defined Requirements
3. Pests must be excluded from the premises to the extent practicable.
4. Ongoing monitoring for infestation must occur. Where an infestation is detected it must be dealt with in a timely and effective manner.
5. Good hygienic practice must be used to avoid creating an environment conducive to pests.
6. Chemical, physical or biological measures used to minimise the access of pests to the product must not present a hazard. Where chemicals are used for this purpose, only approved chemicals as listed in NZFSA Manual 15 http://www.nzfsa.govt.nz/animalproducts/legislation/notices/m15-chem-schedule-all.pdf may be used where there is potential to contaminate the product. Directions and conditions for use must be followed.
7. Pest management system must be documented and records maintained.
8. All pesticides on a premises shall be listed in an inventory.
9. The access, handling and use of pesticides shall be under the supervision of trained personnel
10. Pesticides shall only be used according to the directions of the manufacturer and subject to the conditions of the authorisation
11. All practical steps shall be taken to ensure vermin cannot gain entry to packhouses.
12. There shall be a documented effective pest control system in place. Vermin includes any pests that may carry disease such as insects, rodents, wild birds and animals.

4.8.2.3 Process flow diagram

For chemical pesticides, refer to earlier example.

4.8.2.4 Identify and Analyse Hazards and Other Risk Factors

Sources of hazards	Hazards reasonably likely to occur with each source	Current Control measures	Is there a relevant measurable requirement?
Chemicals used for pest control	**C2: Unapproved chemical residues**	**Only purchase approved chemicals. Comply with conditions of approval and manufacturer's instructions for use.**	**Yes = See 4.8.1**
Flies, cockroaches and other insects	**B1: Salmonella and B2: Other enteric bacteria**	**External environs: Ground maintenance, e.g. foliage, grass Waste control Internal environs: Self closing doors Housekeeping programme Screens (windows/doors)**	**No**
Rats and mice	**B1: Salmonella and B2: Other enteric bacteria**	**External environs: Waste control Drain traps Bait stations (rodenticide) Internal environs Bait boxes Drain traps Housekeeping programme**	**No**
Birds	**B1: Salmonella and B2: Other enteric bacteria**	**External environs: Bird deterrents (noise makers, foliage removal) Waste management**	**No**
Cats, dogs, stoats and ferrets	**B1: Salmonella and B2: Other enteric bacteria**	**External environs: Fencing Traps Waste management**	**No**

4.8.2.5 CCP Determination

There are no CCPs for the non-measurable requirements.

The CCP determination for measurable requirements for pest control chemicals has already been covered in 4.8.1.5.

4.8.2.6 Determine Critical Limits

Not applicable as the only CCPs associated with chemical control has already been covered in 4.8.1.6.

For non-CCPs establish general criteria for control for current control measures.

Physical Controls

The following physical controls are used to prevent entry of pests into packhouses and associated buildings:

- **self closing doors,**
- **drain screens,**
- **insect screens,**
- **wild bird deterrents (e.g. scarecrows, use of nylon lines to prevent landing on roosting areas).**

These controls shall be kept in place year round, even when packhouses are empty.

All storage facilities shall be pest proof and waterproof.

Potable water storage facilities shall be pest proof. i.e. all tanks shall be enclosed with lids on.

Housekeeping / Maintenance

The area immediately surrounding the packhouse shall be kept free of trees, long grass, and any other rubbish or debris that may attract or provide cover for pests.

All animals (eg cats and dogs) shall be denied access to any part of packhouses or assocaited buildings.

Waste shall be enclosed in bins until removal.

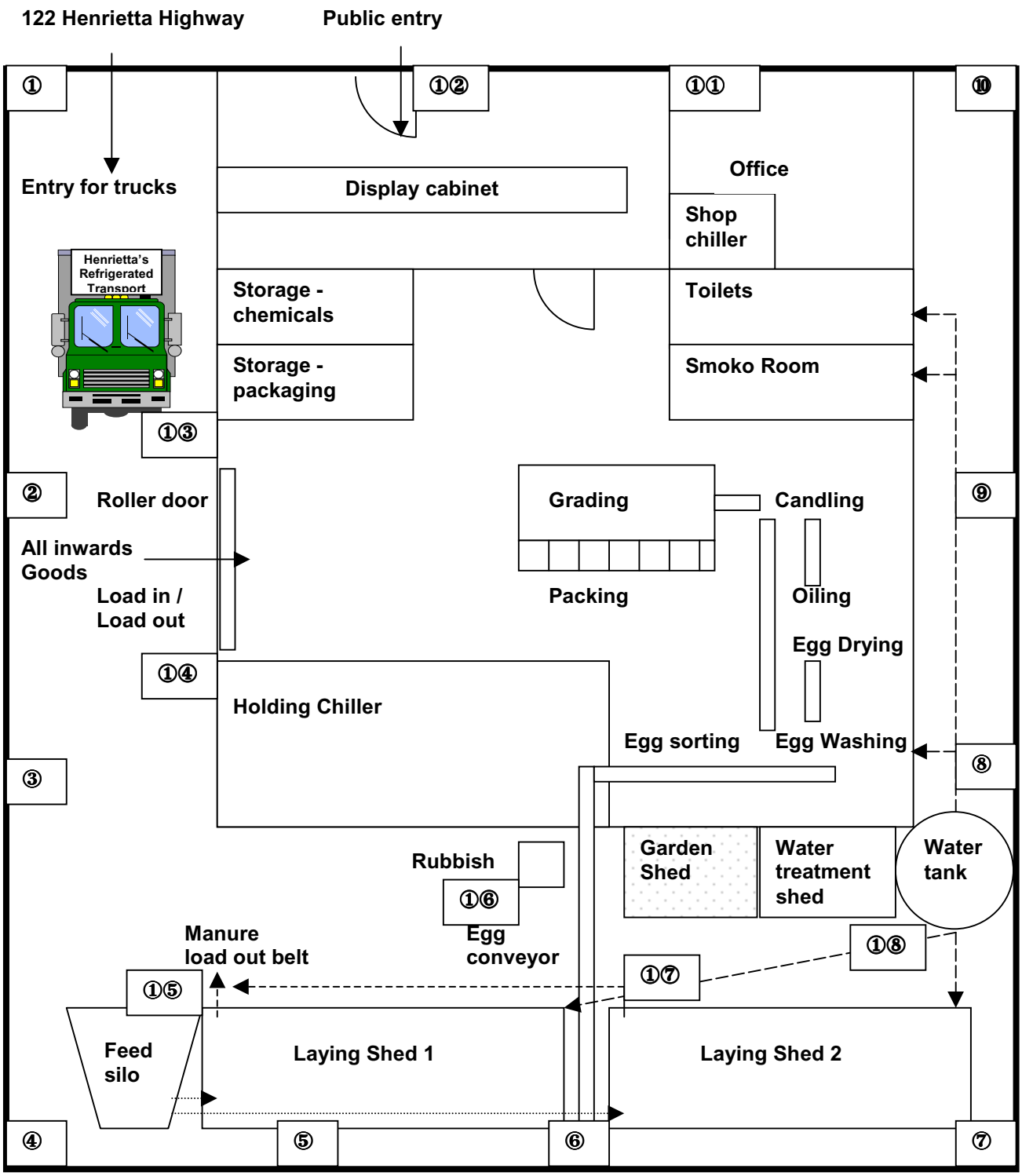
Any egg breakages shall be cleaned up as soon as they are noticed.

Pesticide System

Appropriate measures shall be taken to control pests around the packhouse. This includes:

- **Use of bait stations (they must be protected from access by hens). See site diagram showing their unique numbers and locations.**
- **Use of sticky fly-paper to capture insects.**
- **Use of insecticides – only when necessary.**
- **Use of a registered pest controller to regularly (weekly, fortnightly or monthly depending on performance) check the bait stations and take appropriate corrective action. Name of Pest Control Company = No Flies No Me Ltd. A copy of the company's Registration Certification is kept in the Approved Supplier File.**
- **Use of approved pest control chemicals as listed in NZFSA Manual 15 http://www.nzfsa.govt.nz/animalproducts/legislation/notices/m15-chem-schedule-all.pdf.**
- **Records shall show all pest control activities, dates, chemicals used, quantities, any evidence of pest activity and any corrective action taken.**

All items inside the dark line (which represents the land boundaries) are included in the risk management programme except the garden shed - see shaded building.



Monitoring

The Packhouse Supervisor shall do a weekly inspection of the internal and external environment to check on the effectiveness of the physical controls and the housekeeping / maintenance system. Pest Control Record 2 shall be filled out for each inspection.

The monitoring of the pesticide system shall be done by the Pest Controller. Pest Control Record 1 shall be filled out each time monitoring is done.

Corrective Action

When the monitoring finds problems with the controls appropriate corrective action shall be taken. This may include fixing the physical controls, increasing housekeeping frequencies, retraining staff, increasing inspection frequency, increasing pest control points, changing pest control chemicals etc.

4.8.2.7 Records

The Pest Control record forms mentioned above can be found in Appendix E of this Code Of Practice.

4.8.2.8 Operator verification

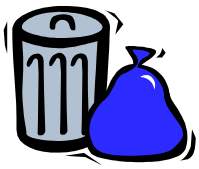
Once a month the Packhouse Manager shall check and sign the records for that month. Any problems shall be noted on the relevant record with the details of the corrective action taken.

4.8.3 Internal environs, facilities and equipment inside the packhouse

4.8.3.1 Scope

Includes the design, construction, maintenance, housekeeping and cleaning of the packhouse (premises and equipment) appropriate to the RMP:

- **storage areas,**
- **egg sorting, washing, drying, grading areas,**
- **packing areas and**
- **any other support areas.**

Tools / Equipment	Dirty surfaces (Floors, walls, ceilings, doors)	Trolleys/Trays Forklifts	Waste Rubbish
			

4.8.3.2 Requirements for the Operator

Regulatory Requirements
1. Animal Products Regulations 2000, 10: Requirements for premises, places, facilities, equipment, and essential services:—All specified persons must ensure that the premises, places, facilities, equipment, and essential services for which they are responsible in relation to the processing of animal material or animal product are-- **(a) designed, constructed, and located to enable suitability of the animal material to be maintained, and the fitness for intended purpose of the animal product to be achieved and maintained, having regard to--** **(i) the animal material or animal product to be processed; and** **(ii) the nature of the processes involved; and** **(iii) the range of the animal products to be produced; and** **(b) operated to minimise and manage the exposure of animal material or animal product or associated things to risk factors, having regard to--** **(i) the animal material or animal product to be processed; and** **(ii) the operational capability and capacity of the premises or place, facilities, equipment, and essential services; and** **(iii) the range of animal products to be produced.**
2. Animal Products Regulations 2000, 11: Hygiene Of Processing Environment-- **(1) All specified persons must establish and carry out effective procedures to--** **(a) ensure appropriate and adequate maintenance, cleaning, and sanitation of processing premises, places, facilities, essential services, and equipment** **(including conveyances); and** **(b) manage waste; and** **(c) control pests.**
3. Animal Products Regulations 2000, 16 Packaging requirements for animal material and product-- All risk management programme operators, operators of animal material depots, and other categories of person specified in specifications for the purposes of this regulation must ensure that any packaging materials (including reusable packaging and inner and outer packaging of any kind) used for animal material, animal product, and associated things are designed, made, stored, and used in a manner that-- **(a) maintains the status of the animal material as suitable for use in processing; and** **(b) maintains the status of the animal product as fit for its intended purpose; and** **(c) minimises contamination of the animal material or animal product.**

Regulatory Requirements
4. Animal Products (Specifications for Products Intended for human Consumption) Notice 2000, 5: Design and construction. **(1) Any material or exposed internal surface finish used in the building, manufacture, or maintenance of facilities, equipment, or internal structures, that may affect the suitability for processing of animal material (other than live mammals or live birds), or the fitness for intended purpose of animal product, must —** **(a) be impervious, non-absorbent, and free from depressions, pits, cracks, and crevices that may harbour contaminants; and** **(b) be easily cleaned and sanitised; and** **(c) be unaffected by any corrosive substance with which it is likely to come into contact, to the extent necessary to ensure that it will not harbour contaminants and is not a source of contamination; and** **(d) be durable, resistant to fracture, and capable of withstanding repeated exposure to normal cleaning and sanitising; and** **(e) in the case of surfaces (other than those used for walking or standing on during operations), be smooth and minimise the accumulation of condensation; and** **(f) in the case of materials lining the walls, floors, and ceilings, be of a colour that does not disguise contaminants having regard to the lighting arrangements.** **(2) The facilities, equipment, and internal structures, that may affect the suitability for processing of animal material or the fitness for intended purpose of animal product, must be of sanitary design.**
5. Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000, 6: Facilities and equipment etc **(2) Cleaning and sanitation facilities, and equipment, must be provided to ensure that the hygiene of personnel, equipment and premises or place can be maintained so that the suitability for processing of animal material and the fitness for intended purpose of the animal product is not adversely affected.**
6. Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000, 19: Management of animal material or animal product not for human consumption **(1) Equipment or storage areas used to store or contain animal material that is not suitable for processing or animal product that is not fit for human consumption, but is suitable or fit for some other purpose, must —** **(a) be clearly identified; and** **(b) not be a source of contamination to other animal material or animal product that is intended for human consumption.** **(2) Animal material or animal product that is not suitable for processing or not fit for human consumption but is suitable or fit for some other purpose, must be kept under controlled conditions until adequately identified in a manner that will ensure that it will not be mistakenly or fraudulently released as suitable for processing or fit for human consumption.**
7. Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000, 6: Temperature controlled rooms and equipment must be operated within their design capability and capacity, and must consistently deliver any temperature as required by this notice or as specified in the risk management programme (as the case may require).
8. Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000, 6: Cleaning and sanitation facilities, and equipment, must be provided to ensure that the hygiene of personnel, equipment and premises or place can be maintained so that the suitability for processing of animal material and the fitness for intended purpose of the animal product is not adversely affected.
9. Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000, 7: Lighting must be of a sufficient intensity and quality to enable satisfactory performance of all operations which might affect the suitability for processing of animal material or the fitness for intended purpose of animal product.
10. Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000, 21: All containers of approved maintenance compounds must be labelled with the name or names of the maintenance compound as so approved, or as they appear in the list of approved maintenance compounds contained in NZFSA Manual 15 http://www.nzfsa.govt.nz/animalproducts/legislation/notices/m15-chem-schedule-all.pdf may be used where there is potential to contaminate the product. Directions and conditions for use must be followed..

Regulatory Requirements
11. Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000, 20: Waste management **(1) For the purposes of this clause** waste **includes animal material and animal product which has been assessed by an examiner who meets the competency requirements of clause 25(1)(a), or an animal product officer, and has been adjudged unsuitable or unfit for any purpose, and is awaiting disposal.** **(2) Equipment, and storage areas, used to store or contain waste must —** **(a) be clearly identified; and** **(b) not be a source of contamination to other animal material or animal product.** **(3) Waste must be kept under controlled conditions until adequately identified in a manner that will ensure that it will not be mistakenly or fraudulently released as suitable for processing or fit for human consumption.** **(4) Waste must be disposed of by a method that ensures that it will not become a source of contamination to other animal material or animal product.**
Operator-defined Requirements
12. Visual assessment of the internal environment (walls, ceilings, floors, drains, entrances etc.) shall verify the effectiveness of the cleaning programme
13. All cleaning chemicals to be approved and to be used as per Approvals Manual /manufacturers requirements.
14. All maintenance compounds to be approved and to be used as per Approvals Manual /manufacturers requirements.
15. Maintenance activities and actions taken to correct sanitary defects shall be carried out so that contamination is minimal

4.8.3.3 Process flow diagram

For chemicals refer to 4.8.1.3.

4.8.3.4 Identify and Analyse Hazards and Other Risk Factors

Sources of hazards	Hazards reasonably likely to occur with each source	Current Control measures	Is there a relevant measurable requirement?
Introduction / spread of hazards from contaminated Tools, equipment, trolleys / trays, Forklifts	**B1: Salmonella species and B2: Enteric bacteria**	**Cleaning and sanitation of all tools, equipment, trolleys, trays and forklifts prior to bringing into packhouse from outside.**	**No**
Introduction / spread of hazards from dirty surfaces	**B1: Salmonella species and B2: Enteric bacteria**	**Regular cleaning and sanitation of all surfaces inside packhouse.**	**No[17]**
Introduction / spread of hazards from waste / rubbish	**B1: Salmonella species and B2: Enteric bacteria**	**Daily removal and disposal of reject eggs.**	**No**
Cleaning chemicals	**C2: Unapproved chemical residues**	**Only purchase approved chemicals. Comply with conditions of approval and manufacturer's instructions for use.**	**Yes = See 4.8.1**

[17] **Some operators may use hygiene swabs to test for microbiological indicator organisms or protein deposits as a check on the effectiveness of their cleaning. In this case they should add a new operator defined spec to the previous table and answer yes here.**

4.8.3.5 CCP determination

There are no CCPs for the non-measurable requirements. The only measurable requirements relate to chemical hazards that have already been addressed. See 4.8.1.5.

4.8.3.6 Critical limit determination

See 4.8.1.6 for chemicals.

Criteria for Packhouse Facilities

All egg grading, storage, and processing facilities, shall be constructed of appropriate materials that can be easily cleaned and sanitised.

Appropriate facilities, equipment and essential services must be provided to facilitate the hygienic performance of all operations, and minimise product contamination and deterioration.

Handwashing facilities shall be available. 'Wash your hands' signs should be displayed above sinks and sanitising stations.

All site and building entrances should be clearly marked to deter unauthorised entry.

Documented cleaning and sanitising programs shall be in place for egg packhouse facilities and equipment.

The sanitary design and layout of the premises, facilities and equipment (including conveyances) must be based on an assessment of the hazards likely to be associated with the product, and must:

- **use materials that are suitable for purpose**
- **allow adequate space to facilitate the hygienic performance of all operations that may affect the fitness for intended purpose of the product.**
- **minimise the entrance and harbourage or accumulation of contaminants or pests.**
- **facilitate people movement and access in a manner that minimises the potential for contamination of the product.**
- **utilise separation by distance and/or physical barriers, where appropriate, to ensure contamination of the product is minimised.**

Premises, facilities and equipment (including conveyances) must be maintained in an appropriate state of hygiene and repair to ensure that:

- **residues and deposits that may contaminate the product are minimised,**
- **cleaning and/or sanitation procedures can be performed effectively;**
- **facilities and equipment can function as intended;**
- **product does not become contaminated (e.g. from pests, metal shards, flaking plaster, and debris).**

Maintenance, cleaning and/or sanitation activities must not result in contamination of the product.

Waste management systems must ensure that all waste is handled consistent with good hygienic practise at all times, including when the premises is operating at full capacity.

Waste must not be allowed to accumulate where it has the potential to contaminate product.

Equipment/containers and storage areas used to store or contain waste must be identifiable.

Waste materials that are to be further processed (into another product) must be handled in a manner that will ensure that it remains fit for intended purpose.

4.8.3.7 Procedures

The following control measures are the responsibility of the Packhouse Supervisor:

Area	General Control	Monitoring	Corrective Action	Records
1. Packhouse design and construction	See Criteria on previous pages	Check that all new Packhouse conform to the criteria prior to eggs being received.	Fix shed to meet criteria.	Use Criteria on previous pages and tick off each one checked. Add cover sheet with date, pack-house name, signature of person doing check, etc)
2. Packhouse maintenance	Packhouse to be maintained to meet criteria under 1 above.	Monthly packhouse inspection.	Correct problem. Retrain staff.	Monthly packhouse inspection record.
3. Packhouse housekeep-ing and cleaning	Packhouse shall be cleaned and sanitised regularly so that any equipment that contacts the eggs is visibly clean.	Monthly packhouse inspection.	Correct problem. Retrain staff.	Monthly packhouse inspection record.
4. Equipment cleaning	Packhouse equipment shall be cleaned and sanitised regularly so that egg contact equipment is visibly clean.	Monthly packhouse inspection.	Correct problem. Retrain staff.	Monthly packhouse inspection record.
7. Tools / Equipment	Clean and sanitise all tools, equipment, trolleys, trays and forklifts prior to bringing into packhouse from outside.	Visual inspection before entry into packhouse.	Reclean.	Daily Packhouse Record
8. Waste disposal	Remove and dispose of reject eggs daily.	N/a	Retrain staff.	Daily Packhouse Record
	All rubbish and liquid waste shall be disposed of in an approved manner.	Monthly packhouse inspection	Correct problem. Retrain staff.	Monthly Packhouse Inspection Record

Cleaning Policy
• All new product contact equipment is to be designed for easy cleaning. • All new product contact equipment to be cleaned before use. • Tools and equipment used outside the packhouse are not to be used inside the packhouse unless they have been cleaned and sanitised first. • All waste and rubbish to be removed from packhouse and put in covered containers. •

Control System

There is a documented cleaning system for the packhouse, including:

- **Cleaning frequencies for all product contact equipment.**
- **Cleaning instructions for all product contact equipment:**

Dismantle (where necessary)

Remove waste

Rinse

Clean with hot water and approved detergent

Rinse

Reassemble

Sanitise with approved sanitiser

Final rinse (if required for that sanitiser).

- **Cleaning frequencies and instructions for other areas inside the packhouse are also on the walls (including store rooms, chillers, freezers, retail room, processing room, amenities, and any other rooms included in the RMP), e.g. floors, ceilings, walls, drains, etc.**
- **A summary of how cleaning equipment is maintained in a hygienic state:**
  - ➜ **Equipment to be made of non-porous materials, or replaced regularly.**
  - ➜ **Equipment to be cleaned and sanitised regularly. Cloths to be boiled, or soaked in a mixture of one teaspoon of chlorine bleach in a litre of water.**
  - ➜ **Cleaning equipment used in areas with known food safety hazards, e.g. toilets, are to be labelled and colour coded and not used to clean product contact surfaces.**

Other Controls

To minimise physical contamination from metal, check equipment is in good condition before use.

There are documented repairs and maintenance policies including:

- **All building alterations and equipment maintenance must be done so that any areas where product is exposed are protected from hazards introduced by this work. Once the work is completed the affected areas are to be cleaned effectively.**
- **All building alterations are to meet the requirements of the Animal Products Regulations and Specifications.**
- **The risk management programme will be updated or amended depending on the significance of the alterations.**

4.8.3.8 Records

Examples of the records can be found in Appendix E of this Code of Practice.

4.8.3.9 Operator verification

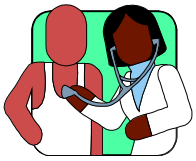
Once a month the Packhouse Manager shall check and sign the records for that month. Any problems shall be noted on the relevant record with the details of the corrective action taken.

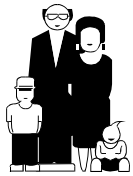
4.8.4 Personnel

4.8.4.1 Scope

Hygiene management for all people (managers, staff, visitors and contractors e.g. maintenance workers, cleaners etc) in all areas appropriate to the RMP. It includes external and internal environs (egg receipt, storage, sorting, washing, grading, packing areas, stores, amenities and any other support areas).

Manager **Staff** **Repairmen / Visitors** **Customers**



4.8.4.2 Requirements for the Operator

Regulatory Requirements
1. Animal Products Regulations 2000, 12: Hygiene of persons whose presence or actions may result in contamination of animal material or animal product-- **All risk management programme operators, persons who transport animal material or animal product from the place or premises of a primary processor, and other categories of person specified in specifications for the purposes of this regulation must ensure that persons, including visitors, whose presence or actions, at any premises or place where animal material or product is processed, may result in contamination of animal material or animal product--** **(a) wear appropriate protective clothing, where necessary; and** **(b) follow an appropriate personal hygiene routine; and** **(c) behave in such a manner as may be necessary or desirable to minimise contamination to animal material, animal product, and associated things.**
2. Animal Products Regulations 2000, 13: Persons infected by or carriers of disease or illness to be excluded from working areas or from handling animal material or product-- **All specified persons must ensure that persons, including visitors, who are known to be, or suspected of being, infected by or a carrier of a disease or illness of public health concern (including a notifiable infectious disease listed in section A of Part 1 of the First Schedule of the Health Act 1956) that is likely to be transmitted through animal material, animal product, or associated things are precluded from--** **(a) working in areas where animal material or animal product is processed, if that may result in contamination of animal product; or** **(b) handling animal material, animal product, or associated things that may result in contamination of animal product.**
3. Animal Products (Specifications for Products Intended For Human Consumption) Notice 2000: 23 Health: **(1). The operator must take reasonable measures to ensure that a person (including any visitor or contractor) who is —** **(a) infected with, or a carrier of, an infectious disease in a communicable form as described in Section A, Part 1, of the First Schedule of the Health Act 1956; or** **(b) suffering from acute respiratory infection; or** **(c) suffering from boils, sores, infected wounds, or any other condition that cannot be adequately protected from becoming a source of contamination — does not work as a product handler or enter an area where he or she may adversely affect the suitability for processing of animal material or the fitness for intended purpose of animal product.**

Regulatory Requirements
(2). A product handler, or any other person who may affect the suitability for processing of animal material or fitness for intended purpose of animal product, after suffering from an illness described in subclause (1)(a) or (b), must provide a certificate from a registered medical practitioner confirming that the person is no longer likely to contaminate the animal material or animal product, prior to resumption of work in that role. **(3). A product handler, or any other person who may affect the suitability for processing of animal material or fitness for intended purpose of animal product, who suffers from a condition described in subclause (1)(c) must, before resuming work, be assessed by a suitably skilled person, nominated by the operator to confirm that the condition is no longer likely to contaminate the animal material or animal product, or that the handler or other person is adequately protected from being a source of contamination.**
Operator-Defined Requirements
4. Minimise contamination of animal product by hazards originating from personnel, contractors, and visitors

4.8.4.3 Process flow diagram

N/a

4.8.4.4 Identify and Analyse Hazards and Other Risk Factors and determine CCPs.

There are no CCPs for the hazards with non-measurable requirements as shown in the table:

Sources of hazards	Hazards reasonably likely to occur with each source	Current Control measures	Is there a relevant measurable requirement?
People carrying pathogens in gut	B1: Salmonella species B2: Enteric bacteria	Handwashing and sanitising programme. Hygiene training. People with diarrhoea excluded from working in food contact areas for 24 hours after problem clears up.	No
People carrying pathogens up nose	B3: *Staphylococcus aureus*	Hygiene training Handwashing and sanitising programme	No
Contaminated clothing / footwear	B1: Salmonella species B2: Enteric bacteria B3: *Staphylococcus aureus*	Laundry procedures Protective clothing programme Boot wash facilities Foot baths	No
Person with exposed boils / sores	B3: *Staphylococcus aureus*	Use of impervious gloves or covers OR Keeping personnel that fit the criteria in specification 23 (1) away from product. Assessment as required by specification 23 (3).	No

There are no CCPs for hazards with non-measurable requirements shown in the above table.

The CCP determination for the measurable requirements is shown in the following table.

			Q1: Is hazard reasonably likely to contact product?	**Q2:** Could the level of hazard exceed the measurable requirement?	**Q3:** Is there one or more new or improved controls that will achieve the measurable requirement?	**Q4:** Are there any other controls?
Hazard or Risk Factor	**Current Control measures , e.g. GHP / GMP / CCPs**	**Is there a relevant measurable requirement (See 4.9.4.2)?**	**If yes, go to Q2. If no, not a CCP. Go to next hazard or risk factor.**	**If yes, go to Q3. If no, not a CCP. Go to next hazard or risk factor.**	**If no, go to Q4. If yes set up CCP to meet measurable requirements and also go to Q4.**	**If yes, redesign / establish GMP/ GHP to meet remaining requirements. If no, and no CCPs list as uncontrolled. Consider at process analysis.**
Food handler with infectious disease, e.g. B1: Salmonella B2: Enteric bacteria B3: *Staphylococcus aureus*	None[18]	Yes – medical certificate available to state freedom from infectious disease	Yes	Yes	Yes – **CCP3**	Keep personnel that fit the criteria in specification 23 (1) (a) or (b) away from product until medical clearance obtained.

4.8.4.5 Determine Critical Limits

Determine critical limits for each CCP (see table below).

CCP No.	CCP	Critical Limits
3	**Personnel who find out they have infectious disease to notify Manager. Get medical Certificate.**	**Infected personnel to be kept away from egg contact duties. Medical Certificate stating clearance to return to work to be viewed by Management prior to return to working in egg contact areas.**

Policy

Personnel shall be trained on:
- **personal hygiene as it relates to food handling,**
- **requirement to notify manager if they find out they have an infectious disease as described in 4.8.4.2.**

This training shall be documented.

Staff shall wear suitable clean outer protective clothing and footwear for tasks within the packhouse. Staff engaged in outside duties shall not engage in grading room duties unless footwear and outer clothing has been changed, and hands washed/ sanitised.

Staff engaged in egg processing duties shall wear suitable outer protective clothing and a hair cover, and shall remove all jewellery.

Outer protective clothing shall be laundered and sanitised to minimise contamination from soiled clothing. This usually means that laundering is done on a daily basis.

Staff shall not keep domestic poultry or other avian species at home.

[18] **If Henrietta had good control measures already in place, (e.g. Send ill staff to Doctor; obtain medical clearance before allowing return to work as food handler) then the answers to the questions would be different and a CCP would not be identified.**

Policy

Food and drink and their containers are not allowed inside the processing areas. Food and drink shall be consumed in a designated area away from such areas.

There shall be no smoking in any of the buildings. A designated smoking/rest area away from these sections is acceptable, provided there is adequate ventilation.

Personnel shall wash or sanitise their hands:
- **Upon entering any production or packaging areas**
- **After handling eggs or egg products**
- **Before handling food packaging**
- **After completing a messy function and/or handling waste.**
- **After visiting the toilet**

Any visitor to the premises must be under supervision and must adhere to the requirements of the areas visited.

4.8.4.6 Procedures

Hazard	General Control	Monitoring	Corrective Action	Records
People carrying pathogens in gut	All staff to wash hands prior to handling eggs.	Supervisor to check when in area.	Retrain staff. Warn repeat offenders.	Daily Packhouse Record.
	People with diarrhoea excluded from working with eggs for 24 hours after problem clears up.	N/a	Retrain staff.	Daily Packhouse Record.
People carrying pathogens up nose	All staff to wash hands prior to handling eggs.	Supervisor to check when in area.	Retrain staff. Warn repeat offenders.	Daily Packhouse Record.
Contaminated footwear	All people to use footbaths before entering barns. Sanitising footbaths to be changed daily or when soiled.	Supervisor to check when in area.	Retrain staff. Warn repeat offenders.	Daily Packhouse Record.
B3: Contaminated clothing	Clean protective clothing to be worn when handling eggs.	Supervisor to check when in area.	Retrain staff. Warn repeat offenders.	Daily Packhouse Record.
B3: Food handler carrying infectious disease	Medical Certificate stating clearance to return to work to be viewed by Manager prior to return to working in egg contact areas.	Manager to check.	Staff to work in other area or be sent home. Retrain staff. Warn repeat offenders.	Daily Packhouse Record.
B3: Person with exposed boils / sores	Cover with of impervious gloves or covers.	Supervisor to check covering.	Retrain staff. Warn repeat offenders.	Daily Packhouse Record.

4.8.4.7 Records

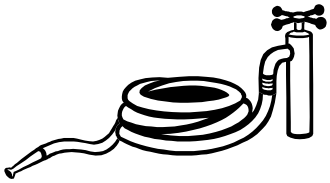
The record forms can be found in Appendix E of this Code Of Practice.

4.8.4.8 Operator verification

Once a month the Packhouse Manager shall check and sign the records for that month. Any problems shall be noted on the relevant record with the details of the corrective action taken.

4.8.5 Identification and Control of Risk Factors From Other Sources – Water

Town Supply | Bore / Well Water | River Water | Roof Water | Ponds





For theory refer to 2.7.6

For forms refer to appendix D section 7

Water Supplier:	**Henrietta's Egg Company Ltd**
Water source:	**Surface water (stream)**
Water potability option:	**Schedule 1. Refer to 4.8.4.1 for details.**
Water Management Plan	**Refer to 4.8.4.2 for details.**
Water Reticulation Plan	**Refer to 4.8.4.3 for details.**
Records	**Approved Supplier file in Manager's office has a completed "Assessment of Water Supply Status Checklist" from Schedule 1.**

Table 1: Quality of Potable Water

Measurement	Criteria
faecal coliforms	**must not be detectable in any 100 ml sample**
Chlorine (when chlorinated)	**not less than 0.2mg/l (ppm) free available chlorine with a minimum of 20 minutes contact time**
pH (when chlorinated)	**6.5 to 8**
Turbidity	**Should not routinely exceed 1 NTU, must not exceed 5 NTU**

4.8.5.1 Checklist: Assessment of Water Supply Status

Part 1: SUPPLIER DETAILS		
Name of Operator: **Henrietta's Egg Company Ltd**	**Type of Operation:** Egg Laying Farm	**Premises Address:** 29 Henry St, Henryville
Postal Address: **PO Box 111** **Henryville**	**Phone Number:** **Fax Number:** **Email Address:**	**(01) 01010101** **(01) 01010100** **Henrietta@eggs.co.nz**

Part 2: WATER SOURCE

Water Source – Indicate all sources intended to be used.

Secure groundwater (not under the influence of surface water) – Go to Part 3 ☐

Surface water (e.g. spring, well, river, stream, dam, lake, reservoir) – Go to Part 4 ☐

Roof water – Go to Part 5 ☐

Part 4: SURFACE WATER
(e.g. Spring, Shallow Well, Dam, Lake, Reservoir, Stream)

1. Management

(i) Describe the water source e.g. spring, well, stream, river, dam, reservoir etc. including name where appropriate.

Stream

(ii) Describe the soil type in the area of the water source e.g. coarse shingle, fine silt, clay etc.

Coarse shingle

	Yes	**No**
(iii) Has a microbiological test been done on this source within the last month?	❑	❑
(iv) Does the water satisfy the criteria in Table 1: Quality of Potable Water (See table on page 3-19, except for criteria relating to chlorine and pH)?	❑	❑?

Name the laboratory which did the test: _____

2. Criteria

(i) Are any of the following within 50 metres of the water source?

	Yes	No		Yes	No
Offal pit / soak hole	❑	❑	**Septic tank / long-drop toilet**	❑	❑
Animal effluent	❑	❑	**Stock yards**	❑	❑
Sumps	❑	❑	**Land disposal site/refuse pit**	❑	❑
Feed pad	❑	❑	**Silage stack**	❑	❑
Fuel tanks	❑	❑	**Chemical preparation/storage**	❑	❑
Timber treatment facility	❑	❑	**Pesticide residues**	❑	❑

(ii) Are there any known water quality problems (e.g. bacterial contamination, turbidity, corrosiveness, sediment, colour, smell, taste)?

(If Yes, specify)
*No*_____

(iii) Do any of the following factors present risks to the quality of the water?

	Yes	No
Spray drift	❑	❑
Nearby factories	❑	❑
Mining operations	❑	❑

(If Yes, specify what activity and how far away)

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3. Intake and storage

	Yes	No
(i) Is any visible matter drawn up in the intake from the water source?	❑	❑
(ii) Are holding tanks used?	❑	❑
(iii) If Yes, are these tanks capable of holding more than or less than 1 days supply of water? (please circle answer)	More	Less
(iv) Is the outlet of the holding tank above or level with the base of the tank? (please circle answer)	Above	Level

4. Additional criteria for flowing water only i.e. rivers, streams, springs etc.	Yes	No
(i) Is there a plan for when the river/stream etc. floods?	❑	❑
(ii) Is effluent discharged less than 2 km upstream of the water intake? If Yes, state source: _____	❑	❑
(iii) If Yes, is effluent discharged less than 4 hours before water is taken from the source?	❑	❑
(iv) Do farmed animals have access to within 10m of the water intake?	❑	❑
(v) Is industrial or urban stormwater discharged to the source water upstream of the intake?	❑	❑

5. Additional criteria for enclosed surface waters only i.e. dams, lakes, reservoirs etc.	Yes	No
(i) Is the water accessible to farmed animals?	❑	❑
(ii) Is effluent discharged into the dam/lake/reservoir?	❑	❑
(iii) Is industrial or urban stormwater discharged into the dam/lake/reservoir?	❑	❑

6 Analysis

- **If the answers to the questions in section 1 are YES and to all questions in sections 2, 3, 4 & 5 are NO, then the water may be considered satisfactory.**
  Section 2 had a YES answer – Silage stack within 50 m.
- **If the answer to any question in section 1 is NO, then a microbiological test must be obtained and, where necessary, a corrective action plan must be designed and included in the water management plan to ensure the water meets the criteria in Table 1: Quality of Potable Water.**
- **If the answer to any question in section 2 is YES, then appropriate action must be taken to ensure potential hazards to human health are identified and, where necessary, a corrective action plan is designed and included in the water management plan to ensure the hazard(s) of concern is/are minimised.**
  Section 2 had a YES answer – Silage stack within 50 m. Silage stack has now been moved further away.
- **In relation to section 3, if visible debris is drawn up in the water intake at any time and if the holding tank capacity is such that water could settle for at least 24 hours before use and the water outlet from the tank is above the base of the tank so that debris can settle, then the facility may be considered satisfactory. If the facility is not considered satisfactory then a corrective action plan must be designed and included in the water management plan.**
- **If the answer to any question in sections 4 or 5 is YES, then appropriate action must be taken to ensure potential hazards to human health are identified and, where necessary, a corrective action plan is designed and included in the water management plan to ensure the hazard(s) of concern is/are minimised.**

4.8.5.2 Water Management Plan:

Why was your water unsatisfactory? (Get this from your earlier answers)	***Stream water = unsecured source.*** ***Silage stack too close.***
Is there a biological, chemical or physical hazard associated with this problem? If so what? (See next table for ideas).	***Yes - Could have harmful bacteria from silage contaminated by rodents and birds.*** ***Yes – could have residues from herbicides used to control gorse on property.***

	Hazards[19]	**Examples**
Biological hazards	**Harmful bacteria from the gut of humans, animals and birds.**	***E.coli*** ***Salmonella* species**
	Parasites	***Giardia*** ***Cryptosporidium***
Chemical hazards	**Chemical residues**	**Pesticides, herbicides, fumigants**
	Heavy Metals	**Mercury, cadmium, copper, lead, zinc, selenium, arsenic, chromium. manganese, antimony**
Physical hazards	**N/a**	**N/a**

What will you do to correct or control this problem/hazard? Consider removing the problem where possible or treatment e.g. chlorination, filtration. **You may need to ask for expert advice on this.**	***Have moved the silage stack.***

[19] **These hazards are summarised from those identified in MAF's generic model for potable water, May 1997.**

What water testing will you do? How often? What criteria must it meet?	***See table below***

Measurement	Criteria	Test frequency Secure water	Unsecure Water <2000 m^3/day	2000-10,000 m^3/day	>10,000 m^3/day
faecal coliforms	**Must not be detectable in any 100 ml sample**	**Nil**	**1 test every month**	**1 test every 2 weeks**	**1 test every week**
Chlorine (when chlorinated)	**Not less than 0.2mg/l (ppm) free available chlorine with a minimum of 20 minutes contact time**	**Nil**	**1 test every month**	**1 test every 2 weeks**	**1 test every week**
pH (when chlorinated)	**6.5 to 8**	**Nil**	**1 test per month**	**1 test per 2 weeks**	**1 test per week**
Turbidity	**Should not routinely exceed 1 NTU, must not exceed 5 NTU**	**Nil**	**daily**	**daily**	**daily**

What will you do if any of these criteria are not met? Consider extra treatment, further testing, alternative supply etc. You may need to ask an expert for help.	***Coli – further treatment – set up chlorination system. Chlorine and pH (if chlorinated due to coli problem) – increase testing frequency so problems detected earlier. Turbidity – ask for expert help.***
What lab does the micro tests?	***Lab X*** ***Secret St*** ***Henryville***
Are they MILAB accredited[20]? If so ask for letter confirming this. If not, find another lab which is.	***Yes***
Who are the water samplers and were they trained by the lab to take samples properly?	***Henrietta and Henry Eggnott*** ***Yes***

[20] MILAB is a laboratory accreditation programme run by NZFSA. See NZFSA web site: www.nzfsa.govt.nz/animalproducts/milab/index.htm or contact Programme Manager, Monitoring and Review for details (04, 4632500).

Who does the pH, chlorine and turbidity tests? Have they been trained?	**pH:** ***Henrietta and Henry Eggnott (both trained)*** **Chlorine:** ***Henrietta and Henry Eggnott (both trained)*** **Turbidity:** ***Henrietta and Henry Eggnott (both trained)***
What equipment/ test kit/ method is used for these tests? How is any equipment calibrated to make sure it is accurate (Refer to the manufacturer's instructions or supplier for details).	**pH:** ***pH meter calibrated and used in accordance with manufacturer's instructions.*** **Chlorine:** ***Lovibond comparator test used in accordance with manufacturer's instructions.*** **Turbidity:** ***Nephilometer, Method SMWW 2130A***
What test records do you have: for pH, chlorine and turbidity tests?	**Micro:** ***Lab report*** **pH:** ***See Record 3*** **Chlorine:** ***See Record 3*** **Turbidity:** ***See Record 3***

Note: If water is supplied by the operator, and the operator fails to comply with any of the requirements of the water management plan (shown on last 3 pages), and has no other means described in the risk management programme to ensure the water meets the original standard at the point of use, all operations involving that water must cease.

4.8.5.3 Water Reticulation Plan

Do you have a plan of the water pipes and tanks on your premises?	***Yes – refer to plan on wall of packhouse manager's office.***
Do you have more than one standard of water on your premises, e.g. potable water, and non-potable water – perhaps for fire fighting?	***No***
Do you have dead ends in your potable water pipes where water can stagnate?	***No***
Are your pipes in good condition, i.e. not rusting, not damaged?	***Yes***
If any of the above change what will you do?	***One or more of the following as appropriate:*** • **Increase water testing,** • **Replace pipes, or otherwise fix the problem,** • **Treat water before point of use.**

Note: These questions have been asked to ensure that the quality of the water coming in is maintained. Further identification and analysis of hazards and other risk factors is not required.

4.9 Analysis / Control of Hazards and Other Risk Factors From the Process

4.9.1 Analyse hazards and other risk factors at each process step

For theory refer to 2.9, and Appendix C: Technical Annex.

For forms refer to appendix D section 9

Refer back to 4.6 to get the process steps and their associated inputs. Enter these into the first two columns in the following table.
Then refer to 4.7 for the hazards and risk factors related to each input. Enter these into the third column in the following table.
When answering questions 1-3 consider the "unacceptable level" as that defined in the product outcomes set in 4.5.

				Q1. Could the risk factor be present in or on the eggs at unacceptable levels at this step?	Q2. Is there a control measure at this step that would prevent unacceptable levels of the risk factor or reduce it to acceptable levels?	Q3. Is there a control measure available at a previous step?	Q4: **Are there any other non-measurable controls?**
Process step	**Input Name**	**Hazard or other risk factor associated with input**	**Hazards and other risk factors from process step, and potential impact of process step on existing hazards and other risk factors**	**Justify answer.** **If no not a CCP. Go to Q4.** **If yes, go to Q2.**	**If no go to Q3.** **If yes, this step is a CCP. Go to Q4.**	**If yes, assign the previous step as a CCP. Go to Q4.** **If no, not a CCP, go to Q4.**	**If no, and no CCPs list as uncontrolled.** **If yes, redesign / establish** general controls **to meet outcomes.**
5. Storage and transfer to grading	Eggs	B1, B2, B3, B4, C1, C2, W1-W9, L1, L2		No – Already controlled. See 4.8.1.			Yes storage at 15°C minimises growth.
	Foklift / Cart/ Truck or conveyor	B1: Salmon-ella species B2: Enteric bacteria		No – already controlled. See 3.9.3.			No
	Trolleys / Labels	B1: Salmon-ella species B2: Enteric bacteria		No – already controlled. See 3.9.3.			No

				Q1. Could the risk factor be present in or on the eggs at unacceptable levels at this step?	Q2. Is there a control measure at this step that would prevent unacceptable levels of the risk factor or reduce it to acceptable levels?	Q3. Is there a control measure available at a previous step?	Q4: **Are there any other non-measurable controls?**
Process step	**Input Name**	**Hazard or other risk factor associated with input**	**Hazards and other risk factors from process step, and potential impact of process step on existing hazards and other risk factors**	**Justify answer.** **If no not a CCP. Go to Q4.** **If yes, go to Q2.**	**If no go to Q3.** **If yes, this step is a CCP. Go to Q4.**	**If yes, assign the previous step as a CCP. Go to Q4.** **If no, not a CCP, go to Q4.**	**If no, and no CCPs list as uncontrolled.** **If yes, redesign / establish** general controls **to meet outcomes.**
6. Sorting		B1: Salmon-ella species B2: Enteric bacteria W5: Rotten eggs W6: Pink egg whites		Yes	Yes – **CCP 4** = Removal of soiled and cracked eggs reduces the amount of contaminated eggs.		No
		L1: Incorrect claims	If eggs from different sheds get mixed up then claims may be incorrect.	Yes	Yes – **CCPL1** – [21]= Process only one shed at a time OR process only one type of egg at the packhouse.		
7a. Washing	Chemicals in rinse water.	C3: Residues from chemicals used in egg washing.		No – already controlled – See 4.8.2.			No
			B1: Salmonella species and B2: Enteric bacteria on outside of shell can get into shell is washing damages it.	Yes	Yes – **CCP 5**= Proper egg washing procedures as per ICMSF guidelines.		No

[21] **The numbering of CCPs for "other risk factors" has been coded by adding an "L" or "W" after "CCP". i.e. Labelling = CCPL, and Wholesomeness = CCPW.**

				Q1. Could the risk factor be present in or on the eggs at unacceptable levels at this step?	Q2. Is there a control measure at this step that would prevent unacceptable levels of the risk factor or reduce it to acceptable levels?	Q3. Is there a control measure available at a previous step?	Q4: **Are there any other non-measurable controls?**
Process step	**Input Name**	**Hazard or other risk factor associated with input**	**Hazards and other risk factors from process step, and potential impact of process step on existing hazards and other risk factors**	**Justify answer.** **If no not a CCP. Go to Q4.** **If yes, go to Q2.**	**If no go to Q3.** **If yes, this step is a CCP. Go to Q4.**	**If yes, assign the previous step as a CCP. Go to Q4.** **If no, not a CCP, go to Q4.**	**If no, and no CCPs list as uncontrolled.** **If yes, redesign / establish** general controls **to meet outcomes.**
7b. Drying							
7c. Oiling	Food grade oil	C3: Residues from chemicals used in egg oiling.		No – already controlled – See 4.8.2.			No
8. Candling			B1: Salmonella species and B2: Enteric bacteria on outside of shell can be reduced by removal of defective eggs.	Yes – previous controls are not a guarantee of removal	Yes – **CCP6** - Candling can allow detection and removal of minor cracks, pin holes etc that will reduce number of contaminated eggs.		No
			W1: Blood or meat spots W3: Roundworms	Yes – not detectable prior to this.	Yes – **CCPW1** – candling can allow detection and removal of these eggs.		No
9. Grading/ Weighing			Egg breakage can redistribute any pathogens to other eggs.	Yes	No.		Yes, immediate clean up of broken eggs to minimise cross contamination.

				Q1. Could the risk factor be present in or on the eggs at unacceptable levels at this step?	Q2. Is there a control measure at this step that would prevent unacceptable levels of the risk factor or reduce it to acceptable levels?	Q3. Is there a control measure available at a previous step?	Q4: **Are there any other non-measurable controls?**
Process step	**Input Name**	**Hazard or other risk factor associated with input**	**Hazards and other risk factors from process step, and potential impact of process step on existing hazards and other risk factors**	**Justify answer.** **If no not a CCP. Go to Q4.** **If yes, go to Q2.**	**If no go to Q3.** **If yes, this step is a CCP. Go to Q4.**	**If yes, assign the previous step as a CCP. Go to Q4.** **If no, not a CCP, go to Q4.**	**If no, and no CCPs list as uncontrolled.** **If yes, redesign / establish** general controls **to meet outcomes.**
10. Packing	Packaging	L1: Incorrect claims		Yes	Yes – **CCPL2** – check that claims on packaging matches product at each shed changeover.		
		L2: Incorrect dates		Yes	Yes – **CCPL3** – check that dates on packaging matches product at each shed changeover.		
11. Egg Storage / Loadout			B1, B2, W5, W6				Yes, storage at or below 15°C minimises bacterial growth and steady temperature minimises mould formation.

4.9.2 Determine Critical Limits

Determine critical limits for each CCP (see table below). The table summarises monitoring and corrective action of CCPs and other general controls. Not all CCPs identified in this Code Of Practice will be applicable to all operations. Some operations may have additional CCPs.

CCP or General Control	Process Step	Hazard ID	Critical Limit or Process Criteria	Monitoring	Corrective Action (Includes retraining staff as necessary)	Records
General Control	5. Storage / Transfer to grading	B1, B2, W5, W6	Store cracked eggs at or below 6°C. Store other eggs at or below 15°C.	Daily check	Get engineer to check refrigeration.	Daily Packhouse Record
CCP 4	6. Sorting	B1, B2, W5, W6	All eggs with total soiling greater than a defined surface area[22] to be washed. All visually cracked eggs removed from A Grade Shell Eggs.	Continuous.	Re-sort eggs. Send soiled eggs for washing or further processing or animal consumption as appropriate. Send cracked eggs for further processing or animal consumption as appropriate.	Daily Packhouse Record
CCP L1		L1	Process only one shed at a time OR process only one type of egg at the packhouse.	Check at change over.	Re-sort eggs.	Daily Packhouse Record
CCP 5	7. Egg [23]Washing	B1 and B2	As per ICMSF guidelines. See page C-51 of Appendix C: Technical Annex.	Record chemicals and volumes used.	Review procedures. Dump affected eggs.	Chemical Use Record
CCP 6	8. Candling	B1 and B2	Removal of all visible cracks and pin holes.	Daily check of a sample of candled eggs.	Recandle eggs since last check.	Daily Packhouse Record
CCP W1		W1, W3	Removal of all eggs with blood or meat spots and roundworms.	Daily check of a sample of candled eggs.	Recandle eggs since last check. Notify layer farm.	Daily Packhouse Record

[22] To be set by egg producer. To define the surface area use an actual size e.g. 1 square cm, or refer to something of known size, e.g. 5 or 10 cent coin (as appropriate).
[23] Some egg producers may choose to reject very dirty eggs rather than to wash them. This would also be a CCP.

CCP or General Control	Process Step	Hazard ID	Critical Limit or Process Criteria	Monitoring	Corrective Action (Includes retraining staff as necessary)	Records
General Control	9. Grading	B1, B2	Immediate clean up of broken eggs to minimise cross contamination.	Check every hour.	Check equipment set up.	Daily Packhouse Record
CCP L2	10. Packing	L1	All claims on packaging matches product at each shed changeover.	Daily check.	Re-sort eggs or use packaging with no claims.	Daily Packhouse Record
CCP L3		L2	All dates on packaging matches product at each shed changeover.	Daily check.	Redate the packs.	Daily Packhouse Record
General Control	11. Egg storage and loadout	B1, B2, W5, W6	Store eggs at or below 15°C.	Daily check	Get engineer to check refrigeration.	Daily Packhouse Record

Note:

It is a good idea to review the product outcomes to ensure that they are still relevant after the analysis has been completed.

Each product outcome and CCP must be validated to show that it can be achieved on an ongoing basis. This will require the collection and analysis of relevant data, e.g. production and control records. For more information on validation refer to 2.16.1 and 4.16.

General Controls – Step 5 = Storage and Transfer to Grading

There shall be clear, physical, and labelled segregation of eggs from each shed or flock at all times, to enable traceability on a per flock or shed basis. All containers of eggs shall be clearly identified with the name of egg producer, flock (ie shed), and date of lay.

Eggs produced from caged hens shall be kept clearly separate from eggs produced by hens from free range and barn systems at all times.

Eggs shall be transported to the grading room, or stored in cool rooms operated at or below 6°C (cracked eggs) or 15°C (other eggs), within 2 hours of collection. Cool-room temperature checks shall be made twice daily.

Eggs stored in cool-rooms on the farm shall be taken to an off-farm grading facility after a maximum of 4 days, and subsequently graded. Date of collection shall be recorded.

Eggs shall be transported in clean enclosed vehicles and maintained below 15°C when transported to any off-farm grading or processing facility.

A cleaning program shall be in place for all vehicles, trolleys, trays, belts, conveyors etc used to transport eggs to the grading room.

General Controls – Step 6 = Sorting

Dirty, cracked, or broken eggs where detected shall be removed from the collection system prior to grading. In automated systems where eggs are directly conveyed to the grader, a pre-candling station may be required to remove dirty, cracked, or broken eggs.

General Controls – Step 7 = Washing / Drying / Oiling (Optional)

Appropriate egg washing / drying and oiling procedures in accordance with the ICMSF recommendations given on page C-51 of Appendix C: Technical Annex shall be documented.

Dirty eggs may be cleaned by dry buffing provided the egg shell cuticle is not damaged.

Manual wet cleaning or wiping of eggs is not permissible.

General Controls – Step 8 = Candling

(1) Eggs that are intended to be traded in the shell must —
- **(a) be visibly clean; and**
- **(b) have no cracks that are visible on candling (or equivalent) unless they have been treated by a process that destroys pathogenic organisms; and**
- **(c) have no evidence of embryo development, or putrefaction, and no significant blood clots; and**
- **(d) not have been incubated; and**
- **(e) be handled and stored under conditions that minimise condensation on the surface of the eggs.**

(2) Any primary processing of eggs intended to be traded in the shell that compromises the integrity of the shell, must be minimised.

General Controls – Step 9 = Grading / Weighing

Minimum egg weights shall be in accordance with the next table.

Calibration and measuring equipment suitability

(1) Measuring equipment, such as scales, thermometers, pH meters, and flow meters (whether stand alone or forming part of a piece of equipment), that is used to provide critical measurements, must —

- **(a) have the accuracy, precision, and conditions of use appropriate to the task performed; and**
- **(b) be calibrated against a reference standard showing traceability of calibration to a national or international standard of measurement (where available), or (if no such standard exists) be calibrated on a basis that is documented in, or incorporated by reference into, the risk management programme; and**
- **(c) be uniquely identified to enable traceability of the calibrations and to identify calibration status.**

(2) Minimum frequencies of calibration must be specified in the risk management programme for each piece of measuring equipment used to provide critical measurements, or used as reference standards, taking into consideration the following (as appropriate) —

- **(a) the stability of the piece of equipment; and**
- **(b) the nature of the measurement; and**
- **(c) the manufacturer's instructions.**

(3) Safeguards must be in place to prevent unauthorised adjustments to the calibration of the measuring equipment, including movement of the equipment where this may invalidate the calibration.

Minimum egg weights shall be:

	Jumbo	Large 7	Standard 6	Mixed Grade	Medium 5	Pullet 4
g/egg	68	62	53		44	35
g/doz	816	744	636	582	528	420

General Controls – Step 10 = Packing

All packaging for saleable eggs shall be clean, intact, and preferably unused.

Packaging materials must;

- **adequately protect the product;**
- **be free from substances that may contaminate the product;**
- **be protected during handling, transport, storage and use; and**
- **be adequately cleaned and sanitised between use if reused.**

All eggs and associated packaging shall be kept from direct contact with the floor at all times (eg stack the cartons on pallets). This enables stock rotation, easy cleaning of the store, and reduces damage, soiling, and deterioration of product packaging.

Labelling must comply with the New Zealand Food Regulations 1984, the Australian Food Standards Code 1992 or other relevant legislation applicable to the product.

Product must be truthfully labelled.

General Controls – Step 10 = Packing

Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000, 30: Packaging

(1) The composition and where appropriate, the conditions of use of packaging must —

(a) comply with the requirements specified in the current US Code of Federal Regulations, Title 21, Parts 170–199 (21 CFR 170–199), which applies equally to coatings and linings of containers and cartons where these are the direct product contact surface; or

(b) comply with the requirements specified in the current "Australian Standard for Plastics Materials for Food Contact Use, Australian Standard AS2070–1999"; or

(c) be determined by the operator to be suitable for use, based on an analysis of hazards and other risk factors from the packaging.

(2) If compliance with this specification is achieved through meeting the requirements of subclause (1)(a) or (b), the risk management programme must state the full reference to the regulation, part, section or standard with which the packaging complies.

A 'best before' date of 35 days maximum shall be fixed to the packaging, including trays, at grading. The 'best before' date is from the date of lay.

All dates and batch codes shall be clear and legible. No forward packing/dating is allowed. A strict stock rotation regime shall be exercised at all times.

Batch codes shall be affixed to packaging, including trays, at grading for traceability and/or recall purposes. Ideally, the batch code will enable eggs to be traced back to a specific flock or shed on a given day. This may be achieved simply by keeping eggs from each flock or shed separate at grading, and printing the producer and/or flock identification number with the 'best before' date (eg 02/03/98-KJ7)

General Controls – Step 11 = Egg Storage / Loadout

Animal Products Regulations 2000, 14: Required measuring equipment to be calibrated and function as intended--

(1) All specified persons must ensure that measuring equipment that is used to carry out a critical measurement is properly calibrated and functions as intended.

(2) In this regulation, "critical measurement" means a parameter identified as critical in any--

(a) specifications or regulated control scheme; or

(b) risk management programme, being a parameter of the nature of the parameters referred to in section 17(3)(c) of the Act in relation to points at which hazards of significance occur.

This means that temperature monitoring equipment is to be calibrated.

Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000, 28: Calibration and measuring equipment suitability

(1) Measuring equipment, such as scales, thermometers, pH meters, and flow meters (whether stand alone or forming part of a piece of equipment), that is used to provide critical measurements, must —

(a) have the accuracy, precision, and conditions of use appropriate to the task performed; and

(b) be calibrated against a reference standard showing traceability of calibration to a national or international standard of measurement (where available), or (if no such standard exists) be calibrated on a basis that is documented in, or incorporated by reference into, the risk management programme; and

(c) be uniquely identified to enable traceability of the calibrations and to identify calibration status.

General Controls – Step 11 = Egg Storage / Loadout

(2) Minimum frequencies of calibration must be specified in the risk management programme for each piece of measuring equipment used to provide critical measurements, or used as reference standards, taking into consideration the following (as appropriate) —
- **(a) the stability of the piece of equipment; and**
- **(b) the nature of the measurement; and**
- **(c) the manufacturer's instructions.**

(3) Safeguards must be in place to prevent unauthorised adjustments to the calibration of the measuring equipment, including movement of the equipment where this may invalidate the calibration.

Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000, 6: Facilities and equipment etc
(1) Temperature controlled rooms and equipment must be operated within their design capability and capacity, and must consistently deliver any temperature as required by this notice or as specified in the risk management programme (as the case may require).

Following grading, eggs shall be stored in clean, vermin proof cool rooms operated below 15°C until distribution. Twice daily cool room temperature checks shall be documented.

(1) Labelling must be provided on transportation outers and must state —
- **(a) the animal material or animal product name or description; and**
- **(b) storage directions, where necessary to maintain the animal material as suitable for processing or animal product as fit for intended purpose; and**
- **(c) lot identification (except that this requirement is optional if the application of lot identification to the retail packaging is a mandatory requirement under other legislation and that legislation is complied with).**

(2) Mandatory labelling must be clear, legible, indelible, and use terms that are commonly used in the English language.

(3) In the case of the transportation outers used for the transportation of unpackaged bulk materials that cannot practicably be labelled, the information specified in subclause (1) may be contained within the accompanying documentation.

(4) The transportation outer of animal material or animal product that is not intended for human consumption but has the appearance of, or could be mistaken for, animal material or animal product that is intended for human consumption, must be labelled to clearly indicate that the animal material or animal product it contains is not intended for human consumption.

(5) If the status of an animal material's suitability for processing, or the fitness for intended purpose of the animal product changes, and the animal material or animal product has been labelled, this labelling must be amended to reflect the new status prior to its release for trade.

DELIVERY OF EGGS TO THE RETAIL MARKET:

Eggs shall be transported in clean enclosed temperature controlled vehicles. Eggs shall be maintained below 15°C.

No other foodstuffs or goods which are likely to impart "foreign odours" to the eggs shall be transported in vehicles carrying eggs.
It is a good idea to review the measurable outcomes to ensure that they are still relevant after the analysis has been completed.

4.9.3 Operator verification

Once a month the Packhouse Manager shall check and sign the records for that month. Any problems shall be noted on the relevant record with the details of the corrective action taken.

Testing for Salmonella shall be undertaken on a composite egg sample, at least weekly. The composite sample should include one egg per day from each flock as per a documented sampling plan. All testing for Salmonella shall be undertaken by a MILAB accredited laboratory.

Any Salmonella-positive samples returned from these tests shall be serotyped, and a thorough cleaning program shall be undertaken as per the documented response procedure. The response procedure should include a trace-back mechanism to determine the source flock. This may require Salmonella testing individual flocks that supplied eggs to make up the Salmonella-positive composite sample. The source flock owner shall be advised, and at depopulation the layer shed shall be retested for Salmonella via an environmental swab, and Salmonella-negative status achieved prior to repopulation.

If *S. enteriditis PT 4* serotype is returned at any time the egg producer shall inform the Regulatory Authority and EPF, and shall recall eggs from affected flocks. Eggs or egg product from affected flocks shall not be offered for sale. The affected flocks shall be quarantined, and if confirmatory tests are returned, immediate depopulation should follow.

<u>Salmonella sampling</u>
Equipment used, including sample bags, shall be stored in sealed, dust-free conditions.
Samples should only be taken by management or trained personnel
Bag, label, and send samples immediately, although composite shell egg samples may be labelled, stored in cool room, and sent on a weekly basis.

4.9.4 Documentation and record-keeping

<u>Documentation</u> is expected for all steps in the application of the HACCP principles, as outlined above. This includes each CCP, where relevant, and all general controls.

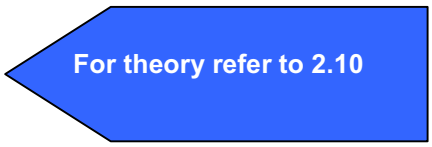
<u>Records</u> are expected for all monitoring, corrective action and operator verification activities, both in relation to CCPs and all general controls.

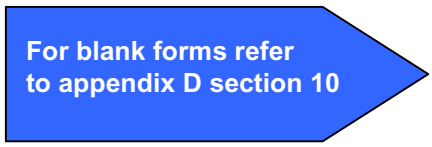
Note: **some control measures may be repeated in other supporting systems. If this occurs only one set of documentation and records is necessary for each control measure.**

4.9.4.1 Records

The record forms can be found in Appendix E of this Code Of Practice.

4.10 Operational authorities and responsibilities





The following responsibilities and authorities should be allocated for the risk management programme:

Person responsible for:	Name or title[24]	Training received
CCP1 - 6	Joe Eggbert / Jane Eggbert / Jim Eggleton	On job training by Henrietta Eggnot, 17/18/2/2000
CCPL1 - 3	Joe Eggbert / Jane Eggbert / Jim Eggleton	On job training by Henrietta Eggnot, 17/18/2/2000
CCPW1	Joe Eggbert / Jane Eggbert / Jim Eggleton	On job training by Henrietta Eggnot, 17/18/2/2000
Monitoring	Henry Eggnot	On job training by Henrietta Eggnot, 17/18/2/2000
Corrective action	Henry Eggnot	On job training by Henrietta Eggnot, 17/18/2/2000
Operator Verification	Henrietta Eggnot	EPF approved HACCP course, 3 day, 14-16/2/2000

Detailed training records are kept in the Packhouse Manager's Office. Records that can be used for this are given in Appendix E.

[24] If the person is likely to change it is more sensible to put the title or designation so that this section won't need updating.

4.11 Generic corrective action procedure[25]

For theory refer to 2.11

For blank forms refer to appendix D section 11

When to use it:	When non-complying animal material or animal product is produced - • using a process or associated thing that deviates from the risk management programme; or • not in compliance with the outcomes documented in the risk management programme; or • where an unforeseen hazard or other risk factor arises; and • when a specific corrective action has not been complied with or has not been identified in the risk management programme.
Inventory control	Non-complying animal material or animal product must be identified and retained separately under inventory control pending a full assessment by a suitably-skilled person (nominated by the egg producer).
Procedure	The suitably skilled person shall: • review the relevant processing records, animal material or animal product, to identify any potential risk factors. • make a decision regarding the suitability for processing of the animal material, or the fitness for intended purpose of the animal product, and • ensure the appropriate disposition is carried out.
Reporting	The suitably skilled person must complete and sign a full report on the management of the non-compliance, including details of - • the deviation from the risk management programme, and the impact on any hazards or other risk factors present in the animal material or animal product; and • the identification of the affected animal material or animal product; and • any additional processing of the animal material or animal product; and • the analyses made to reach the final decision; and • the decision on the disposition of the animal material or animal product; and • confirmation that the disposition of animal material or animal product has been carried out; and • any actions taken to prevent recurrence of the non-compliance. The egg producer must provide the report, as soon as practicable, to MAF's Director-General or an animal product officer.
Verification	The egg producer must bring to the attention of the accredited verifier at the next verification visit, any use of the generic corrective action procedure.

[25] An alternative to including this procedure in the RMP is to just cross reference to Specifications 12 and 13 of the Animal Products (Risk Management Programme Specifications) Notice 2000.

4.12 Recall Procedure

For theory refer to 2.12

For blank forms refer to appendix D section 12

Responsibility / Authority:	• Henrietta Eggnot is totally responsible for the control of any recalls and has the authority to co-opt staff members from normal duties to participate in recall activities. In Henrietta's absence the second in charge shall assume these authorities and responsibilities until Henrietta is available.
Identification and traceability:	• All eggs shall be traceable from the laying farm and shed to the grading facility[26].. • At the grading facility the person feeding the grader shall record each change of laying farms and/or shed and the time that the change occurred. All packed eggs shall be labelled with the pack date and time.
Risk assessment and decision on whether or not to recall.	• Henrietta has the authority to decide whether or not a recall is necessary. This will depend on her assessment of the risk to customers/consumers. She may choose to consult with relevant regulatory authorities or food safety experts prior to making this decision. • The Director-General of MAF must be notified if any recall goes ahead.
Communication and documentation	• All recall communications are to be approved by Henrietta Eggnot. No one else is to contact ANYONE outside of the company with respect to the recall without her knowledge and agreement. Media statements are only to be made by Henrietta. • Henrietta shall keep a diary of all communications including the date, time, contact person, summary of discussion, agreed actions, due dates etc. • To speed up communication most urgent correspondence will be done by phone. All correspondence must be confirmed in writing. • All records relevant to the recall shall be collected and filed by Henrietta in a "Recall File".
Product Recovery / Disposition	• Henrietta Eggnot is responsible for discovering how much suspect product is subject to recall and monitoring the progress on locating this product. A product recovery tree shall be used to record these details. • Henrietta is also responsible for deciding on the disposition of any recalled product. This may be by dumping, further processing, regrading etc as appropriate.
Corrective / preventive action	• Once the suspect product has been located and dealt with, the cause of the problem shall be investigated and appropriate actions taken to prevent a recurrence of the problem.
Review of recall effectiveness	• Once all of the above steps have been completed Henrietta shall involve all relevant people in a review of the recall. This shall consider how well each of the steps were performed and what improvements could be made. A final report shall be compiled. If necessary a copy of this shall be sent to relevant regulatory authorities and/or customers to inform them of the outcome of the recall.

[26] Some egg producers may wish to be able to trace eggs back to specific flocks or sheds within a farm. This is basically a commercial decision. The better the traceability the smaller any recall is likely to be if there is a problem.

4.13 Operator Verification

For theory refer to 2.13

For blank forms refer to appendix D section 13

Validation:	**Henrietta Eggnot has partially validated this RMP. Refer to 4.16 for further information.**
Routine Verification:	**Routine operator verification of each RMP component has already been described in the documentation of each component.**
Audit:	**In addition to the above verification activities, once a month the Packhouse Manager shall select an RMP component and shall audit it to ensure that it is implemented effectively. The audit shall check that:** • **staff understand the requirements and are following procedures correctly,** • **monitoring and appropriate corrective action is occurring, and** • **records are being correctly and accurately filled out.** **Each time a component is audited the Packhouse Manager shall write a brief report outlining the component audited, findings and any corrective action taken as a result of the findings. These reports will be filed in the Packhouse Manager's filing cabinet.** **The Manager shall sign the records for that month. Any problems shall be noted on the relevant record with the details of the corrective action taken.**
Ongoing Review:	**The Packhouse Manager shall also review the whole RMP:** • **at least once a year, and** • **when the operation changes and** • **when problems arise.** **If necessary the Manager shall ensure that the RMP is updated; or amended, revalidated, re-evaluated and re-registered.**

4.14 External verification[27]

For theory refer to 2.14

For blank forms refer to appendix D section 14

Policy on Verifier's Rights

Henrietta's Egg Company Ltd is committed to the implementation and maintenance of its risk management programme and will ensure that its risk management programme is verified by an accredited verifier at the frequency stipulated by NZFSA. The accredited verifier shall have the freedom and access necessary to allow them to carry out verification functions and activities, including -:

(a) having access to all parts of the premises or place and facilities within the physical boundaries of or relating to the risk management programme; and

(b) having access to all documentation, records and information relating to, or comprising, the risk management programme (including records held in electronic or other form); and

(c) having freedom to examine all things necessary and open any containers, packages and other associated things to inspect their contents; and

(d) having freedom to identify or mark any animal material, animal product, equipment, package, container or other associated thing; and

(e) having freedom to -

(i) examine and take samples of any animal material, animal product or any other input, substance, or associated thing which has been, is, or may be in contact with, or in the vicinity of, any animal material or animal product; and

(ii) test, or analyse, or arrange for the testing, or analysis of such samples; and

(iii) order retention of raw materials including animal material, ingredients, animal products, packaging or equipment pending testing results and decisions on disposition; and

(f) having authority where there may be significant risk to fitness for intended purpose of animal product or suitability for processing of animal material to detain any animal material and animal products or other relevant things in the event of non-compliance with the risk management programme; and

(g) having authority in cases of significant risk to fitness for intended purpose of animal product or suitability of animal material for processing to intervene and direct a temporary interruption of processing until the cause of the risk has been remedied.

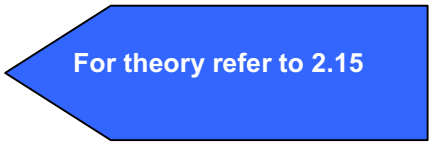
Signed by: ***Henrietta Eggnot***

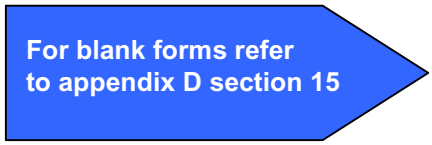
Date:

A letter from the nominated verifying agency is attached confirming their willingness to carry out verification of the RMP. (Egg producer is to attach the letter here).

[27] An alternative to including this procedure in the RMP is to just cross reference to Specification 15 of the Animal Products (Risk Management Programme Specifications) Notice 2000.

4.15 Documentation and record-keeping





4.15.1 Document Control System

RMP Documents	**All RMP documents:** • **are typed,** • **are listed on the RMP document list, (See next page)** • **have a date and version on each page,** • **are authorised before issue by the Operator of the RMP by signing the RMP document list after it has been updated to reflect the changes.**
Availability	**The registered RMP and all reference material relating to it must be readily accessible to:** • **all those who have responsibilities under the RMP. This is achieved by having a copy of the RMP at the following distribution points:** **- Packhouse Manager's Office** **- Staffroom.** • **accredited persons, animal product officers and the Director-General or persons authorised by the Director-General, within two working days of any request.**
Updates and Amendments	**Whenever one or more page(s) of a document is changed:** • **the date and version number of the each altered page shall be updated,** • **a line shall be placed in the margin to show where the changes have been made,** • **details of the page, date and version number shall be recorded on the RMP document list,** • **the updated RMP document list shall be authorised by the RMP Operator,** • **if the change constitutes an amendment to the RMP as defined in Section 25 of the Animal Products Act it shall be validated, evaluated and registered prior to implementing the change,** • **on implementation of the change, all copies of the relevant pages of the RMP shall be replaced as soon as possible.**
Obsolete Documents	• **All obsolete documents or parts of documents are removed as soon as practicable from all distribution points (which are listed under availability heading above).** • **One hard copy of any obsolete part of the RMP is archived for 4 years and made available to accredited persons, animal product officers and the Director-General and persons authorised by the Director-General, as required.**

4.15.2 List of documents making up the RMP

RMP component	Programme / Document Name[28]	Version / Issue	Date	Reference (to pages / sections etc)	Viewed by Evaluator
Title Page	P-RMP-1				
Management Authorities and Responsibilities	P-RMP-2				
Scope of RMP	P-RMP-3				
Product Description and Intended Purpose	P-RMP-4				
Product Outcomes	P-RMP-5				
Process description	P-RMP-6				
Identification, Analysis and Control of Hazards and Other Risks Factors from Inputs	P-RMP-7				
Identification, Analysis and Control of Hazards and Other Risks Factors from Other Sources	P-RMP-8				
Identification, Analysis and Control of Hazards and Other Risks Factors from The Process	P-RMP-9				
Operational Authorities and Responsibilities	P-RMP-10				
Generic Corrective Action Procedure	P-RMP-11				
Recall Procedure	P-RMP-12				
Operator Verification	P-RMP-13				
External Verification	P-RMP-14				
Documentation and Record-Keeping	P-RMP-15				
Validation Protocol	P-RMP-16				
Signed by *Henrietta Eggnott* (Operator)		Signed by (Evaluator)			
Operator's name in full: Henrietta Eggnott		Evaluator's name in full			
Date: 10/9/01		Date:			

[28] The numbers given in this column have been chosen to represent the Packhouse's RMP (P-RMP) with a number for each different section or RMP component. Alternative numbering systems are equally acceptable.

4.15.3 Record Control System

RMP Records	**Records shall be kept to demonstrate compliance to the RMP. This includes monitoring, corrective action and operator verification records for CCPs and other controls.**
Details to be recorded	**All RMP records must be legible and must include the following details:** • **date and time of observation; and** • **subject and description of observation; and** • **any corrective action undertaken; and** • **means to identify the observer and any person who undertook corrective action; and** • **any other information required under the risk management programme as applicable.** **Electronic records must show the person who entered the data on them unless access to them is password protected.** **Where monitoring and corrective action records for the risk management programme have been subject to operator verification, the signature or unique identifier of the operator verifier must be recorded on those records, or on records generated by the operator verification activities.**
Availability	**All RMP records must be readily accessible and made available to accredited persons, animal product officers, the Director-General and persons authorised by the Director-General, all records relevant to the operator verification, as required.**
Archiving	**All RMP records will be stored for at least 4 years as follows:** • **Manual records in cardboard box files in the Packhouse Manager's office.** • **Electronic records on clearly labelled floppy disks in a disk storage unit in the Packhouse Manager's office.**

4.16 Validation Protocol

Henrietta Eggnott has checked that the RMP documentation is complete. Refer to Validation Report (see Appendix E).

The following protocol explains how product outcomes will be validated by demonstrating that:
a) each Product Outcome is achieved on a consistent basis.
b) each CCP achieves or contributes to the achievement of the relevant Product Outcome:
c) other controls meet regulatory requirements or contribute to the achievement of the relevant Product Outcome.

Product Disposition: All eggs produced during the validation period will be either processed or rejected according to the documented procedures in this RMP.

4.16.1 Hazards to Human Health

Hazard or other risk factor	Example Product outcomes	Key Control Measures[29]	Proposed Validation
B1 & B2: Salmonella and other enteric pathogens.	A Grade Eggs: Salmonella not detected in 25g from a weekly composite sample of A grade shell eggs.	• As below	At least 1 weekly composite sample tested for Salmonella and all results are not detected. (This minimal amount of testing is only acceptable if ongoing verification includes weekly Salmonella testing).
	Check that eggs are visibly clean.	CCP 4 Sorting	Demonstration of procedure. Records of performance: • Historical performance for existing operations • Actual performance for new operations.
	Wash dirty eggs and floor eggs	CCP 5 Washing of Very Dirty Eggs	Demonstration of procedure. Records of performance: • Historical performance for existing operations • Actual performance for new operations.
	Transportation and storage temperature no higher than 15°C.	GC Temperature checks	Records of temperatures of transport and storage facilities (receipt and dispatch): • Historical performance for existing operations • Actual performance for new operations.

[29] Not all of these example control measures will suit all operations. E.g. those operations with automatic collection may not be able to separate eggs as implied here.

Hazard or other risk factor	Example Product outcomes	Key Control Measures[29]	Proposed Validation
B1 & B2: Salmonella and other enteric pathogens.	Check that eggs are not visibly cracked.	CCP 4 Sorting	Demonstration of procedure. Records of performance: • Historical performance for existing operations • Actual performance for new operations.
		CCP 6 Candling	Demonstration of procedure. Feedback from Packhouse. Records of performance: • Historical performance for existing operations • Actual performance for new operations.
	No dry cleaning of eggs.	N/a	N/a
	Immediate clean up of broken eggs	GC Grading area	Demonstration of procedure.
	Other controls	CCP 3 Personnel with infectious diseases to get medical clearance before handling product	Training records show that employees and managers have had awareness training for these requirements. Check that there is a procedure for recording medical clearances received.
C3 and C4: Residues from egg washing and egg oiling chemicals	No chemical residues over MRLs.	CCP 1 Order Chemicals	One check that all chemicals currently on site or on order have appropriate approval under NZFSA Manual 15 http://www.nzfsa.govt.nz/animalproducts/legislation/notices/m15-chem-schedule-all.pdf
		CCP 2 Use Chemicals	One check that the correct chemical is used in the correct area (as per NZFSA approval) and in accordance with the manufacturer's instructions, e.g. amount, contact time, method of application.

4.16.2 Risks to Wholesomeness

Hazard or other risk factor	Example Product outcomes	Key Control Measures[30]	Proposed Validation
W1: Blood or meat spots	Less than 0.1% eggs have defect.	CCPW1 Candling	Records of performance: • Historical performance for existing operations • Actual performance for new operations.
W3: Roundworms	Less than 0.1% eggs have each defect.	CCPW1 Candling	Records of performance: • Historical performance for existing operations • Actual performance for new operations.
W2: Watery whites W6: Pink or iridescent whites W5: Rotten eggs W4: Off odours and flavours W7: Eggs older than use by date	Less than 0.1% eggs have each defect.	GC Temperature checks GC Stock Rotation	Records of storage and transportation temperatures: • Historical performance for existing operations • Actual performance for new operations. Records of performance: • Historical performance for existing operations • Actual performance for new operations.
W8: Soft shells	Less than 0.1% eggs have defect.	GC Should not come in but would be rejected at sorting or grading if so.	Records of performance: • Historical performance for existing operations • Actual performance for new operations.
W9: Mouldy eggs	None	GC Temperature checks	Temperature records as above.

[30] Not all of these example control measures will suit all operations. E.g. those operations with automatic collection may not be able to separate eggs as implied here.

4.16.3 Risks from False or Misleading Labelling

Hazard or other risk factor	Example Product outcomes	Key Control Measures[31]	Proposed Validation
L1: Incorrect claims for free range, barn, caged or organic eggs	All eggs must be true to label.	CCP L1Sorting check of claims on labels	For each claim type: do one check on how different sheds are identified at egg sorting.
		CCP L2Packing	For each claim type: do one check that label claims made accurately reflect the egg production system. Show how labels with different types of claims are controlled so that they are applied to the correct eggs.
L2: Incorrect date marking	All eggs must be true to label.	CCP L2Dates on Labels	Where dating is applied show how use by dates are determined and relate this to actual egg collection and delivery frequency. • Demonstrate accuracy of dates on one day's production.

[31] Not all of these example control measures will suit all operations. E.g. those operations with automatic collection may not be able to separate eggs as implied here.

Appendix A: Definitions

A full glossary of terms relevant to the Animal Product Act is given in MAF's Animal Products Website. Terms used in this document are:

A Grade Shell Eggs	**Eggs without visible cracks or internal defects so are suitable for retail sale for human consumption.**
Accredited Evaluator	**A person currently accredited by the Director-General as a risk management programme evaluator.**
Accredited Person	**In relation to any verification or other specialised function or activity, means a person accredited by the Director-General to perform that function or activity.**
Accredited Verifier	**A person currently accredited by the Director-General as a risk management programme verifier.**
Acute	**(Of disease) Coming sharply to a crisis.**
Amenities	**Includes toilets, wash rooms, locker rooms, change rooms, lunch/smoko rooms, and cafeterias**
Animal Remedy	**Has the same meaning as in the Animal Remedies Act 1967 and includes a veterinary medicine within the meaning of the Agricultural Compounds and Veterinary Medicines Act 1997**
Approved Maintenance Compound	**Any maintenance compound that is approved by the Director-General or listed in specifications made under the Act**
Barn-raised	**Birds shall not be caged after reaching point of lay. Birds shall remain within the shed during their laying period. Birds shall be kept in accordance with the current Animal Welfare Code requirements.**
Biosecurity	**Procedures and systems to protect against entry of biological hazards.**
Carcinogen	**Cancer-producing substance.**
Chronic	**(Of disease) Lingering, lasting.**

Clean	When used as a verb, means to remove visible contaminants from any surface
Commercial Grade Eggs	Eggs without visible cracks but may have size/shape abnormalities or other minor defects that do not compromise egg safety or wholesomeness – not for retail sale in shell but still suitable for human consumption. These eggs are normally sold for catering, bakeries, further processing or other similar uses.
Control	(Verb): To take all necessary actions to ensure and maintain compliance with criteria established in the HACCP plan.
Control	(Noun): The state wherein correct procedures are being followed and criteria are being met.
Control Measure	Any action and activity that can be used to prevent or eliminate a food safety hazard or reduce it to an acceptable level.
Corrective Action	Any action to be taken when the results of monitoring at the Critical Control Point indicate a loss of control.
Cracked Eggs	Eggs that can be sent for further processing (Pasteurisation or equivalent) or for animal consumption.
Critical Control Point	A step at which control can be applied and is essential to prevent or eliminate a risk factor[1] or reduce it to an acceptable level, as described in section 17(3)(b) of the Act.
Critical Limit	A criterion which separates acceptability from unacceptability and includes acceptable parameters as described under section 17 (3) (c) of the Act
Direct Supervision	In relation to any function, operation or activity means supervising any function, operation or activity while in sufficiently close physical proximity to ensure that any relevant specifications are met.
Enteric	Of the intestines.

[1] Under the Animal Products Act, it is mandatory to apply HACCP principles to determine whether Critical Control points are necessary for hazards, but it is optional whether this methodology is used for other risk factors (i.e. risks to wholesomeness, and risks from false or misleading labelling).

Equipment	Includes — (a) the whole or any part of any utensil, machine, fitting, device, instrument, stamp, apparatus, table, or article, that is used or available for use in or for the preparing, marking, processing, packing, storing, carrying, or handling of any animal material, animal product, ingredient, additive, or processing aid; and (b) any utensil or machine used or capable of being used in the cleaning of any equipment or facilities
Essential Services	Includes the provision of process gases, lighting, ventilation, water, and waste management
Evaluation	The process of externally assessing the validity of a risk-based programme with the intent of recommending registration[/approval] of the programme. (This will always involve assessment of documentation and may involve assessment of on-site operations)
Exotic	Introduced from abroad
External Verification	Includes the ongoing checks carried out by accredited verifiers to determine whether,- • Operations that are subject to a risk management programme or a regulated control scheme are in compliance with the requirements of the programme or of the Animal Products Act: • Animal material or products for whose export an official assurance is required have been produced or processed in a way that meets the requirements for the official assurance
Facilities	Includes amenities, storage areas, and processing areas
Fit For Intended Purpose	The phrase, used in relation to any animal product, that has been processed in accordance with the requirements of a registered RMP under the Animal Products Act 1999, means that by reason of animal material or product having had the relevant risk factors managed and meeting any relevant animal product standards and associated specifications, the product is suitable for the purpose for which the product is specifically stated or could reasonably be presumed to be intended having regard to its nature, packaging, and identification.
Free Range	Birds shall be free ranged in accordance with the current Animal Welfare Code requirements. Birds shall have access to open-air runs and sheds.
Good Hygienic Practice (GMP)	Hygienic measures and activities acceptable to the industry and regulatory agency , that are routinely achieved

Good Manufacturing Practice (GMP)	Assurance that product is consistently produced and controlled to quality standards appropriate to their intended use and as required by the regulatory authority and industry.
Hazard	A biological, chemical, or physical agent that – • Is in or has the potential to be in animal material or product, or is or has the potential to be a condition of animal material or product; and • Leads or could lead to an adverse health effect on humans or animals.
Hazard Analysis	Hazard analysis: The process of collecting and evaluating information on hazards and conditions leading to their presence to decide which are significant for food safety and therefore should be addressed in the HACCP plan.
Hazard Analysis and Critical Control Point (HACCP)	HACCP: A system which identifies, evaluates and controls hazards that are significant for food safety.
Human or animal consumption	Used in relation to any animal product, means that the product is intended to be eaten, or taken orally, or administered parenterally (by injection), or applied topically (on the skin)
Infective Dose	Infective Dose: Number of microorganisms need to induce illness.
Label	Includes any wording, tag, brand, symbol, picture, or other descriptive matter written, printed, stencilled, marked, embossed, impressed on, appearing on, attached to, or enclosed within any animal material or animal product
Licensed Animal Remedy	An animal remedy licensed under the Animal Remedies Act 1967; and includes a veterinary medicine registered under the Agricultural Compounds and Veterinary Medicines Act 1997
Lot	A quantity of animal material or animal product that has been produced and handled under uniform conditions and within a limited period of time
Lot Identification	An identifier that is sufficient to enable the source of a lot to be traced
Maximum Residue Limit (MRL)	The maximum permissible level at which a substance may be present in animal material or animal product, as specified in regulation 4 of the Meat (Residues) Regulations 1996 (SR 1996/199) or in any specifications
Microorganism	Organism not visible to the naked eye, e.g. bacterium or virus.

MILAB Laboratory

A laboratory approved under the MILAB Laboratory Approval Scheme. Refer to http://www.nzfsa.govt.nz/animalproducts/milab/index.htm for more details.

Operator Verification

The application of methods, procedures, tests and other checks by the operator to —

(a) validate the risk management programme; and

(b) determine the ongoing compliance and applicability of the risk management programme; and

(c) revalidate the risk management programme when changes occur that may have a significant impact on the fitness for purpose of animal product or the suitability for processing of animal material.

Organic

Eggs labelled as organic must be produced under a recognised organic system. Both feed and egg production systems must comply with all system requirements. Certification is not mandatory, but information regarding organic certification can be obtained from one of the following organisations:

The Bio Dynamic Farming & Gardening Association of New Zealand (Inc.)
PO Box 39045
Wellington Mail Centre
Tel: 04 589 5366
Fax: 04 589 5365

The New Zealand Biological Producers & Consumers Council
Biogro New Zealand
PO Box 9693
Marion Square
Wellington
Tel: 04 801 9741
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Packaging

Any material that is intended to protect and that comes into immediate contact with the animal material or animal product; and

(b) includes rigid materials such as cartons and containers where animal material or animal product is filled directly into the carton or container; and

(c) includes any other material contained with, in, or attached to, the animal material or animal product (such as labels, satay sticks, and heat sensors)

Pandemic

Disease prevalent over the whole of a country of over the whole world.

Pasteurisation	**Partial sterilisation by heating.**
Pathogen	**Disease causing organism.**
Pathogenic	**Able to cause disease.**
Phage	**A virus that can infect bacteria.**
Phagetype	**A further classification of organisms within a bacterial species, based on the type of phage that can infect it.**
Potable Water	**Water that —** **(a) in relation to water supplied by an independent supplier (including a public or private supplier), is of a standard administered by the independent supplier under the Health Act 1956 and any regulations made under that Act; or** **(b) in relation to water supplied by the operator solely for the use of the operator (such as bore water, rainwater, surface water, or ground water), —** **(i) is of a standard equivalent to that referred to in paragraph (a), as determined by the operator based on an analysis of hazards and other risk factors; or** **(ii) complies with the requirements in** Schedule 1**; or** **(c) meets the requirements of the current "Meat Division Circular 86/3/2: Surveillance of Potable Water in Meat and Game Export Premises" issued by the Ministry**
Protective Clothing	**Garments intended to preclude the contamination of animal material or animal product, that are used as outer wear by persons; and includes head coverings and footwear**
Reject Eggs	**Eggs unsuitable for human or animal consumption**
Reticulation Management Plan	**A documented programme that contains procedures for the management of the water reticulation system, (including pipework and fittings e.g. backflow prevention devices etc.), within the premises or place to ensure that the water quality is not adversely affected prior to the point of use**
Risk factor	**Means:** • **Risks from hazards to animal or human health:** • **Risks from false or misleading labelling:** • **Risks to the wholesomeness of animal material or product.** **and "risk" has a corresponding meaning.**

Risk Management Programme	A programme designed to both identify and control, manage, and eliminate or minimise hazards and other risk factors in relation to the production and processing of animal material and animal products, in order to ensure that the resulting animal product is fit for intended purpose. A risk management programme established under the Animal Products Act, 1999 may also encompass as a component, part of the food safety programmes (or part thereof) established under the Food Act Regime.
Risk Management Programme Operator	An operator of a premises or place who operates an animal product business that is subject to a risk management programme
Sanitary Design	In relation to any premises or place, facility, internal structure, equipment, or conveyance, means designed, constructed, and located so that it — (i) meets the requirements appropriate to the type of animal material or animal product and process, and which includes consideration of the movement of people, access, and process flow; and (ii) can be readily maintained, cleaned, sanitised, and sterilised where required, to ensure that risk factors from contaminants and pests are minimised; and (b) in relation to any equipment or accessway in any processing area, means that the equipment or accessway is designed, constructed and located so that it — (i) is easily accessible for maintenance, cleaning, operation, checking, and inspection; and (ii) minimises the contact of contaminants with any animal material (other than live mammals or live birds), or animal product or other equipment; and (iii) precludes the harbouring or accumulation of any contaminants or pests
Sanitise	The application of an approved maintenance compound or physical agent with the intention of reducing microbial contamination to a level that will avoid the creation of a hazard in the product
Serology	Scientific study of serum (part of the blood) and its effects.
Serotype	A further classification of organisms within a bacterial species.
Subclinical	Not yet presenting definite symptoms
Suitably Skilled Person	A person who in the opinion of the operator is skilled in a particular activity or task through training, experience, or qualifications

Supplier Guarantee Programme	A programme documented in a risk management programme, that establishes the animal treatment and exposure status of animal material presented for primary processing by requiring specified suppliers (identified in the programme) to provide information that would be equivalent to the supplier statement for that animal material
Supplier Statement	Either — (a) the specified contents for a statement; or (b) a form of statement — provided for in Schedule 5, that is signed by a supplier and affirms that certain requirements of this notice have been met; and includes certified supplier statements.
Suspect Animal Material	An animal or line of animals showing symptoms or suspected of being diseased or contaminated, or having an abnormality, that may affect the suitability for processing or the manner of processing of the animal material; and includes — (a) animals with clinical disease: (b) tuberculosis (Tb) reactors: (c) animals covered by a veterinary certificate of disease or injury: (d) animals from sources named in surveillance lists under the Act: (e) animals covered by a supplier statement indicating an uncertain animal suitability status
Transportation Outer	A package (other than a container used for bulk transportation on a ship or aircraft) that — (a) encases any packaged or unpackaged animal material or animal product for the purpose of transportation and distribution; and (b) is either removed before the animal product is used or offered for retail sale, or is not taken away by the consumer of the product
Validate	The process by which the operator ensures that the risk management programme is complete, and meets the requirements of the Act and any relevant animal product regulations and specifications; and when implemented, will consistently achieve the required outcomes of the programme; and re-validate has a corresponding meaning.
Water Management Plan	A documented programme that specifies the water quality standard and criteria, and procedures for the management of the water quality within the premises or place to ensure that the appropriate quality of water is delivered at the point of use; but “premises or place” in this definition does not include a fishing vessel

Whole Flock Health Scheme

In relation to a flock of farmed birds means a documented effective system of health surveillance and includes, where applicable —

(a) disease control or eradication; and

(b) the management of agricultural compounds and animal remedies according to any general or specific conditions of use

Wholesomeness

In relation to any regulated animal product, means that the product does not contain or have attached to it, enclosed with it, or in contact with it anything that is offensive, or whose presence would be unexpected or unusual in product of that description.

Withholding Period

A period after treatment or exposure to an animal remedy or other chemical substance within which the animal material concerned must not be presented for primary processing.

Appendix B: Abbreviations

ACMSF	Advisory Committee on Microbiological Safety of Food
AEB	American Egg Board
AEIA	Australian Egg Industry Association
ANZFA	Australia New Zealand Food Authority
AWAC	Animal Welfare Advisory Committee
CCP	Critical Control Point
CDC	Centres for Disease Control and Prevention
CFSAN	USFDA's Center for Food Safety & Applied Nutrition
COP	Code Of Practice
CFIA	Canadian Food Inspection Agency
DDT	Dichlorodiphenyltrichloroethane
DHHS	Department of Health and Human Services (Australia)
DPIWE	Department of Primary Industries, Water and Environment (Australia)
dr	Draft
EC	European Commission
EEC	European Economic Community
EPF	Egg Producers' Federation
ESR	Environmental and Science Research Limited (New Zealand)
ESR-CDC	Environmental and Science Research Limited-Communicable Disease Centre (New Zealand)
et al	And Others
FAO/WHO	Food and Agriculture Organisation / World Health Organisation
FDA	Food and Drug Administration
FSIS	Food Safety Inspection Service
FSNet	Food Safety Net information service
GHP	Good Hygienic Practice
GMP	Good Manufacturing Practice
HACCP	Hazard Analysis and Critical Control Point
ICMSF	International Commission on Microbiological Specifications for Foods
MAF	Ministry of Agriculture and Forestry (New Zealand)
MAFF	Ministry of Agriculture, Fisheries and Food (England)
MFE	Ministry for the Environment (New Zealand)
NAHMS	USDA's National Animal Health Monitoring System
NZCDC	New Zealand Communicable Disease Centre
NZFSA	New Zealand Food Safety Authority
NZPA	New Zealand Press Association
pH	Measure of acidity or alkalinity
PIANZ	Poultry Industry Association of New Zealand
SCVPH	Scientific Committee On Veterinary Measures Relating To Public Health
SE	*Salmonella enteritidis*
Spp	Species
UK	United Kingdom
UPC	United Poultry Concerns
USA	United States of America
USDA	United States Department of Agriculture
USFDA	United States Food and Drug Administration
VMD	The Veterinary Medicines Directorate
WFHS	Whole Flock Health Scheme
WHO	World Health Organisation

Appendix C: Technical Annex

CONTENTS

1. Purpose Of This Document

Egg producers need to keep their eggs safe to eat in order to stay in business. If there is a problem associated with their eggs this may result in:

- loss of earnings;
- legal action;
- unemployment;
- loss of reputation; and
- loss of business.

In many overseas countries food-borne illnesses have been directly related to consumption of raw eggs. Whilst the corresponding figures for eggs in New Zealand are much lower there is no room for complacency. Industry professionals have a legal and moral responsibility to:

- protect their customers;
- provide safe food; and
- protect their business and the reputation of the industry.

Remember that prevention is better than the cure. The Animal Products Act 1999 requires those who process animal products to have a **risk management programme,** based on HACCP (Hazard Analysis and Critical Control Point) principles, to identify and control hazards and other risk factors so that their products are **fit for their intended purpose**.

This technical annex has been produced by MAF Food Assurance Authority in conjunction with the Egg Producers Federation of NZ Inc.

The annex will provide scientific and technical information, from both New Zealand and overseas, to facilitate the updating of the industry agreed Code of Practice so that it:

- will help egg producers to develop their risk management programmes;
- is based on the principles of HACCP;
- identifies the following hazards and other risk factors associated with the production, grading and packing of whole shell eggs and any by-products;
  - hazards to human health,
  - hazards to animal health,
  - risks to wholesomeness, and
  - risks from false or misleading labelling.
- covers any new or emerging hazards that should be addressed; and
- discusses possible control measures for the identified hazards and other risk factors.

The New Zealand commercial poultry flock (including chickens, hens, turkeys and ducks) has a unique animal health status superior to that in other countries. This sometimes makes extrapolation of overseas findings and requirements inappropriate to the New Zealand situation.

A significant portion of New Zealand's eggs are produced under one of two existing Codes of Practice:

- A supermarket-required Code of Practice has been available since 1998.
- Commercial egg producers with over 100 birds have had access to an industry agreed Code of Practice since June 1993.

This means that many of the hazards and other risk factors that are identified in this annex are already subject to suitable controls. These existing Codes of Practice give guidelines on currently accepted practices but are not necessarily based on the principles of HACCP – so it is not always obvious why some practices are recommended.

Key Messages to New Zealand Egg Producers:

Key points for the reader to note are shown in boxes in this annex as shown here.

2. The New Zealand Egg Production Industry

No table eggs are imported into New Zealand because MAF imposes strict quarantine regulations to protect the superior health status of the New Zealand poultry flocks. There are some exports from New Zealand of:

- specialist eggs to niche markets overseas, and
- fertile eggs and day old chicks to the Pacific (PIANZ, 2001).

In the late 1980s there were over 450 egg producers. At this time price and production controls in the egg industry were abolished, and the New Zealand Poultry Board was dis-established. This change was followed by a dramatic reduction in returns to producers, though this was not always matched by a reduction in retail egg prices. Deregulation changed the relationship and relative profitability of producers and egg wholesalers. Many producers now sell direct to the wholesale and retail trade rather than through co-operatives or other organisations.

Poor profitability for egg producers during 1994 and 1995 resulted in a reduced egg supply as producers went out of business. By mid 1996 increased demand for eggs led to the advent of higher wholesale egg prices, though this was short lived. The cyclical nature of the egg industry will continue. The last decade has also seen a wider choice of egg types available from standard white to brown, to whole-grain, vegetarian, omega enriched, barn, and free range eggs.

In 1998 New Zealand's estimated 2.6 million laying hens produced close to 65 million dozen eggs. Over 85% of eggs are sold as table eggs within the domestic market, with the remainder used in the baking and catering industries. Total egg production has remained relatively static for the past decade, with per capita consumption around 200 eggs per person annually. Most eggs produced in New Zealand are from caged hens. Free range and barn egg production account for around 7% of the total.

The Egg Producers Federation of New Zealand has estimated that in the year 2000 there were around 130 commercial egg producers, with the largest 20 producers accounting for over 50% of total production. Since deregulation in the late 1980's the number of commercial egg producers has declined rapidly. This decline is likely to continue with further restructuring of the industry hastened by the introduction of the Animal Products Act 1999.

3. Foodborne Illness

Key Messages to New Zealand Egg Producers:

The most important reason for having a risk management programme is to help avoid making your customers sick, and to protect your business.

3.1 New Zealand Situation – All Foods

In New Zealand, 1998 and 1999 were record years for salmonellosis from all food types. In 1998, 2069 cases were notified (a rise of 77% from 1997 figures) and in 1999, 2079 cases were notified. In the year 2000 there was a decrease down to 1802 cases of Salmonellosis (ESR, 2000). The following table gives the figures for the years 1995 to 2000.

Table 1: Total *Salmonella* Cases By Year In New Zealand[1]:

Year	Total Cases	Rate per 100,000 people (Crude rate based on 1996 Census Population figures)
1995	1334	36.9
1996	1140	31.5
1997	1169	32.3
1998	2069	57.2
1999	2079	57.5
2000	1802	49.8
2001	2275[2]	52.4

Salmonella Typhimurium 160 has emerged as a major source of human gastroenteritis in New Zealand over the last three years. No human cases were identified in New Zealand before 1998. One case was identified in 1998 and one in 1999 before case numbers began to increase steeply from June 2000 onward. *Salmonella* Typhimurium 160 was isolated in one-third of all human Salmonella cases in the year to November 2001. During November 2001, *Salmonella* Typhimurium 160 accounted for almost one-half (47 percent) of all cases (MOH, 2001).

While *Salmonella* Typhimurium 160 was initially limited to one geographic area of the country, the locations of isolation have now spread throughout the country. (Nicol, unknown).

A large number of bird deaths, mainly in sparrows, coincided with the increase in *Salmonella* Typhimurium 160 from humans. The affected birds died quickly from acute septicemia, with no evidence of enteritis. *Salmonella* Typhimurium 160 has also recently been isolated from cats, dogs, sheep, cattle and horses and the poultry environment (Nicol, unknown).

1 Data provided by ESR.
2 Year to December 14

Table 2: Total Number Of *Salmonella* Outbreaks By Year In New Zealand[3]:

Year	Total number of outbreaks	Note
1997	108	Information only from July 1997
1998	313	
1999	361	
2000	289	

Large numbers of sparrow deaths in Canterbury during 2000 were attributed to *Salmonella* Typhimurium 160 infection. Not all birds which get the illness die -- some will remain well and can excrete the bacteria for weeks. The disease can transfer to humans through direct hand contact with bird faeces, eating food with contaminated hands, preparing food with contaminated hands, and contact with infected animals (particularly their faeces). Careful hand hygiene is recommended as a precaution (MOH, 2001).

A national study into an outbreak of illness caused by *Salmonella* Typhimurium phage type 160 (STM160) identified the following risk factors: contact with an individual with diarrhoea in the previous month, or contact with wild birds or their droppings (sometimes through drinking untreated water from domestic roof-collected rainwater supplies). Cases were over four times more likely to have had contact with another individual with diarrhoea or vomiting in the 28 days before they became ill. People who caught salmonella infection were 30 times more likely than well people to have touched wild birds within the three days before the onset of their illness. Some cases had drunk untreated water from domestic roof-collected rainwater supplies in the three days before they became ill. STM160 was found in four of the eight water supplies tested. As STM160 is carried in the gut of birds there is a risk their droppings may contaminate untreated roof water supplies. Eating raw eggs in products like eggnog, raw cake mix or mousse was not associated with STM160 infection but still carries food safety risks and is not recommended (MOH, 2001).

3.2 New Zealand Situation - Specific to eggs[4]:

Table 3: Total *Salmonella* Outbreaks In New Zealand Due To Eggs/Egg Products

Year	Total number of outbreaks	Suspected Source
1995	0	
1996	0	
1997	0	
1998	2	Free range eggs and duck eggs
1999	2	Free range eggs
2000	0	

As part of an outbreak investigation 180 egg samples from Auckland (a total of 918 eggs) were analysed. These were the same brand and purchased from the same supermarkets as those eaten by cases reporting raw egg consumption. *Salmonella* Typhimurium 160 was not found on the surface or inside these eggs. However, other salmonella bacteria were identified on the outside of some eggs (MOH, 2001).

3 Data provided by ESR.
4 Data provided by ESR.

Key Messages to New Zealand Egg Producers:

The above table shows that few outbreaks have definitely been linked to eggs. It must however be remembered that in many instances it is impossible to determine the food vehicle responsible for an outbreak so **there is no room for complacency**.

3.3 Overseas Situation

New Zealand's rates of notified Salmonellosis are compared with those in other countries in the following table.

Table 4: Rates of Notified Salmonellosis per 100 000 People

	New Zealand5	Australia	US	Canada	England and Wales*
1995	36.9	32.65	17.66	21.80	56.78
1996	31.5	31.82	17.15	22.20	56.14
1997	32.3	37.8	15.66	20.10	63.14
1998	57.2	41.07	16.17	23.30	45.96
1999	57.5	38.64			33.96
2000	49.8	31.72			28.75

*Unofficial rates calculated from incidence data from
http://www.phls.co.uk/facts/Gastro/Salmonella/salm.htm
and population data from: http://www.visitbritain.com/facts_figures/pop.htm

Numerous cases and outbreaks of foodborne illness world-wide have been attributed to the consumption of eggs or egg products.

3.3.1 UK Situation

From 1981 to 1991 the UK had more than a 170% rise in the number of reported cases of *Salmonella* in humans. This was mainly due to an increase in infections due to *Salmonella* Enteritidis. Infections in Northern Ireland have dropped since 1987 when the industry improved control of *Salmonella* Enteritidis in their poultry flock (ACMSF, 1993).

Between 1989 and 1991 the Communicable Disease Surveillance Centre received reports of 2767 outbreaks of foodborne infections due to *Salmonella* Enteritidis in England and Wales which were attributed to eggs or foods containing eggs, but not pasteurised egg (ACMSF, 1993). In the years from 1993 to 1998, 41% of the UK's foodborne outbreaks were caused by *Salmonella* Enteritidis. A variety of other *Salmonella* serotypes including Typhimurium accounted for a further 10% of foodborne illnesses. (WHO, 2001). 10% of all outbreaks were associated with the consumption of eggs.

5 Figures are from Table 1 on page C-4.

Since the peak in 1997, laboratory-confirmed cases of human salmonellosis have fallen from nearly 36,400 to just under 17,000, a 53% reduction. The Chairman of the ACMSF was reported as saying "There has been a sustained drop in human *Salmonella* cases since 1997. We believe that this reflects a corresponding fall in the levels of *Salmonella* in eggs. There are reasons for believing that these improvements flow from the widespread vaccination of egg laying flocks against *Salmonella* Enteritidis, combined with improved flock hygiene measures." (ACMSF, 2001). Further studies have been recommended to confirm this.

In 1988 Edwina Currie stated that a large part of the UK egg production flock was infected with *Salmonella*. In a talk to the British Veterinary Poultry Association in 1990, the Chief Veterinary Officer, advanced the view that the abandonment of a requirement for 100% Pullorum testing of parent flocks in the mid 1980s allowed *Salmonella* Enteritidis to get a hold in a few parent flocks which spread the infection around commercial layer flocks. This was relevant as *Salmonella* Enteritidis is a group D salmonella with somatic antigens O:1,9,12. These antigens are shared by *Salmonella* Pullorum and *Salmonella* Gallinarum. (Christensen, 2001).

Key Messages to New Zealand Egg Producers:

In New Zealand layer parent flocks are small in number, and, as most are used for export (unlike the UK situation) Pullorum testing is still carried out. About 30% of *Salmonella* Enteritidis positives will react to a Pullorum test, and with a 100% test of parents, some *Salmonella* Enteritidis positive reactors would be expected if a parent flock were infected with *Salmonella* Enteritidis, and could be further investigated. It is vital that Pullorum testing of parent flocks in NZ be maintained, even if they are not used for export supply. (Christensen, 2001).

3.3.2 USA Situation

The *Salmonella* Enteritidis pandemic that begun in the 1980s led to increased illnesses associated with eggs and egg products (Thorns, 2000). During the years 1988-92, *Salmonella* Enteritidis was responsible for the largest number of outbreaks, cases and deaths reported in the USA (Bean *et al.,* 1997).

24.5% of all *Salmonella* isolates are *Salmonella* Enteritidis. The occurrence of *Salmonella* Enteritidis has increased from 1,207 isolates in 1976 to 10,201 in 1995. Outbreaks and sporadic cases of *Salmonella* infections show an association with the consumption of raw or undercooked eggs. 82% of the *Salmonella* Enteritidis outbreaks were attributed to shell eggs. (*Salmonella* Enteritidis Risk Assessment Team, 1998).

The baseline model for shell eggs used in the FSIS's Salmonella Risk Assessment For Shell Eggs (*Salmonella* Enteritidis Risk Assessment Team, 1998) estimated that:

- 46.8 billion eggs are produced in the US per year
- 2.3 million will contain *Salmonella* Enteritidis
- 661,633 human illnesses per year will be related to the consumption of these eggs
- 94% of people will recover without medical care
- 5% visit a physician
- 0.5% are hospitalised
- 0.05% result in death.

Key Messages to New Zealand Egg Producers:

The makers of Meganvac are currently pursuing Egg Layer claims for the product in the USA. Their first target is a claim for protection against *Salmonella* Enteritidis, but *Salmonella* Typhimurium work is also underway and so far successful. (Personal Communication, Christensen, 2001).

3.3.3 European Situation

In Europe, eggs and food containing eggs have been associated with food-borne illness as shown in the Seventh Report on Surveillance of Foodborne Diseases in Europe 1993-98 (WHO, 2001). Some examples are given below but these are by no means exhaustive.

In **Austria**, the foods most frequently involved in mass catering outbreaks reported to the Austrian Salmonella Centre from 1993-1998 were eggs and egg products, foods containing egg, or salads and dressings.

In **Switzerland** over the same period 69% of outbreaks where the causative agent was identified were due to enteric *Salmonella*, 81% of which were *Salmonella* Enteritidis. All but three of the Enteritidis outbreaks were related to consumption of food containing raw or partly cooked eggs.

In the **Netherlands** *Salmonella* Enteritidis is closely followed by *Salmonella* Typhimurium as a causative agent in human cases of Salmonellosis. It is interesting that in the Netherlands, unlike in many other European countries, eggs and egg products are not the most prevalent food vehicle for foodborne disease.

In **Sweden** the situation is better still. Of the 4308 cases of Salmonellosis reported in 1998, all but 452 of these were thought to have been acquired abroad. None of the outbreaks were related back to eggs.

In **Norway** the incidence of salmonellosis infections is at 34.7 per 100,000 people. Of these, 54.3% were due to *Salmonella* Enteritidis and 15.4% due to *Salmonella* Typhimurium with a number of other serotypes making up the rest of the isolations. Of the total, 85-94 % were acquired abroad. Only 0.6% of outbreaks were attributed to eggs.

In **Finland** the incidence of Salmonella infections was quite high at 53.8. Again most of these were acquired abroad. In 1998 *Salmonella* Enteritidis made up over a third of the serotypes isolated with *Salmonella* Typhimurium the next most prevalent. Only 1.1% of outbreaks were attributed to eggs or egg products.

Key Messages to New Zealand Egg Producers:

This section has shown that a number of countries have a problem with food-borne illnesses due to eggs. New Zealand is lucky that its isolation and good biosecurity measures have helped in this regard but **there is no room for complacency**.

4. Biological Hazards

The egg production environment cannot be made sterile, so it is important to understand how eggs can be contaminated, so that this can be minimised throughout the production and packing processes.

Layer hens become infected with bacteria in three main ways:
- by transmission between and within flocks;
- by the consumption of contaminated feed or water;
- through the environment.

Eggs become contaminated by bacteria:
- as the egg is formed - by infection through the ovaries of the layer hen (trans-ovarian) or
- after the egg is formed (during or after lay) – by entering through the shell (trans-shell) (Bruce and Drysdale, 1994).

Trans-Ovarian Infection

Infection of the ovaries can result in transfer of salmonellae to the yolk, while infection of the oviduct can result in contamination of the albumin. Any contamination occurs prior to the formation of the egg shell and shell membranes (Barnhart *et al*., 1991). Trans-ovarian infection has been associated with *Salmonella* Pullorum, *Salmonella* Gallinarum, and *Salmonella* Enteritidis. The first two species impact on animal health and the third on human health (Stanley and Baquar, 1994).

Prior to the emergence of *Salmonella* Enteritidis, there was a serious outbreak of salmonellosis in Sheffield due to transovarial transmission of *Salmonella* Typhimurium (Phage Type 141) (Chapman *et al*, 1988). *Salmonella* Typhimurium can on rare occasions be transmitted in this fashion (Christensen, 2001).

Although *Salmonella* Enteritidis infections via the transovarial route (in the egg) are important epidemiologically, transmission on the outside of the egg is probably numerically more important with SE infected flocks (Christensen, 2001).

Trans-Shell Infection

The bird's intestinal, urinary and reproductive tracts share a common opening so the outside surface of the newly formed egg is contaminated with a variety of enteric microorganisms. This is the most common route of contamination for salmonellae other than *Salmonella* Enteritidis. (ICMSF, 1998). Pathogenic and spoilage bacteria may also be transferred onto the egg shell by contact with faeces, nesting material, dust, feed, humans etc.

When a healthy hen lays an egg, the hen's bearing (labelled vagina in fig 1) everts beyond the alimentary tract. This protects the emerging egg from faecal contamination. Also, the stretching of the cloacal lining effectively makes the alimentary opening somewhat slit-like further reducing the opportunity for contamination of egg shells. This is why most egg shells in healthy birds are not covered in faeces. If the bird is suffering from enteritis leading to diarrhoea, this arrangement is less effective at preventing shell contamination (Christensen, 2001).

Key Messages to New Zealand Egg Producers:

This means that egg producers need to keep the hens healthy, and any egg-contact surfaces as clean as possible.

Figure 1: Possible Routes of Infection for Salmonellae Into the Hen's Egg

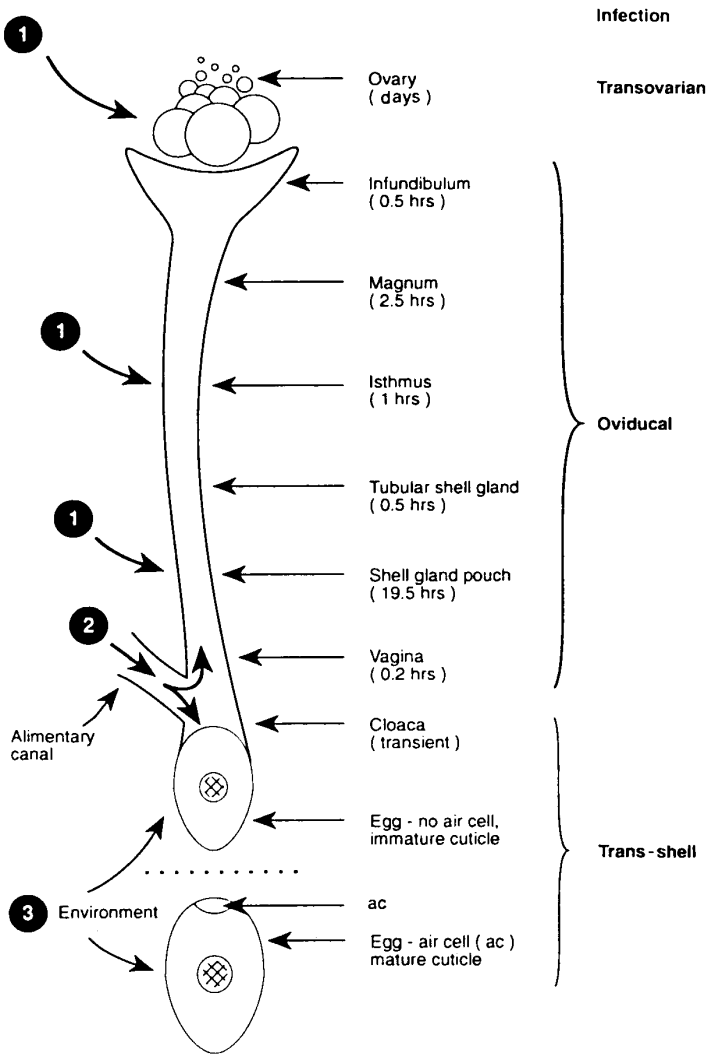


FIGURE 8.5. Possible routes of infection for salmonellae into the hen's egg. **1**, Via the bloodstream and (a) the ovary to the yolk, or (b) through the oviduct wall into the albumen or the membranes before shell formation. **2**, From the intestines via the cloaca up the oviduct or in the cloaca (through the shell). **3**, Through the shell from the environment, especially before the cuticle has matured. (Reproduced by kind permission of Professor R. G. Board.)

Figure ex (Mossel *et al*, 1995)6

6 Contrary to how it is depicted in the diagram, when an egg is laid, the blunt end comes out first.

It takes approximately 2 weeks for each egg to be formed. This includes secretion of egg white to surround the yolk, followed by formation of the shell membrane and the shell itself. Several of the egg's structures protect it from penetration by microorganisms. In decreasing order of importance they are: cuticle, inner membrane, shell, outer membrane (Lifshitz *et al*., 1964). Cracks that penetrate the inner membrane enable spoilage and pathogenic bacteria to enter the egg. If the shell is very dirty, microorganisms are likely to penetrate the egg sooner and in greater numbers (Rosser, 1942; Hartung and Stadelman, 1963).

Table 5: Eggs Structures and Their Role in Defence Against Microorganisms

Egg structures	Description
Cuticle	• A coating, made largely of protein, on the exterior of the shell that protects the egg for at least 4 days if undamaged. • After 4 days it begins to fail, probably due to cracking as it dries out. • It is permeable to gases. • Fairly resistant to water and detergents but damaged by abrasion.
Shell	• Mostly calcium carbonate. • If undamaged and dry, this will usually keep an egg edible for many months even when stored at room temperature. • Porous, permeable to gases. • Potential for bacteria to invade after cuticle dries up or is washed away.
Outer Coarse Membrane	• This is porous and does not provide a barrier to microbial entry.
Inner Fine Membrane	• This has a fine structure with few pores which delays bacterial entry for a few days. • Also protects against moulds.
Outer Thin White	• Has an alkaline (high) pH that helps to control the growth of most bacteria.
Thick White	• Contains antimicrobial components that make it an antagonistic medium for microbial growth. These include Lysozyme and conalbumin.
Inner Thin White	• Has a high pH.
Chaliziferous Layer	• This is a very dense but very thin layer of albumen. • It ends in the chalaza cords which anchor the yolk in the egg's centre, thus protecting the yolk from damage.
Vitelline membrane	• This encloses the yolk.
Yolk	• As rapidly perishable as milk.
Air chamber (sac)	• Created by evaporation of water reducing the volume of the contents. • Formed between the inner and outer membranes at the blunt end of the egg. • Temperature reduction causes the air sac to contract, resulting in negative pressure. The quicker the drop the greater the pressure differential between the interior and exterior of the egg. As the temperature differential equalises, water and bacteria are aspirated through the shell and become trapped at the surface of the inner membrane.

The table was adapted from information given in ICFMS 1998.
Egg white is also known as Albumen.

Figure 2: Structure of an avian egg

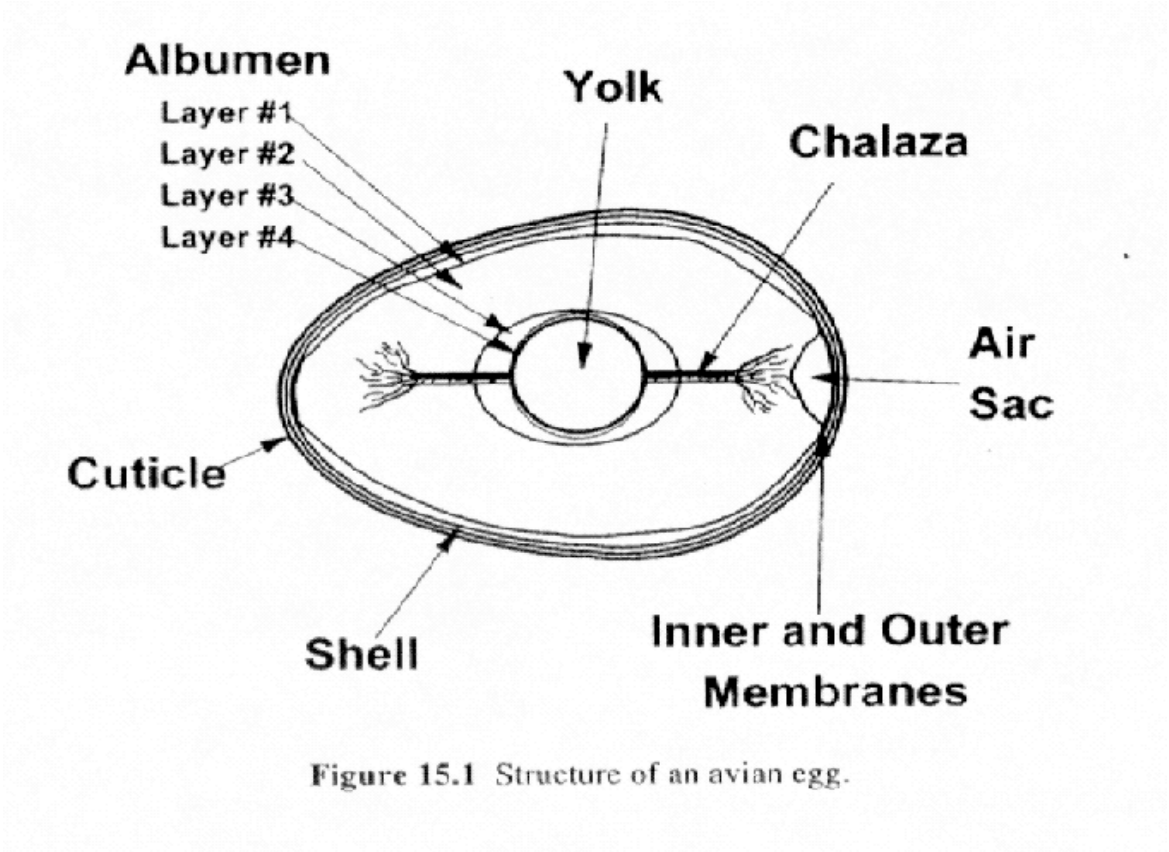


Figure ex (ICMSF, 1998)

4.1 Salmonella

Key Messages to New Zealand Egg Producers:

Salmonella has caused major problems for the egg industries in the UK and the USA. In both countries the government/and or the industry has introduced new requirements to control this bacteria. The costs to the industry of new labelling, storage, hygiene and vaccination programmes have been significant.

Where a reference has not been specifically given the information on this page has been adapted from the "Bad Bug Book" (USFDA CFSAN, 2000).

Salmonella is a bacterium found in animals, especially in poultry and swine. Environmental sources of the organism include water, soil, insects, factory surfaces, kitchen surfaces, animal faeces, raw meats, raw poultry, and raw seafood, to name only a few.

Salmonellae grow at temperatures between 2 – 45.6°C with optimum growth at 35-37°C. The pH range for growth is 4 to 9.5. Minimum water activity for growth and survival is 0.93. (Canadian Food Inspection Agency, 1998).

There are about 2,000 different Salmonella organisms. These are classified by the protein antigenic types that make up their cell walls ("O" antigens) and flagella ("K" antigens). They can be further classified by phage typing.

Table 6: Main Species of Salmonellae Associated with Eggs

Species	Phage Types	Impact
typhimurium	42, 46	Most common serotype isolated from animals in New Zealand. (Midwinter 1999).
	44, 170, 179, 185	Reported from Australia. Some isolates resistant to antibiotics.
	12, 104, 170, 193, 195, 208	Reported from the UK. Many isolates resistant to antimicrobial agents
	DT 104	Causes disease in many species of animals including humans. Considered to be an emerging pathogen. Resistant to 5 commonly used antibiotics (ampicillin, chloramphenicol, streptomycin, sulfonamides and tetracycline). Rare in NZ.
enteritidis	4	Trans-ovarian so can be passed from infected layer hen to egg. Most common phage type associated with egg-borne outbreaks in UK and USA.
	6, 8, 9a, 13, 13a	Trans-ovarian
gallinarum		Trans-ovarian Affects animal health – Fowl typhoid
pullorum		Trans-ovarian Affects animal health – Pullorum disease

Table 7: Food-borne illness Associated with Salmonellae

Acute symptoms:	Nausea, vomiting, abdominal cramps, diarrhoea, fever, and headache.
Chronic consequences:	May get arthritic symptoms 3-4 weeks after onset of acute symptoms.
Onset time:	6-48 hours.
Infective dose:	As few as 15-20 cells; depends upon age and health of host, and strain differences among the members of the genus.
Duration of symptoms:	Acute symptoms may last for 1 to 2 days or may be prolonged, again depending on host factors, ingested dose, and strain characteristics.
Associated Foods:	Raw meats, poultry, eggs, milk and dairy products, fish, shrimp, frog legs, spices, yeast, coconut, sauces, salad dressing, cake mixes, cream-filled desserts and toppings, dried gelatin, peanut butter, cocoa, and chocolate. Various *Salmonella* species have been isolated from the outside of egg shells.

The egg is not an ideal environment for growth of salmonellae. It has been found that most salmonellae do not grow in eggs below 10°C (ICMSF, 1998). Despite the egg's defensive qualities, salmonellae are the most important human pathogen carried by eggs. *Salmonella* Typhimurium was previously the species most often implicated in egg-associated outbreaks but in many countries *Salmonella* Enteritidis is now the species of concern.

4.1.1 New Zealand Situation

Total results (not necessarily egg related):

In New Zealand the Environmental and Science Research Limited-Communicable Disease Centre (ESR-CDC) acts as the *Salmonella* reference laboratory. Isolates from many New Zealand laboratories, including MAF's Animal Health Laboratories, are sent there for typing (Carman and Gardner, 1997).

4.1.1.1 Salmonella Typhimurium

The phage types for which antibiotic resistance has been recorded overseas are uncommon or absent in specimens submitted to the Animal Health Laboratories. (Midwinter, 1999). The following phage types have been isolated in 1995 and 1996 from cattle, sheep, other livestock and miscellaneous sources including cats, dogs, birds and possums by the Animal Health Laboratories: 1, 8, 9, 12a, 23, 26, 41, 42, 60, 80, 101, 126, 135, 149, 154, 155, 156, 193, 197, 205. Phage type 104 was not isolated in these years and was less than 0.3% of non-human *Salmonella* Typhimurium isolates in 1994. (Midwinter 1999).

Salmonella Typhimurium phage type 160 has been isolated from sparrows in New Zealand (MOH, 2001). Chickens (broilers at least) are relatively resistant to the effects of *Salmonella* Typhimurium phage type 160, compared with other birds, such as young turkeys, pheasants and quail that suffer quite high mortality. Chickens are more likely to become sub-clinically infected (Christensen, personal communication, 2001). Apramycin has proved effective in halting mortality. Meganvac1 vaccination is registered for poultry in New Zealand. As a live vaccine that is applied to the birds by eye drop or coarse spray, it is a non-invasive and effective means of protecting at-risk populations. The source of the *Salmonella* Typhimurium phage type 160 was found to be contaminated shavings (Christensen, Unknown).

In New Zealand *Salmonella* Brandenburg has historically been isolated from small numbers of humans and a range of domestic animals. However in 1996, a unique strain of *Salmonella* Brandenburg was diagnosed as the cause of sheep abortions in mid-Canterbury. It causes ewes in late pregnancy to become very dull and fevered, they abort and occasionally they develop severe diarrhoea. If the ewes are not treated immediately with broad spectrum antibiotics they die. Since then, the disease has spread south. Cases of abortion in cattle were first diagnosed in 1998 and are now increasing. This strain has not been isolated from animals in the North Island. Why it has not progressed north of Canterbury to date is not clear at this stage. The flare-up of *Salmonella* Brandenburg in South Island sheep flocks during the past four years is mainly an animal health problem to this point, but there have been human cases (mainly people working with affected stock) (MAF, 1998; MAF, 2001).

If *Salmonella* Brandenburg should appear in meat and bone meal, this would have implications for feed, and therefore indirectly for egg production.

4.1.1.2 Salmonella Enteritidis

Salmonella Enteritidis is present in New Zealand and has been recovered from a range of domestic species, (cattle, sheep, goats, deer and dogs) as well as humans. It has also been isolated from a suburban hedgehog (*Erinaceus europeus*), from environmental sources, once from poultry feed, and from imported products such as prawns and spices (Carman and Gardner, 1997).

Salmonella Enteritidis appears to be increasing in New Zealand. Initially only sporadic isolates were recovered, e.g. one in 1985 (from cattle), one in 1988 (from cattle), and two in 1990 (one from a sheep and the other from sewage sludge). To put this into perspective, the ESR-CDC handled 610 poultry and 943 other domestic animal *Salmonella* isolates between 1988 and 1990. Only the two animal isolates referred to above were *Salmonella* Enteritidis (Carman and Gardner, 1997).

From about 1990 the situation began to change. Isolates of *Salmonella* Enteritidis began to appear more frequently in both humans and animals. By 1994 there had been 32 isolations of *Salmonella* Enteritidis from domestic animals, 27 of these were from cattle. The number of isolates in 1994 was double that of the previous year. Human isolates remained in the 10-20 range between 1985 and 1989, but by 1994 had risen to around 150. However, the percentage of all *Salmonella* isolates from humans that are *Salmonella* Enteritidis appears to be fairly constant in New Zealand at 6.5%. This situation contrasts with the United Kingdom and United States where 21-71% of human *Salmonella* isolates are *Salmonella* Enteritidis (Carman and Gardner, 1997).

Phage typing of New Zealand animal isolates began in 1986 and most have been phage type 9A. One bovine isolate in each of 1988, 1991 and 1992 was phage type 4. Phage type 4 has only been recovered from a few human patients who acquired their infections overseas. Occasional other phage types have been isolated, including phage type 26 from shellfish and effluent and assorted other phage types from humans (Carman and Gardner, 1997).

Key Messages to New Zealand Egg Producers:

Salmonella Enteritidis is present in New Zealand. This is a concern, given the problems that it has caused egg producers overseas.

4.1.1.3 Poultry and Eggs

A survey of New Zealand egg producers showed that 12 out of 15 respondents have tested for *Salmonella* as part of their routine quality assurance programmes, some for as long as 7 years. Samples included whole shell eggs, eggs without shell, feed, and swabs from the laying shed. All eggs tested have been negative for *Salmonella*. 4 respondents also tested for *Salmonella* Enteritidis and none has been detected. Most feed and swab samples were negative for *Salmonella* but there have been occasional positive results. This indicates that there could be a low likelihood that eggs will be contaminated with *Salmonella* from these sources. It must be remembered that the survey was not statistically based so responses are not necessarily typical of the New Zealand situation. The survey was done only to get some rapid indicative data. Any sampling that is done to support validation and ongoing testing programmes should

be set up in a statistically sound manner. The following sampling plan will detect *Salmonella* Enteritidis-infected flocks with approximately 95% confidence that the flock contains no *Salmonella* Enteritidis birds:

Flock Size	**No. birds**	**Eggs after 5% production level achieved**
Less than 40 birds	Test all birds	First 40 eggs
40 to 120 birds	Test all birds	First 80 eggs
120 to 300 birds	Test 120 birds	First 100 eggs
300 to 500 birds	Test 150 birds	First 125 eggs
More than 500 birds	Test 175 birds	First 150 eggs

Figures ex Table 11, Healthy Free Range Hens, Christensen, 1995.

The emergence of *Salmonella* Enteritidis infection in New Zealand is evident records from the MAF Animal Health Laboratory and the Institute of Environmental Science and Research's Communicable Disease Centre (ESR-CDC) since 1985. To date, *Salmonella* Enteritidis has not been recovered from poultry products or eggs (Carman and Gardner, 1997). *Salmonella* Enteritidis has never been isolated from commercial poultry or from any other avian species in New Zealand (O'Neil, 1998).

Unlike overseas, New Zealand does not have any evidence that *Salmonella* Enteriditis phage type 4 is in the poultry food chain (MAF, 1997). New Zealand has a unique and superior animal health status in its poultry flocks. There are several exotic poultry diseases and food poisoning organisms that are present in overseas countries but not in New Zealand.

Key Messages to New Zealand Egg Producers:

This shows that even though we do have *Salmonella* Enteritidis in New Zealand, it has not yet been associated with eggs. **This is a status worth protecting.**

***Salmonella* Pullorum**

Pullorum disease is only relevant for animal health. It has not been recorded in New Zealand since 1985 as shown by serological monitoring of commercial breeder flocks (MAF, 1997). *Salmonella* Pullorum, the causative agent of pullorum disease (also known as bacillary white diarrhoea), can be transmitted in eggs layed by adult birds without symptoms that carry the organism. They can also contaminate feed, water and the environment with their faeces. The oral infective dose for humans is high so the public health significance is low.

4.1.1.4 Salmonella Gallinarum

Salmonella Gallinarum causes fowl typhoid, but is exotic to New Zealand. If it did enter New Zealand, it would only be of relevance as a hazard to animal health. (MAF, 1997).

4.1.2 Overseas Situation

Salmonella Enteritidis

The incidence of *Salmonella* contamination of shell eggs from hens varies, but salmonellae have been detected at a level of 6 contaminated eggs per thousand eggs from flocks infected with *Salmonella* Enteritidis (Humphrey *et al*, 1991). Internal contamination of the intact eggs can occur before or after the shell has been formed.

Egg production in flocks infected with *Salmonella* Enteritidis may not be adversely affected. Subclinical infections also do not result in a decrease in fertility. Not all birds in an infected layer flock will excrete the pathogen, and the proportion of infected eggs that are laid varies. Most studies show the percentage to be below 3%. One study had the incidence as high as 19% (ICMSF, 1998).

Salmonella Enteritidis can cause mortality in young chicks, but rarely causes clinical disease in adult birds. It can infect internal organs, including the ovaries and oviduct (ACMSF, 1993).

Humphrey *et al* 1991, found that the contents of 32 (0.6%) of 5700 eggs were positive for *Salmonella* Enteritidis and not for any other serotype, even though *Salmonella* Enteritidis, *Salmonella* Hadar and *Salmonella* Typhimurium were also isolated from the shell. They also found that of 1952 eggs tested, 21 were positive for *Salmonella* Enteritidis on the shells and 18 in the contents. In most cases *Salmonella* Enteritidis was found more frequently in the albumen but at a much lower number than in the yolk. The albumen's natural defences minimise the growth of these bacteria. The protein-rich yolk provides a better environment for their growth. In eggs stored for longer than 14 days, the yolk's membrane starts to deteriorate and the yolk's constituents move into the albumen. This provides food to support growth. *Salmonella* Enteritidis that is already inside the egg is likely to multiply faster than Salmonellae that have to migrate through the shell to the yolk.

In a number of countries, *Salmonella* Enteritidis phage type 4 is controlled by, the eradication of infected flocks, or the pasteurisation of eggs from infected flocks. This can also be accompanied by consumers education about correct cooking of eggs.

4.1.3 Australian Situation

Until recently, most human cases of *Salmonella* Enteritidis in Australia were believed to have been acquired overseas, where *Salmonella* Enteritidis is closely linked to the poultry industry. Over Easter 2000, four human cases of *Salmonella* Enteritidis phage type 4 occurred in Tasmania. Two of the human cases were linked but the other two cases had no obvious links. There were no further human cases reported and a check with other states did not reveal any cases with links to Tasmania.

No connection was established between the human *Salmonella* Enteritidis phage type 4 cases and any Tasmanian or Australian poultry farm or product. *Salmonella* Enteritidis, which has tentatively been identified phage type 1, was recovered from environmental drag swabs on a poultry farm in southern Tasmania. This farm was investigated after a traceback from the

human cases. While *Salmonella* Enteritidis was not isolated from the poultry on the farm it was assumed that the birds were infected. As the *Salmonella* Enteritidis isolated from the suspect farm was a different phage type to the human cases this broke the link between the two events. It is unknown where the infection on the suspect farm came from, or if *Salmonella* Enteritidis was present in other layer flocks.

Export certification for poultry and poultry products relies to some extent on the ability to certify freedom from *Salmonella* Enteritidis, as do import restrictions on poultry products entering Australia. As *Salmonella* Enteritidis had not previously been detected in a poultry flock there was no agreed strategy for the control of the infection.

At this time, Tasmania was not involved in overseas export of poultry products and had only limited interstate trade. The DPIWE, DHHS and representatives of the Tasmanian layer industry proposed a response to address human health concerns from a Tasmanian perspective including:

- Development of a cold chain for the product, from production to consumption, to reduce the risk of multiplication of potentially pathogenic organisms. This required development of cold storage on farm, transportation in insulated vehicles, refrigeration at retail outlets, and on carton advice about refrigeration.
- On-farm Quality Assurance / HACCP program targeted at food safety on farms.
- Industry were advised to source birds only from accredited *Salmonella* Enteritidis-free flocks (at the time only New South Wales could provide this).
- A drag swab survey of the layer industry was to be conducted to determine the extent of the problem. If *Salmonella* Enteritidis was detected then birds were to be sampled.
- Carton date marking.
- Media releases were made containing general consumer advice about the need to refrigerate and properly cook eggs.
- High risk outlets (institutions) receiving eggs from the suspect farm were directly targeted by DHHS with appropriate advice.

Key Messages to New Zealand Egg Producers:

The key message here is that this is close to home. It could happen in New Zealand. Again prevention is better than cure.

4.1.4 UK Situation

Prior to the 1980s, *Salmonella* Typhimurium was the species of salmonellae that was implicated in most egg-associated food poisoning outbreaks. In the UK more than 80% of the *Salmonella* Typhimurium isolates from animal sources were phage type 104 (Midwinter 1999).

Salmonella Enteritidis came into prominence in Britain in the late 1980s due to outbreaks of human disease associated with eggs and poultry products. Shell eggs have been implicated as one of the food vehicles that may be responsible for transmission of the organism. By 1987 the associated publicity had resulted in enormous economic damage to the poultry industry (Carman and Gardner, 1997).

Since the 1980s, *Salmonella* Enteritidis was increasingly isolated from poultry and eggs. There was also a sharp increase in human salmonellosis associated with the consumption of foods containing raw or undercooked eggs (ICMSF, 1998).

One in 650 British eggs are positive for Salmonellae and 1 out of 880 for *Salmonella* Enteritidis. One out of 370 eggs imported into the UK were found to be contaminated with *Salmonella* and one out of 2,720 with *Salmonella* Enteritidis. (ACMSF, 1993).

Salmonella Enteriditis phage type 4 is now the most common salmonella serotype associated with food borne infections. A survey of eggs destined for retail sale showed a contamination rate of 0.04 – 0.11% for *Salmonella* Enteritidis. Only 0.03-0.08% were of Phage Type 4 (de Louvois, 1993). This low level was probably due to the fact that eggs from positive flocks were mixed with eggs from negative flocks so the overall incidence was very small.

The following recommendations were made by the Chief Medical Officer to reduce the risk of human Salmonellosis from eggs (ACMSF, 1993):

- No-one should eat raw eggs.
- Vulnerable groups should eat only eggs that have been cooked until both the white and yolk are solid.
- Eggs should be used within 3 weeks of lay and "use-by" dates should be provided on egg packs and possibly on eggs.
- Eggs should be kept at a constant temperature during storage, transport and retailing and should never exceed 20°C.
- Once purchased, eggs should be stored in a refrigerator.
- Pasteurised eggs should be substituted in raw or lightly cooked egg dishes.

In England and Wales in 1999 there was a 34% fall in the incidence of Salmonellosis from figures in 1998. The 1999 result was the best since 1986 (Editors, 2000). This was attributed as possibly being due to:

- Improvements in food hygiene, and
- Vaccinations of poultry flocks.

Key Messages to New Zealand Egg Producers:

The experience gained in the United Kingdom for control of *Salmonella* in eggs demonstrates that a risk management programme with appropriate controls[7] will also be beneficial to egg safety and industry security in New Zealand.

7 In New Zealand there are no *Salmonella* vaccines registered for use in layer hens. Currently Meganvac 1 (ARB 7935) is registered for use in broilers, and has been used in breeders and layer hens. It has also been successfully used to protect a variety of poultry species (turkeys, quail, ducks, pheasants) against clinical infection with *Salmonella* Typhimurium PT160. The vaccines used in Europe are killed oil emulsion vaccines, whereas Meganvac is an attenuated live vaccine. Killed vaccines produce largely humoral (circulating) antibodies, whereas live vaccines produce a full range of immune responses including the important cell mediated responses, which are vital in protecting hens against intestinal colonisation. Humoral antibodies play some role in protection where the bacteria are in the blood (i.e. *Salmonella* Enteritidis) but not in the enteric infections currently important in New Zealand.

4.1.5 European Situation

The Seventh Report of the World Health Organisation Surveillance Programme for Foodborne Diseases in Europe, 1993-98, reported that salmonellae caused most foodborne infections in the majority of European countries. *Samonella* Enteritidis was the most commonly reported serotype. (WHO, 2001).

Key Messages to New Zealand Egg Producers:

The food-borne illness data in section 3.3.3 shows that there is a huge difference in the number of illnesses linked to eggs in different countries. The reasons for this have not been stated but may be due to the prevalence of *Salmonella* Enteritidis in the national poultry flocks.

4.1.6 USA Situation

The Centers for Disease Control (CDC) has recorded more than 120 outbreaks of *Salmonella* Enteritidis to date, many occurring in restaurants, and some in nursing homes, hospitals and prisons. In August and September, 1985, *Salmonella* Enteritidis was isolated from employees and patrons of restaurants of a chain in Maryland. The outbreak in one restaurant included at least 71 illnesses, resulting in 17 hospitalisations. Scrambled eggs from a breakfast bar were implicated in this outbreak.

The CDC estimates that 75% of *Salmonella* Enteritidis outbreaks are associated with the consumption of raw or inadequately cooked Grade A whole shell eggs. The U.S. Department of Agriculture published Regulations on February 16, 1990, in the Federal Register establishing a mandatory testing program for egg-producing breeder flocks and commercial flocks implicated in causing human illnesses. This testing was expected to lead to a reduction in cases of gastroenteritis caused by the consumption of Grade A whole shell eggs.

During 1976-1994, the proportion of reported Salmonella isolates that were *Salmonella* Enteritidis increased from 5% to 26%. CDC surveillance data show that the rate if isolation of *Salmonella* Enteritidis has increased from 0.5 to 3.9 per 100,000 population during the period from 1976 to 1994. In the 1980s, the main phage types in the United States were 8 and 13. Subsequently phage type 4 was detected (Carman and Gardner, 1997). During 1985-1995, state and territorial health departments reported 582 *Salmonella* Enteritidis outbreaks, which accounted for 24,058 cases of illness, 2290 hospitalizations, and 70 deaths. Grade A whole shell eggs or foods that contained raw or undercooked eggs were found to be a major source of *Salmonella* Enteritidis human infections in the United States (ACMSF, 1993).

Several outbreaks of *Salmonella* Enteritidis infection associated with the consumption of raw shell eggs in the United States from 1994 to 1995 were reported in the CDC's National *Salmonella* Surveillance System (CDC, 1996). Four outbreaks were linked to hollandaise sauce prepared with raw eggs, eggs prepared for breakfast at a nursing home (where 3 people died as a result), Caesar salad dressing made with raw eggs and a Jamaican malt drink prepared with raw eggs. These examples indicate that outbreaks of egg-associated *Salmonella*

Enteritidis infections remain a public health problem in the United States. The case-fatality rate in institutions was 70 times higher than in outbreaks in other settings. This underscores the importance of using pasteurised egg products for all recipes requiring pooled, raw, or undercooked shell eggs for the institutionalised elderly and other high-risk populations.

It is estimated that 2 to 4 million cases of Salmonellosis occur in the United States annually. The incidence of *Salmonella* Enteritidis increased 6 fold from 1976 to 1990 in the north-eastern United States (Rodriguez *et al*, 1990). The increase in human infections is spreading south and west, with sporadic outbreaks in other regions (USFDA CFSAN, 2000). The Northeast of the USA has shown a decrease in isolations from 1990-1994 over the period that increased egg quality assurance efforts have been implemented. (USDA, 1999c).

2.3 million of 46.8 billion shell eggs produced annually in the United States are infected with *Salmonella*. The USDA and the FDA are considering requiring sell by dates on fresh eggs, controlling truck temperatures and tracking *Salmonella* among flocks nationwide (Reuters, 1999). Approximately one in every 20,000 eggs is infected with *Salmonella* Enteritidis, a significant source of food poisoning since the 1980s. A peak of 3.6 cases for every 100,000 people was reached in 1996. By 1998 the rate had dropped to 2.2 cases per 100,000 (Brasher, 2000).

Key Messages to New Zealand Egg Producers:

The overseas data clearly shows that *Salmonella* Enteritidis is a major hazard to egg safety in many countries. Visitors from overseas and New Zealanders travelling overseas may bring *Salmonella* Enteritidis infections back into New Zealand. The fact that this bacterium has already been detected in New Zealand, though not from eggs, suggests that there is a potential risk of this bacterium becoming established in New Zealand. It is recommended that New Zealand egg producers consider implementing relevant controls (perhaps some of those used by other countries, particularly the UK and USA) to minimise the risk of *Salmonella* Enteritidis becoming established in the New Zealand egg production sector.

4.2 Campylobacter jejuni

Where a reference has not been specifically given the information on this page has been adapted from the "Bad Bug Book" (USFDA CFSAN, 2000).

Campylobacter jejuni is recognised as a major source of foodborne illnesses, usually associated with the consumption of contaminated raw milk, undercooked meat or undercooked poultry products.

Campylobacter jejuni is a relatively fragile bacterium which is sensitive to environmental stresses (e.g., 21% oxygen, drying, heating, disinfectants, acidic conditions). *Campylobacter jejuni* is often isolated from healthy cattle, chickens, birds and even flies. It is sometimes present in non-chlorinated water sources such as streams and ponds.

Table 8: Food-borne illness Associated with *Campylobacter jejuni*

Symptoms:	*Campylobacter jejuni* infection causes diarrhoea, which may be watery or sticky and can contain blood and white cells. Other symptoms often present are fever, abdominal pain, nausea, head ache and muscle pain.
Onset time:	Illness usually 2-5 days after ingestion of contaminated food or water.
Infective dose:	This is considered to be small. Human feeding studies suggest that about 400-500 bacteria may cause illness in some individuals, while in others, greater numbers are required.
Duration of symptoms:	Illness generally lasts 7-10 days, but relapses are not uncommon (about 25% of cases). Most infections are self-limiting and are not treated with antibiotics. However, treatment with erythromycin reduces the length of time that infected individuals shed the bacteria in their faeces.
Complications:	These are relatively rare, but include reactive arthritis, haemolytic uremic syndrome, and following septicemia, infections of nearly any organ. The fatality rate for *Campylobacter jejuni* infections is 0.1, i.e. one death per 1,000 cases (usually occurs in debilitated patients). Only 20 reported cases of septic abortion induced by *Campylobacter jejuni* have been recorded in the literature. Meningitis, recurrent colitis, acute cholecystitis and Guillain-Barre syndrome are very rare complications.
Associated Foods:	*Campylobacter jejuni* frequently contaminates raw chicken (not surprising as many healthy chickens carry these bacteria in their intestinal tracts). Raw milk and non-chlorinated water may also be a source of infections.

4.2.1 NZ Situation

In New Zealand, *Campylobacter* infections accounted for 67% of reported gastrointestinal illnesses from all sources. (NZCDC, 1989). In the 12 months up to and including May 2001 there have been 524 cases of campylobacteriosis at a rate of 222.4 cases per 100,000 people (ESR, 2001). The presence of the organism in or on eggs in New Zealand is currently unknown.

4.2.2 Overseas Situation

Campylobacter jejuni is the leading cause of bacterial diarrhoea in the U.S.A. Potential sources of *Campylobacter* are flies, wild birds, rodents, water or contaminated equipment. (FSIS, 1999). Laying flocks are frequently infected with *Campylobacter jejuni* but when infected birds lay eggs the surface of the egg shells are rarely positive. When the organism is present it dies off rapidly under normal egg storage conditions. It is therefore unlikely that *Campylobacter* is transmitted via eggs (ICMSF, 1998).

Key Messages to New Zealand Egg Producers:

The ICMSF data suggests that Campylobacter is unlikely to be a hazard to egg safety. There is no evidence to suggest that it would be any different in New Zealand.

4.3 Listeria monocytogenes

Where a reference has not been specifically given the information on this page has been adapted from the "Bad Bug Book" (USFDA CFSAN, 2000). Listeria is a bacterium. Some studies suggest that 1-10% of humans may be intestinal carriers of *Listeria monocytogenes*. It has been found in at least 37 mammalian species, both domestic and feral; at least 17 species of birds; some species of fish and shellfish; soil, silage, and other environmental sources. It is quite hardy and resists the deleterious effects of freezing, drying, and heat remarkably well for a bacterium that does not form spores. Most *Listeria* are pathogenic to some degree.

Table 9: Food-borne illness Associated with *Listeria monocytogenes*

Symptoms of Listeriosis:	Septicemia, meningitis, encephalitis, and intrauterine or cervical infections in pregnant women, which may result in spontaneous abortion (2nd/3rd trimester) or stillbirth.
Onset time:	The above disorders are usually preceded by influenza-like symptoms including persistent fever. It was reported that gastrointestinal symptoms such as nausea, vomiting, and diarrhoea may precede more serious forms of listeriosis or may be the only symptoms expressed. The onset time to serious forms of listeriosis is unknown but may range from a few days to three weeks. The onset time to gastrointestinal symptoms is unknown but is probably greater than 12 hours.
Infective dose:	Unknown but believed to vary with the strain and susceptibility of the victim. Fewer than 1,000 total organisms may cause disease.
Complications/ Mortality:	The 1987 incidence data collected by CDC suggests that there are at least 1600 cases of listeriosis with 415 deaths per year in the U.S. The vast majority of cases are sporadic, making epidemiological links to food very difficult. Most healthy persons probably show no symptoms. When listeric meningitis occurs, the overall mortality may be as high as 70%; from septicemia 50%, from perinatal/neonatal infections greater than 80%. In infections during pregnancy, the mother usually survives.
Susceptible persons:	• pregnant women/fetus - perinatal and neonatal infections; • persons with defective immune systems due to corticosteroids, anticancer drugs, graft suppression therapy, AIDS; • cancer patients - leukemic patients particularly; • less frequently reported - diabetic, cirrhotic, asthmatic, and ulcerative colitis patients; • the elderly; • normal people--some reports suggest that normal, healthy people are at risk, although antacids or cimetidine may predispose.
Associated Foods:	*Listeria monocytogenes* has been associated with such foods as raw milk, supposedly pasteurised fluid milk, cheeses (particularly soft-ripened varieties), ice cream, raw vegetables, fermented raw-meat sausages, raw and cooked poultry, raw meats (all types), and raw and smoked fish. Its ability to grow at temperatures as low as 3°C permits multiplication in refrigerated foods.

4.3.1 NZ Situation

The presence of the organism in or on eggs produced in New Zealand is currently unknown.

4.3.2 Overseas Situation

Listeria monocytogenes can be isolated from poultry flocks and the birds' immediate environment. It is likely that Listeria is present on the shells of freshly laid eggs. (ICMSF, 1998). Listeriosis has been observed in chickens and at least 22 other avian species such as turkeys, ducks, geese and pheasants. Sporadic cases are often accompanied by shedding of *Listeria monocytogenes* in faeces but without any symptoms (Ryser and Marth, 1991).

No cases of foodborne illnesses due to Listeriosis traceable to eggs were firmly documented over a 40-year period. There was however one outbreak tentatively linked with eggs. (Ryser and Marth, 1991). Listeria is able to survive on eggs stored at 5°C for 90 days. This indicates that eggs may be a potential vehicle for Listeria related food poisoning – especially from cracked eggs. Some studies have shown that the virulence of *Listeria monocytognes* increases when it is grown at low temperatures (Ryser and Marth, 1991).

Urbach and Schabinski (1955) found that numbers of *Listeria monocytognes* in whole shell eggs increased nearly six-fold during 10 days of storage at ambient temperature. Another study found that growth of *Listeria monocytogenes* was mainly in the egg yolk with generation times of 1.7 days at 5°C and 2.4 hours at 20°C (Ryser and Marth, 1991). Interestingly the overall numbers of Listeria over a period of storage remained the same but the number decreased dramatically in raw albumen (partially due to high pH) while the numbers in the yolk increased.

Key Messages to New Zealand Egg Producers:

The overseas data suggests that *Listeria* is likely to be present on freshly laid eggs, and is likely to be able to survive during storage. The impact on human health is unclear.

4.4 Miscellaneous enterics (intestinal bacteria)

Where a reference has not been specifically given the information in this section has been adapted from the "Bad Bug Book" (USFDA CFSAN, 2000).

A number of different bacteria may contaminate the external surface of the egg, during or shortly after lay. These include: *Klebsiella, Enterobacter, Proteus, Citrobacter, Aerobacter, Providencia,* and *Serratia.* These enteric (intestinal) bacteria have been suspected of causing acute and chronic gastrointestinal disease. The organisms may be recovered from natural environments such as forests and freshwater as well as from farm produce (vegetables) where they reside as normal microflora. They may be recovered from the stools of healthy individuals with no disease symptoms. The relative proportion of pathogenic to nonpathogenic strains is unknown.

Table 10: Food-borne illness Associated with Enteric Bacteria

Acute Symptoms:	Gastroenteritis: Two or more of vomiting, nausea, fever, chills, abdominal pain, and watery diarrhoea occurring 12-24 hours after ingestion of contaminated food or water.
Chronic Symptoms:	Dysenteric symptoms: foul-smelling, mucus-containing, diarrheic stool with flatulence and abdominal distention. The chronic disease may continue for months and require antibiotic treatment.
Infective dose:	Unknown
Complications/ Mortality:	Healthy individuals recover quickly and without treatment from the acute form of gastrointestinal disease. Malnourished children (1-4 years) and infants who endure chronic diarrhoea soon develop structural and functional abnormalities of their intestinal tracts resulting in loss of ability to absorb nutrients. Death is not uncommon in these children and results indirectly from the chronic toxigenic effects which produce poor absorption and malnutrition.
Associated Foods:	Dairy products, raw shellfish, and fresh raw vegetables. The organisms occur in soils used for crop production and shellfish harvesting waters and, therefore, may pose a health hazard.

4.4.1 NZ Situation

A survey of New Zealand egg producers showed that only one had been testing whole shell eggs for E. coli. All 100 tests to date have been negative.

4.4.2 Overseas Situation

The incidence of eggs contaminated with Enterobacteriaceae increases with flock age (Bruce and Johnson, 1978) possibly due to an increase in the number of eggs with poor cuticles as the flocks age (Bruce and Drysdale, 1994). The initial flora of liquid eggs is similar to that found on egg shells. Under good manufacturing practices total counts in raw liquid eggs below 10^6cfu ml^{-1} and *E. coli* below 10^2 are easily achievable (Mossel *et al*., 1995).

A Korean study tested 135 dozen shell eggs for the presence of *Salmonella* spp. None of the egg yolks were found to contain *Salmonella* organisms but *Escherichia coli*, *Escherichia hermanii*, and *Citrobacter freundii* were isolated from egg shells. (Chang, 2000). In 1997, Papadopoutou *et al* reported that they had isolated the following bacteria from hen's eggs: *Staphylococcus aureus*, *Enterococcus faecalis*, *Escherichia coli*, *Enterobacter cloacae*, Proteus species, *Pseudomonas stutzeri* and *Citrobacter freundii*.

Key Messages to New Zealand Egg Producers:

The overseas data suggests that enteric microorganisms and other bacteria are likely to be present on freshly laid eggs but the impact on human health is unclear.

4.5 Staphylococcus aureus

Staphylococcus aureus is a bacterium. Some strains are capable of producing a highly heat-stable enterotoxin that causes illness in humans.

Staphylococci exist in air, dust, sewage, water, milk, and food or on food equipment, environmental surfaces, humans, and animals. Humans and animals are the primary reservoirs. Staphylococci are present in the nasal passages and throats and on the hair and skin of 50 percent or more of healthy individuals. This incidence is even higher for those who associate with or who come in contact with sick individuals and hospital environments. Although food handlers are usually the main source of food contamination in food poisoning outbreaks, equipment and environmental surfaces can also be sources of contamination with *Staphylococcus aureus*. Human intoxication is caused by ingesting enterotoxins produced in food by some strains of *Staphylococcus aureus*, usually because the food has not been kept hot enough (60°C, 140°F, or above) or cold enough (7.2°C, 45°F, or below).

Table 11: Food-borne illness Associated with *Staphylococcus aureus*

Symptoms:	Nausea, vomiting, retching, abdominal cramping, and prostration. Some individuals may not always demonstrate all the symptoms associated with the illness. In more severe cases, headache, muscle cramping, and transient changes in blood pressure and pulse rate may occur. Recovery generally takes two days, but complete recovery may take three days and sometimes longer in severe cases.
Onset:	Usually rapid and in many cases acute, depending on individual susceptibility to the toxin, the amount of contaminated food eaten, the amount of toxin in the food ingested, and the general health of the victim.
Infective dose:	A toxin dose of less than 1.0 µg in contaminated food will produce symptoms of staphylococcal intoxication. This toxin level is reached when *Staphylococcus aureus* populations exceed 100,000 per gram.
Complications/ Mortality:	Death from staphylococcal food poisoning is very rare, although such cases have occurred among the elderly, infants, and severely debilitated persons.
Associated Foods:	Foods that are frequently incriminated in staphylococcal food poisoning include meat and meat products; poultry and **egg products**; salads such as **egg**, tuna, chicken, potato, and macaroni; bakery products such as cream-filled pastries, cream pies, and chocolate eclairs; sandwich fillings; and milk and dairy products. Foods that require considerable handling during preparation and that are kept at slightly elevated temperatures after preparation are frequently involved in staphylococcal food poisoning.

Key Messages to New Zealand Egg Producers:

The data suggests that *Staphylococcus aureus* has been linked with food-borne illness associated with eggs and egg products. One of the main reservoirs of this bacteria is humans so the control of personal hygiene is very important when working with eggs.

4.6 Streptococcus species.

Streptococci are bacteria. They have been split into a number of groups based on characteristics that can be checked in the laboratory (Groups A, B, C, D, F, and G). Groups A and D can be transmitted to humans via food.
Group A: one species with 40 antigenic types (*S. pyogenes*).
Group D: five species (*S. faecalis*, *S. faecium*, *S. durans*, *S. avium*, and *S. bovis*).

Table 12: Food-borne illness Associated with *Streptococci*

	Group A	Group D
Illness:	Septic sore throat, scarlet fever, and other pyogenic / septicemic infections	May produce a clinical syndrome similar to staphylococcal intoxication.
Symptoms:	Sore and red throat, pain on swallowing, tonsilitis, high fever, headache, nausea, vomiting, malaise, rhinorrhea; occasionally a rash occurs, onset 1-3 days; the infectious dose is probably quite low (less than 1,000 organisms).	Diarrhoea, abdominal cramps, nausea, vomiting, fever, chills, dizziness in 2-36 hours following ingestion of suspect food. The infectious dose is probably quite high.
Complications/ Mortality:	Streptococcal sore throat is very common, especially in children. Usually it is successfully treated with antibiotics. Complications are rare and the fatality rate is low.	Diarrhoeal illness is poorly characterised, but is acute and self-limiting.
Associated Foods:	Food sources include milk, ice cream, **eggs**, steamed lobster, ground ham, potato salad, egg salad, custard, rice pudding, and shrimp salad. In almost all cases, the foodstuffs stood at room temperature for several hours between preparation and consumption.	Food sources include sausage, evaporated milk, cheese, meat croquettes, meat pie, pudding, raw milk, and pasteurised milk.
Entrance into Food:	Due to poor hygiene, ill food handlers, or use of unpasteurised milk. Most outbreaks have involved complex foods (i.e., salads) which were infected by a food handler with septic sore throat. One ill food handler may subsequently infect hundreds of individuals.	Due to under-processing and/or poor and unsanitary food preparation. Outbreaks are not common and are usually the result of preparing, storing, or handling food in an unsanitary manner.

Streptococcus species form part of the normal intestinal flora of poultry and are commonly found in poultry environments (MAF, 1997).

Key Messages to New Zealand Egg Producers:

The data suggests that *Streptococcus* has been linked with food-borne illness associated with eggs and egg products usually by contamination from infected food handlers. Thus the control of personal hygiene is very important when working with eggs.

4.7 Mycotoxins from fungi

Mycotoxins are toxic substances produced by fungi - often by *Aspergillus* and *Fusarium* species. Aflatoxicosis is described in the USDA's "Bad Bug Book" as "poisoning that results from ingestion of aflatoxins in contaminated food or feed." Aflatoxins are produced by certain strains of *Aspergillus flavus* and *Aspergillus parasiticus* under favorable temperatures and humidity.

Aflatoxins produce acute necrosis, cirrhosis, and carcinoma of the liver in a number of animal species. For most species, the LD50 value ranges from 0.5 to 10 mg/kg body weight. The toxicity can be influenced by environmental factors, exposure level, and duration of exposure, age, health, and nutritional status of diet. Aflatoxin B1 is a very potent carcinogen in many species, including non-human primates, birds, fish, and rodents. In each species, the liver is the primary target organ of acute injury. Aflatoxin M is a major metabolic product of aflatoxin B1 in animals and is usually excreted in the milk and urine of dairy cattle and other mammalian species that have consumed aflatoxin-contaminated food or feed (USDA CFSAN, 2000).

The adverse effects of aflatoxins in animals (and presumably in humans) have been categorised in two general forms.

- Acute aflatoxicosis:
  - when moderate to high levels of aflatoxins are consumed.
  - hemorrhage, acute liver damage, edema, alteration in digestion, absorption and/or metabolism of nutrients, and possibly death.
- Chronic aflatoxicosis:
  - when low to moderate levels of aflatoxins are ingested.
  - usually subclinical and difficult to recognise. Some of the common symptoms are impaired food conversion and slower rates of growth.

Although humans and animals are susceptible to the effects of acute aflatoxicosis, the chances of human exposure to acute levels of aflatoxin is remote in well-developed countries. (USDA CFSAN, 2000)

4.7.1 NZ Situation

Studies by Lauren *et al* have shown that there are mycotoxins in grain grown in New Zealand, particularly as a result of contamination with *Fusarium* species. The highest levels of contamination found were 16.6 mg/kg of zearalenone, and 7.4 mg/kg of Nivalenol in the leaf fraction of maize. 40-95 mg/kg of zearalenone, Nivalenol or deoxynivalenol were detected in the ear fractions of the maize. The levels in maize were not extrapolated to predict the subsequent levels that may be present in animal feed made with these grains. FDA permits 10 ppm (=mg/kg) in grains and by-product fed to chickens (Tarr, B, 1996).
Companies that import grain into New Zealand usually have maximum mycotoxin levels included in their purchasing specifications.

The presence of mycotoxins in eggs produced in New Zealand is currently unknown.

4.7.2 Overseas Situation

Deoxynivalenol is a toxin produced by *Fusarium graminearum*. Christensen *et al*, 1988 found that deoxynivalenol was not detected in the flesh or eggs from chickens that consumed a ration with 9.18 ppm of deoxynivalenol.

T-2 and diacetoxyscirpenol (DAS) are toxins that can be produced by a number of Fusarium species. Christensen, 1988, found that these toxins can result in reduced egg production in laying hens.

A number of studies have shown that poultry feed can be contaminated with mycotoxins. Oyejide *et al* found Aflatoxin B1 at between 0.57 and 2.55 micrograms/g in 68.6% of layer samples analysed in Nigeria (Oyejide *et al*, 1987). Moreno and Suarez (1995) isolated 49 strains of Aspergillus that produce aflatoxins from poultry mixed feeds. In 1996 Castella *et al* isolated fusarium species from 59.1% of mixed poultry feeds and of these isolates 97.4% were capable of producing fumonisin B1 or B2 – a mycotoxin.

Aflatoxins produced by *Aspergillus flavus* and *A. parasiticus* have been found in feeds that have a suitable environment for the growth of fungi, especially corn. Meronuck (1988) contends that "indirect exposure of humans to aflatoxins can occur by consumption of foods derived from animals that consume contaminated feeds" and gives milk from dairy cattle consuming contaminated feed as an example. No mention was made of this possibility in association with eggs.

An experiment was carried out where layers were fed aflatoxin B1-contaminated feed for 7 days, and then aflatoxin free feed for a further 7 days. The level of Aflatoxicol (R0) and B1 in eggs started at 0.02 to 0.2ng/g, then increased steadily for 4 or 5 days, plateaued, then decreased after contaminated feed was withdrawn. 7 days after withdrawal only trace amounts of R0 (0,01 ng/g) remained in the eggs (Trucksess *et al*, 1983).

Control of mycotoxins is best achieved by controlling fungal growth (e.g. using low moisture and temperatures, or by adding chemical preservatives such as propionic acid to grain or feed).

Key Messages to New Zealand Egg Producers:

The overseas data suggests that mycotoxins may sometimes be present in layer and other feed, but that the likely levels of contamination are well below the LD50 values that have been found to be toxic to most animal species.

5. Chemical Hazards

Chemical hazards that could be present in eggs include agricultural chemicals (pesticides, herbicides, veterinary drugs) and environmental contaminants (heavy metals, organochlorines).

5.1 Agricultural chemicals

Animal remedies are occasionally used to prevent disease and ensure the health of laying hens. Very few animal remedies are permitted and there is an economic incentive not to use them due to the additional cost.

5.1.1 NZ Situation

Animal remedies are approved for administration to layers in New Zealand by MAF's Agricultural Compounds and Veterinary Medicines Group. Antibiotics are not used as growth promotants in the egg production industry but there is some prophylactic use. A database of currently licensed animal remedies is available on the MAF web site at: http://www.maf.govt.nz/cgi-bin/db_search.cgi?setup_file=animal-rem-prod.setup.cgi. Further information on products is available by emailing requests to acvm@maf.govt.nz.

Some pesticides are used to control lice, mites etc in nest boxes. A database of currently registered pesticides is available on the MAF web site at: http://www.maf.govt.nz/cgi-bin/db_search.cgi?setup_file=pesticides.setup.cgi. Further information on products is available by emailing requests to acvm@maf.govt.nz.

An industry Veterinary source said that there are registered animal remedies available to control parasites and worms in the poultry industry. These organisms may be an issue for barn and free range birds. These animal remedies may be appropriate for use with layers and should not cause a residue problem if egg producers follow the manufacturers' instructions.

5.1.2 UK Situation

In the UK antibiotics are not a part of the laying hen's diet and are never used by the egg industry as growth promoters or routine treatments. Any use of antibiotics for laying hens must be prescribed by a veterinary surgeon and the eggs produced by these layers cannot be sold for the withdrawal period specified.

5.1.3 European Situation

In Europe the Veterinary Medicines Directorate's Annual Report on Surveillance for Veterinary Residues in 1998 showed that of 512 samples, each made up of a dozen eggs, 499 were free of detectable residues. Of the others 4 contained dimetridazole or its metabolite, 2 contained lasalocid and 7 contained nicarbazin residues, (VMD, 1998). Tracebacks found that contamination at the feed mill was the most likely source of most of these residues.

Key Messages to New Zealand Egg Producers:

The overseas data suggests that residues may be an issue in eggs. New Zealand's situation should be acceptable if egg producers are using registered products in accordance with registration details. Egg producers are considering setting up an industry residue monitoring programme to establish actual residue levels in this country.

5.2 Environmental contaminants

DDT (dichlorodiphenyltrichloroethane) was widely used in New Zealand in the 1950s and 60s. It was banned in 1970 but it has a half life of approximately 50 years and DDE (a breakdown product from DDT) has been detected in the food chain. The 1997/98 New Zealand Total Diet Survey (Cressey *et al*, 2000) showed that residues of DDT derivatives were detected in most foods of animal origin. The total DDT estimated dietary exposure has decreased from the survey done in 1990/91. This result was expected as the parent compound, pp-DDT, has been banned for some time. The survey concluded that the levels found were unlikely to have any adverse health implications for the New Zealand population. There was however one unexpected result. The parent compound, pp-DDT, was detected in one food sample (eggs). The report recommended that further work be undertaken to identify whether the presence of pp-DDT in eggs is a common occurrence, as its presence was unexpected, and indicates use of, or exposure to a deregulated pesticide.

An environmental survey of New Zealand soils showed that organochlorine pesticide residues (including DDT) were lower than for comparable environments reported overseas. DDT and DDE were found at all forest and grassland sites, but no residues exceeded 3µg/kg dry weight. Results of soil testing from provincial centres showed most were below 15µg/kg although the level in Invercargill was 121µg/kg. In metropolitan areas Auckland's result was similar to provincial areas, but Christchurch's concentrations were higher (in the range of 78.8 - 340µg/kg). Nevertheless, all of these results compared favourably to overseas data (Buckland *et al*, 1998).

Key Messages to New Zealand Egg Producers:

The pesticide levels found in the New Zealand total diet Survey are unlikely to have any adverse health implications for the New Zealand population. Organochlorine pesticide concentrations in forest and grassland soils, and in urban centres were lower than for comparable data overseas. The data does however suggest that residues of DDT derivatives are likely to be present at low levels in the environment, and that levels can vary significantly from one region to another. It would be advisable to test free range hen sites to check that residues are not above expected levels. Egg producers must also ensure that DDT is not used on their property.

5.3 Colourants in feed

5.3.1 NZ Situation

The colour of egg yolks and chicken skin depends entirely on what the birds eat, because animals cannot synthesise the pigments causing these colours. Therefore, to satisfy the consumer's perception that a rich, golden yolk means a healthier or tastier egg, (not actually true), feed manufacturers use pigments added to the feed. These pigments are four types:

1. "Natural" Red. This is usually made from Paprika, but the extraction methods involve chemical treatments. Some customers specify this red because it is from a natural plant source. *Salmonella* is often associated with paprika but it is likely that the process used to extract the colourant will kill any bacteria.
2. "Natural" yellow. This is from Marigold.
3. Synthetic Red. Artificially synthesised.
4. Synthetic yellow. Artificially synthesised.

Red and yellow are almost always used in combination. A typical inclusion might be 300-500 grams of natural pigments per tonne of feed (total red and yellow), or in the synthetic variety 50-100 grams per tonne of feed (Meads, 2000). The synthetic pigments are less variable and stronger so smaller quantities are required. The major suppliers in NZ are BASF and Roche, who have their own products. Other traders import products from China and Mexico. Anecdotal evidence from these suppliers suggests that they are not aware of any hazards associated with the use of these colorants in layer feed.

Canthaxanthin, an artificial colourant, is listed in the list of Oral Nutritional Compounds that are 'Generally Recognised as Safe' (GRAS) in the ACVM Regulations as stated in a letter issued by MAF on 14th December 2000 to RJ Diprose (MAF, 2000).

5.3.2 UK Situation

A newspaper article stated that a British supermarket chain has stipulated that canthaxanthrin is not to be used in layer feed as this substance may damage the eye's retina. The article stated that Canthaxanthin (E161g) could be present in up to 65% of British eggs and that two other colourants, E161I and E160, have no known side-effects (Murphy, 1999). The article did not make reference to any scientifically credible literature to back up the claims.

Canthaxanthin has been approved for use as a colour additive in food in the European Economic Community (EEC number: E161g).

5.3.3 USA Situation

Canthaxanthin has been approved under the USA's Code of Federal Regulations Section 73.75 where it is "approved for foods generally, not to exceed 30 mg/lb of solid or semisolid food or per pint of liquid food; May also be used in broiler chicken feed". (USFDA, CFSAN, 2000a).

5.4 Dioxin

Dioxin is a general term for a group of chemicals, that contain chlorine and have similar chemical and physical properties. Dioxin is a man-made contaminant found in the environment at very low levels. Dioxin is produced during combustion processes, such as incineration of household, hospital, industrial waste and of sewerage sludge, and as an unwanted by-product of some industrial chemical processes. Dioxin is found in foods as a background contaminant at extremely low levels that are not considered to be of public health concern.

Dioxin is toxic to animals at high levels of exposure. It has been reported to affect the immune system, hormones and reproduction. Humans appear to be much less susceptible to the short-term effects of dioxin than animals. Industrial accidents have shown that the only significant effect was damage to the skin (chloracne).

Exposure to dioxin at relatively high doses from industrial accidents has been associated with long term toxic effects, including skin damage. There is only weak evidence of increased incidence of nonspecific cancers (International Programme on Chemical Safety IPCS monograph, WHO/IPCS Consultation 1998). The World Health Organization (WHO) established a safe level of intake for dioxin of 10 picograms/kilogram bodyweight in 1990 relating to life time exposure in humans. This was lowered to 1-4 picograms/kilogram bodyweight in 1998. It was not considered necessary to set a short term exposure level.

5.4.1 NZ Situation

Research by the Ministry for the Environment shows that levels of dioxins in New Zealand's environment, in food and in people are low compared with other countries. (MFE, 2001).

5.4.2 USA Situation

In the USA the FSIS issued an advisory notice to egg producers and poultry custodians about possible exposure to high levels of dioxin in animal feed that may have rendered resulting food products adulterated. This was done after 2 out of 80 poultry samples were found by the FSIS and the Environmental Protection Agency to have unusually high levels of dioxin. The source of the contamination was ball clay which was added to soybean meal as a flowing or anti-caking agent. It was determined that the levels of dioxin in feed and foods produced from animals that consumed the feed presented no immediate health risk. The feed was however recalled to prevent any further exposure to elevated dioxin levels. FDA advised shell egg producers that products that contain dioxin at or above 1 part per trillion are deemed adulterated (FSIS, 1997).

5.4.3 European Situation

Fats contaminated with dioxin from recycled PCB oil were distributed to 11 feed mills (in Belgium, France and the Netherlands). These mills produced animal feed pellets that were distributed to over 1500 poultry, pork and cattle (beef and dairy) farms in Belgium, the Netherlands and France. Animals on these farms were fed the contaminated feed, and food produced from the animals has subsequently been traded with other European Union Member

States and to countries such as Australia. The level of dioxin in these foods (poultry, egg, pork, beef and dairy products) is unclear due to limited test results (ANZFA, 1999).

In response to public health concerns about the above contamination, the European Commission (EC) implemented a ban on 3 June 1999 on the marketing of foods from Belgium containing egg or poultry products, produced between 15 January and 1 June 1999 and later extended it to other products (ANZFA, 1999). Consumers were advised that the consumption of the contaminated foods under discussion would not be expected to cause harmful effects, due to the relatively short period of exposure (ANZFA, 1999).

Key Messages to New Zealand Egg Producers:

The problems that have been found overseas indicate that there is potential for dioxins to be inadvertently introduced into animal feed, including that for layer hens. This situation could occur in New Zealand. Egg producers should therefore obtain their feed from suppliers with appropriate quality and product safety systems.

6. Physical Hazards

Because of the protective nature of the shell, no physical hazards have been identified for whole shell eggs.

7. Risks to Wholesomeness

Wholesomeness, in relation to any regulated animal product, is defined in the Animal products Act 1999 to mean that: "**the product does not contain or have attached to it, enclosed with it, or in contact with it** anything that is **offensive**, or whose presence would be **unexpected** or unusual in product of that description".

7.1 Appearance

The Egg Quality Handbook issued by the Queensland Department of Primary Industries' gives a very good summary of the causes and control measures for egg defects that are quality related (Coutts and Wilson, 1990). Copies of the Handbook are available from New Zealand's Egg Producers' Federation.

Table 13: Egg Defects

Shell Defects - Quality	Internal Defects - Quality
Hairline cracks	**Blood spots**
Star cracks	**Meat spots**
Thin-shelled eggs and shell-less eggs	**Watery whites (indicate staleness)**
Sandpaper or rough shells	Pale yolks
Misshapen eggs	Mottled yolks and discoloured yolks
Flat-sided eggs	Discoloured whites
Body-checked eggs (marked by grooves and ridges)	**Rotten eggs**
Pimples	**Roundworms in eggs**
Pinholes	**Off odours and flavours**
Mottled or glassy shells	
Cage marks	
Stained eggs	
Fly marks	
Fungus or mildew on shells.	

The defects that are in bold in the above table would fall into the definition of wholesomeness under the Animal Products Act 1999:

Possible causes and control measures are clearly explained in the Egg Quality Handbook.

In addition the FSIS, (1999a) says:

- **Blood spots** are caused by a rupture of one or more small blood vessels in the yolk at the time of ovulation. It does not indicate the egg is unsafe.
- A **cloudy white** (Albumen) is a sign of a very fresh egg. A **clear egg white** is an indication that the egg is ageing.
- **Pink** or **iridescent egg white** indicates spoilage due to *Pseudomonas* bacteria. Some of these microorganisms – which produce a greenish fluorescent, water-soluble pigment – are harmful to humans.
- The **yolk colour** varies depending on the hen's diet. Artificial colour additives are not permitted in eggs (in the USA – but this is not the case in New Zealand).
- A **green ring** on a hard-cooked yolk is a result of overcooking and is caused by sulphur and iron compounds in the egg reaching the yolk's surface, or by a high amount of iron in the cooking water. The green colour is safe to consume (FSIS, 1999a).

Blood or meat spots are occasionally found on an egg yolk and are merely an error on the part of the hen. They're caused by the rupture of a blood vessel on the yolk surface when it's being formed or by a similar accident in the wall of the oviduct. Most eggs with blood spots are detected by electronic spotters and never reach the market. But, even with mass scanners, it's impossible to catch them all. Both chemically and nutritionally, eggs with blood spots are fit to eat. You can remove the spot with the tip of a knife, if you wish (AEB, 2000).

The twisted, ropey strands of the egg white are the *chalazae* that anchor the yolk in the center of the thick white. They're composed of nutritious egg albumen and do not indicate contamination. In fact, the more prominent the chalazae, the fresher the egg. These natural parts of the egg don't interfere with cooking or beating of the white and you don't need to remove them, although some cooks like to strain them from stirred custard (AEB, 2000).

Blood stained eggs may result from uterine prolapse and vent pecking (Christensen, 1995).

Watery egg whites are found in eggs produced by birds infected with Infectious bronchitis virus and other viral diseases notably EDS 76, (Soft shells more noticeable though). Mallow weed *(Malva parviflora*) does some interesting things to internal eggs – I have seen rubbery pink whites. (Christensen, 2001).

Anecdotal evidence from the industry suggests that New Zealand consumers would also classify the following as wholesomeness issues:

- **Pink** or iridescent egg whites.
- **Soft shells**.
- Eggs that are **older** than their use by date.

7.2 Mould

Mould growth on eggs has been found when egg collection is unduly delayed, or following poor storage and handling (especially when temperature fluctuations result in condensation on the eggs). *Cladosporium herbarum* has been associated with spoilage of eggs when its penetrates the shell's pores and spreads throughout the interior of the egg (ICMSF, 1998).

Key Messages to New Zealand Egg Producers:

It is important to minimise temperature fluctuations to stop condensation on eggs. This condensation encourages mould growth.

7.3 Pseudomonas

Pseudomonas species are ubiquitous in the environment and water, and some species like cool temperatures. These bacteria are important because they are resistant to most antibiotics and they are capable of surviving in conditions that few other organisms can tolerate. *Pseudomonas aeruginosa* is of clinical significance as an opportunistic pathogen but has rarely been implicated in gastroenteric infection. Other species are significant in food spoilage, particularly in chilled food. Levels higher than 107 cfu/g or ml of food may result in off flavours, off odours and visual defects. The incidence of eggs contaminated with *Pseudomonas* increases with flock age (Bruce and Johnson, 1978). *Pseudomonas* organisms may be related to spoilage of eggs. See section 9.11.3 of the annex for further details.

Key Messages to New Zealand Egg Producers:

Pseudomonas species are likely to be involved in spoilage of eggs.

7.4 Genetic modification

7.4.1 Genetic modification of birds

Currently only traditional animal husbandry and breeding of livestock is used in the egg-laying industry. Cocks and hens are chosen as parents for breeding egg layers based on their positive characteristics - a practice which doesn't involve genetic engineering.

7.4.2 Genetic modification of feed ingredients

The Chief Executive of Crop and Food Research wrote that if a chicken were to be fed with feed that contained modified protein: "any potential danger would come not from the DNA which is present in all living organisms but the proteins which the new DNA (genes) would produce. Protein is rapidly degraded in the gut to amino acids which are the 'building blocks' of proteins. These amino acids are then reassembled by the animal into the proteins that are needed to sustain life. Thus it is extremely unlikely that any GMO-derived protein could survive the digestive process intact and become part of the animal or products such as eggs." (Dunbier, 1999). Research has confirmed that no genetically engineered materials would be passed into the hen's eggs (AEB, 2000).

Key Messages to New Zealand Egg Producers:

Genetic modification is not an issue for New Zealand's egg producers, except that their customers' perceptions of risk may be different to those of the industry.

8. False or Misleading Labelling

Labelling is subject to compliance with the Animal Products Act 1999, the Food Act 1981 and the Fair Trading Act 1986. Claims (e.g. for cage laid, barn laid, free range or organic) must comply with legislation and should not mislead consumers.

When eggs from differing systems are packed off on communal grading equipment, it is easy to get them mixed up.

In June 1999 the New Zealand Consumer magazine reported that many so called "free range" eggs are not laid by hens kept on free range but were instead from caged hens. Some egg cartons for cage laid eggs have pictures on them which imply that the hen can get outside. This is misleading. On March 16, 2001 the New Zealand Press Association reported that a Canterbury farmer was fined $35 000 for labelling cage-laid eggs as free range. The Commerce Commission considered that this was a deliberate deception aimed at falsely achieving the higher price for free-range eggs (NZPA, 2001).

One New Zealand supermarket now only accepts free range, organic and barn eggs that are produced and packed on properties that do not produce other types of eggs. There are two quality assurance schemes operated by Bio-Gro New Zealand and Bio Dynamic Farming and Gardening Association (Demeter) for eggs with claims. Approximately 70% of barn eggs produced in New Zealand are now audited under the "RNZSPCA standards for accreditation of barn egg production". This specifies that accreditation is not available to any producer who has a caged production system on the same property or who packs eggs from both cage and barn systems on the same property (Napier, 2001).

The Egg Producers Federation recommends that those who wish to make claims about the origin of their eggs participate in a credible assurance scheme such as those discussed above.

Food package labelling in New Zealand is further regulated by:

- The Food Regulations 1984
- The Australian Food Standards Code and
- The Australia/New Zealand Food Standards Code.

The latter will phase out the two former statutes in November 2002.

It is recommended that Egg Producers consult the Australia New Zealand Food Standards Code which is freely available at the following web site:
http://www.anzfa.gov.au/draftfoodstandardscode/

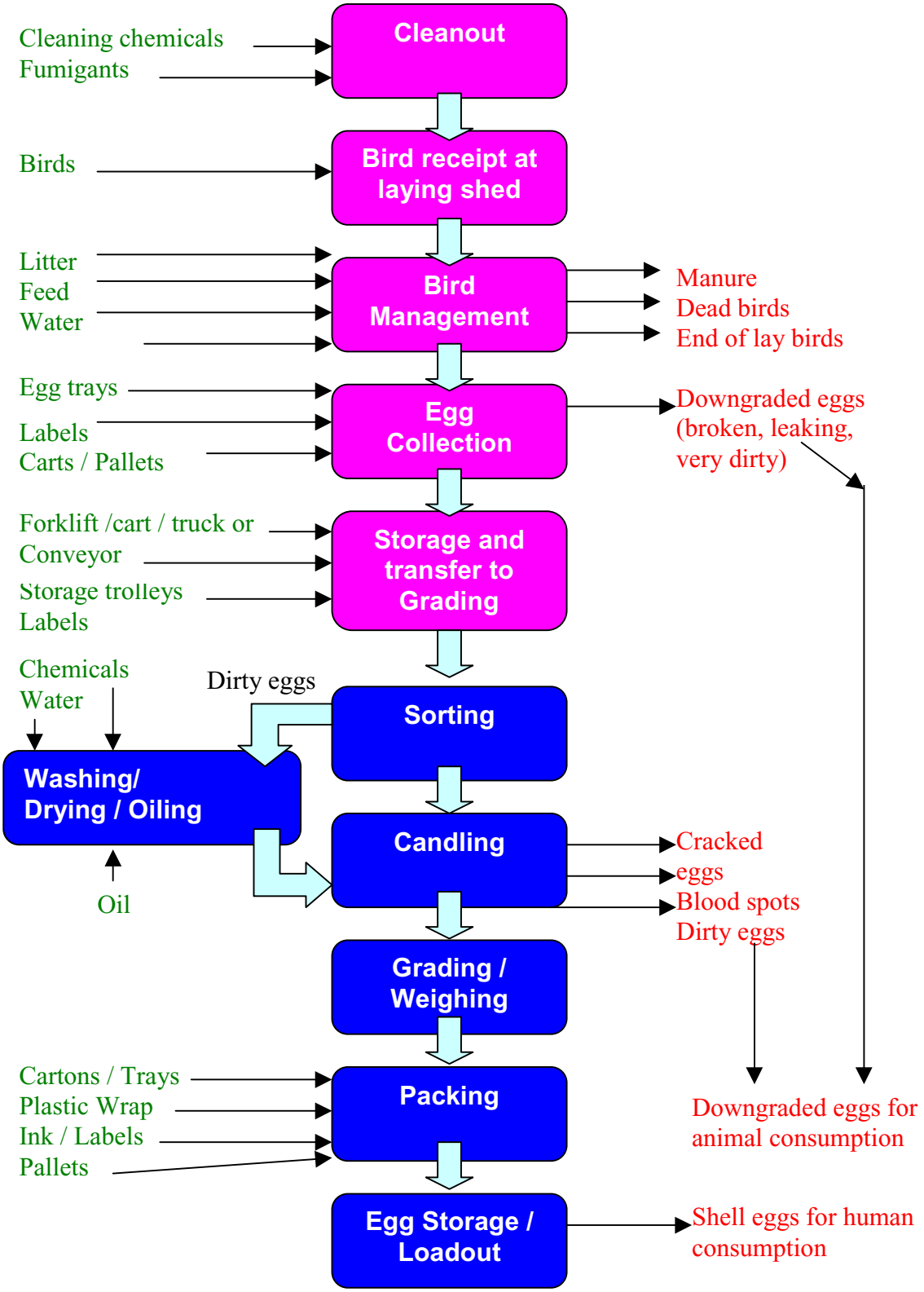
Anecdotal industry evidence suggests that many egg producers recycle packaging and this can result in claims on the original pack not being met by the subsequent user.

Shelf life can be calculated using the guidelines in the Ministry of Health's booklet: "A Guide to Calculating the Shelf Life of Foods – Information Booklet for the Food Industry, 1st Edition, July 1995. It is recommended that egg producers use "Use By" dates on their eggs. Shelf life is achieved by using good handling and storage practices as discussed in section 9 of this annex.

Some eggs that are intended for commercial use are erroneously on-sold for human consumption as shell eggs. The eggs should be clearly labelled to show the intended purpose and to make it clear that they are not intended for sale for resale for human consumption without further processing or cooking.

9. Key Process Steps and Their Inputs: Identification of Hazards and Other Risk Factors and Discussion of Potential Impact of Step on Existing Hazards and other Risk Factors

Figure 3: Egg Production Process



9.1 Cleanout

Before birds are placed in laying sheds there is generally a full clean out (depopulation, litter removal if any, manure removal, dry clean, wet clean, sanitise/disinfection) followed by fumigation to endeavour to rid the shed of any harmful bacteria. If a full depopulation and cleanout has not been done then there is an increased likelihood of contamination to the remaining birds.

Ideally, all birds should be taken for slaughter at the same time - the "all-in, all-out" principle. When the houses are empty, spent litter and faeces must be removed from the farm after which the houses, their equipment and the immediate environment must be thoroughly cleaned and disinfected before re-use. It is also advisable to allow the houses to remain empty for as long as possible to allow a natural die-off of any pathogens present. (SCVPH, 1998). If a full clean is not possible then litter and manure should be removed and a dry clean should be done.

9.1.1 Cleaning Chemicals and Fumigants

Use of unapproved chemicals could leave residues behind on equipment, including that used for feed and water. This may result in traces of residues in water and feed.

9.2 Bird Receipt at Laying Shed

Apparently healthy birds may be carriers of harmful bacteria so laying hens received at the laying shed may bring harmful bacteria in with them. It is possible to reduce the risk of this happening by sourcing laying hens from a supplier who uses good hygienic practices, good biosecurity practices and preferably tests both their birds and feed for *Salmonella*. Birds carrying harmful bacteria may contaminate eggs that they lay, and will also contaminate the environment that they are kept in. If the birds are free range or barn raised there are more opportunities for cross contamination between birds than if they are caged.

Competitive Exclusion (CE) treatment “giving young chicks “good bacteria” is sometimes used to protect chicks against infection by a variety of *Salmonella* serotypes, including both invasive and non-invasive strains. Vaccines can be used to preventing vertical transmission of specific invasive *Salmonella* serotypes. Research has centred on live, attenuated and dead vaccines and some are available commercially. An inactivated vaccine is becoming widely used and aims to reduce vertical and horizontal transmission of *Salmonella* Enteritidis. When parent stock are vaccinated with the preparation, it is claimed that chicks show passive immunity for at least 21 days. As with CE treatment, effective vaccination depends upon the simultaneous use of other control measures, especially a high standard of biosecurity (SCVPH, 1998). Good (i.e. undefined) competitive exclusion (CE) products (Avigard and Broilact) are not available in New Zealand, although Avigard has received biosecurity clearance (Christensen, 2001).

Laying birds should be acquired from flocks that are free from *Salmonella* (Cox *et al*., 1990).

9.3 Bird Management

The following data has on the whole come from overseas reports.

9.3.1 Environment / Manure and Litter

Once *Salmonella* is in a laying shed it can be very difficult to get rid of it, even with very good cleaning procedures. *Salmonella* that persists in the farm environment can spread to incoming flocks. Rodents, insects, birds as well as domestic pets have been suggested as potential sources of *Salmonella* in poultry flocks. Workers and visitors may also contribute as vectors of *Salmonella* contamination from the general environment. (SCVPH, 1998).

Conditions of intensive rearing tend to favour the spread of any pathogens that gain access to the flocks; however, the use of controlled-environment housing for this purpose provides an opportunity to exclude undesirable micro-organisms by maintaining an appropriate level of biosecurity. For *Salmonella*, high standards of personal hygiene are essential and must include proper use of protective clothing, disinfectant footbaths etc. It is also necessary for each farm to exclude biological vectors as far as possible and to implement rodent-baiting programmes. (SCVPH, 1998).

Although attention to husbandry hygiene helps to reduce flock infection with *Campylobacte*r, control of the organism is hampered by lack of knowledge on the sources of flock infection, modes of transmission to poultry flocks and availability of suitable preventive measures. It is clear that animal vectors can play a part, as can farm personnel, if hygiene precautions are inadequate. Vertical transmission seems unlikely because *Campylobacter* shows poor survival in egg contents and newly hatched chicks are invariably free from overt infection. Nevertheless, some evidence suggests that vertical transmission could occur.

It is also useful to control rodents and other vermin, chlorinate the drinking water and effectively disinfect production facilities to disrupt the transmission of *Salmonella* Enteritidis to future flocks (ICMSF, 1998). Mice appear to become infected by *Salmonella* Enteritidis when exposed to contaminated manure. A single mouse can produce 100 droppings a day and if they defecate into feed troughs and on egg belts they can spread the infection to birds and eggs. Rodents can reproduce rapidly in poultry sheds. A few can proliferate to high numbers (up to 10,000 or more) during the life of a single flock (Penn State, 1997). A source from the United Egg producers has been quoted by the UPC as saying, "One rodent can deposit 100 pellets in the course of one night and each pellet can contain 25,000 different *Salmonella* organisms" (Transcript, March 30, 2000, Columbus, Ohio, p. 19). Many of these *Salmonella*-contaminated rodent pellets are deposited in the food troughs and are therefore unavoidably consumed by the hens.

The laying environment can be an important source of salmonellae onto the external surface of the egg. *Salmonella* have been isolated from egg belts, egg collectors, ventilation fans and wash water. Cages, litter and nesting materials should be kept clean and as free of faeces as possible. (ICMSF, 1998).

Flies are potential vectors of foodborne *Salmonella* pathogens. Flies collected at caged-layer facilities that had produced eggs that were implicated as the food vehicle in two recent

outbreaks of *Salmonella* Enteritidis infections were tested for Salmonella. *Salmonella* Enteritidis was isolated from houseflies. *Salmonella* Infantis was isolated from houseflies and from dump flies and *Salmonella* Heidelberg from houseflies. *Salmonella* Mbandaka was isolated from a lesser mealworm, *Alphitobius diaperinus* (Panzer) (Coleoptera: Tenebrionidae). (Olsen and Hammack, 2000).

USA Findings:

Environmental samples were collected from manure, egg belts, elevators, and walkways of 200 layer houses and tested for *Salmonella* Enteritidis. It was found in environmental samples in 7% of layer houses, and NAHMS estimated regional prevalence ranging from 0 to 17%. 4% of house mice collected in 129 of the layer houses were also positive. The prevalence of SE in mice from environmentally positive houses was nearly four times that of mice from environmentally negative houses (Anonymous, 2000).

Other highlights:

- 17 environmental samples were collected from each of 200 layer houses for culture. SE was found in 7.1% of layer houses.
- Flocks less than 60 weeks of age were 4.7 times more likely to test positive than older, unmoulted flocks. Flocks that were 0-16 weeks post-molting were 9.3 times more likely to test positive compared to flocks that were 60 or more weeks of age and unmoulted, but flocks more than 16 weeks post-molt had very little increased risk.
- None of the houses tested positive for SE on farms where the feeders or hoppers were cleaned and disinfected between each flock or where cages, walls, and ceilings were washed between each flock, whether or not they were fumigated.
- Houses with a high rodent index were more likely to have SE found within the house than houses with a low rodent index.
- Overall, 3.7% of house mice cultured were positive for SE.
- Only 15.7% of farm sites routinely tested for SE in 1994, whereas 58.0% of farm sites routinely tested for SE in 1999. (Anonymous, 2000).

9.3.2 Feed

Various surveys have identified feed as an important source of *Salmonella* for the farm. . Successful control of *Salmonella* on the farm is dependent on a consistent supply of *Salmonella*-free feed. Although raw materials used for preparation of feed may harbour the pathogen, pelleting, heating and other specific treatments are generally successful in eliminating *Salmonella*. However, the final feed may be contaminated because of an insufficient heating process or to recontamination in the feed mill, during transport or during storage at the farm. Measures taken at feed mills to safeguard the final product include the use of a heating process, sometimes combined with chemical treatment of the feed, and care to prevent recontamination during cooling. Short-chain fatty acids, such as formic and propionic acids, may be incorporated in feed and have the advantage of protecting it against recontamination during distribution and storage. The acids can reduce the incidence of *Salmonella* infections in poultry but are active only when the feed is moistened following consumption by the birds. Acids have no beneficial effect once the birds have become infected. (SCVPH, 1998).

Feed, on the other hand, is too dry to favour survival of Campylobacter and is not regarded as a source of campylobacter infection. (SCVPH, 1998). Feed should be kept dry during storage and delivery to the birds. If there is any chance feed can get wet (e.g. free range birds) then it should be fed in quantities so that all feed is consumed daily to minimise the likelihood of mould growth. This will also discourage rodents and wild birds somewhat. (Christensen, 1995).

New Zealand Situation

The New Zealand Code of Good Manufacturing Practice for Compound Feeds, Premixes and Dietary Supplements, March 2000, was approved by the Director-General, MAF, as being compliant with the ACVM Standard for Codes of Practice. This voluntary code is an appropriate manufacturing guide for the industry, and if implemented should address the critical control points in the production of compound feed, premixes and dietary supplements from the purchasing of ingredients through to the sale of the finished product. The code is designed to enhance both product quality and consumer protection.

A survey of NZ egg producers has found that *Salmonella* is occasionally found in feed.

9.3.3 Drinking Water

Contaminated water can be a source of foodborne pathogens, including *Salmonella* when it is dispensed in open troughs that can become contaminated by dust, litter, feed, feathers and faeces. (SCVPH, 1998).

There is a possibility that untreated water-supplies can transmit the organisms and, if mains water is not available, the supply to the growing houses should be chlorinated. Since campylobacters survive well in biofilms, thorough cleaning and disinfection of the water-supply system in each house is essential between different crops of birds. (SCVPH, 1998).

A survey on microbiological testing done by 15 New Zealand egg producers showed that only one had tested the drinking water and their results indicated that there may have been an issue with faecal coliforms and *E. coli* which were found to be present in some samples.

The Codes or Recommendations and Minimum Standards for the Welfare of Layer Hens (AWAC, 1999) states:
"10.1.1 Hens must be offered a continuously available supply of potable water…
10.1.3 All water should be tested for salt content and microbiological contamination and advice obtained on its suitability for poultry…"

A supermarket Code of Practice that some egg suppliers have been operating to require drinking water to meet the NZ Drinking water microbiological standards, with water at point of use checked at least once a year.

9.4 Forced moulting

Forced moulting is the process of reducing feed and /or water for a specified period to induce moulting, which also gets another laying cycle out of a hen. It usually results in lower production volumes, lower egg quality and a shorter laying cycle. There can also be animal welfare issues if the forced moulting is not properly managed.

9.4.1 New Zealand Situation

Moult inducement and controlled feeding may only legally be done in accordance with the Code of Recommendations and Minimum Standards for the Welfare of Layer Hens issued in November 1999 by AWAC (Animal Welfare Advisory Committee). It states:

"13.4.1 Moult inducement or controlled feeding practices should only be carried out on healthy hens under close management supervision and under conditions that will not cause cold stress. Substitution of a high fibre diet, (for example, whole barley), in place of normal rations is a preferred method of moult inducement. Adequate feeding space should be provided during such practices.

13.4.2 Methods of moult inducement and controlled feeding which totally deprive hens of food or water for more than 48 hours must not be used."

9.4.2 Overseas Situation

Forced molting (starving hens for 5 to 14 or more days) is illegal in the UK and the European Union, and is not done in Canada. US Department of Agriculture studies have shown that the "traumatic physiological impact" of total food removal results in a significant increase in *Salmonella* infected hens and eggs. While unmoulted hens have to ingest 50,000 Salmonellae to become infected, force-molted hens need fewer than 10. (UPC, 2000)

The USDA and Pennsylvania Department of Agriculture conducted field studies of 31 flocks from May 1992 to May 1994 which showed that molted flocks "produced SE-positive eggs twice as frequently as non-molted flocks for a period up to 140 days"-4 1/2 months-following the forced molt. (UPC, 2000)

In California a bill is being introduced to ban forced moulting (currently used on 95% of California's 25 million laying hens). This practice of withdrawing all food from hens for 10-14 days disrupts the hens natural immunity predisposing them to *Salmonella* infestation (Wade, 2000).

There is a cause and effect relationship between forced molting and *Salmonella* Enteritidis in eggs (UPC, 2000a). USDA immunologist Peter Holt and his colleagues published a series of Agricultural Research Service studies between 1992 and 1996 in which they found that depriving hens of sustenance causes immune suppression, thereby predisposing the birds to SE invasion, colonization and migration.

A USDA Risk Assessment predicted that human *Salmonella* Enteritidis infections could be "reduced by 2.1 percent if forced molting were eliminated. USDA's Food Safety and Inspection Service wrote: "FSIS recognises that public health concerns are raised by highly

stressful forced molting practices. For example, extended starvation and water deprivation practices lead to increased shedding of *Salmonella* Enteritidis by laying hens subjected to these practices" (UPC, 2000a).

USDA's Food Safety and Inspection Service has agreed that there is epidemiological evidence associating forced molting with higher prevalence of *Salmonella* Enteritidis in flocks. Experimentally, Holt *et al*. (1996, 1995, 1994, 1993, 1992) have demonstrated that molting is associated with increased numbers of SE in hens intestinal tracts, and higher rates of SE-positive eggs are produced following [the forced] molt. (*Salmonella* Enteritidis Risk Assessment Team, 1998).

"Stress situations can reactivate a previous infection. . . . and feed withdrawal to induce a molt can also cause the recurrence of a previous *Salmonella* Enteritidis infection". "Recrudescence of infection was observed significantly more often in molted birds. These birds shed significantly more *Salmonella* Enteritidis and more readily transmitted the organism to previously uninfected, but contact-exposed hens". "The molted hens also produced more eggs contaminated with the organism".

It is significant that an intestinal microorganism like *Salmonella* has evolved a serotype *Salmonella* Enteritidis that thrives in the ovaries and oviducts of hens where their eggs are formed, thereby precontaminating the interiors of intact eggs. According to the Centers for Disease Control, "The specific serotype *Salmonella* Enteritidis can live in the intestinal tract, but it also can infect the ovaries and oviducts of egg-laying hens. It is not known why this is an increasing problem. It is possible that this bacterial strain has become more invasive, or that hens have less resistance, or that some change in poultry husbandry permitted this strain to become more widespread" (CDC Record, June 8, 1990, .p. 2; see also p. 12 of the Transcript of the April 6 Public Meeting in Sacramento, California) (UPC, 2000a).

Key Messages to New Zealand Egg Producers:

The forced moulting practices that are sometimes used overseas are not in accordance with the New Zealand's current Code of Recommendations and Minimum Standards for the Welfare of Layer Hens. This code is a "deemed" code under the Animal Welfare Act 1999, which makes it legally binding. For this reason the arguments put forward overseas cannot be directly applied in New Zealand, but they do raise awareness of a possible increase in shedding of pathogenic bacteria should these recommendations not be followed.

9.5 Laying

9.5.1 NZ Situation (Data provided by Egg Producers Federation).

Of the estimated 2,700,000 layers currently in production in New Zealand, an estimated 93% are in cage systems, 2% in barns and 5% on free range.

Caged Systems

Approximately 70% of the caged layers use multi-layer cage units, mainly installed in the last 5-6 years with automated collection systems conveying eggs directly to an egg grader. Eggs are produced, conveyed, graded and packed without human handling except for the removal of undergrades, and are therefore least exposed to hazards associated with more manual systems.

Manure is automatically removed every few days, and substantially reduces rodent and fly build-up that may present additional hazards.

With multi-aged flocks in these systems, care should be taken to minimise any cross contamination between flocks of different ages. Sheds are rarely, if ever, empty so additional care is required at cleanout following removal of spent layers.

The remainder (30%) of caged layers use semi-automated or manual egg collection systems which rely on placing eggs in trays (usually plastic) for subsequent transport to a grading facility. Depending on the time taken between collection, transportation and grading sometimes an intermediate cool room is required.

Advantages	Disadvantages
• Easy to control environment eg temperature, feed, water and light • Space restriction suppresses hen aggression • Small hen colony size • Good disease control • No threat from predators	• Lack of space/facilities prevents certain normal behaviour eg dust bathing • Cage structure may cause feather and foot damage • Confinement leads to weak bones and bone breakages

Barn Systems

Of the barn systems (2% of production), approximately 55% of the eggs are conveyed directly to the grader, with the balance being packed for subsequent grading. Layers are in direct contact with the ground, litter, and their own and other birds' faeces. The risk of contamination from these sources is greater than in caged systems.

Advantages	Disadvantages
• Varied physical environment where normal behaviour can be expressed • Protection against predators • Freedom to move within the hen house • Provision of nest boxes, perches and dust bathing facilities • Improved bone strength due to increased activity • Birds can escape aggression by moving within the hen house	• Beak trimming may be required to prevent bird aggression such as feather pecking and cannibalism • Management of waste droppings more difficult • Hens can be injured by falling between perches at different levels • Floor eggs will be dirtier than nest eggs and should not be sold as first grade eggs • Increased risks of parasites

Free Range Systems

At the time of publication, all egg collection systems on free range production facilities are manual, i.e. none provide an automated "on line" collection and grading system. Free range layers have direct access to outside so are likely to be exposed to a wider range of bacteria and parasites from natural waterways, wild birds, contaminated pasture and soil, than layers kept in other systems. Ducks and wild fowl are known reservoirs of harmful bacteria so free range areas near to the water fowl habitat should be avoided when providing free range areas. Free range hens may also have access to poisons intended to control pests.

This is particularly likely if there is no set rotational pasture system in place. Like barn kept birds, free range birds are in direct contact with the ground, litter, and their own and other birds' faeces. The risk of contamination is therefore greater for free range systems than for either caged or barn systems.

Birds placed on free range units will be at risk from worm infestation. The worm eggs are difficult to kill and may survive in the soil for up to one year. The best methods to control the worm eggs are paddock rotation and harrowing the pasture to expose the worm eggs to sunlight, lethal to the worm eggs. Worm egg populations are seasonal since they favour warm, wet conditions. Keeping pastures short or grazed through the year will reduce the survival time of worm eggs. Good hygiene will reduce the spread of infestation. It is advisable to routinely check for worms through taking representative dropping samples 2 or 3 times during a flocks life. This is a simple test and can be carried out by any veterinary practice. (A representative sample would be a pot containing 40-50 faeces).

If hens are suffering from diarrhoea the nest boxes are likely to become soiled and there is a much greater chance of faecal soiling of the egg. In these circumstances, frequent changes of the next box litter is necessary until the condition is brought under control. (Christensen, 1995).

Advantages	Disadvantages
• Freedom to move freely and express wide range of behaviour • Opportunity to graze on vegetation and varied diet • Opportunity to dust bathe in soil • Improved bone strength due to increased activity	• Beak trimming essential to prevent bird aggression such as feather pecking and cannibalism because of large flock sizes • Risk of predators • Disease risk due to access to droppings and contact with wild birds • Increased risk of respiratory problems • Adverse climate outside • Floor eggs will be dirtier than nest eggs and should not be sold as first grade eggs • Increased risks of parasites / worms

9.5.2 Overseas Situation

The European Union has banned battery cages for welfare reasons in member countries after 2012. No new battery cages may be installed after 2003. After 2012 all hens must have at least 750sqcm of space, a perch, a nest, and litter to scratch and peck.

Key Messages to New Zealand Egg Producers:

It is expected that the number of free range and barn operations will also rise in New Zealand. If this is so, extra care will be needed to protect the hens from contamination wherever possible.

9.6 Egg Collection / Holding / TRANSFER TO GRADING

9.6.1 New Zealand Situation

Egg collection methods in New Zealand include both automatic conveyor collection and manual systems as described in 9.5.1. The Egg Producer's Federation recommends that eggs are collected at least every 24 hours, and more frequently if possible.

Plastic trays used for egg collection are usually recycled. There is a possibility that dirty trays could contaminate eggs that are placed in them. Some eggs are held at room temperature until moved to the grading facility. This could allow growth of any pathogens that are present.

In manual collection systems the eggs are often pre-sorted to separate out badly soiled or cracked eggs from the others.

Various methods are used in the industry to transfer the eggs to the grading facility – often dependent on the distance. These include by truck, trolley, automatic conveyor, forklift etc.

9.6.2 Overseas Situation

The earlier that eggs are collected after laying, the lower is the rate of contamination of the shell with microorganisms (North, 1984).

In the USA studies have shown that temperature abuse, i.e. holding eggs and foods containing raw egg at room temperature instead of under refrigeration, is a common factor in SE outbreaks (USDA, 1999c).

Pathogen growth can occur due to inadequate holding temperature and relative humidity (CFIA, 1998).

The Australian Code of Practice States that eggs shall be collected at least once a day and stored and transported below 20°C.

Key Messages to New Zealand Egg Producers:

The frequency of egg collection recommended overseas would currently be more frequent than that used by some of New Zealand's small operations. New Zealand's Egg producers Federation recommends that eggs are collected at least every 24 hours, and more frequently if possible.

9.7 Dry Cleaning

Eggs can be dry cleaned, e.g. using a stiff brush, sandpaper or steel wool, or washed. Mechanical dry cleaners may themselves be difficult to clean and may actually be a source of contamination. Dry cleaning removes the cuticle, thereby reducing the egg's protective barriers. The egg is more susceptible to microbial penetration when wet. Dry cleaning may force microorganisms from the surface of the egg into the shell's pores – actually making the situation worse. If eggs are stored under proper humidity control dry cleaning can be as effective as washing the eggs (ICMSF, 1998).

When dirty eggs are cleaned with abrasives, the cuticle is damaged. Any damage may allow entry of microorganisms. The cuticle is however fairly resistant to water, detergents, or gentle rubbing with a cloth. (Baker, 1974).

Specification 107(2) of New Zealand's Animal Products (Specifications for Products Intended for Human Consumption) Notice 2000 states: "Any primary processing of eggs intended to be traded in the shell that compromises the integrity of the shell, must be minimised." Dry cleaning is a process that would fall into this category.

Key Messages to New Zealand Egg Producers:

Dry cleaning should be avoided.

9.8 Washing / Drying / Oiling

Pathogens can survive in wash water due to inadequate control of temperature and/or pH, and insufficient changes of wash water. Contamination can also occur due to dirty water and brushes. Pathogens can contaminate eggs during drying if there are dirty air filters. An ineffective or inoperative dryer can result in eggs not being properly dried. Pathogens can also be transferred to the eggs from bacterial growth on oiling brushes. (CFIA, 1998).

9.8.1 NZ Situation

Some egg producers do wash eggs in New Zealand. The Food Regulations 1984, 131 (4) states: "Subject to subclause (5) of this regulation, eggs may be cleaned and oiled with edible oils or mineral oils" and subclause (5) states: "No person shall use, or permit to be used, any process or appliance for or in connection with the cleaning and oiling of eggs, unless that process has been approved for that purpose, within the preceding 12 months, by an Officer." Clause 132 of the same Regulations states: "Eggs for sale that have been preserved by the application of any substance, other than edible oils, that seals the pores of the shells shall be stamped on the shells in indelible ink, in 2 mm lettering, with the word "preserved".

9.8.2 Overseas Situation

Cleaning of eggs is required in the United States and Canada, presumably to reduce the risk of pathogenic bacteria penetrating the egg. There are conflicting studies that show that there is a greater rate of spoilage after cleaning due to increased penetration by bacteria (ICMSF,1998).

The following factors related to washing affect microbial penetration and spoilage (Stadelman, 1994):

- Washing eggs in liquid that is at a lower temperature than the eggs results in liquid (plus any bacteria in it) being drawn through the pores. The temperature of the liquid should be at least 12°C higher than the temperature of the eggs.
- Visibly dirty eggs tend to have a higher spoilage rate than those that are clean.
- Any process that wets the shell increases spoilage.
- Damage to the cuticle results in increased microbial penetration.
- Wash water containing iron increases the iron level in the albumen, neutralising the antimicrobial affect of conalbumin. Wash water should have less than 2ppm Fe(III). Levels above 5ppm may greatly accelerate spoilage and growth of pathogens.
- The use of potable water, disinfectants or alkaline detergents reduces the microbiological impact of washing.

Washing recommendations (ICMSF, 1998):

- Only fresh, intact eggs that have been ideally cooled to 10-14°C should be washed. This helps to achieve the desired temperature differential between the egg and the wash water.
- Washing should take place as soon as possible after collection as washing will not remove bacteria that have already had time to penetrate the egg.
- Jets of wash water and/or brushes should have complete access to each egg.
- The washing temperature should be 40-42°C (higher may risk cuticle damage).
- Wash water should be purified or filtered to remove organic matter and the microbes.
- The detergent used should be alkaline (capable of raising the pH of the wash water to 10-11) as acid detergents attack the shell.
- Detergent should be low foaming and improve the dirt removing efficiency of the water.
- A final rinse with clean water containing a sanitiser should be applied, e.g. 100-200 ppm of chlorine, quaternary ammonium compounds or calcium hypochlorite, or 12-25 ppm iodine. A potable water final rinse is required when iodine is used. Iodophors or chlorine-bromine compounds have also been found to be effective. The temperature of the rinse water should always be slightly higher than the wash water, e.g. 43-45°C.
- If the washing machine recirculates the hot, detergent/sanitiser-treated water then care should be taken to ensure that the organic and microbiological loading does not increase to unacceptable levels. This is usually done through filtration and periodic water changes (at least daily and more frequently if required).
- Immediately after washing is completed the eggs should be dried quickly and completely to reduce the risk of any remaining bacteria being aspirated into the egg.
- Drying should be followed by candling where any cracked eggs must be removed.
- Some countries permit the use of mineral oil (paraffin oil) sprays to protect the egg from water loss and the associated increase in air cell volume during cold storage. This protects the egg to some extent from bacterial penetration. Some other coatings have also been trialled successfully, e.g. alginates, polymethacrylic acid, corn promaline, polyvinyldene chloride, hydrolysed sugar derivative.

Pathogen survival increases if the wash water temperature and the pH is too low, i.e. 32-35°C, or 9-10 respectively. Cross contamination by *Salmonella* Enteritidis has been observed when the wash water had a pH of 9 but not at 11. *Yersinia enterocolitica* and *Listeria monocytogenes* have both been isolated from wash water (ICMSF, 1998).

The Canadian Food Inspection Agency's HACCP generic Model of 1998 recommends that wash water is at least 40°C and at a minimum pH of 10.5 under normal conditions (CFIA, 1998).

Key Messages to New Zealand Egg Producers:

The above details show that washing should only be carried out if it can be carefully controlled and in accordance with above guidelines.

9.9 SORTING / Candling / Grading

Badly cracked and soiled eggs are usually removed from the conveyor belt prior to candling and grading.

Failure to remove excessively dirty and/or leaking eggs can result in cross contamination of equipment, wash water (if used) and other eggs (CFIA, 1998).

Eggs should be candled using white light and black light candlers. This enables the operator to identify and remove spoiled, leaking or otherwise unacceptable eggs. This includes cracked eggs and those with punctured yolks.

Returned eggs coming back from customers should be sent for further processing.

Eggs should be put into one of the following categories:

A grade shell eggs = eggs without visible cracks or internal defects so are suitable for retail sale for human consumption.

Commercial eggs = eggs without visible cracks, but may have size/shape abnormalities or other minor defects that do not compromise egg safety or wholesomeness – not for retail sale in shell but still suitable for human consumption. These eggs are normally sold for catering or other similar uses.

Cracked eggs = eggs that can be sent for further processing (Pasteurisation or equivalent) or for animal consumption.

Reject eggs = eggs unsuitable for human or animal consumption.

9.10 Packing / LABELLING

Most labels are printed on the pack or attached to the pack at this time. It is important to check that the eggs that are being packed match the label at this step.

The Egg Producers Federation recommends that egg packhouses ensure that they can trace eggs so that they can at least identify which farms' eggs were packed on each day.

Anecdotal evidence from the New Zealand industry suggests that some product packaging is recycled. It is possible that eggs could be contaminated by dirty packaging. The Egg Producer's Federation recommends that recycling of packaging is not practised for A grade eggs.

9.11 Storage

9.11.1 New Zealand Situation

A supermarket Code of Practice requires eggs to be held at 15°C with a shelf life of 30 days – mainly for quality reasons (to get the right Haugh units).

The current Egg Producers' Federation Code Of Practice recommends eggs be held at 15°C with a maximum Best Before date of 35 days from date of lay. There have been no known problems associated with this regime.

It is therefore recommended that eggs should only be stored out of direct sunlight, in a temperature controlled environment, at or below 15°C, and once subject to temperature control, this should be maintained (including during transportation) with minimal fluctuations until the egg producer relinquishes control of the eggs.

Eggs that have been graded as suitable for "further processing" only (cracks) must be stored as either whole, or split into satisfactory containers, and stored at 4°C or below. These eggs must then be "processed" within 3 days (except that if these splits have been frozen then time is not an issue). All these products must be clearly dated and labelled, e.g. "EGGS FOR PROCESSING ONLY. NOT FOR RESALE."

9.11.2 Impact of Storage Conditions on Pathogenic Organisms – Overseas Data

Studies have shown that older eggs are more likely to be contaminated with enough bacteria, including *Salmonella,* to cause food-borne illnesses (Hagenbauch, 1999). *Salmonella* numbers per egg rise after storage of eggs at ambient temperature (Clay and Board, 1991; Humphrey and Whitehead, 1992). This is likely to be due to the defence mechanisms of the egg deteriorating over time.

The age of the yolk was found to be a principal factor controlling the growth of *Salmonella* Enteritidis by Humphrey and Whitehead (1993). Growth rates were more rapid in eggs that

were 21 days or older. Storage temperature fluctuations were also found to facilitate the growth of *Salmonella* Enteritidis.

Eggs are stored with the blunt end up to keep the yolk from drifting towards the inner membrane. If this were to happen, any microorganisms that penetrate the membrane could bypass the protective barriers in the white and directly contaminate the yolk, resulting in rapid spoilage (Board, 1964; Brown *et al.,* 1970).

Storage temperatures below 8°C inhibit the growth of bacteria. At temperatures up to 18°C the egg's antimicrobial barriers degrade slowly, but the degradation accelerates at temperatures over 18°C (ICMSF, 1998).

Cold-stored eggs that are submitted to warmer, moist conditions can be subject to condensation. If these eggs are returned to the cooler temperature while they are still wet then surface bacteria can be aspirated into the egg as the air sac contracts (ICMSF, 1998). The relative humidity during storage should be between 70 and 85% (Henderson and Lorenz, 1951). Below 70%, the quality is affected by the rapid weight loss through evaporation. Above 85%, microbial penetration is enhanced and moulds may grow.

Bradshaw *et al* (1990) found that when *Salmonella* Enteritidis was injected into the yolk of eggs from normal and seropositive hens, and the eggs were then stored at different temperatures, the generation time for bacterial growth also varied. In normal yolk, it was 25 minutes at 37˚C and 3.5 hours at 15.5˚C. In yolk from seropositive hens the generation time was 35 minutes at 37˚C.

Eggs can be infected with *Salmonella* Enteritidis internally or externally at lay, or can become contaminated after lay. The principal site of contamination of the egg contents appears to be either the outside of the yolk membrane or the albumen surrounding it. The yolk membrane becomes more permeable during storage and multiplication of these organisms can occur when eggs are stored above 20°C, or kept for more than 3 weeks. In 1993 the Government's Advisory Committee on the Microbiological Safety of Food (ACMSF) recommended that eggs should be maintained at a temperature below 20°C and consumed within 21 days (British Egg Information Service, 1999).

A 12% reduction in human illnesses was predicted by a risk assessment model if all eggs are immediately cooled after lay to an internal temperature of 45°F (7.2°C), then maintained at this temperature throughout shell egg processing and distribution. If the temperature controls start at processing then an 8% reduction in illnesses is predicted. (*Salmonella* Enteritidis Risk Assessment Team, 1998). These figures were based on the fact that there is an inherent delay in the growth of *Salmonella* Enteritidis of 11 days at an internal egg temperature of 45°F (7.2°C), or 30 days at an internal egg temperature of 60°F (16°C). It is critical that the internal temperature of the egg is reduced to 45°F (7.2°C) before the inherent resistance to yolk membrane breakdown is exhausted.

T.J. Humphrey found that in eggs artificially inoculated with *Salmonella*, no growth was observed after 3 weeks at 8˚C, but growth was observed at 10, 12 and 15˚C. Bradshaw *et al* observed no significant growth when eggs with inoculated yolks were held at 7˚C for up to 94 days. On reviewing the above articles the FDA stated "the scientific evidence on the growth of *Salmonella* Enteritidis in eggs shows that control of the storage temperature of shell eggs can effectively prevent the multiplication of any *Salmonella* Enteritidis that may be present.

While there is some debate about the optimum storage temperature for eggs, the research…indicates that refrigerating shell eggs at 8˚C and 7.2˚C or less greatly extends the time that an egg can maintain its defenses against movment of contaminating bacteria such as *Salmonella* to the nutrient rich yolk, and, therefore, substantially reduces the likelihood that any *Salmonella* Enteritidis that is present will be able to increase in numbers. Moreover there is evidence that cooling eggs reduces the heat resistance of *Salmonella* Enteritidis microorganisms, making any microorganisms that may be present in an egg more likely to be killed when the egg is less than completely cooked." (FDA, 1999).

The Canadian Food Inspection Agency's HACCP generic Model recommends that ungraded eggs are stored at or below 13˚C prior to washing, and that graded product be stored at or below 7˚C to control the growth of *Salmonella* Enteritidis if it is present (CFIA, 1998).

C. J. Kim *et al* (1989) found that temperature was the most important determinant in the growth of *Salmonella* Enteritidis in infected eggs, and that the growth response was directly proportional to the temperature at which the inoculated eggs were held. They found that even with low numbers of *Salmonella* Enteritidis originally inoculated into the albumen, temperatures of 10˚C or higher for up to 30 days allowed numbers to multiply to substantial levels.

Bacteria, if they are present at all, are most likely to be in the white and will be unable to grow, mostly due to lack of nutrients. As the egg ages, however, the white thins and the yolk membrane weakens. This makes it possible for bacteria to reach the nutrient-dense yolk where they can grow over time if the egg is kept at warm temperatures. But, in a clean, uncracked, fresh shell egg, internal contamination occurs only rarely (AEB, 2000). Egg quality is tied to three things: time, transport and temperature. Egg quality deteriorates slowly at 5°C but rapidly at 25°C. Eggs should be held at the right temperature as soon as possible as egg quality is noticeably reduced if they are first held at room temperature for 1-2 weeks. Variations in temperature (greater than 2 degrees C) have a particularly adverse affect on quality (Anonymous, 1959).

Salmonella Enteritidis can cause mortality in young chicks, but rarely causes clinical disease in adult birds. It has the ability to infect internal organs, including the ovaries and oviduct (ACMSF, 1993). It has a generation time of approximately 30 minutes at 37°C, 3.5 hours at 15.5°C, and no multiplication after 94 days at 7-8°C. Storage at 20°C restricted growth until the 21st day (Humphrey, 1994). Storage at room temperature did not affect the incidence of *Salmonella* contamination, but those eggs held for more than 21 days were more likely to be heavily contaminated. The ACMSF (1993) concluded that the normal antimicrobial barriers in shell eggs are sufficient to control *Salmonella* Enteritidis growth as long as eggs are less than 21 days old and the temperature has not exceeded 20°C. If either condition is exceeded then eggs should be stored at not more than 8°C.

Freshly laid eggs have a pH of 7.6-7.8. After 1-3 days at room temperature the pH of the egg white increases to 9.1-9.6 due to the loss of carbon dioxide (Board, 1969). Bacteria that penetrate the shell may be able to multiply inside the egg after storage. It is recommended that eggs are stored at 10°C or below to prevent multiplication of *Salmonella* (Clay and Board, 1991; Dolman J. and Board, 1992). The Australian Code of Practice recommends that eggs are stored "below 20°C at the farm, during transport and at the retail outlet, in conditions which avoid surface condensation or contamination" (AEIA, 2001).

Figure 4: Changes Occurring In Infertile Eggs During Storage

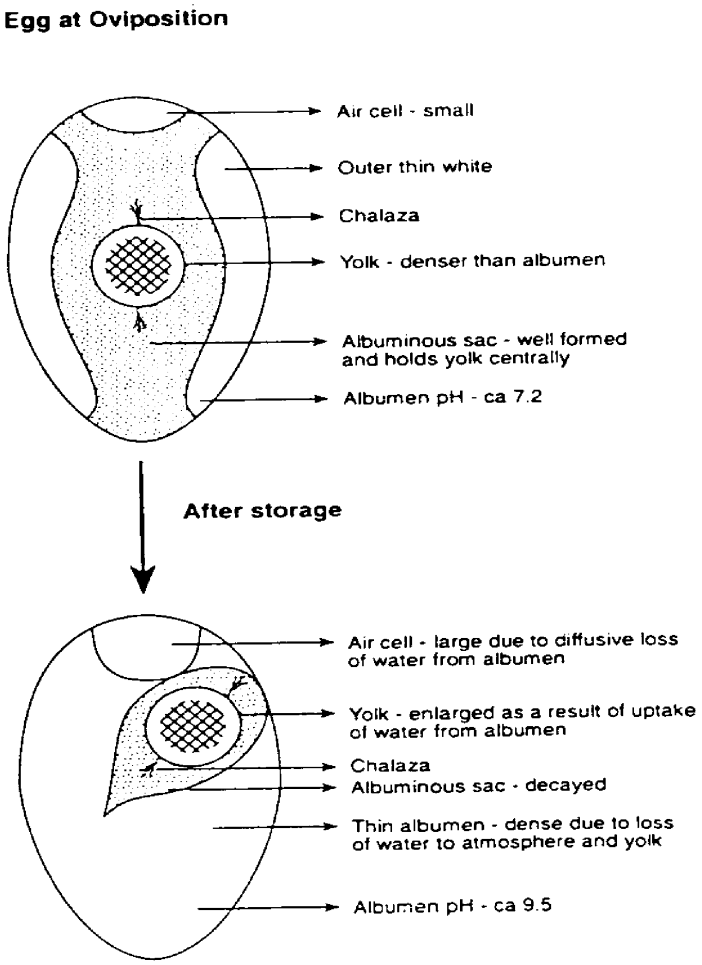


FIGURE 8.6. Changes occurring in infertile eggs during storage, which, by the end of 10–15 days, allow the bacteria present on the membranes to multiply in the egg. (Reproduced by kind permission of Professor R. G. Board.)

Figure ex (Mossel *et al*, 1995)

Key Messages to New Zealand Egg Producers:

Countries that have a *Salmonella* Enteritidis problem associated with eggs have required more stringent refrigeration regimes than is currently the case in New Zealand. If this bacteria becomes a problem in the New Zealand industry then these refrigeration requirements should be considered.

Figure 5: Changes in Quality As the Egg Ages

Changes in quality as the egg ages

Changes in quality as the egg ages are summarised in figure 2. To slow down these changes, new-laid eggs can be put in cool storage, and/or the shells covered in a thin layer of an approved oil, particularly over the air cells.

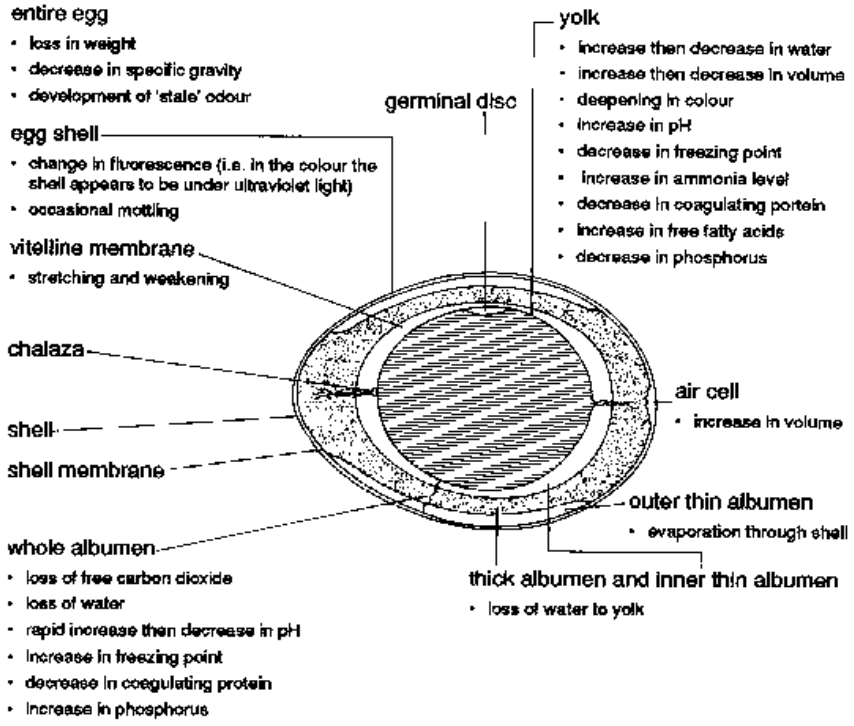


Figure 2 Structure of the egg. A summary is given of the changes occurring as the egg ages.

Figure ex Egg Quality Handbook, Coutts and Wilson, 1990, page 4.

9.11.3 Impact of Storage Conditions on Spoilage Organisms – Overseas Data

When properly handled and stored, eggs rarely spoil. As an egg ages, the white becomes thinner, the yolk becomes flatter and the yolk membrane weakens. These changes may affect appearance, but they don't indicate spoilage and don't have any great effect on the nutritional or baking quality of the egg (AEB, 2000).

Chilled storage minimises but does not prevent bacterial spoilage of eggs (which can result in rotten eggs) and is usually caused by *Pseudomonas* spp., *Acinetobacter, Moraxella, Alcaligenes* and Enterobacteriaceae e.g. *Enterobacter, Proteus, Escherichia* and *Serratia* spp.

The following table gives a good indication of microorganisms that are likely to cause spoilage.

Table 14: Microflora On The Eggshell And Within Spoiled Eggs

Type of microorganism	Frequency of occurrence[a]	
	On the shell	In rotten eggs
Micrococcus	+ + +	+
Escherichia, Pseudomonas, Alcaligenes	+ +	+ + +
Arthrobacter, Bacillus, Cytophaga, Achromobacter, Flavobacterium	+ +	+
Enterobacter, Staphylococcus	+ +	-
Proteus	+	+ + +
Aeromonas	+	+ +
Streptococcus	+	+
Sarcina, Serratia	+	-

[a]No. Of plus signs indicates relative frequency of occurrence.
Adapted from Mayes and Takeballi, 1983, as adapted from Bruce and Drysdale, 1994.

Like all natural organic matter, eggs can eventually spoil through the action of spoilage organisms, which although unpleasant, don't cause foodborne illness. The bacteria *Streptococcus*, *Staphylococcus*, *Micrococcus* and *Bacillus* may be found on egg shell surfaces because all these species can tolerate dry conditions. As the egg ages, though, these bacteria decline and are replaced by spoilage bacteria, such as coliform and *Flavobacterium*, but the most common are several types of *Pseudomonas*. *Pseudomonas* can grow at temperatures just above refrigeration and below room temperatures and, if they're present in large numbers, may give eggs a sour or fruity odor and a blue-green coloring (AEB, 2000).

Although it is more likely for bacteria to cause spoilage during storage, mold growth can occur under very humid storage conditions or if eggs are washed in dirty water. Molds such as *Penicillum*, *Alternaria* and *Rhizopus* may be visible as spots on the shell and can penetrate the shell to reach the egg (AEB, 2000).

Discard any eggs with shells that don't look or feel clean, normally colored and dry. A slimy feel can indicate bacterial growth and, regardless of color, powdery spots that come off on your hand may indicate mold (AEB, 2000).

Key Messages to New Zealand Egg Producers:

Minimising the environmental contamination of eggs, and handling and refrigerating them properly will reduce the likelihood of spoilage of the eggs. The Egg Producers Federation of New Zealand recommends eggs be held at 15°C with a maximum Best Before date of 35 days from date of lay.

9.12 Loadout and Delivery

Loadout and delivery can be considered to be a continuum of storage. See 9.11.

9.13 Consumer Information

Occasionally, even in New Zealand where *Salmonella* Enteritidis is not a major issue, eggs with clean, uncracked shells can be contaminated with bacteria. If foods containing harmful bacteria are consumed, they can cause food-borne illness. The risk is very low, but the consumer can minimise the risk further by following the recommendations of the American Egg Board as summarised below.

At the supermarket, select perishable foods last and separate raw meat, fish, seafood and poultry from eggs and other foods in your grocery cart. At home, refrigerate raw shell eggs in their cartons in the coldest part of the refrigerator, away from any meat that might drip juices or any produce that might come into contact with eggshells. To guard against breakage and odor absorption and to help prevent the loss of carbon dioxide and moisture which lowers egg quality, store raw shell eggs in their cartons. Place egg cartons on a middle or lower shelf where the temperature will fluctuate less than on the door. For longer storage, beat whole eggs just until blended, pour into freezer containers, seal the containers tightly, label with the number of eggs and the date and freeze for up to 1 year. Substitute 3 tablespoons thawed whole egg for 1 large fresh egg. Avoid freezing hard-cooked whole eggs or whites as freezing causes them to become tough and watery. Check occasionally with a thermometer to be sure your refrigerator temperature is 4° C or below and that your freezer temperature is -18° C or below. To maintain safe temperatures, allow cool air to circulate, rather than packing your refrigerator.

Beware of cross-contamination. The egg may not be contaminated when you buy it, but it can become contaminated from other sources, such as hands, pets, other foods and kitchen equipment. Always wash hands with hot, soapy water then dry them with clean (preferably disposable towels) *before* and *after* food preparation, as well as when you're handling raw animal products, such as raw eggs. Always wash surfaces and cooking equipment, including blenders, in hot, soapy water *before* and *after* food preparation.

Bacteria can multiply in moist high-protein foods, including desserts and salads. Don't leave perishables out at room temperature for more than 2 hours and on hot days reduce this time to 1 hour. Cover or wrap any egg mixtures or leftover cooked egg dishes before refrigerating. Refrigeration *slows* bacterial growth, so refrigerate eggs and egg-containing foods.

Do not taste foods that contain raw eggs. It is important to cook eggs thoroughly until the yolks and whites are firm to inactivate any bacteria that are present. Even light cooking will begin to destroy any *Salmonella* that might be present, but proper cooking brings eggs and other foods to a temperature high enough to destroy them all. For eggs, the white will set between 62 and 69° F, the yolk between 69and 70° C, and whole egg between 62 and 70° C. Egg products made of plain whole eggs are pasteurised (heated to destroy bacteria), but not cooked, by bringing them to 60° C and keeping them at that temperature for 3 1/2 minutes. If you bring a food to an internal temperature of 71° C, you will instantly kill almost any bacteria. By diluting eggs with a liquid or sugar (as in custard), you can bring an egg mixture to 71° C. Use these temperatures as rough guidelines when you prepare eggs (AEB, 2000).

All models of microwave ovens tend to cook foods unevenly, leaving cold spots. To encourage more even cooking, cover the dish, stir the ingredients, if possible, and rotate the dish at least once or twice during the cooking time.

EGG DONENESS GUIDELINES (AEB, 2000).

FOOD	GUIDELINES
Scrambled eggs, omelets and frittatas	Cook until the eggs are thickened and no visible liquid egg remains.
Fried eggs	To cook both sides and increase the temperature the eggs reach, cook slowly and either baste the eggs, cover the pan with a lid or turn the eggs. Cook until the whites are completely set and the yolks begin to thicken but are not hard.
Soft-cooked eggs	Bring eggs and water to a full, rolling boil. Turn off the heat, cover the pan and let the eggs sit in the hot water about 4 to 5 minutes.
Poached eggs	Cook in gently simmering water until the whites are completely set and the yolks begin to thicken but are not hard, about 3 to 5 minutes. Avoid precooking and reheating poached eggs.
Baked goods, hard-cooked eggs	These will easily reach internal temperatures of more than 71° C when they are done. Note, though, that while *Salmonella* are destroyed when hard-cooked eggs are properly prepared, hard-cooked eggs can spoil more quickly than raw eggs. After cooking, cool hard-cooked eggs quickly under running cold water or in ice water. Avoid allowing eggs to stand in stagnant water. Refrigerate hard-cooked eggs in their shells promptly after cooling and use them with 1 week.
French toast, Monte Cristo sandwiches, crab or other fish cakes, quiches, stratas, baked custards, most casseroles	Cook or bake until a thermometer inserted at the center shows 71° C or a knife inserted near the center comes out clean. You may find it difficult to tell if a knife shows uncooked egg or melted cheese in some casseroles and other combination dishes that are thick or heavy and contain cheese – lasagne, for example. To be sure these dishes are done, check to see that a thermometer at the center of the dish shows 71° C. Also use a thermometer to help guard against uneven cooking due to hot spots and inadequate cooking due to varying oven temperatures.
Soft (stirred) custards, including cream pie, eggnog and ice cream bases	Cook until thick enough to coat a metal spoon with a thin film and a thermometer shows 71° C or higher. After cooking, cool quickly by setting the pan in ice or cold water and stirring for a few minutes. Cover and refrigerate to chill thoroughly, at least 1 hour.
Soft (pie) meringue	Bake a 3-egg white meringue spread on a hot, fully cooked pie filling in a preheated 177° C oven until the meringue reaches 71° C, about 15 minutes. For meringues using more whites, bake at 163° C (or a lower temperature) until a thermometer registers 71° C, about 25 to 30 minutes (or more). The more egg whites, the lower the temperature and longer the time you need to cook the meringue through without excessive browning. Refrigerate meringue-topped pies until serving. Return leftovers to the refrigerator.

10. Other Country requirements

Country Standard	Requirements
Australia New Zealand Food Standards Code: Standard 2.2.2 Egg and Egg Products NB: This was adopted by State Health Ministers (incl. NZ's) on 24 November 2000. It will run in parallel with the NZ Food Regulations and the current Australian Food Standards Code until November 2002 at which time the latter two pieces of legislation will lapse.	Purpose: This Standard provides definitions for egg and egg products. Processing requirements for egg products and requirements relating to the sale of cracked eggs are included in this Standard and Standard 1.6.2. 1 Interpretation: In this Code - **egg** means the reproductive body in shells obtained from any avian species, the shell being free from visible cracks, faecal matter, soil or other foreign matter. **egg products** means the content of egg, as part or whole, in liquid, frozen or dried form. **visible cracks** includes cracks visible by candling. 2 Processing of egg products (1) Subject to subclause (2), egg products must be pasteurised or undergo an equivalent treatment so that the egg product meets the microbiological criteria specified in Standard 1.6.1. (2) Subclause (1) does not apply to the non-retail sale of egg products used in a food which is pasteurised or undergoes an equivalent treatment so that the egg product used in the food meets the microbiological criteria specified in Standard 1.6.1. 3 Sale of cracked eggs (1) Cracked eggs must not be made available for retail sale or for catering purposes. (2) Cracked eggs sold for non-retail must be pasteurised or have undergone an equivalent treatment so that the egg product meets the microbiological criteria specified in Standard 1.6.1
Australia New Zealand Food Standards Code (ANZFSC): Standard 1.2.3	Unpasteurised egg and egg products are to be labelled with an advisory statement that the product is unpasteurised.
ANZFSC: Standard 1.6.1	Microbiological Limits for Food
EC Council Regulation (EEC) No. 1907/90 Certain Marketing Standards for Eggs and Commission Regulation (EEC) No. 1274/91 and Council decision 94/371 and (EEC) No 12771/75.	Eggs have to be shipped to the licensed packing station at least every third working day, or once a week where the intervening storage temperature does not exceed 18°C (ICMSF, 1998). Also covers labelling of eggs and where eggs of certain grades may be sent.
EC Council Regulation (EC) No 1804/1999.	Covers requirements for organic production of agricultural products.
EC Council Directive 96/23/EC, 29 April 1996,	Certain substances and residues in live animals and animal products are to be monitored. Chapter 2 specifies the

Country Standard	Requirements
Chapter 2 Eggs	sampling to be done at the farm or packing centre. The sample size is at least 12 eggs. The sample rate is at least 1 per 1,000 tonnes of the annual production of consumption eggs, with a minimum of 200 samples per member state. The substances to be checked are listed in annex II as: A6 = Compounds included in Annex IV to Council Regulation (EEC) No 2377/90 of 26 June 1990, (pharmacologically active substances for which no mrls can be fixed and 'Aristolochia spp. and preparations thereof`) (EEC Council, 1990a). B1 = Antibacterial substances including sulphonomides, quinolones, 2b = Anticoccidials, including nitroimidazoles, 3a = Organochlorine compounds inclunding PCBs.
Council Directive 1999/74/EC	Covers the minimum standards for the protection of laying hens.
The Ungraded Eggs (Hygiene Regulations) 1990. UK 1990 No. 1323.	Prevents the sale of eggs containing cracks visible without candling to the naked eye.
USFDA Federal Register: December 5, 2000 (Volume 65, Number 234)[Page 76091-76114]--21 CFR Parts 16, 101 and 115 Food Labeling, Safe Handling Statements, Labeling of Shell Eggs; Refrigeration of Shell Eggs Held for Retail Distribution; Final Rule	The refrigeration requirement will be effective in 6 months, while the safe handling requirement will be effective in 9 months. The regulation requires shell egg cartons to bear safe handling instructions because of eggs' association with Salmonella Enteritidis (SE), a bacterium responsible for foodborne illness. The required statement is as follows: **SAFE HANDLING INSTRUCTIONS:** To prevent illness from bacteria: keep eggs refrigerated, cook eggs until yolks are firm, and cook foods containing eggs thoroughly. The rule requires that eggs be placed promptly under refrigeration at 45°F (7.2°C) or lower upon delivery at retail establishments (supermarkets, restaurants, delis, caterers, vending operations, hospitals, nursing homes and schools). This rule is one part of the larger Egg Safety Action Plan, a farm-to-table approach for ensuring the safety of our nation's egg supply, which was announced by the President on December 11, 1999. The Plan, seeks to reduce by 50 percent the number of *SE* illnesses attributed to contaminated eggs by 2005 and eliminate egg-associated *SE* illnesses by 2010.
US FDA	*Salmonella* Enteritidis positive eggs have to be pasteurised or diverted from market. (Brasher, 2000)

11. Codes of Practice / Control Systems:

Issuer	Contents	Reference
Codex Alimentarius	Covers eggs in shell and products consisting wholly or mainly of one or more constituents of egg, intended for human consumption. Sections include: • Raw material requirements; • Plant, Facilities and Operating Requirements; • End Product Specifications • Annexes of test methodologies.	Codex Alimentarius (1994). Code of Hygienic Practice for Egg Products CAC/RCP 15-1976, amended 1978, 1985. Volume 11, 1994.
Australian Egg Industry Association	General Food Safety Hazards Personnel Hygiene Requirements Poultry and Packing Buildings The Flock Egg Collection Process Appendices covering food safety program, sanitisers, egg quality, egg standards, egg washing and process temperatures, guidelines for retailers, wholesalers, caterers and food service organisations.	AEIA (Australian Egg Industry Association) (2001). Code of Practice For Shell Egg Production, Grading, Packing and Distribution. 13 February, 2001.
USA	The PEQAP (Pennsylvania Egg Quality Assurance Program) has been developed to promote egg quality and food safety. It contains rules for: egg testing, rodent control, monitoring and testing of chicks, pullets and layers, manure sampling and culturing, farm biosecurity, processing and packaging, carton coding, record-keeping, refrigeration (7.2°C) and disinfection between flocks.	PennAg Industries Association. (1999). Pennsylvania takes lead in egg safety, quality. Press Release. 12/11/99.
USA	The following strategies were identified to eliminate human illnesses due to *Salmonella* Enteritidis in eggs: • Chicks from SE-free breeders • SE testing – environmental, eggs. • Diversion of positives to pasteurisation • Biosecurity • Rodent/Pest Control • Cleaning and disinfection • Prerequisite programmes • HACCP system with a "kill step" • Refrigeration during transport and storage • Food Code Provisions • Monitoring of human infections • Research • Education The goal is to reduce foodborne illnesses associated with *Salmonella* Enteritidis in eggs by 50% by 2005.	President's Council on Food Safety (1999). Egg Safety From Production to Consumption: An Action Plan to eliminate *Salmonella* Enteritids Illnesses Due to Eggs. December 10, 1999. http://www.foodsafety.gov/~fsg/

Issuer	Contents	Reference
USA	The American Egg Board and United Egg producers is minimising the risk of egg-related *Salmonella* by a voluntary Pro-active Quality Control Campaign that requires control of 5 critical areas: • Poultry house cleaning and disinfecting • Rodent and pest elimination • Proper egg washing • Biosecurity and • Refrigeration.	FSNet (1999): Egg Industry Food Safety Programs. June 30 Press Release. http://www.foodsafety.org/ht/ht430.htm
USA	Includes: • Goals and objectives • Strategy I: SE testing-egg diversion system on farm. • Strategy II: Lethal treatment, or "kill step" at packer/processor. • Detailed Action Plans. • Performance Measures.	USFDA, 1999c. President's Council on Food Safety. Egg Safety From Production to Consumption. An Action Plan to Eliminate *Salmonella* Enteritidis Illnesses Due to Eggs, 10/12/1999.
Canada	HACCP based programme covering on farm aspects of egg production: • Refrigerated storage (egg coolers to be between 7-13°C). • Facility hygiene • Pest Control • Sorting and Packing • Premises • Sanitary Facilities • Receiving and Storage • General Equipment • Personnel • Records	Canadian Egg Marketing Agency. (1997). Start Clean Stay Clean On-Farm Food Safety Program for Canadian Shell Egg Producers.
Canada	Covers: • Product description • Product ingredients and incoming materials • Process Flow diagram • Plant schematic • Biological, chemical and physical hazards • CCP determination • Controls • Hazards not controlled by the operator • HACCP plan	Canadian Food Inspection Agency (1998). HACCP Generic Model – Shell Eggs. October 1998.

Issuer	Contents	Reference
Holland	Covers: • Risk analysis: physical, chemical and microbiological • *Salmonella* prevention • Hygiene requirements for the preparation of eggs for consumption • Cleaning and sanitation • Personal hygiene and health requirements • Vermin control • Training • Use of the hygiene code	Dutch Code Of Practice
UK	Covers: • Epidemiology of Human Salmonellosis. • Epidemiology of *Salmonella* in poultry flocks. • Contamination of eggs. • Egg production, distribution and processing. • Use and handling of eggs. • Conclusions and Recommendations.	MAFF, 1993. Advisory Committee on the Microbiological Safety of Food. Report on *Salmonella* in Eggs.
UK	Recommendations include: • Advice to consumers. • Handling and storage of eggs. • Use of pasteurised egg. • Training of food handlers. • Improvements in the monitoring/reporting of Putbreaks of foodborne illness. • Government measures for the control of *Salmonella* in poultry. • Research and surveillance. • Surveillance studies.	MAFF, 1993a. Advisory Committee on the Microbiological Safety of Food. *Salmonella* in Eggs: Recommendations and Government's Response.
UK	Covers: • Production site • Poultry house • Egg collection • Egg storage on the farm • Eggs in transit • Egg grading, packing and labelling • Eggs at wholesalers • Eggs at caterers • Eggs at retailers	MAFF, 1996. Code of Practice. The Handling and Storage of Eggs From Farm to Retail Sale

Issuer	Contents	Reference
UK	Optional "Lion Quality" Code of Practice for Lion Eggs. Control measures include: • Vaccination of all hens against *Salmonella* Enteritidis, • Passport for traceability of hens and eggs, • Registration of all Licensees and listing of associated hatcheries, rearing and laying farms, • Independent auditing of egg farms and packing centres • Feed produced to the UKASTA Feed Assurance Scheme standard, • Modern packing centre technology • Date coding of eggs, • New hygiene controls on egg farms and packing centres including temperature control, • Animal welfare provisions, and • Environmental policies.	British Egg Industry Council. (1998). Egg men crack *Salmonella* problem. http://www.britegg.co.uk/news/news1.htm British Egg Industry Council. (1999). Lion Quality Code of Practice for Lion Eggs, 3rd Version: November 1999.

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13. Summary of Hazards and Other Risk Factors Reasonably Likely to Occur in Shell Eggs

All of the previous information has been summarised into tables that also relate the hazards and other risk factors to their cause or source and possible controls. These tables show the linkage between the hazards and controls in the later sections in this Code of Practice.

The egg producer should consider all of the listed hazards and other risk factors to see whether they need to be included in their RMP. They should also decide whether they have any additional hazards or risk factors that are specific to their own operation.

How to use the Summary Tables on Next Pages

1st column: Each hazard or other risk factor has been given an identification code in this column The letter at the start of the code refers to:
B = Biological hazard,
C = Chemical hazard,
P = Physical hazard,
W = Wholesomeness issue and
L = Labelling issue.
The numbers are issued sequentially.
These codes have been given to help trace the hazards and other risk factors and the controls documented later in the COP.

2nd column: The hazards and other risk factors that were identified in the Technical Annex in Appendix C as reasonably likely to occur have been listed in this column.

3rd column: The cause or source of the hazards and other risk factors have been listed in this column.

4th column: Possible controls are listed in this column. Not all of these controls will be used by every egg producer.

5th column: This column cross references to the later parts of the COP that elaborate on the controls for the hazard or risk factor.

The summary tables below summarise all of the hazards and risk factors identified in the technical annex.

13.1 Summary Of Biological Hazards Reasonably Likely To Occur In Whole Shell Eggs

ID	Examples reasonably likely to occur	Cause/source	Possible controls	For analysis Refer to	
B1	Salmonella species	From hens that are infected or are carriers.	Sourcing layer hens from parent flocks and hatcheries that have been tested and are "not detected" for Salmonella. Use feed that has been tested and is "not detected" for Salmonella. Treatment of hen's drinking water. Vaccination. Competitive exclusion.	3.7	Farm inputs: bird, feed, water and medication.
			No forced moulting.	3.9	Step 3
			Keeping free range hens away from uncontrolled water sources.	3.8	Other farm sources
		From external contamination of the shell. This is made worse if shell is not intact or damaged, e.g. by vigorous dry cleaning, or through incorrect washing of eggs.	Cleaning and sanitation of shed, cages and conveyor belt.	3.9	Step 1
			Replacement of nest box material.	3.9	Step 3
			Manure removal. Pest control. Personal hygiene. Keeping free range hens out of wet, muddy areas.	3.8	Other farm sources
			Collection of eggs ASAP after laying. Rejection of very dirty eggs. No dry cleaning of eggs. Separation of cracked/damaged eggs.	3.9	Steps 4, 6 & 8
			Correct egg washing procedures.	3.9	Step 7

ID	Examples reasonably likely to occur	Cause/source	Possible controls	For analysis Refer to	
B2	Other enteric bacteria	From hens.	Sorting of eggs so that only clean eggs go for human consumption.	3.9	Steps 4, 5, 6, 7 & 8
		From external contamination of the shell. This is made worse if shell is not intact or damaged, e.g. by vigorous dry cleaning, or through incorrect washing of eggs.	As for salmonella.	3.8 3.9	See above
B3	*Staphylococcus / Streptococcus spp*	Infected food handlers.	Personal hygiene.	3.8 4.8	Other packhouse sources
B4	*Listeria monocytogenes*	From packhouse environment, contaminated equipment and condensation.	Cleaning and sanitation of premises and equipment.	4.8	Other packhouse sources

13.2 Summary Of Chemical Hazards Reasonably Likely To Occur In Whole Shell Eggs[8]

C1	Residues from animal remedies e.g. antibiotics	Incorrect use of animal remedies	Use only approved chemicals for medication. Abide by witholding periods.	3.7	Farm inputs, medication
C2	Residues from chemicals used in shed cleaning, sanitation and fumigation	Incorrect use of chemicals could leave residues on equipment used for feeding and watering hens.	Use only approved chemicals in shed.	3.8	Other farm sources, chemicals
C3	Residues from chemicals used in egg washing	Incorrect use of chemicals.	Use only approved chemicals for washing.	4.7	Packhouse inputs
C4	Residues from chemicals used in egg oiling	Non-food grade oils used to seal washed eggs.	Use only approved chemicals for oiling.	4.7	Packhouse inputs

8 This is a summary of the information presented in the technical annex which can be found in Appendix C.

13.3 Summary Of Physical Hazards Reasonably Likely To Occur In Whole Shell Eggs[9]

ID	Examples reasonably likely to occur	Cause/source	Possible controls	For analysis Refer to	
P	N/a – no physical hazards likely to occur because of the protective nature of the shell.				

9 This is a summary of the information presented in the technical annex which can be found in Appendix C.

13.4 Summary Of Risks To Wholesomeness Reasonably Likely To Occur In Whole Shell Eggs

ID	Examples reasonably likely to occur	Cause/source	Possible controls	For details Refer to	
W1	Blood or meat spots	Caused by a rupture of one or more small blood vessels in yolk at ovulation.	Keep flock age as low as economically possible. Feed to have vitamins A & K. Do not allow feed lines to become wet or mouldy.	3.7	Farm inputs: birds, feed
W2	Watery whites	Egg is aging or hen is infected with infectious bronchitis virus or other viral diseases.	Collect all eggs ASAP after laying.	3.9	Step 4
			If birds are sick contact an avian vet for advice on vaccination.	3.7	Farm inputs, medication
W3	Roundworms in eggs	Internal parasite of the hen can migrate to oviduct and be enclosed in egg.	Medication.	3.7	Farm inputs, medication
			Keep birds off fouled or damp ground or litter.	3.8	Other farm sources
			Disinfection of poultry house.	3.9	Step 1
W4	Off odours and flavours	Strongly flavoured feed ingredients, e.g. fishmeal.	Change feed composition to reduce suspect ingredient.	3.7	Farm inputs, feed
W5	Rotten eggs	Spoilage due to *Pseudomonas* bacteria. Storage at high temperatures.	Reject extremely dirty eggs. Wash other dirty eggs using correct procedures. Maximum storage temperature = 15 °C.	3.9 4.9	Steps 4, 5, 6,7, 8, 11
W6	Pink or iridescent egg whites.	Spoilage due to *Pseudomonas* bacteria Storage at high temperatures.	Reject extremely dirty eggs. Wash other dirty eggs using correct procedures. Maximum storage temperature = 15 °C.	3.9 4.9	Steps 4, 5, 6,7, 8, 11
W7	Eggs that are older than their use by date.	Delayed egg collection, packing or selling. Incorrect date coding.	Collect all eggs ASAP after laying. Check that eggs are not trapped in cages. These may eventually roll out and be collected when they are stale.	3.9	Step 4

ID	Examples reasonably likely to occur	Cause/source	Possible controls	For details Refer to	
W8	Soft shells.	Inadequate feed, water.	Improve feed composition.	3.8	Farm inputs, feed
W9	Mouldy eggs	Delayed egg collection.	Collect all eggs ASAP after laying.	3.9	Step 4
		Poor storage and handling. When temperature fluctuations result in condensation on eggs.	Maximum storage temperature = 15 °C. Maximum humidity = 80%.	3.9	Steps 5, 11
			Clean and disinfect storage rooms regularly.	3.8 4.8	Other sources

13.5 Summary of Risks Of False Or Misleading Labelling Reasonably Likely To Occur In Whole Shell Eggs

ID	Examples reasonably likely to occur	Cause/source	Possible controls	For details Refer to	
L1	Incorrect claims re caged, barn, free range or organic eggs.	Birds not qualifying for claim.	Check birds meet criteria.	3.7	Farm inputs, birds
		Incorrect label design. Use of incorrect label or pack. Use of recycled packaging with wrong label.	Checks of label proofs for new labels. Check of labels and packages at start of each day and for each change of shed. Clear labelling of all egg containers.	3.9 4.9	Steps 4-10
		Mix up of eggs.	Collect and process different egg types in separate batches and store in different areas.	3.9 4.9	Steps 4-10
L2	Incorrect date marking	Delayed collection. Date not changed.	Check date at start of each day. Do not reuse packaging.	3.9 4.9	Steps 4, 10

Appendix D: Forms To Use For Your RMP

Doc ID:	Version:	Issue Date:	Page:

1. Title Page

Risk Management Programme

Business Name:

Type of Operation:

Products:

Doc ID:	Version:	Issue Date:	Page:

2. Management Authorities and Responsibilities

Business Name:	
Business Operator's Full Legal Name[1]:	
Business Identifier[2]:	
Business Address:	
Postal Address (If different from the business address):	
Registered Company Address (If different from the business address)	
Email Address:	
Phone Number	
Fax Number	

Person responsible for:	Name or title	Training received
Day to day management of RMP		
Deputy for Day to Day Manager of RMP		

[1] For a company this is just the company name, otherwise put in the Partnership name or name of the Sole Trader.
[2] Business Identifier must not be the same as an exporter ID operating from the same premises;
Must be a number or a number/letter combination of:
- at least 3 and not more than 10 characters;
- at least one character as a number;
- no leading zeros.

Doc ID:	Version:	Issue Date:	Page:

3. Scope of the risk management programme

Business Name:	
Type of Premises:	
Name of Animal Material:	
Name of Animal Products:	
Location:	
Start of RMP:	
Processes:	
End of RMP:	
Risk Factors Covered (delete those that are not applicable):	**Hazards to Human Health** **Hazards to Animal Health** **Risks to Wholesomeness** **Risks From False or Misleading Labelling**

For each risk management programme the egg producer must describe the physical boundaries of the programme. Do this using a plan you already have or draw a plan on a separate page.

Doc ID:	Version:	Issue Date:	Page:

4. Product description and intended purpose

An example for a product description for shell eggs is given below. If any product (e.g. reject eggs) is meant for animal consumption a separate product description should be written for this. A blank form is given in the appendix. One form should be filled out for each type of product, e.g. whole shell eggs, broken eggs, downgraded eggs.

Product Name:				
Product Description:				
Intended Uses:				
Intended Consumer:				
Shelf Life From Date of Lay:				
Labelling Instructions:				
Packaging:				
Where it is to be Sold:				
Storage and Distribution Conditions:				

Doc ID:	Version:	Issue Date:	Page:

5. Product outcomes for all eggs except reject eggs.

5.1 Hazards to Human Health

	Hazard or other risk factor	Aim of RMP	Product outcome	Key Control Measures	Response if outcome not met
Biological:					
Chemical:					
Physical:					

Doc ID:	Version:	Issue Date:	Page:

5.2 Hazards to Animal Health

	Hazard or other risk factor	Aim of RMP	Product outcome	Key Control Measures	Response if outcome not met
Biological:					
Chemical:					
Physical:					

Doc ID:	Version:	Issue Date:	Page:

5.3 Risks to Wholesomeness

Hazard or other risk factor	Aim of RMP	Product outcome	Key Control Measures	Response if outcome not met

Doc ID:	Version:	Issue Date:	Page:

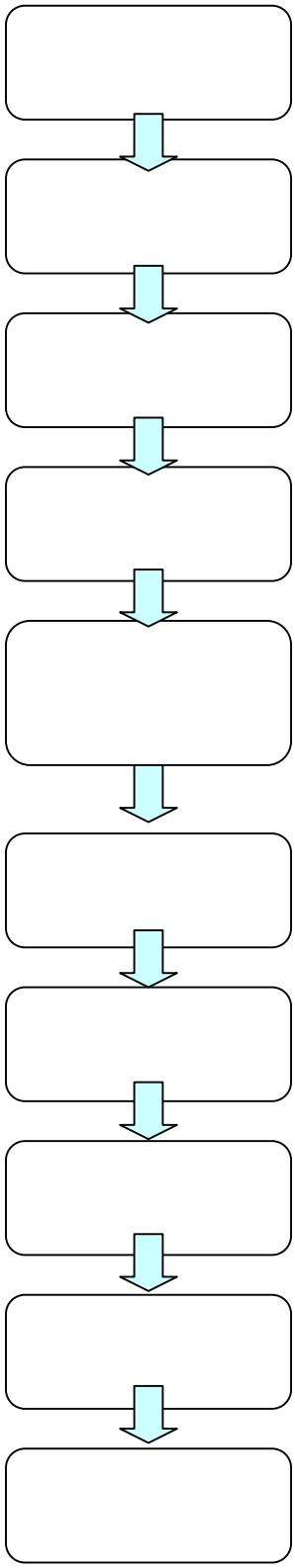
5.4 Risks From False or Misleading Labelling

Hazard or other risk factor	Aim of RMP	Product outcome	Key Control Measures	Response if outcome not met

Doc ID:	Version:	Issue Date:	Page:

6. Process / operation description

Inputs	Process Steps	Outputs



Doc ID:	Version:	Issue Date:	Page:

7. Analysis / Control of Hazards and Other Risk Factors From Inputs

7.1 Input type:

7.1.1 Hazards or other Risk Factors

7.1.2 Supplier Requirements

Regulatory Requirements
Operator-defined Requirements

7.1.3 Procedures

Step	Control Measure	Monitoring	Corrective Action	Records

[3]

7.1.4 Operator verification

7.1.5 Records

[3] In some cases you may need to attach or refer to additional information – e.g. criteria for visual inspection of birds.

Doc ID:	Version:	Issue Date:	Page:

7.2 Analysis / Control of Hazards and Other Risk Factors From Water

Water Supplier:	
Water source:	
Water potability option:	
Water Management Plan	
Water Reticulation Plan	
Records	

Table 1: Quality of Potable Water

Measurement	Criteria
faecal coliforms	**must not be detectable in any 100 ml sample**
Chlorine (when chlorinated)	**not less than 0.2mg/l (ppm) free available chlorine with a minimum of 20 minutes contact time**
pH (when chlorinated)	**6.5 to 8**
Turbidity	**Should not routinely exceed 1 NTU, must not exceed 5 NTU**

If using Schedule 1 potability option, fill out and attach Checklist from the Schedule in Appendix G here.

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7.2.1 Water Management Plan:

Why was your water unsatisfactory? (Get this from your earlier answers)	
Is there a biological, chemical or physical hazard associated with this problem? If so what? (See next table for ideas).	

	Hazards	Examples
Biological hazards	**Harmful bacteria from the gut of humans, animals and birds.**	***E.coli*** ***Salmonella* species**
	Parasites	***Giardia*** ***Cryptosporidium***
Chemical hazards	**Chemical residues**	**Pesticides, herbicides, fumigants**
	Heavy Metals	**Mercury, cadmium, copper, lead, zinc, selenium, arsenic, chromium. manganese, antimony**
Physical hazards	**N/a**	**N/a**

What will you do to correct or control this problem/hazard? Consider removing the problem the problem where possible or treatment e.g. chlorination, filtration. **You may need to ask for expert advice on this.**	

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What water testing will you do? How often? What criteria must it meet?

See table below

		Test frequency			
		Secure water		Unsecure Water	
Measurement	Criteria		<2000 m^3/day	2000-10,000 m^3/day	>10,000 m^3/day
faecal coliforms	Must not be detectable in any 100 ml sample	Nil	1 test every month	1 test every 2 weeks	1 test every week
Chlorine (when chlorinated)	Not less than 0.2mg/l (ppm) free available chlorine with a minimum of 20 minutes contact time	Nil	1 test every month	1 test every 2 weeks	1 test every week
pH (when chlorinated)	6.5 to 8	Nil	1 test per month	1 test per 2 weeks	1 test per week
Turbidity	Should not routinely exceed 1 NTU, must not exceed 5 NTU	Nil	daily	daily	daily

What will you do if any of these criteria are not met? Consider extra treatment, further testing, alternative supply etc. You may need to ask an expert for help.

What lab does the micro tests?

Are they MILAB[4] accredited? If so ask for letter confirming this. If not, find another lab which is.

Who are the water samplers and were they trained by the lab to take samples properly?

[4] MILAB is a laboratory accreditation programme run by NZFSA. See NZFSA web site: www.nzfsa.govt.nz/animalproducts/milab/index.htm or contact Programme Manager, Monitoring and Review for details (04, 4632500).

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Who does the pH, chlorine and turbidity tests? Have they been trained?	**pH:** **Chlorine:** **Turbidity:**
What equipment/ test kit/ method is used for these tests? How is any equipment calibrated to make sure it is accurate (Refer to the manufacturer's instructions or supplier for details).	**pH:** **Chlorine:** **Turbidity:**
What test records do you have: pH, chlorine and turbidity tests? Have they been trained?	

Note: If water is supplied by the operator, and the operator fails to comply with any of the requirements of the water management plan (shown on last 3 pages), and has no other means described in the risk management programme to ensure the water meets the original standard at the point of use, all operations involving that water must cease.

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7.2.2 Water Reticulation Management

Do you have a plan of the water pipes on your premises?	
Do you have more than one standard of water on your premises, e.g. potable water, and non-potable water – perhaps for fire fighting?	
Do you have dead ends in your potable water pipes where water can stagnate?	
Are your pipes in good condition, i.e. not rusting, not damaged?	
If any of the above change what will you do?	

Note: These questions have been asked to ensure that the quality of the water coming in is maintained. Further identification and analysis of hazards and other risk factors is not required.

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8. Analysis / Control of Hazards and Other Risk Factors From Other Sources

8.1 Source type:

8.1.1 Scope:

8.1.2 Requirements for the Operator

Regulatory Requirements

Operator-defined Requirements

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8.1.3 Process flow diagram

Inputs	Process steps	Outputs

8.1.4 Identify / Analyse Hazards and Other Risk Factors, and Determine CCPs

			Q1: Is hazard reasonably likely to contact product?	**Q2:** Could the level of hazard exceed the measurable requirement?	**Q3:** Is there one or more new or improved controls that will achieve the measurable requirement?	**Q4:** Are there any other controls?
Hazard or Risk Factor	**Current Control measures, e.g.** **GHP / GMP**	**Is there a relevant measurable requirement?** **(See 8.1.2)**	**If yes, go to Q2.** **If no, not a CCP. Go to next hazard or risk factor.**	**If yes, go to Q3.** **If no, not a CCP. Go to next hazard or risk factor.**	**If no, go to Q4.** **If yes set up CCP to meet measurable requirements and also go to Q4.**	**If yes, redesign / establish GMP/GHP to meet remaining requirements.** **If no, and no CCPs list as uncontrolled. Consider at process analysis.**

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8.1.5 Determine Critical Limits

Seetable below.

CCP No.	CCP	Critical Limits

8.1.6 Procedures

Step	CCP or General Control	Critical Limit or General Criteria	Monitoring	Corrective Action	Records

Doc ID:	Version:	Issue Date:	Page:

Step	CCP or General Control	Critical Limit or General Criteria	Monitoring	Corrective Action	Records

[5]

8.1.7 Operator Verification

8.1.8 Records

[5] In some cases you may need to attach or refer to additional information – e.g. policies, detailed cleaning procedures, pest control map showing location of bait stations.

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9. Analysis / Control of Hazards and Other Risk Factors From The Process

9.1.1 Analyse hazards and other risk factors at each process step

				Q1. Could the risk factor be present in or on the eggs at unacceptable levels at this step?	Q2. Is there a control measure at this step that would prevent unacceptable levels of the risk factor or reduce it to acceptable levels?	Q3. Is there a control measure available at a previous step?	Q4: **Are there any other non-measurable controls?**
Process step	**Input Name**	**Hazard or other risk factor associated with input**	**Hazards and other risk factors from process step, and potential impact of process step on existing hazards and other risk factors**	**Justify answer.** **If no not a CCP. Go to Q4.** **If yes, go to Q2.**	**If no go to Q3.** **If yes, this step is a CCP. Go to Q4.**	**If yes, assign the previous step as a CCP. Go to Q4.** **If no, not a CCP, go to Q4.**	**If no, and no CCPs list as uncontrolled.** **If yes, redesign / establish** general controls **to meet outcomes.**

				Q1. Could the risk factor be present in or on the eggs at unacceptable levels at this step?	Q2. Is there a control measure at this step that would prevent unacceptable levels of the risk factor or reduce it to acceptable levels?	Q3. Is there a control measure available at a previous step?	Q4: **Are there any other non-measurable controls?**
Process step	**Input Name**	**Hazard or other risk factor associated with input**	**Hazards and other risk factors from process step, and potential impact of process step on existing hazards and other risk factors**	**Justify answer.** **If no not a CCP. Go to Q4.** **If yes, go to Q2.**	**If no go to Q3.** **If yes, this step is a CCP. Go to Q4.**	**If yes, assign the previous step as a CCP. Go to Q4.** **If no, not a CCP, go to Q4.**	**If no, and no CCPs list as uncontrolled.** **If yes, redesign / establish** general controls **to meet outcomes.**

Doc ID:	Version:	Issue Date:	Page:

				Q1. Could the risk factor be present in or on the eggs at unacceptable levels at this step?	Q2. Is there a control measure at this step that would prevent unacceptable levels of the risk factor or reduce it to acceptable levels?	Q3. Is there a control measure available at a previous step?	Q4: **Are there any other non-measurable controls?**
Process step	**Input Name**	**Hazard or other risk factor associated with input**	**Hazards and other risk factors from process step, and potential impact of process step on existing hazards and other risk factors**	**Justify answer.** **If no not a CCP. Go to Q4.** **If yes, go to Q2.**	**If no go to Q3.** **If yes, this step is a CCP. Go to Q4.**	**If yes, assign the previous step as a CCP. Go to Q4.** **If no, not a CCP, go to Q4.**	**If no, and no CCPs list as uncontrolled.** **If yes, redesign / establish** general controls **to meet outcomes.**

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9.1.2 Determine Critical Limits

The table below summarises monitoring and corrective action of CCPs and other general controls. Not all CCPs identified in this Code of Practice will be applicable to all operations. Some operations may have additional CCPs.

CCP or General Control	Process Step	Hazard ID	Critical Limit or Process Criteria	Monitoring	Corrective Action (Includes retraining staff as necessary)	Records

Doc ID:	Version:	Issue Date:	Page:

General Controls

Doc ID:	Version:	Issue Date:	Page:

9.1.3 Operator verification

9.1.4 Documentation and record-keeping

Doc ID:	Version:	Issue Date:	Page:

10. Operational Authorities and Responsibilities

Person responsible for:	Name or title	Training received
CCPs		
Monitoring		
Corrective action		
Operator Verification		

Doc ID:	Version:	Issue Date:	Page:

11. Generic corrective action procedure

When to use it:	**When non-complying animal material or animal product is produced -** • using a process or associated thing that deviates from the risk management programme; or • not in compliance with the outcomes documented in the risk management programme; or • where an unforeseen hazard or other risk factor arises; and • when a specific corrective action has not been complied with or has not been identified in the risk management programme.
Inventory control	**Non-complying animal material or animal product must be identified and retained separately under inventory control pending a full assessment by a suitably-skilled person (nominated by the egg producer).**
Procedure	**The suitably skilled person shall:** • review the relevant processing records, animal material or animal product, to identify any potential risk factors. • make a decision regarding the suitability for processing of the animal material, or the fitness for intended purpose of the animal product, and • ensure the appropriate disposition is carried out.
Reporting	**The suitably skilled person must complete and sign a full report on the management of the non-compliance, including details of -** • the deviation from the risk management programme, and the impact on any hazards or other risk factors present in the animal material or animal product; and • the identification of the affected animal material or animal product; and • any additional processing of the animal material or animal product; and • the analyses made to reach the final decision; and • the decision on the disposition of the animal material or animal product; and • confirmation that the disposition of animal material or animal product has been carried out; and • any actions taken to prevent recurrence of the non-compliance. **The egg producer must provide the report, as soon as practicable, to MAF's Director-General or an animal product officer.**
Verification	**The egg producer must bring to the attention of the accredited verifier at the next verification visit, any use of the generic corrective action procedure.**

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12. Recall Procedure

Responsibility / Authority:	
Identification and traceability:	
Risk assessment and decision on whether or not to recall.	
Communication and documentation	
Product Recovery / Disposition	
Corrective / preventive action	
Review of recall effectiveness	

Doc ID:	Version:	Issue Date:	Page:

13. Operator verification

Validation:	
Routine Verification:	
Audit:	
Ongoing Review:	

Doc ID:	Version:	Issue Date:	Page:

14. External verification

Policy on Verifier's Rights
We are committed to the implementation and maintenance of its risk management programme and will ensure that its risk management programme is verified by an accredited verifier at the frequency stipulated by NZFSA. The accredited verifier shall have the freedom and access necessary to allow them to carry out verification functions and activities, including **(a) having access to all parts of the premises or place and facilities within the physical boundaries of or relating to the risk management programme; and** **(b) having access to all documentation, records and information relating to, or comprising, the risk management programme (including records held in electronic or other form); and** **(c) having freedom to examine all things necessary and open any containers, packages and other associated things to inspect their contents; and** **(d) having freedom to identify or mark any animal material, animal product, equipment, package, container or other associated thing; and** **(e) having freedom to -** **(i) examine and take samples of any animal material, animal product or any other input, substance, or associated thing which has been, is, or may be in contact with, or in the vicinity of, any animal material or animal product; and** **(ii) test, or analyse, or arrange for the testing, or analysis of such samples; and** **(iii) order retention of raw materials including animal material, ingredients, animal products, packaging or equipment pending testing results and decisions on disposition; and** **(f) having authority where there may be significant risk to fitness for intended purpose of animal product or suitability for processing of animal material to detain any animal material and animal products or other relevant things in the event of non-compliance with the risk management programme; and** **(g) having authority in cases of significant risk to fitness for intended purpose of animal product or suitability of animal material for processing to intervene and direct a temporary interruption of processing until the cause of the risk has been remedied.**
Signed by: **Date:**

A letter from the nominated verifying agency is attached confirming their willingness to carry out verification of the RMP. (Egg producer is to attach the letter here).

Doc ID:	Version:	Issue Date:	Page:

15. Documentation and record-keeping

15.1.1 Document Control System

RMP Documents	
Availability	
Updates and Amendments	
Obsolete Documents	

Doc ID:	Version:	Issue Date:	Page:

15.1.2 List of documents making up the RMP

RMP component	Programme / Document Name[6]	Version / Issue	Date	Reference (to pages / sections etc)	Viewed by Evaluator
Title Page					
Management Authorities and Responsibilities					
Scope of RMP					
Product Description and Intended Purpose					
Product Outcomes					
Process description					
Identification, Analysis and Control of Hazards and Other Risks Factors from Inputs					
Identification, Analysis and Control of Hazards and Other Risks Factors from Other Sources					
Identification, Analysis and Control of Hazards and Other Risks Factors from The Process					
Operational Authorities and Responsibilities					

[6] The numbers given in this column have been chosen to represent the Farm's RMP (F-RMP) with a number for each different section or RMP component. Alternative numbering systems are equally acceptable.

Doc ID:	Version:	Issue Date:	Page:

15.1.3 List of documents making up the RMP

RMP component	Programme / Document Name[7]	Version / Issue	Date	Reference (to pages / sections etc)	Viewed by Evaluator
Generic Corrective Action Procedure					
Recall Procedure					
Operator Verification					
External Verification					
Documentation and Record-Keeping					
Validation Protocol					
Signed by (Operator)		Signed by (Evaluator)			
Operator's name in full:		Evaluator's name in full			
Date:		Date:			

[7] The numbers given in this column have been chosen to represent the Farm's RMP (F-RMP) with a number for each different section or RMP component. Alternative numbering systems are equally acceptable.

Doc ID:	Version:	Issue Date:	Page:

15.1.4 Record Control System

RMP Records	
Details to be recorded	
Availability	
Archiving	

Doc ID:	Version:	Issue Date:	Page:

16. Validation Protocol

A check has been done that the RMP documentation is complete. Refer to Validation Report.

The following protocol explains how product outcomes will be validated by demonstrating that:
a) each Product Outcome is achieved on a consistent basis.
b) each CCP achieves or contributes to the achievement of the relevant Product Outcome:
c) other controls meet regulatory requirements or contribute to the achievement of the relevant Product Outcome.

Product Disposition: All eggs produced during the validation period will be either processed or rejected according to the documented procedures in this RMP.

16.1 Hazards to Human Health

Hazard or other risk factor	Example Product outcomes	Key Control Measures	Proposed Validation

Doc ID:	Version:	Issue Date:	Page:

Hazards to Human Health continued

Hazard or other risk factor	Example Product outcomes	Key Control Measures	Proposed Validation

Doc ID:	Version:	Issue Date:	Page:

16.2 Hazards to Animal Health

Hazard or other risk factor	Example Product outcomes	Key Control Measures	Proposed Validation

Doc ID:	Version:	Issue Date:	Page:

16.3 Risks to Wholesomeness

Hazard or other risk factor	Example Product outcomes	Key Control Measures	Proposed Validation

Doc ID:	Version:	Issue Date:	Page:

16.4 Risks From False or Misleading Labelling

Hazard or other risk factor	Example Product outcomes	Key Control Measures	Proposed Validation

Once the proposed validation has been completed the results will be summarised in the Validation Report and all raw data shall be made available to the evaluator.

Appendix E: Records To Use For Your RMP

The following records are optional. If you have alternative records that capture similar information this is acceptable.

Supplier Declaration for Layer Hens

Supplier Declaration for Eggs

Supplier Declaration for Feed

Approved Supplier List

Chemical Use Record

Pest Control Record 1

Pest Control Record 2

Monthly Shed Inspection Record

Daily Farm Record

Verification of Standards for Caged Layer Production

Verification of Standards for Barn Egg Production

Verification of Standards for Free Range Production

Monthly Packhouse Inspection Record

Daily Packhouse Inspection Record

Training Record

Validation Report

Doc ID:	Version:	Issue Date:	Page:

Supplier Declaration for Layer Hens

- **Layer hens were hatched and reared under a whole flock health scheme and only apparently healthy birds are supplied for laying. The following records were kept:** ☐
  - ➜ record of any medications or immunisations given to the flock (or individual birds) during the entire growing period ☐
  - ➜ records of feeding regimes ☐
  - ➜ records from visits by company or independent veterinarian or competent person ☐
  - ➜ records of blood tests or the results of other individual or flock diagnostic results that would establish and verify the health status of the individual/flock ☐
  - ➜ records from *Salmonella* testing of the flock, and any other microbiological results performed on the flock ☐
  - ➜ other records that would help establish and verify the health status of the flock ☐

- **The above evidence was collected by or under the supervision of a competent person.** ☐
- **Birds that are apparently unhealthy shall not be sent to layer farms.** ☐
- **The welfare of birds during transportation and handling shall be in accordance with the current *'AWAC Code*.** ☐

- **Salmonella surveillance was done at:**
  - ➜ 6 weeks of age ☐
  - ➜ 12-16 weeks of age ☐

- **Birds were reared in accordance with requirements for claims for:**
  - ➜ free range ☐
  - ➜ barn ☐
  - ➜ organic ☐

Test results for the layer hens being delivered on this date all meet agreed specifications.

Supplying Company:…….

Signed:……..

Name:…….

Date:……..

Doc ID:	Version:	Issue Date:	Page:

Supplier Declaration for Eggs

- **Layer hens were hatched and reared under a whole flock health scheme and only apparently healthy birds are supplied for laying. The following records were kept:** ☐
  - ➜ record of any medications or immunisations given to the flock (or individual birds) during the entire growing period ☐
  - ➜ records of feeding regimes ☐
  - ➜ records from visits by company or independent veterinarian or competent person ☐
  - ➜ records of blood tests or the results of other individual or flock diagnostic results that would establish and verify the health status of the individual/flock ☐
  - ➜ records from *Salmonella* testing of the flock, and any other microbiological results performed on the flock ☐
  - ➜ other records that would help establish and verify the health status of the flock ☐

- **The above evidence was collected by or under the supervision of a competent person.** ☐
- **Birds that are apparently unhealthy shall not be sent to layer farms.** ☐
- **The welfare of birds during transportation and handling shall be in accordance with the current *AWAC Code*.** ☐

- **Eggs meet specifications 2 - 6 of the RMP:**
  - ➜ Eggs meet trading requirements ☐
  - ➜ The integrity of the shell has not been compromised. ☐
  - ➜ Very dirty and cracked eggs have been rejected. ☐
  - ➜ Good eggs have been collected separately from floor eggs, soiled eggs and eggs with minor defects. ☐
  - ➜ Eggs are correctly labelled. ☐

Test results for the layer hens being delivered on this date all meet agreed specifications.

Supplying Company:……

Signed:……..

Name:……

Date:……..

Doc ID:	Version:	Issue Date:	Page:

Supplier Declaration for Feed

- **Feed has been made to agreed formulation** ☐
- **Purchasing specifications and purchase contracts for raw materials include requirement that raw materials are Salmonella negative** ☐
- **Control point to destroy pathogens, such as Salmonella, in raw materials during feed manufacture identified** ☐
- **System to prevent contamination of finished feed in place** ☐
- **'Housekeeping' and cleaning procedure documented** ☐
- **Salmonella testing programs**
  - ➜ Testing for Salmonella carried out by a laboratory accredited to nationally or internationally recognised standards ☐
  - ➜ Appropriate Salmonella testing program for raw materials ☐
  - ➜ Weekly Salmonella testing program for finished feed ☐
  - ➜ Monthly Salmonella testing program for environmental samples ☐
  - ➜ Monthly Salmonella testing program for feed trucks ☐
- **Response procedures or action plans**
  - ➜ Appropriate Salmonella testing program for raw materials ☐
  - ➜ Weekly Salmonella testing program for finished feed ☐
  - ➜ Monthly Salmonella testing program for environmental samples ☐
  - ➜ Monthly Salmonella testing program for feed trucks ☐

Test results for the feed being delivered on this date all meet agreed specifications.

Supplying Company:……

Signed:……..

Name:……

Date:……...

Doc ID:	Version:	Issue Date:	Page:

Approved Supplier List

Supplier's Name	Contact Details	Goods Supplied

Date: _____ Signature: _____ Name: _____

Doc ID:	Version:	Issue Date:	Page:

Chemical Use Record

Date	Chemical Name	Used For	Approved / licensed for that Use	Quantity Used	Dilution Rate	Signature of User

Date: _____ **Signature:** _____ **Name:** _____

Doc ID:	Version:	Issue Date:	Page:

Pest Control Record 1

	Date Checked		Date Checked		Date Checked		Date Checked	
Pest Control Point	Activity / Action Taken		Activity / Action Taken		Activity / Action Taken		Activity / Action Taken	

Date: _____ Signature: _____ Name: _____

Doc ID:	Version:	Issue Date:	Page:

Pest Control Record 2

Interior check **Date:**

- **Self closing doors to layer sheds** ☐
- **Insect screens on windows and doors** ☐
- **No uncovered waste to attract pests** ☐
- **No evidence of pest activity** ☐
- **Feed fully enclosed and no feed spillages in storage areas.** ☐

Exterior Check

- **Grass short around exterior of sheds** ☐
- **No uncovered waste to attract pests** ☐
- **Drain traps in place to prevent entry of pests into buildings** ☐
- **Fences intact** ☐
- **Feed silos fully enclosed** ☐
- **No feed spillages** ☐

Problems:
Corrective Action Taken:

Date: _____ **Signature:** _____ **Name:** _____

Doc ID:	Version:	Issue Date:	Page:

Monthly Shed Inspection Record

Shed: **Month:**

- **Shed maintained in suitable state** ☐
- **Shed and any equipment that contacts the eggs is visibly clean.** ☐
- **All rubbish, liquid waste and shed washings disposed of in an approved manner** ☐
- ☐
- ☐
- ☐
- ☐
- ☐
- ☐
- ☐

Problems:
Corrective Action Taken:

Date: _____ **Signature:** _____ **Name:** _____

Doc ID:	Version:	Issue Date:	Page:

Daily Farm Record

Shed: **Date:**

- **Dead birds removed from sheds daily, and buried, incinerated, composted, frozen, and/or otherwise removed from the farm.** ☐
- **Dead birds not available to domestic pets or vermin.** ☐
- **Applicable personnel, equipment, and vehicles shall follow documented cleaning and sanitisation procedures after disposal of dead birds and/or rubbish** ☐
- **Free range nest boxes are clean.** ☐
- **Free range areas are not muddy.** ☐
- **Staff handling eggs have washed hands first.** ☐
- **Footbaths to barn sheds changed and in use.** ☐
- **Personnel handling eggs are wearing clean protective clothing.** ☐
- **Daily feed usage recorded.** ☐
- **Claims and dates on egg collection labels checked.** ☐
- **Very dirty eggs rejected and floor eggs and cracked eggs in separate collection trays.** ☐
- **Collection at least 24 hourly.** ☐

Problems:
Corrective Action Taken:

Date: _____ Signature: _____ Name: _____

Doc ID:	Version:	Issue Date:	Page:

Verification of Standards for Caged Layer Production

Construction and layout of sheds meets outlined standards

- **Single batch system operating in shed** ☐
- **Multi-batch system operating in shed** ☐

Boot change, boot covers, or footbaths used between sheds ☐

Area around sheds free from long grass and debris ☐

Stocking density in cages 450cm^2 per bird maximum ☐

Force-ventilated sheds have an automatic alarm system, and alternative provisions for ventilation in the case of power failure. ☐

Cleaning programs

- **Maintain sheds whilst hens in lay** ☐
- **Depopulation, cleaning, and sanitising** ☐

Microbiological tests to verify sanitising program is effective following depopulation ☐

Records of daily maximum and minimum poultry shed temperatures ☐

No animals (eg cats and dogs) in sheds ☐

Medication records ☐

Logbook of visitors who enter poultry sheds ☐

Water quality - annual tests to NZ drinking water standards ☐

Water in poultry sheds inspected twice daily ☐

Feed meets standards outlined in Chapter 3 ☐

Feed in poultry sheds inspected twice daily ☐

Vermin control program records ☐

No wild birds in poultry sheds ☐

Dead birds removed appropriately ☐

Waste disposed of appropriately ☐

Personnel trained in personal hygiene as it relates to food handling. ☐

Salmonella test results:

- **6 week pullets** ☐
- **12-16 week pullets** ☐
- **60-80 week hens** ☐

Salmonella-positive response procedure

- **6 week pullets** ☐
- **12-16 week pullets** ☐
- **60-80 week hens** ☐

Salmonella serotyped if a positive test returned ☐

Laboratory accredited to appropriate standards ☐

Problems:
Corrective Action Taken:

Date: _____ **Signature:** _____ **Name:** _____

Doc ID:	Version:	Issue Date:	Page:

Verification of Standards for Barn Egg Production

Construction and layout of sheds meets outlined standards	☐
Single batch system operating in shed	☐
Boot change, boot covers, or footbaths used between sheds	☐
Area around sheds free from long grass and debris	☐
Stocking density bird maximum 7-10 birds per m^2 (10-14 birds on slats)	☐
Cleaning programs	
• **Maintain sheds whilst hens in lay**	☐
• **Depopulation, cleaning, and sanitising**	☐
Claims not made until birds are in barns	☐
Eggs produced from free range or caged systems clearly defined, and kept separate at all times	☐
Microbiological tests to verify sanitising program is effective following depopulation	☐
Records of daily maximum and minimum poultry shed temperatures	☐
No animals (eg cats and dogs) in sheds	☐
Disease monitoring tests	☐
Medication records	☐
Logbook of visitors who enter poultry sheds	☐
Water quality - annual tests to NZ drinking water standards	☐
Water in poultry sheds inspected twice daily	☐

Feed meets standards outlined in Chapter 3 ☐

Feed in poultry sheds inspected twice daily ☐

Vermin control program records ☐

No wild birds in poultry sheds ☐

Dead birds removed appropriately ☐

Waste disposed of appropriately ☐

Personnel trained in personal hygiene as it relates to food handling. ☐

Salmonella test results:

- **6 week pullets** ☐
- **12-16 week pullets** ☐
- **60-80 week hens** ☐

Salmonella-positive response procedure

- **6 week pullets** ☐
- **12-16 week pullets** ☐
- **60-80 week hens** ☐

Salmonella serotyped if a positive test returned ☐

Laboratory accredited to appropriate standards ☐

Problems:
Corrective Action Taken:

Date: _____ **Signature:** _____ **Name:** _____

Doc ID:	Version:	Issue Date:	Page:

Verification of Standards for Free Range Production

Construction and layout of sheds and runs meet outlined standards	☐
Single batch system operating	☐
Boot change, boot covers, or footbaths used between sheds	☐
Minimum three paddocks covered in palatable vegetation; no debris	☐
Stocking density maximum of 1 bird per 11m^2, and 7-10 birds per m^2 in shed	☐
Cleaning programs	
• **Maintain sheds whilst hens in lay**	☐
• **Depopulation, cleaning, and sanitising**	☐
Microbiological tests to verify sanitising program is effective following depopulation	☐
Chick or pullet purchases recorded; free ranged before claims are made	☐
Eggs produced from caged or barn systems clearly identified, and kept separate at all times	☐
Daily maximum and minimum poultry shed temperature records	☐
No animals (eg cats and dogs) in sheds	☐
Disease monitoring tests	☐
Medication records	☐
Logbook of visitors who enter poultry sheds or runs	☐
Water quality - annual tests to NZ drinking water standards	☐
Water in poultry sheds inspected twice daily	☐

Birds denied access to water not provided by controlled system ☐

Feed meets standards outlined in Chapter 3 ☐

Feed in poultry sheds inspected twice daily ☐

Vermin control program records ☐

No wild birds in poultry sheds ☐

Dead birds removed appropriately ☐

Waste disposed of appropriately ☐

Personnel trained in personal hygiene as it relates to food handling. ☐

Salmonella test results:

- **6 week pullets** ☐
- **12-16 week pullets** ☐
- **60-80 week hens** ☐

Salmonella-positive response procedure

- **6 week pullets** ☐
- **12-16 week pullets** ☐
- **60-80 week hens** ☐

Salmonella serotyped if a positive test returned ☐

Salmonella testing laboratory accredited to appropriate standards ☐

Problems:
Corrective Action Taken:

Date: _____ **Signature:** _____ **Name:** _____

Doc ID:	Version:	Issue Date:	Page:

Monthly Packhouse Inspection Record

- Construction of buildings meets outlined standards ☐
- Cleaning and sanitising programs
  - Egg grading and stores including coolrooms and vehicles ☐
  - Egg processing areas ☐
  - Microbiological tests to verify sanitising effective in processing areas ☐
- Physical and labelled segregation of eggs from each flock ☐
- No animals (eg cats or dogs) in storage, grading, or processing facilities ☐
- Complaint and product recall procedures ☐
- Vermin control program records ☐
- Waste disposed of appropriately ☐
- Personnel trained in personal hygiene as it relates to food handling ☐
- Personnel wearing suitable outer protective clothing ☐
- Coolroom temperature records
  - Pre-grading (where applicable) ☐
  - After grading, and packaging ☐
- Containers of eggs destined for grading labelled (where applicable) ☐
- Eggs cleared daily if automated belt system, twice daily if manual ☐
- Eggs from each flock kept physically separate, and batch labelled ☐
- Eggs offered for sale are candled, and records of daily packaged egg checks show compliance with stipulated egg standards and grades ☐

- **Date and batch codes affixed to egg packaging** ☐

- **Salmonella test results:**
  - **Shell eggs - weekly shell egg composite sample** ☐

- **Salmonella-positive response procedures including trace-back**
  - **Shell eggs and egg product samples** ☐
  - **Environmental sample** ☐
  - **Salmonella serotyped if a positive test returned** ☐

- **Laboratory accredited to appropriate standards** ☐

Problems:
Corrective Action Taken:

Date: _____ **Signature:** _____ **Name:** _____

Doc ID:	Version:	Issue Date:	Page:

Daily Packhouse Inspection Record

- Visual inspection of equipment and tools show all visually clean. ☐
- Reject eggs disposed of daily. ☐
- Staff handling eggs have washed hands first. ☐
- Footbaths to barn sheds changed and in use. ☐
- Personnel handling eggs are wearing clean protective clothing. ☐
- All soiled and cracked eggs removed from A grade shell eggs. ☐
- All Eggs stored at or below 15°C. Cracked eggs stored at or below 6°C. ☐
- Only one shed at a time processed. ☐
- Hourly check done for broken eggs. ☐
- Claims on packaging checked for each shed's eggs. ☐
- Dates on packaging checked for each shed's eggs. ☐
- ☐
- ☐

Problems:
Corrective Action Taken:

Date: _____ Signature: _____ Name: _____

Doc ID:	Version:	Issue Date:	Page:

Training Record

Worksheet	Subject	Worker's Name			
1	Introduction to the RMP				
2	Management Authority and Responsibility				
3	Scope of the RMP				
4	Product Description and Intended Purpose				
5	Product Outcomes				
6	Process / Operation Description				
7	Identification, Analysis and Control of Hazards and Other Risk Factors From Inputs				
8	Identification, Analysis and Control of Hazards and Other Risk Factors From Other Sources				
9	Identification, Analysis and Control of Hazards and Other Risk Factors From The Process				
10	Operational Authorities and Reponsibilities				
11	Generic Corrective Action Procedure				
12	Recall Procedure				
13	Operator Verification				
14	External Verification				
15	Documentation and Record-keeping				
16	Validation				
	CCP				
	CCP				
	CCP				
	CCP				
	CCP				
	CCP				
	CCP				
	CCP				
	CCP				
	CCP				
	CCP				
	CCP				
	Vaccination				

Doc ID:	Version:	Issue Date:	Page:

Validation Report

1. Check that all RMP components have been developed and documented.

RMP Component:	Completed
Title Page	
Management Authorities and responsibilities	
Scope of the RMP	
Product Description and Intended Purpose	
Product Outcomes	
Process / Operation Description	
Identification / Analysis / Control of Hazards and other Risk Factors From Inputs	
Identification / Analysis / Control of Hazards and other Risk Factors From Other Sources	
Identification / Analysis / Control of Hazards and other Risk Factors From The Process	
Operational Authorities and Responsibilities	
Generic Corrective Action Procedure	
Recall Procedure	
Operator Verification	
External Verification	
Documentation	
Record-keeping	

2. Check that all regulatory requirements have been covered in the RMP.

RMP Specifications[1]:	Covered
5 Boundaries of a risk management programme	
6 Animal material and animal product description	
7 Fitness for purpose	
8 Actions when outcomes not met	
9 Describing the process or operation	
10 Identification and analysis of hazards	
11 Control of hazards	
12 Application of generic corrective action procedure	
13 Generic corrective action procedure to deal with unforeseen circumstances	
14 Identities of responsible persons	
15 Verifiers' freedom and access to carry out verification functions	
16 Documentation and record keeping requirements	
17 Monitoring, corrective action and operator verification records	
18 Validation	
24 Operator verification activities	
26 Recall	

[1] Note that these clause headings list the major areas that you must cover in your RMP according to the Animal Products (Risk Management Programme Specifications) Notice 2000. There are subclauses that need to be checked underneath some of the main headings.

Specifications for Products Intended for Human Consumption:	Covered
5 Design and construction	
6 Facilities and equipment	
7 Lighting	
8 Water coming into contact with animal material or animal product	
9 Water not coming into contact with animal material or animal product	
11 Requirement for reticulation management plan	
12 Requirement for water management plan	
13 Water analyses	
14 Non-complying water	
15 Process gases	
16 Compressed air	
17 Additives, processing aids, vitamins, minerals, and other nutrients	
19 Management of animal material or animal product not for human consumption	
20 Waste management	
21 Approved maintenance compounds to be labelled	
23 Health of Personnel	
26 Skills maintenance and supervision	
28 Calibration and measuring equipment suitability	
30 Packaging	
32 Labelling	
34 Records	
106 Whole Flock Health Scheme	
107 Shell eggs	
115 Process inputs	
116 Process control	

Animal Products Regulations 2000:	Covered
10 Requirements for premises, places, facilities, equipment, and essential services	
11 Hygiene Of Processing Environment	
12 Hygiene of persons whose presence or actions may result in contamination of animal material or animal product	
13 Persons infected by or carriers of disease or illness to be excluded from working areas or from handling animal material or product	
14 Required measuring equipment to be calibrated and function as intended	
16 Packaging requirements for animal material and product	
17 Carriage and delivery requirements for animal material and product	
23 Health	

3. Summary of Validation Results for Product Outcomes / Key Control Measures.

Hazard or other risk factor	Product Outcomes / Key Control Measures	Summary of Validation Results

Application Form AP4: Registration of Risk Management Programme

7 October 2008

Please refer to the following page:

http://www.nzfsa.govt.nz/animalproducts/publications/forms/rmp/index.htm

6. Categories:

Refer to Guidelines to complete the following table:

Product Purpose E.g. HC, AC, IE	**Product / Material** **Refer to list provided in Guidelines. Select product / material as appropriate.**	**Processing Categories** Refer to list provided in Guidelines. Select categories as appropriate.	**Elected RMP** (✓)	**FSP Application No. & period of use**

7. Responsible persons / organisations:

Refer to Guidelines to complete the following table:

Day-to-day Manager of the RMP: name / position / designation	**Accredited Evaluator**	**Recognised Verifying Agency**	**FSP Auditor and Company**

8. Minimum Documentation Requirements attached (✓): Refer to Risk Management Programme Manual

[ ] Independent evaluators report

RMP Documentation:

Refer to Guidelines for minimum outline documentation required to be submitted with an application for RMP registration.

Format:

[ ] RMP or the RMP outline either as:

- One electronic file (in a form acceptable to the Director-General) endorsed by the evaluator; or
- An original evaluator endorsed hard copy and two additional copies.

Changes:

Any changes to the submitted RMP since the evaluation report was prepared? **Yes / No** (circle one)

If Yes:

[ ] Attach description of changes

9. Operator Declaration: To be completed by Operator (Refer Animal Products Act, section 22)

I declare that:

a) I am authorised to make this application as the Operator of the RMP or on behalf of the Operator; and
b) the information supplied in this application is accurate to the best of my knowledge; and
c) neither I nor any of the directors, partners and managers, have had a conviction relating to fraud or dishonesty or the management control or business activities of a kind regulated under the Animal Products Act 1999; and
d) the operator is a New Zealand resident within the meaning of section OE1 or section OE2 of the Income Tax Act 1994.

Name: Date:

Designation: Signature:

10. MAF Fees: Attach cheque to application form, payable to 'Ministry of Agriculture and Forestry'

RMP Application Fee attached: $100 inc. GST ✔ [ ] GST No. 64-558-838

Note: In addition to the application fee, an assessment fee based on an hourly rate will be charged.

MAF Administration:

Date Receipt No.

Name Signature

Collection of Personal Information on Individuals

In regard to any information being collected on this application for registration of a risk management programme under the Animal Products Act 1999 (that is personal information identifying or being capable of identifying an individual person), notification is hereby provided in accordance with principle 3 of the Privacy Act 1993, to individuals of the following matters:

1. This information is being collected for purposes relating to registration of a risk management programme and administration of the Animal Products Act 1999.

2. The recipient of this information, which is also the agency that will collect and hold the information, is the Ministry of Agriculture and Forestry, P O Box 2526, Wellington.

3. The collection of information is authorised under section 20 of the Animal Products Act 1999. The provision of this information is necessary in order to process this application. Failure to provide information is likely to result in the return of this application form to the applicant.

4. You are reminded that under Principles 6 and 7 of the Privacy Act 1993, you have the right of access to, and correction of, any personal information, which has been provided.

Application Guidelines for

AP4: Registration of Risk Management Programme

1. Application form AP4: Registration of Risk Management Programme must be completed by applicants requiring registration of their **risk management programme (RMP)** under section 20 of the Animal Products Act 1999. This application can also be used for registration of a food safety programme (FSP) to be recognised as a RMP, under section 33 and 34 of the Animal Products Act 1999.

   The operator is to submit separate applications in respect of each RMP requiring registration.

   Note: When to use other application forms:
   (a) A person who is a **dual operator butcher** must complete application form AP3: Dual Operator Butcher in order to register a RMP.
   (b) If there is an **amendment to the RMP that requires registration** under section 25 of the Animal Products Act 1999, complete application form AP6: Registration of Amendment to Risk Management Programme.
   (c) If the only change to the RMP is a **change in operator or operator name,** complete application form AP5: Registration of Risk Management Programme under New Operator.

2. Application form sections:

Section 1 Business Identification:

A unique business identification will be allocated to each premises or place, in respect of the physical location. An identification can be chosen by the applicant and must not be the same as an exporter ID operating from the same premises.

It is strongly recommended that any current Meat Act premises ID (ME, PH etc.) is kept for country listing and brand/label purposes. If a new ID is chosen both packaging and any country listings must be updated to reflect this change. Certain country listings may take up to 6 weeks to update therefore any product produced under the RMP with a new ID may not be eligible for export to the affected countries until country listings have been updated. Once your business ID has been established, it will be the current business ID for any future RMP registration applications.

The business ID must be a number or a number/letter combination of at least 3 and not more than 10 characters with at least one character as a number and no leading zeros.

Where a business identification is not nominated, is not suitable, or it does not adhere to the criteria, an identification will be assigned by MAF Food Assurance Authority.

RMP Number:
MAF Food will assign a two digit RMP number (1-99) to each registered RMP application.

Unique RMP Identifier:
The business ID is combined with the two-digit RMP number to produce the unique identifier for each registered risk management programme at that premises or place. It is the unique RMP identifier that will appear on the Notice of Registration for each registered RMP.

Also refer to MAF web site document ‘Identification numbers under the Animal Products Act 1999 at: http://www.maf.govt.nz/animalproducts/publications/forms/index.htm .

Section 2 Operator name is the full legal name of the Operator. This is the name of the owner or other person in control of the business, and may be the name of a company, a partnership or an individual:

- Company - provide the name of the company as registered under the Companies Act. The registered company name will appear as a direct copy of the Notice of Registration as stated in the Companies Office database. The use of upper and lower case will be used as stated in the application form.
- Partnership - provide the full legal names of all individuals and / or companies within the partnership and the trading name used by the partnership. The use of initials for individuals is not permitted. The name will appear on the Notice of Registration in the format "<partner names>, a partnership trading as <trading name>" and as stated in the application form, including the use of upper and lower case as provided by the applicant. The operator will be permitted to use the trading name as the operator name on applicable eligibility documents.
- Individual - provide the full legal name of the individual and a trading name if applicable. The use of initials for individuals is not permitted. The name will appear on the Notice of Registration as stated in the application form, including the use of upper and lower case as provided by the applicant. If the applicant has a trading name, the name will appear on the Notice of Registration in the format "<individual name> trading as <trading name>". The operator will be permitted to use the trading name as the operator name on applicable eligibility documents.

Section 3 The name of the fishing vessel and number of the fishing vessel as allocated by the Ministry of Fisheries, is to be provided here if applicable.

Section 4 The address of the business location and the business contact details are to be provided here.

If you provide an email address, tick the box provided if you consent to being sent information electronically from time to time. This may include the issue of official notifications and letters in electronic form only, or in conjunction with a mailed hard copy.

Section 5 The registered company address of the operator is the address registered with the New Zealand Companies Office. This address may or may not be the same as that provided in section 4 above. Only provide details if the registered company address is different from that of the business address stated in section 4.

Section 6 Details of the capabilities are to be provided as follows:

Product Purpose
State the intended purpose of the product:
HC – human consumption (includes food, pharmaceutical)
AC – animal consumption
IE – inedible
or another purpose such as, injection,….

Product / Material
Select appropriate type(s) of animal material and animal product to which the RMP applies from the primary and/or secondary processing columns from the Product/Material table given in "Principal Categories of Processing under the RMP; and Animal Material/Animal Product to which the RMP applies". This document is available on the MAF web site under Animal Products, Forms.

This information will appear in the public register of RMPs available of the MAF web-site.

Processing Categories
Select appropriate principal categories of processing and other operations carried out under the RMP from the Processing Categories table given in "Principal Categories of Processing under the RMP; and Animal Material/Animal Product to which the RMP applies". This document is available on the MAF web site under Animal Products, Forms.
This information will appear in the public register of RMPs available of the MAF web-site.

Elected RMP (if applicable)
This applies to a secondary processor of an animal product which is a food within the meaning of the Food Act 1981, who elects under section 32 of the Animal Products Act 1999 to operate under a registered risk management programme rather than under a food safety programme or under the Food Hygiene Regulations 1974 in respect of that product.
Tick the indicated column if the operator elects to operate under the Animal Products Act 1999.

Food Safety Programme (FSP) Application Number and period of use (if applicable)
This applies to a secondary processor who wishes to have an approved food safety programme recognised as a risk management programme to be operated on an intermittent basis under sections 33 and 34 of the Animal Products Act 1999. Provide the FSP Application number and state the period of intermittent use, e.g. every Tuesday, June – August, two months every year, etc.

Section 7 Details of responsible persons / organisations are to be provided as follows:
Day-to-day Manager of the RMP
State the name, position or designation of the business manager(s) responsible for the daily management of the RMP (if you wish to supply specific contact details, please attach).
Accredited Evaluator
State the name of the accredited evaluator who signed the evaluation report.
Recognised Verification Agency or FSP Auditor and Company
State the recognised verification agency or the approved FSP auditor and auditor company prepared to undertake verification functions in respect of the programme.

Section 8 The following is a checklist of the minimum RMP outline documentation that must accompany the application form. Refer to the Risk Management Programme Manual for full details.

[ ] Name & address of RMP operator (including the electronic address, if available);

[ ] Name, position or designation of person responsible for day to day management of RMP;

[ ] Principal categories of processing and animal material;

[ ] Location and type of premises or place, and the physical boundaries of the RMP; Note: if a hard copy site plan is used to indicate the RMP boundaries three copies must be provided;

[ ] Name of recognised verifying agency, that has indicated responsibility for the verification function;

[ ] The indication from the named recognised verifying agency that it is prepared to undertake verification functions. This is most likely to be in the form of a letter;

[ ] Range of risk factors addressed;

[ ] Outcomes relating to animal material or animal product;

[ ] Process description;
[ ] Generic Corrective Action Procedure;
[ ] Provisions for verifiers rights and activities;
[ ] List of documents and systems that make up the RMP (process control and supporting systems) - including those subject to the transitional provisions;
[ ] Document control provisions (the entire document control system, not an outline).

Note: The first on-site assessment made in relation to the evaluation, the evaluation report and any supporting reports must have been made within the last 6 months of the date of application for registration of the RMP.

Electronic files

At present the following file types are acceptable:

- Microsoft Word (97 & 2000)
- Microsoft Excel (97 & 2000)
- Acrobat pdf (created from Microsoft Word)

Electronic file endorsement

The endorsement procedure for each file type is described in "RMP Electronic: Endorsement Procedure" which is available on the internet at: http://www.maf.govt.nz/animalproducts/publications/forms/.

Section 9 The declaration must be completed by the operator (eg. a director, partner or person with legal authority to act on behalf of the registered company or partnership or individual).

Section 10 An application fee of $100 is payable by cheque only, to the Ministry of Agriculture and Forestry.

In addition to the application fee, an assessment fee based on an hourly rate of $80 will be charged to the operator for assessment of the RMP application. The Director-General may also estimate and require payment of the assessment fee in advance.

3. The completed registration of RMP application form together with the cheque, the independent evaluators report and the other minimum documentation requirements are to be sent direct to MAF Food Assurance Authority, Animal Products, attention Programme Manager (APS). The address is given on the header of the application form.

4. The application will be assessed by MAF Food Assurance Authority, Animal Products.

The assessment will result in either:

- the RMP being registered in accordance with section 22 of the Animal Products Act 1999; or
- further information requested from the operator in accordance with section 21 of the Animal Products Act 1999; or
- the RMP will be proposed for refusal to register in accordance with section 23 of the Animal Products Act 1999.

It should also be noted that where a RMP application is refused for registration, the application fee will not be refunded and the applicant may still be charged for an assessment fee.

5. Details on the registered RMP will be displayed on a public register of risk management programmes, available on the internet at: http://www.maf.govt.nz/animalproducts/registers-lists/. Alternatively, the register is open for public inspection at the Ministry of Agriculture and Forestry Head Office, MAF Food Assurance Authority, 101-103 The Terrace, Wellington, or a copy can be requested by writing to the Programme Manager (APS), MAF Food Assurance Authority.

Appendix G: Schedule 1: Specification for Operator Supply of Potable Water

Potable water **supplied by the operator solely for the use of the operator (such as bore water, rainwater, surface water, or ground water) must comply with the requirements in** Schedule 1 **as shown below**.

Schedule 1

Specification for operator supply of potable water

1. Initial Assessment of Water Supply Status

   Operators supplying potable water solely for the use of the operator, within a premises or place must complete the Assessment of Water Supply Status checklist to assess all of the applicable water sources and keep a copy of the completed checklist as part of the risk management programme.

2. Reassessment of Water Supply Status

   The potable water supply must be reassessed by completing the Assessment of Water Supply Status checklist at least once every 3 years and within the time specified as follows:

   (a) in the case of a new source of water being used (that is, the source changes or a new source is added), the checklist must be completed prior to use of the water; and

   (b) in the case of any changes to the environment on or around the water source that may affect the water quality, the checklist must be completed within 1 month.

3. Ongoing Water Monitoring

   Potable water must be subject to ongoing monitoring according to the following requirements —

   (a) Potable water must meet the criteria at the point of use set out in Table 1 according to the testing frequency set out in Table 2:

   (b) Water analyses used to demonstrate compliance with this clause must be performed by a MILAB laboratory registered for the required analyses, or a laboratory with persons who are accredited as signatories for the required analyses:

   (c) The operator must ensure that the training of water samplers is undertaken by a laboratory referred to in paragraph (b).

4. Meaning of "secure"

   In this schedule, secure **means the water has met the requirements of the Assessment of Water Supply Status Checklist, Part 3.**

Table 1: Quality of Potable Water

Measurement	Criteria
faecal coliforms	**must not be detectable in any 100 ml sample**
Chlorine (when chlorinated)	**not less than 0.2mg/l (ppm) free available chlorine with a minimum of 20 minutes contact time**
pH (when chlorinated)	**6.5 to 8**
Turbidity	**Should not routinely exceed 1 NTU, must not exceed 5 NTU**

Table 2: Frequency of Testing

Type of Operation[1]	Frequency of microbiological testing	Frequency of turbidity testing[2]	pH[3]	equency of chlorine testing[3]
Dual Operator Butcher – secure source water	nil	nil	nil	nil
Dual Operator Butcher – unsecured source water	1 test per 6 months	1 test per 6 months	1 test per 6 months	daily
Processor using <2000 m^3/day	1 test every month	1 test every month	est per month	daily
Processors using 2000-10,000 m^3/day	1 test every 2 weeks	1 test every 2 weeks	1 test per 2 weeks	daily
Processors using >10,000 m^3/day	1 test every week	1 test every week	test per week	daily

1 average daily use (while processing)

2 the frequency of turbidity testing will depend on the degree of protection of the water source and whether the operator elects to filter the water

3 chlorine and pH testing applies only if the water is chlorinated

Part 2: Checklist: Assessment of Water Supply Status

This checklist must be completed by any operator supplying potable water to the premises or place solely for their own use during processing of animal material or animal product, in order to determine whether additional water treatment is necessary prior to use of the water.

Part 1: SUPPLIER DETAILS		
Name of Operator:	**Type of Operation:**	**Premises Address:**
Postal Address:	**Phone Number:** **Fax Number:** **Email Address:**	

Part 2: WATER SOURCE

Water Source – Indicate all sources intended to be used.

Secure groundwater (not under the influence of surface water) – Go to Part 3 ☐

Surface water (e.g. spring, well, river, stream, dam, lake, reservoir) – Go to Part 4 ☐

Roof water – Go to Part 5 ☐

If there is more than one source of water then the appropriate checklist(s) will need to be filled out for each source (including multiple secure groundwater/surface water sources) of water used by the operator for the purposes of the risk management programme.

Part 3: SECURE GROUNDWATER (i.e. Bore)

Depth of bore:_____metres

Criteria	**Yes**	**No**
1. Is surface water able to drain into the bore, due to the bore-head being inadequately sealed?	❑	❑
2. Is the bore in an area prone to ponding and flooding?	❑	❑
3. Do farmed animals have access to the bore-head?	❑	❑
4. Is there any septic tank/long drop toilet outlet within 100 meters from the bore-head?	❑	❑
5. Do any of the following water characteristics change after rain?		
Colour	❑	❑
temperature	❑	❑
turbidity	❑	❑
pH	❑	❑
***E. coli* or faecal coliform count**	❑	❑

Analysis

- **If the answer to all questions is NO then the water source may be considered to be secure ground water provided the bore is of an adequate depth and the soil types are not porous.**
  No additional treatment need be applied.

- **If the answer to any of the questions is YES, or the bore is of an inadequate depth or the soil types are porous, then the water source must not be considered to be secure ground water.** Go to Part 4

Part 4: SURFACE WATER (e.g. Spring, Shallow Well, Dam, Lake, Reservoir, Stream)

1. Management

(i) Describe the water source e.g. spring, well, stream, river, dam, reservoir etc. including name where appropriate.

(ii) Describe the soil type in the area of the water source e.g. coarse shingle, fine silt, clay etc.

_____

	Yes	No
(iii) Has a microbiological test been done on this source within the last month?	❑	❑
(iv) Does the water satisfy the criteria in Table 1: Quality of Potable Water (except for criteria relating to chlorine and pH)?	❑	❑

Name the laboratory which did the test: _____

2. Criteria

(i) Are any of the following within 50 metres of the water source?

	Yes	No		Yes	No
Offal pit / soak hole	❑	❑	**Septic tank / long-drop toilet**	❑	❑
Animal effluent	❑	❑	**Stock yards**	❑	❑
Sumps	❑	❑	**Land disposal site/refuse pit**	❑	❑
Feed pad	❑	❑	**Silage stack**	❑	❑
Fuel tanks	❑	❑	**Chemical preparation/storage**	❑	❑
Timber treatment facility	❑	❑	**Pesticide residues**		

(ii)	Are there any known water quality problems (e.g. bacterial contamination, turbidity, corrosiveness, sediment, colour, smell, taste)?		
	(If Yes, specify) _____		
(iii)	Do any of the following factors present risks to the quality of the water?		
		Yes	No
	Spray drift	❑	❑
	nearby factories	❑	❑
	mining operations	❑	❑
	(If Yes, specify what activity and how far away)		

3.	Intake and storage		
		Yes	No
(i)	Is any visible matter drawn up in the intake from the water source?	❑	❑
(ii)	Are holding tanks used?	❑	❑
(iii)	If Yes, are these tanks capable of holding more than or less than 1 days supply of water? (please circle answer)	More	Less
(iv)	Is the outlet of the holding tank above or level with the base of the tank? (please circle answer)	Above	Level

4.	Additional criteria for flowing water only i.e. rivers, streams, springs etc.	Yes	No
(i)	Is there a plan for when the river/stream etc. floods?	❑	❑
(ii)	Is effluent discharged less than 2 km upstream of the water intake? If Yes, state source: _____	❑	❑
(iii)	If Yes, is effluent discharged less than 4 hours before water is taken from the source?	❑	❑
(iv)	Do farmed animals have access to within 10m of the water intake?	❑	❑
(v)	Is industrial or urban stormwater discharged to the source water upstream of the intake?	❑	❑

5.	Additional criteria for enclosed surface waters only i.e. dams, lakes, reservoirs etc.	Yes	No
(i)	Is the water accessible to farmed animals?	❑	❑
(ii)	Is effluent discharged into the dam/lake/reservoir?	❑	❑
(iii)	Is industrial or urban stormwater discharged into the dam/lake/reservoir?	❑	❑

6 Analysis

- **If the answers to the questions in section 1 are YES and to all questions in sections 2, 3, 4 & 5 are NO, then the water may be considered satisfactory.**
- **If the answer to any question in section 1 is NO, then a microbiological test must be obtained and, where necessary, a corrective action plan must be designed and included in the water management plan to ensure the water meets the criteria in Table 1: Quality of Potable Water.**
- **If the answer to any question in section 2 is YES, then appropriate action must be taken to ensure potential hazards to human health are identified and, where necessary, a corrective action plan is designed and included in the water management plan to ensure the hazard(s) of concern is/are minimised.**
- **In relation to section 3, if visible debris is drawn up in the water intake at any time and if the holding tank capacity is such that water could settle for at least 24 hours before use and the water outlet from the tank is above the base of the tank so that debris can settle, then the facility may be considered satisfactory. If the facility is not considered satisfactory then a corrective action plan must be designed and included in the water management plan.**
- **If the answer to any question in sections 4 or 5 is YES, then appropriate action must be taken to ensure potential hazards to human health are identified and, where necessary, a corrective action plan is designed and included in the water management plan to ensure the hazard(s) of concern is/are minimised.**

Part 5: ROOF WATER

		Yes	No
1.	Roofing materials		
	Galvanised iron?	❑	❑
	Lead materials (lead nails, flashings, paint)?	❑	❑
	Asbestos materials?	❑	❑
	Paint or other surface treatment in poor condition?	❑	❑

2.	Roof maintenance	
	Gutterings are cleaned out at a frequency of (tick one):	
	Once a year or less	❑
	More than once a year but less than once per month	❑
	Once a month or more frequently	❑

		Yes	No
3.	Roof environment		
	Is the roof overhung by trees?	❑	❑
4.	Atmospheric fall out	❑	❑
	Are there industrial or natural sources of atmospheric fall out?	❑	❑
	Is there any ash/ soot/ bird deposit on the roof?		

5. Analysis

- **If the answer to all questions in sections 1, 3 and 4 are NO and the gutterings are cleaned once a month or more frequently, then the water may be deemed to be satisfactory.**
- **If the answers to any questions in sections 1, 3 and 4 are YES then a corrective action plan must be designed and included in the water management plan.**
- **If the gutterings are cleaned out less frequently than once a month then the water management plan must validate the frequency at which gutterings are cleaned.**

Appendix H: Egg Producers Federation Layer Farm Protocol[1]

Letter from Egg Producer's Federation:

24April 2002

To All Egg Producers

Salmonella Typhimurium type 160 is a strain of salmonella that has made a dramatic impact in New Zealand in a short time. It is the major factor in the high rate of recent sparrow deaths in New Zealand. It has three factors that make it a particular concern for the egg laying industry. It is extraordinarily prevalent in the environment; it is highly adaptable to avian species and vertical (ovarian) transmission is a possibility.

The fact that the two breeding companies have detected this strain in their sheds and it has infected some breeding flocks shows the risk. This is despite the high level of biosecurity within the two companies. The infection was identified in late 2001. The breeding companies acted very quickly and are now vaccinating all day old chicks.

The prevalence in the environment of this strain of salmonella means that it poses a higher risk to our industry than any salmonella threat we have faced before. The Egg Producers Federation has brought together expert technical and veterinary personnel for a full and careful assessment of the situation. The advice they have given is in the attached Protocol. An EPF Executive subcommittee worked with the technical experts and representatives of the breeding companies in developing the Protocol. The EPF Executive then reviewed the Protocol to ensure that it is practical and workable.

The Protocol sets out a series of key actions that should be undertaken in relation to Biosecurity, Vaccination and Training. The actions are very important and we urge you to act on them as soon as possible. The Protocol should be part of your Risk Management Programme. The Protocol will be included in the generic layer hen RMP once it is in place.

There are two features of the Protocol. The first we would bring to your attention is the importance of reducing the risk of salmonella infection from feed. We recommend heat treatment or the introduction of a salmonella inhibitor at the manufacturers recommended rate as soon as possible and no later than 1 November 2002. Feed is considered a major potential source of salmonella infection and this recommendation is a crucial element of the defence against its introduction.
The second and major feature of the Protocol is the decision to vaccinate. The vaccination must be applied on three occasions.

1. **The two breeding companies and PacificVet, the New Zealand distributors of the vaccine, *MeganVac-1*, have agreed that the cost of the first vaccination, which will be undertaken at day old, will be paid by the breeding companies and added to the chick cost.**

2. **The breeding companies hatchery chicken dispatch docket will have information on the contact details for Pacific Vet (a toll free number is available) and the dates for the second and third vaccinations.**

3. **Pacific Vet will invoice each producer directly by dispatching the vaccine to the address on the dispatch docket that has been forwarded to Pacific Vet by the breeding company hatcheries on the day of dispatch of the day old chicks.**

[1] **The various controls that have been recommended in this protocol have been incorporated into the relevant sections of the Layer Farm RMP in Chapter 3 of this Code of Practice.**

4. **The large majority of farmers are already clients of PacificVet. However, where producers are not on the PacificVet books the breeding company hatcheries will provide full details including the postal address and telephone number to PacificVet.**

5. **A list of poultry specialist veterinarians and their contact details will accompany the PacificVet invoice. Normal PacificVet policy will apply in respect of transport costs.**

6. **Veterinary prescription will be part of the dispatch docket. Information on the vaccine is included with this posting and we urge you to read it**

7. **Pacific Vet will forward a reminder to producers who have not ordered. A follow – up to vaccinate will be made to producers**

8. **The vaccination programme outlined will commence on Monday 29 April 2001. It will apply to each new flock you receive from your breeding company.**

9. **The Egg Producers Federation is also working with Agriquality on extending the current Agriquality testing regime for eggs to assist in maintaining public confidence in the safety of egg consumption.**

This strain of salmonella has the ability to cause serious illness in humans. The virulence of the strain and the possibility of ovarian transmission make it a potential public health concern. It is therefore vital we act as a united industry to protect firstly the public and our industry.

The Ministry of Health[2] and the Ministry of Agriculture[3] are aware of the risk posed by STM 160. The Egg Producers Federation has kept both government departments informed of the actions we are undertaking. They are supportive of our proactive actions for consumer food safety. It is important that we are successful in its implementation. Prevention is better than cure.

We thank you for your support.

Michael Brooks,
Egg Producers Federation

24 April 2002 (Clause (a)(iv) amended July 2002)

REARING FARM/LAYER FARMS PROTOCOL

SALMONELLA TYPE 160

(a) Biosecurity

- **(i) Sheds should be bird and rodent proof;**
- **(ii) Change of boots and over clothing and a minimum of hand washing or full shower if possible when exiting from positive sheds;**
- **(iii) Use only potable water on the farm;**
- **(iv) Egg collection belts in the shed must be dry-cleaned to a regular programme. The pre-grading egg conveyor belts must also be cleaned and sanitized to a regular programme. Should a positive test occur for salmonella then sanitizing must be weekly using Virkon or another approved chemical. The conditions for the use of Virkon are that before use all edible product and packaging material must be removed from the room. Following its use food surfaces must be thoroughly rinsed with potable water before production starts. There is a list of other approved chemicals on the following web site www.nzfsa.govt.nz/animalproducts/legislation/notices/m15-chem-scheule-all.pdf;**

[2] **Food-related activities are now covered by the New Zealand Food Safety Authority.**
[3] **Food-related activities are now covered by the New Zealand Food Safety Authority.**

(v) **Foot baths must be at the entrance of all sheds and changed three times a week;**

(vi) **Movement between sheds should always be from youngest to oldest birds. If there are positive or potentially positive flocks on site then movement must be from negative to positive flocks;**

(vii) **Equipment used on the farm must go through the biosecurity process in the same manner as it is applied to individuals. Equipment must not be moved from shed to shed unless a total clean down and disinfection programme has been carried out;**

(viii) **A vermin control programme must be in place to control rodents;**

(ix) **Manure when collected and removed off the site must be securely covered when transported to an approved destination;**

(x) **Wild birds must be prevented entry to open style sheds and any feed spillages removed as soon as they occur;**

(xi) **Egg trays and egg trolleys must be cleaned and sanitized prior to their return to the farm site from the egg packing house;**

(xii) **Feed must be treated to exclude the risk of salmonella. We recommend that you phase in as soon as possible, and no later than 1 November 2002, treatment by either an approved heat treatment or the introduction of a salmonella inhibitor added at the manufacturers recommended rate;**

(xiii) **Feed should be kept in closed containers on farms;**

(xiv) **Sheds should be cleaned and sanitized after the depletion of all flocks;**

(xv) **Sheds that have had a positive flock must be cleaned and sanitized;**

(xvi) **All sheds should be swept down daily to keep dust levels down.**

Sanitized in this Protocol means spraying with disinfectant. Sanitizing programmes should only be undertaken with approved products.

(b) Vaccination

(i) **Take time to read the vaccine 'Directions for Use'.**

(ii) **Per your veterinarian's prescription, use one-half dose per layer pullet (i.e. a 1000 dose vial vaccinates 2000 layer pullets, a 500 dose vial vaccinates 1000 layer pullets).**

(iii) **Vaccination of all flocks at day old in the hatchery followed by a second vaccination at two–six (2-6) weeks of age and a third vaccination between thirteen - sixteen (13-16) weeks of age.**

(iv) **A coarse spray applies the first vaccination in the hatchery. The second and third vaccinations may be applied by either coarse spray or drinking water methods. *Note: Do not use chlorinated water as this kills the vaccine. Use unchlorinated, potable water. Add 'trim milk' to drinking water per instructions to neutralise any residual chlorine or disinfectant.***

(c) Training

(i) **Training in vaccination application will be necessary for layer farm/ rearing farms operators who have not been trained.**

(ii) **The person in your operation who will undertake vaccination application should be identified and trained.**

(iii) **PacificVet (toll free 0508-388-388) can offer training or advice on application.**