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Linking live animals and products: traceability

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Summary

It is rarely possible to successfully contain an outbreak of an infectious animal disease, or to respond effectively to a chemical residue incident, without the use of a system for identifying and tracking animals.

The linking of animals at the time they are slaughtered – through the use of identification devices or marks and accompanying movement documentation – with the meat produced from their carcasses, adds further value from the perspective of consumer safety.

Over the past decade, animal identification technology has become more sophisticated and affordable. The development of the Internet and mobile communication tools, complemented by the expanded capacity of computers and associated data management applications, has added a new dimension to the ability of Competent Authorities and industry to track animals and the food they produce for disease control, food safety and commercial purposes.

Keywords

Animal health – Disease control – Food safety – Identification – Traceability.

Introduction

Animal traceability is far more than the identification of animals. The use of brands, marks and identification devices is but one component in a series of parts that must be linked together to enable an animal or group of animals to be tracked along a production chain and to be quickly located should the need arise. These components, when pieced together, form a traceability system that can then be used to address animal health and food safety challenges. The importance of animal identification and traceability is recognised in two chapters of the *Terrestrial Animal Health Code* of the World Organisation for Animal Health (OIE), and in a Codex Alimentarius standard that is dedicated to this subject (3, 20).

Since the earliest of times, identification of animals has been used to demonstrate ownership (2). Over the past century, identification techniques have increasingly been used to enable animals to be tracked to assist in controlling outbreaks of contagious diseases (7). Effective tracking enables the prompt implementation of preventive measures and may assist in shortening the life of an epidemic, thereby delivering considerable commercial and animal welfare benefits. Identification devices such as ear tags, boluses and implants, and brands and marks, have also been used to identify animals that have been vaccinated against particular diseases or treated in a particular manner. For example, ear punching has been used to identify vaccinated animals in foot and mouth disease and bovine brucellosis eradication campaigns (12, 17). The ability to accurately identify animals is also important when collecting disease surveillance information and when animals are sampled for diagnostic purposes.

The identification of animals also provides a tool to assist with managing food safety (13). The ability to quickly pinpoint likely sources of disease or contamination greatly facilitates responses to food safety incidents. Product recalls or on-farm follow-up investigations, for example, may be facilitated by the easy acquisition of information on the possible location of similarly affected animals.

For addressing many animal health and food safety issues, a 'whole of life' approach, by which animals can be tracked back to their farm of birth should the need arise, is essential. Temporary identification covering the period between the dispatch of an animal or group of animals from an establishment and their arrival at a different establishment (this period usually extends for a finite period after their arrival) may be useful in some instances (Fig. 1). The ability to trace forward in order to locate cohorts is

equally important from a disease control and food safety perspective, because during an incident there is usually a need to promptly locate animals or products that may have moved from the establishment where they were exposed.

Systems designed to enable animals to be tracked back to the farm on which they were born can also be used to help support claims by suppliers of meat, dairy products and eggs about the production systems that were used throughout an animal's life (19). These claims may, for example, relate to 'organic' and husbandry-related production systems such as 'free range'.

An animal identification system is an integrated package linking numerous components in a framework to address clearly defined objectives (8, 20). There are common elements to systems used to identify and track animals; these are discussed below, particularly in relation to how they assist with achieving both animal and animal product traceability.

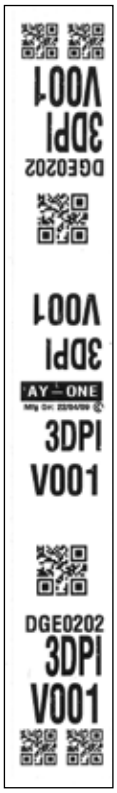
System components and functions

Establishment registration

The key to achieving successful animal traceability is the comprehensive registration – utilising an appropriately designed and secure database – of establishments where species of interest are kept, including their physical location, the type of establishment and the species present. The key locations that are typically registered for animal health and food safety purposes include farms, feedlots, selling centres, depots, fair grounds, abattoirs and dead stock collection points.

The register needs to include the name of the person responsible for the management of animals at each establishment, and sufficient information to enable that person to be promptly contacted. The registration process

a) Cattle identified with adhesive tail tags
(this type of tag has been used in Australia)



b) Tail tag
The source establishment identifier and tag serial number are visually readable and also encoded in a two-dimensional code

Fig. 1
Adhesive tail tags for cattle
Temporary identification of animals or groups of animals covering the movement from one establishment to another and covering a finite period of time may be useful in some cases

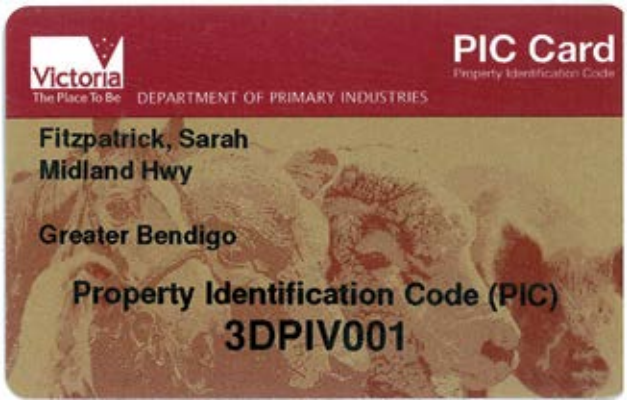


Fig. 2
An example of a card issued to livestock producers in Victoria, Australia, showing the unique establishment identifier known as a Property Identification Code

typically includes the allocation of an establishment identifier (Fig. 2). This unique establishment identifier can then be recorded on movement documentation, and checked against official identification devices registered on the central database.

Ideally, the register should contain spatial data to enable registered establishments to be mapped through the use of applications such as Google Maps© or geographical information systems. This allows establishments with species of interest to be displayed (Fig. 3) and has a variety of applications; for example, during a disease outbreak it can assist with the planning process and the interpretation of movement and epidemiological data (11).

Fig. 3
Map showing the location of registered establishments in a part of Victoria
Active establishments are purple and establishments no longer used for livestock production are orange

Means of animal identification

An important concept in the context of tracking animals is that of the 'epidemiological unit', which is defined by the OIE as a group of animals with a defined epidemiological relationship that share approximately the same likelihood of exposure to a pathogen (20).

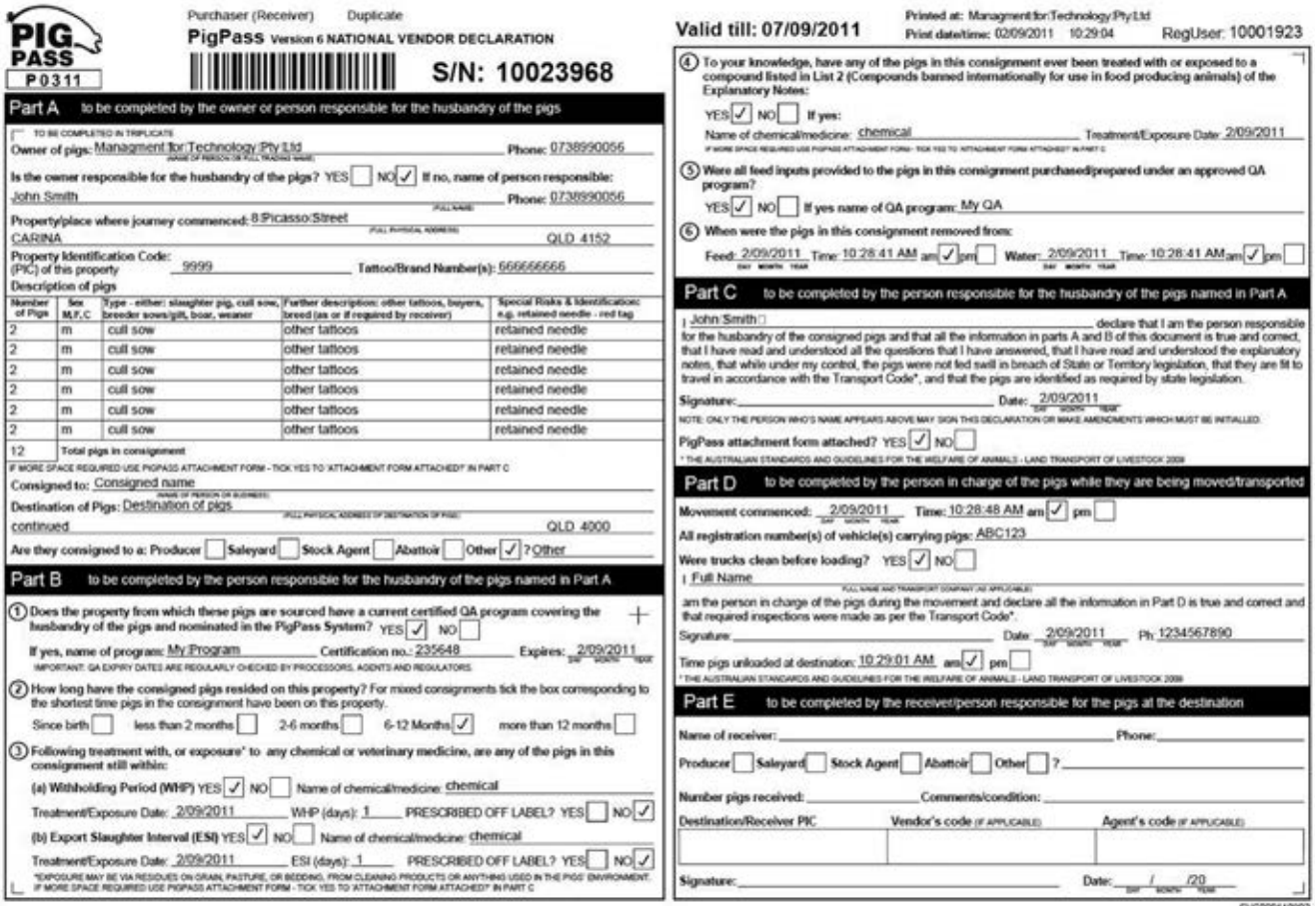
If a group of animals is expected to remain intact within the production chain, the presence of an official identifying tag or brand on individual animals may be of limited value. It is typically only ever feasible to manage poultry on a group or batch basis. When groups of animals move, an accompanying document specifying the establishment of dispatch and the destination establishment may be more useful, particularly if complemented by the recording of the movement details on an official database (Fig. 4).

If animals are likely to be mixed, for example, at selling centres, depots and fair grounds, or if groups are likely to be split as they move within the production chain, the physical identification of individual animals becomes unavoidable if successful traceability is to be achieved. Radio-frequency identification (RFID) tags, boluses and implants allow for individual animals to be uniquely identified (Fig. 5).

While tags printed with visually readable numbers and/or barcodes are still widely used, they are difficult to read accurately in live animals. Brands, tattoos and ear marks can also be used to identify animals on a group or individual basis (Fig. 6). Where animals are managed in discrete batches from birth until slaughter, such group identifiers may be appropriate.

An animal identification system should have relevant standards for the method(s) of identification selected. These should include permitted identification device types, protocols for visually readable numbering and electronic numbering, and field and laboratory testing requirements for characteristics of identification devices, such as their physical and print durability, retention following attachment to animals, readability in commercial environments and ability to withstand tampering (10). The internationally recognised standards for RFID technology used for animal identification are ISO 11784 and ISO 11785. These standards accommodate both half duplex and full duplex transponders. Conformance and performance standards in relation to devices containing ISO 11784 and ISO 11785 compliant transponders have been developed and are administered by the International Committee for Animal Recording.

Selection of official identification devices should also take into account their potential to be used commercially for herd and flock management and productivity measuring purposes.


PIG PASS P0311

Purchaser (Receiver) Duplicate

PigPass Version 6 NATIONAL VENDOR DECLARATION

S/N: 10023968

Valid till: 07/09/2011

Printed at: Managment for Technology Pty Ltd

Print date/time: 02/09/2011 10:29:04

RegUser: 10001923

Part A to be completed by the owner or person responsible for the husbandry of the pigs

TO BE COMPLETED IN TRIPLICATE

Owner of pigs: Managment for Technology Pty Ltd (NAME OF PERSON OR FULL TRADING NAME) Phone: 0738990056

Is the owner responsible for the husbandry of the pigs? YES [ ] NO [✓] If no, name of person responsible:

John Smith (FULL NAME) Phone: 0738990056

Property/place where journey commenced: 8 Picasso Street

CARINA (FULL PHYSICAL ADDRESS) QLD 4152

Property Identification Code (PIC) of this property: 9999 Tattoo/Brand Number(s): 666666666

Description of pigs

Number of Pigs	Sex M,F,C	Type - either: slaughter pig, cull sow, breeder sows/gilt, boar, weaner	Further description: other tattoos, buyers, breed (as or if required by receiver)	Special Risks & Identification: e.g. retained needle - red tag
2	m	cull sow	other tattoos	retained needle
2	m	cull sow	other tattoos	retained needle
2	m	cull sow	other tattoos	retained needle
2	m	cull sow	other tattoos	retained needle
2	m	cull sow	other tattoos	retained needle
2	m	cull sow	other tattoos	retained needle
12	Total pigs in consignment			

IF MORE SPACE REQUIRED USE PIGPASS ATTACHMENT FORM - TICK YES TO 'ATTACHMENT FORM ATTACHED?' IN PART C

Consigned to: Consigned name (NAME OF PERSON OR BUSINESS)

Destination of Pigs: Destination of pigs (FULL PHYSICAL ADDRESS OF DESTINATION OF PIGS)

continued QLD 4000

Are they consigned to a: Producer [ ] Saleyard [ ] Stock Agent [ ] Abattoir [ ] Other [✓] ? Other

Part B to be completed by the person responsible for the husbandry of the pigs named in Part A

① Does the property from which these pigs are sourced have a current certified QA program covering the husbandry of the pigs and nominated in the PigPass System? YES [✓] NO [ ]

If yes, name of program: My Program Certification no.: 235648 Expires: 2/09/2011 (DAY MONTH YEAR)

IMPORTANT: QA EXPIRY DATES ARE REGULARLY CHECKED BY PROCESSORS, AGENTS AND REGULATORS

② How long have the consigned pigs resided on this property? For mixed consignments tick the box corresponding to the shortest time pigs in the consignment have been on this property.

Since birth [ ] less than 2 months [ ] 2-6 months [ ] 6-12 Months [✓] more than 12 months [ ]

③ Following treatment with, or exposure* to any chemical or veterinary medicine, are any of the pigs in this consignment still within:

(a) Withholding Period (WHP) YES [✓] NO [ ] Name of chemical/medicine: chemical

Treatment/Exposure Date: 2/09/2011 WHP (days): 1 PRESCRIBED OFF LABEL? YES [ ] NO [✓]

(b) Export Slaughter Interval (ESI) YES [✓] NO [ ] Name of chemical/medicine: chemical

Treatment/Exposure Date: 2/09/2011 ESI (days): 1 PRESCRIBED OFF LABEL? YES [ ] NO [✓]

*EXPOSURE MAY BE VIA RESIDUES ON GRAIN, PASTURE, OR BEDDING, FROM CLEANING PRODUCTS OR ANYTHING USED IN THE PIGS' ENVIRONMENT. IF MORE SPACE REQUIRED USE PIGPASS ATTACHMENT FORM - TICK YES TO 'ATTACHMENT FORM ATTACHED?' IN PART C

④ To your knowledge, have any of the pigs in this consignment ever been treated with or exposed to a compound listed in List 2 (Compounds banned internationally for use in food producing animals) of the Explanatory Notes:

YES [✓] NO [ ] If yes:

Name of chemical/medicine: chemical Treatment/Exposure Date: 2/09/2011

IF MORE SPACE REQUIRED USE PIGPASS ATTACHMENT FORM - TICK YES TO 'ATTACHMENT FORM ATTACHED?' IN PART C

⑤ Were all feed inputs provided to the pigs in this consignment purchased/prepared under an approved QA program?

YES [✓] NO [ ] If yes name of QA program: My QA

⑥ When were the pigs in this consignment removed from:

Feed: 2/09/2011 (DAY MONTH YEAR) Time: 10:28:41 AM am [✓] pm [ ] Water: 2/09/2011 (DAY MONTH YEAR) Time: 10:28:41 AM am [✓] pm [ ]

Part C to be completed by the person responsible for the husbandry of the pigs named in Part A

I John Smith (FULL NAME) declare that I am the person responsible for the husbandry of the consigned pigs and that all the information in parts A and B of this document is true and correct, that I have read and understood all the questions that I have answered, that I have read and understood the explanatory notes, that while under my control, the pigs were not fed swill in breach of State or Territory legislation, that they are fit to travel in accordance with the Transport Code*, and that the pigs are identified as required by state legislation.

Signature: Date: 2/09/2011 (DAY MONTH YEAR)

NOTE: ONLY THE PERSON WHO'S NAME APPEARS ABOVE MAY SIGN THIS DECLARATION OR MAKE AMENDMENTS WHICH MUST BE INITIALLED

PigPass attachment form attached? YES [✓] NO [ ]

* THE AUSTRALIAN STANDARDS AND GUIDELINES FOR THE WELFARE OF ANIMALS - LAND TRANSPORT OF LIVESTOCK 2008

Part D to be completed by the person in charge of the pigs while they are being moved/transported

Movement commenced: 2/09/2011 (DAY MONTH YEAR) Time: 10:28:48 AM am [✓] pm [ ]

All registration number(s) of vehicle(s) carrying pigs: ABC123

Were trucks clean before loading? YES [✓] NO [ ]

I Full Name (FULL NAME AND TRANSPORT COMPANY (AS APPLICABLE))

am the person in charge of the pigs during the movement and declare all the information in Part D is true and correct and that required inspections were made as per the Transport Code*.

Signature: Date: 2/09/2011 (DAY MONTH YEAR) Ph: 1234567890

Time pigs unloaded at destination: 10:29:01 AM am [✓] pm [ ]

* THE AUSTRALIAN STANDARDS AND GUIDELINES FOR THE WELFARE OF ANIMALS - LAND TRANSPORT OF LIVESTOCK 2008

Part E to be completed by the receiver/person responsible for the pigs at the destination

Name of receiver: Phone:

Producer [ ] Saleyard [ ] Stock Agent [ ] Abattoir [ ] Other [ ] ?

Number pigs received: Comments/condition:

Destination/Receiver PIC	Vendor's code (IF APPLICABLE)	Agent's code (IF APPLICABLE)

Signature: Date: / /20 (DAY MONTH YEAR)

Fig. 4

An example of movement documentation used in Australia for the movement of groups of pigs between establishments

Source: Australian Pork Limited

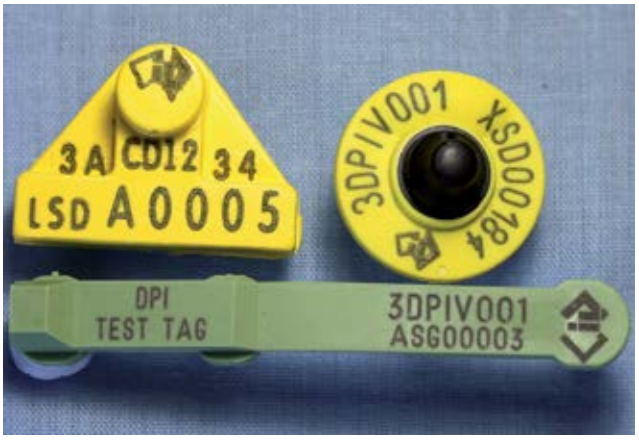


Fig. 5

Examples of official radio-frequency identification ear tags used for the identification of sheep in Australia

Information management

In most countries, the Internet and mobile communication tools now enable information about animals and their movements to be transmitted efficiently and quickly from all points in the production chain. With the potential for the collection of large amounts of information about animals as they move along the production chain, secure computer systems are now used routinely to receive, process, store and enable prompt retrieval of the data for legally permitted purposes.

The information can be managed using a single official central database or a network of connected databases.

Movement databases typically record information on the establishments to which official identification devices have been issued and the movement of animals between establishments on either an individual animal or group basis. While establishment and animal databases record the existence of physical entities (official identification devices and establishments), movement records contain details of the type of movement or type of event (e.g. birth, official identification, death or slaughter), the number of animals and species involved and the date on which it occurred.

The official computer system should be amenable to queries about the movements of individual animals or groups of

Fig. 6
An identification tattoo on a pig
As identification tattoos are permanent and cannot be removed, they are an effective method of identifying pigs on a group basis, from birth until slaughter

animals, thus facilitating the prompt location of cohorts of interest. For any individual animal, arranging movement records sequentially enables a life history of the animal to be constructed showing establishment-to-establishment movements from birth to death. Other potentially valuable information, such as the presence of an animal at a particular location on a particular day, can also be recorded.

The National Livestock Identification System which operates in Australia is an example of a national movement database. This database receives and processes approximately one million cattle movements per month (21), and is complemented by establishment registers that are maintained by the Competent Authority in each Australian state/territory.

When RFID technology is used to create individual animal identities, an integrated information management system is essential to register devices and to manage relevant information, in particular when devices are acquired by a

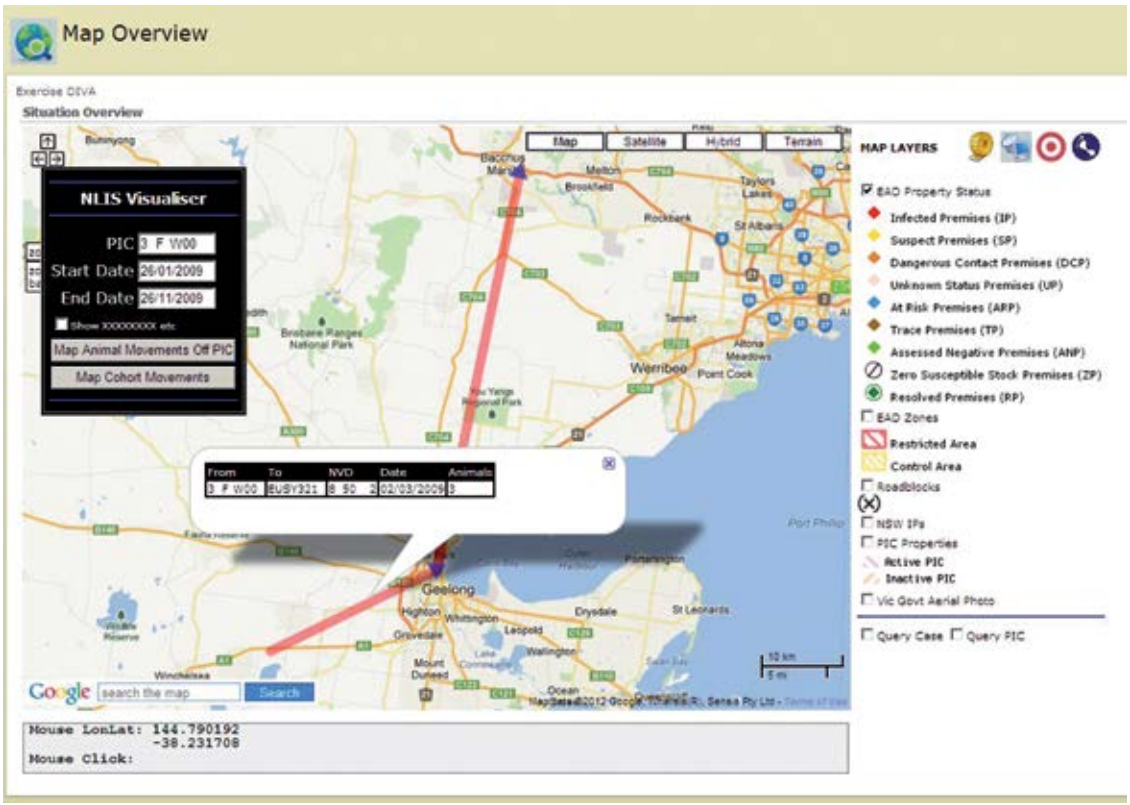


Fig. 7
An example of the use of movement data in a disease outbreak management computer application

farmer, and when animals move between establishments and are slaughtered or are exported live to another country.

It is important to have the means of accessing the data for use in other applications, such as disease outbreak management packages (Fig. 7).

Given the capacity of systems in common use today to generate and collect large amounts of information about animals, data interpretation has become both challenging and extremely rewarding, particularly in the context of preparing for and responding to a disease incident. It cannot be assumed, however, that simple data manipulation techniques will be able to analyse and display data, potentially from a number of sources, in a meaningful manner during an escalating disease emergency. The rapid analysis of large data sets (movement records typically run into millions) requires high-powered computer software and specialised analysis techniques (14).

With large amounts of movement data available now, it is possible to build networks of entities, such as establishments, connected by animal movements, and study these using the tools and methods provided by social network analysis (5). Such analyses have been used for a number of purposes, e.g. for descriptive studies of national animal movements, retrospective analysis of epidemics, risk-based surveillance and modelling the impact of disease control measures and epidemic spread (1, 5, 6).

Visualisation is a way of representing complex information in a simple, concise format that is easy to understand. It can take many forms, such as maps, graphs, link analysis and timeline charts, and can be used to analyse large volumes of data extremely quickly. Link analysis is a method of visually displaying the relationships linking entities (e.g. people, establishments and animals of interest) using visual icons in order to examine the relationships between them (Fig. 8). When connected using appropriate software, the entities can be expanded an unlimited number of times to determine interrelations with other entities. When link analysis is combined with geo-spatial analysis, the results are even more powerful. Each entity can have attributes appended to it, which can also be analysed, such as treatment and vaccination history, diagnostic results, and disease and contaminant status. This broadens the capacity of the analytical process. From there, extensive querying and analysis of the data can be performed rapidly to find links between animals and establishments.

Business rules

Animal identification systems need documented business rules that describe and define the responsibilities of participants, legal constraints and obligations, procedures for dealing with exceptions and database protocols (16, 18).

No animal identification system is perfect. Animals lose identification devices, and some devices, brands and tattoos may become unreadable. There can be problems with a batch system when animals die, as they inevitably do from time to time, or if they are removed from or added to batches. Such scenarios need to be addressed through the business rules.

Rules should address when and how devices are first applied to an animal, how soon after the event movements must be reported to the movement database, and by whom and in what manner. It may be necessary to enshrine some or all of these rules within a legal framework designed to protect the integrity of the system.

Abattoirs, rendering plants and dead stock collection points should ensure that official identification devices are collected and disposed of in accordance with the business rules and associated legal framework. These procedures should minimise the risk of unauthorised reuse and, if appropriate, include rigorous rules for the reuse of official identification devices or components such as transponders.

If the design, implementation and operation of an animal identification system are to be successful, there must be a close cooperative relationship between the Competent Authority and all sectors within the production chain. It is therefore important that each sector is able to contribute to the development of the business rules and to implementation planning, and participate in the performance testing of the system and its periodic review.

Legal framework

The legal framework should enshrine those elements of the business rules that relate to the obligations of those within the production chain, and specify prohibited actions that, if permitted, would compromise the system.

A key principle supported by the legal framework should be that those in charge of animals must verify that the animals in their care are identified and traceable in accordance with the business rules before the animals are permitted to move forward along the production chain. This approach is consistent with contemporary arrangements within food industries that place the onus on participants in the supply chain to demonstrate that they are compliant. Such an approach is generally recognised as having delivered a better outcome in relation to meat and milk hygiene, product integrity, animal welfare and environment management than traditional regimes of government inspection that have focused on the detection of non-compliance.

Structured quality assurance arrangements, ideally incorporating third-party auditing, supported by an ongoing and adequately resourced education programme

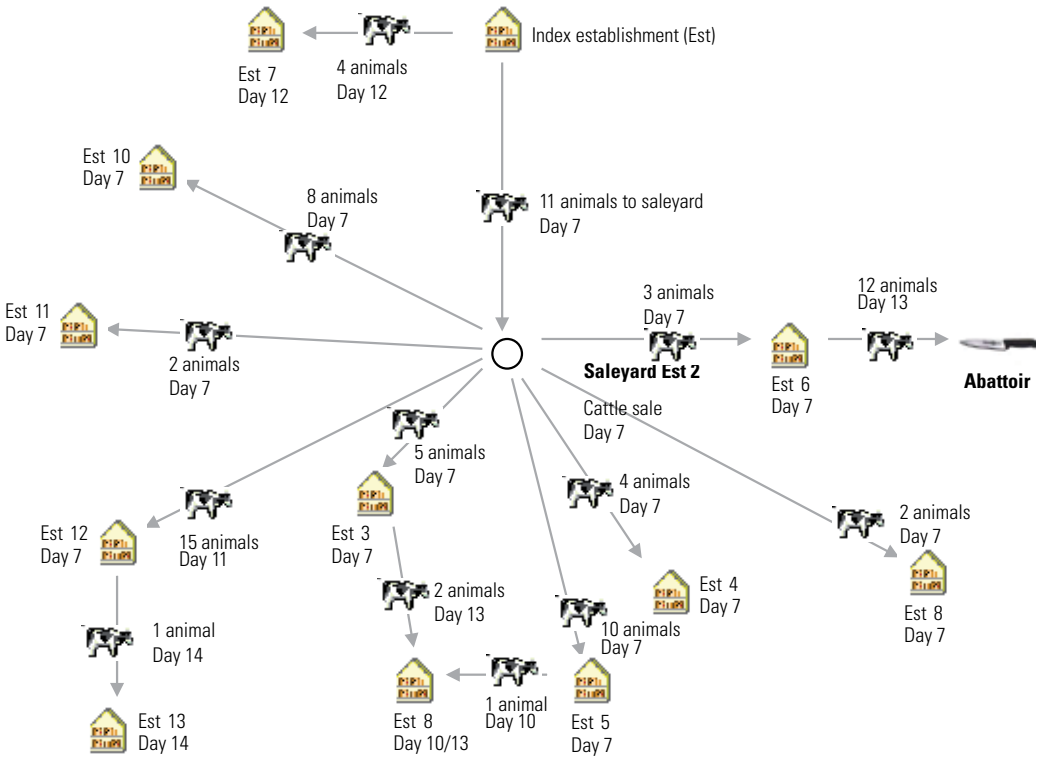


Fig. 8
The liveTRACE system
Visualisation is a useful method for analysing large amounts of animal movement data. The liveTRACE system employs dedicated proprietary software which captures select data from relevant databases and displays these visually

that includes training and technical support, are important considerations in this context (Fig. 9).

Auditing should be carried out under the auspices of the Competent Authority to measure performance against agreed performance criteria, to detect any weaknesses in the system, and to identify aspects that could be improved. An example of performance standards for an animal identification system is provided in Appendix 1. The periodic performance testing of the system – through tracking exercises that select animals at random in locations such as abattoirs and attempt to establish their life histories and the current location of cohorts – will provide additional rigour (4).

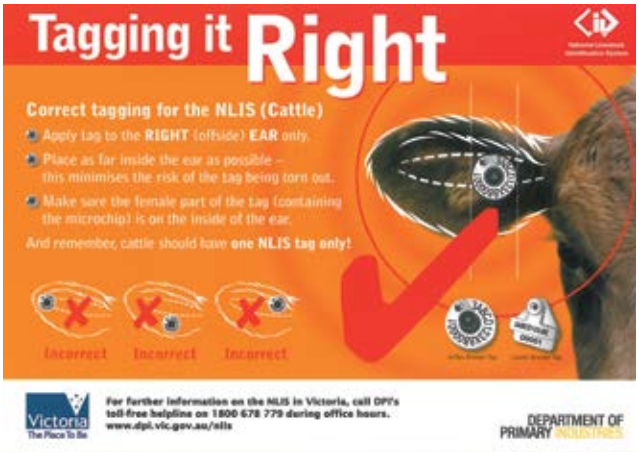


Fig. 9
Educational material used in Victoria, Australia
An ongoing educational programme is critical to the success of animal identification systems

Linkage to animal products

The components of the animal identification system operating within abattoirs should complement and be compatible with arrangements for tracking animal products throughout the food chain. At an abattoir, animal identification should be maintained during the processing of an animal carcass at least until the carcass is deemed fit for human consumption and all sampling for testing purposes has been completed.

Systems for linking live cattle with their carcasses using individual identification devices are relatively straightforward, because typically carcasses are processed in sequence. Carcass tickets are one method for maintaining

Fig. 10
A carcass ticket
A carcass ticket system can be used to maintain the link between a live animal and its carcass prior to deboning

the link between a bovine animal and its carcass through the chilling process prior to deboning (Fig. 10).

In contrast, although maintaining the link between adult cattle and their carcasses is fairly simple, there are challenges associated with linking individual calves and other small ruminants, such as sheep and goats, at slaughter with their carcasses along the processing chain. This is because processing of small ruminants can involve the movement of carcasses between chains. In addition, occasionally, carcasses may fall from gambrels or be diverted to retaining areas for inspection or trimming. Gambrels that do not have a carcass suspended from them, animals without devices or with devices that cannot be read, can also impact on live animal-to-carcass correlation.

To overcome these challenges, a technology solution needs to be employed that will ensure that the link between the live animal and its carcass is maintained, regardless of the situations that generally might compromise this. Due to the operational demands and costs within an abattoir, the technology employed must be automated and operate seamlessly within the processing environment with limited need for human intervention. One solution is to embed transponders in gambrels, place transponder readers at strategic points along the processing chain and use a supporting computer system and software. This makes it possible to maintain the correlation between the individual small ruminant at slaughter and its carcass (15).

Ensuring that an animal retains a link with its unique identifier at all stages of processing provides opportunities to introduce automated grading and chiller sorting, removal of tickets, detailed inventory and product status control, automated boning room input and carcass load out. It also makes it possible to provide online and web feedback on an individual animal basis to buyers and producers.

Where live animal-to-carcass correlation systems are in place, quality assurance procedures should be established and abattoir staff should be trained to know what to do if standard operating procedures are breached. The periodic use of DNA analysis to confirm that live animals are being accurately linked to their carcasses is a valuable verification tool.

The boning room creates a further challenge in relation to maintaining the traceability of meat from abattoir to consumer. Barcode labelling of packaging is a commonly used method of establishing a link between meat, the date and place of processing and, where applicable, the animal or batch of animals from which the meat was sourced (Fig. 11).

Systems designed to enable animals to be tracked back to the farm from which they were sourced enable suppliers of meat, dairy products and eggs to help support claims about the production systems that were used throughout an animal's life (8). For example, tracking systems can help suppliers back up claims that their products and practices are 'organic', 'free range', 'hormone free' and/or 'welfare friendly'. Such systems also allow the public disclosure of individual animal information, such as breed, date of birth and farm of origin, for animal products if required (9).

To make the traceability system complete, it is essential that, within the abattoir, carcasses can be linked to animal identification devices and accompanying movement

Fig. 11
Barcode labelling of meat packaging
Barcodes can provide a range of information on the processing and source of an animal product

documentation until at least all inspections and testing for diseases of interest and chemical contamination have been completed. While retail outlets need to be able to promptly and accurately establish the origin of the meat they are selling, the extent to which there is linking of information about batches of animals or individual animals with packages of meat derived from their carcasses will typically be a commercial matter determined by the requirements of the intended customer, the value of the meat, and commercial claims relating to the treatment and management of the animals prior to slaughter.

Conclusion

Animals have been identified using simple techniques such as brands, ear marks and tattoos since ancient times, principally as a method for demonstrating ownership. Over the past century, the identification of animals has increasingly been used to aid in the monitoring of the productivity of animals, and to enable tracking of animals for disease control and food safety purposes. Given the capacity of systems in common use today to generate and collect large amounts of information about animals, data interpretation has become both challenging and extremely rewarding, particularly in the context of preparing for and responding to a disease incident.

To achieve traceability, a modern animal identification system should have the following elements:

– an establishment registration system which includes the allocation of a unique identifying number to establishments, information on the species present, contact details for the person who is responsible for the animals and mapping capability

– when groups of animals are not expected to remain intact within the production chain, defined means of physically identifying animals or groups of animals

– defined movement documentation requirements

– an official secure database or network of databases where records are kept

– an event and movement recording system that records the establishment-to-establishment movements of animals and the dates of these movements, including their slaughter or live export

– business rules and associated legal and quality assurance frameworks, developed with input from all sectors of the production chain

– an ongoing and appropriately resourced programme to educate industry participants about their responsibilities and to provide training and technical support

– documented arrangements for performance monitoring, enforcement, evaluation and periodic review

– a query system that enables the history and whereabouts of individuals or groups to be elucidated with ease and displayed in conjunction with spatial and temporal information.

Traceability involves far more than simple identification; it requires the careful integration of a number of components. While the exact nature of these components may vary from country to country, according to national requirements and species, the presence of each is essential for traceability to be complete and to facilitate linkages to the supply chain for food products.

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Relier les animaux vivants à leurs produits : la traçabilité

A.G. Britt, C.M. Bell, K. Evers & R. Paskin

Résumé
Il est très difficile de réussir à maîtriser les foyers de maladies animales infectieuses ou de réagir efficacement en cas de détection de résidus chimiques dans des produits d'origine animale, sans recourir à un système d'identification et de traçabilité des animaux.
L'utilisation de marques ou de dispositifs d'identification animale et les documents d'accompagnement et de transport permettent de relier les viandes à l'animal d'où elles sont issues au moment de l'abattage des animaux, ce qui constitue une valeur ajoutée pour la sécurité du consommateur.
Au cours de la décennie écoulée, les technologies appliquées pour l'identification animale ont gagné en précision tout en devenant plus abordables. Le développement des outils de communication par internet et de la téléphonie mobile et l'amélioration des moyens informatiques, notamment les logiciels de gestion des données, ont donné aux Autorités compétentes et au secteur privé de nouvelles capacités pour assurer la traçabilité des animaux et de leurs produits à des fins de lutte contre les maladies, de sécurité sanitaire des aliments et de compétitivité commerciale.

Mots-clés
Identification des animaux – Lutte contre la maladie – Santé animale – Sécurité sanitaire des aliments – Traçabilité.

El vínculo entre los animales vivos y sus productos derivados: rastreabilidad

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Resumen
Rara vez es posible contener con éxito un brote zoosanitario infeccioso o afrontar eficazmente un incidente ligado a la presencia de residuos químicos sin emplear un sistema de identificación y rastreo de los animales.
El hecho de establecer un nexo entre un animal en el momento de su sacrificio y la carne obtenida a partir de su canal, utilizando el dispositivo o marca de identificación del animal y la correspondiente documentación sobre sus movimientos, aporta valor añadido al producto desde el punto de vista de la seguridad sanitaria del consumidor.
A lo largo del último decenio las técnicas para identificar a los animales han ido ganando en sofisticación y asequibilidad. La aparición de herramientas de comunicación móviles y por Internet, aunada al aumento de capacidad de los ordenadores y las aplicaciones conexas de gestión de datos, ha agregado una nueva dimensión a la capacidad de los organismos competentes y de la industria para seguir el rastro de los animales y los productos derivados que de ellos se obtienen con fines de control de enfermedades, inocuidad de los alimentos o comerciales.

Palabras clave
Control de enfermedades – Identificación – Inocuidad de los alimentos – Rastreabilidad – Sanidad animal.

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Appendix 1
Australia's National Traceability Performance Standards

Applicable to all FMD susceptible livestock species[1]	
1.1	Within 24 h of the relevant CVO[2] being notified[3], it must be possible to determine the location(s)[4] where a specified animal was resident during the previous 30 days
1.2	Within 24 h it must be also possible to determine the location(s)[4] where all susceptible animals that resided concurrently and/or subsequently on any of the properties on which a specified animal has resided in the last 30 days
Applicable to cattle only[5]	
2.1	Within 48 h of the relevant CVO[2] being notified[3], it must be possible to establish the location(s)[4] where a specified animal has been resident during its life
2.2	Within 48 h of the relevant CVO[2] being notified[3], it must be possible to establish a listing of all cattle that have lived on the same property as the specified animal at any stage during those animals' lives
2.3	Within 48 h of the relevant CVO[2] being notified[3], it must also be possible to determine the current location[4] of all cattle that resided on the same property as the specified animal at any time during those animals' lives
Applicable to all FMD susceptible livestock species except cattle (lifetime traceability excluding the preceding 30 days – addressed by 1.1 and 1.2 above)	
3.1	Within 14 days of the relevant CVO[2] being notified[3], it must be possible to determine all locations[4] where a specified animal has been resident during its life
3.2	Within 21 days of the relevant CVO[3] being notified[3], it must also be possible to determine the location[4] of all susceptible animals that resided concurrently with a specified animal at any time during the specified animal's life

Source: Animal Health Australia (www.animalhealthaustralia.com.au)

(1) For the purposes of these Standards, 'FMD susceptible species' means cattle, sheep, goats, and domesticated buffalo, deer, pigs, camels and camelids

(2) 'The relevant CVO' means the state or territory Chief Veterinary Officer, or their delegate, in the jurisdiction where the specified animal is located or has been traced to

(3) For the purposes of these Standards, the term 'notified' means the relevant CVO is aware of an incident that required tracing

(4) 'Location' means any definable parcel of land including (but not limited to): any parcel of land with a Property Identification Code, travelling stock routes, saleyards, abattoirs, feedlots, live export collection depots, show grounds, Crown land and transport staging depots

(5) Given the risks posed by BSE, it was considered appropriate to establish separate standards for cattle