

Best Food Safety Practices From Farm to Fork

Safe Food Handling Practices on the Farm: Meeting the Needs of Foodservice Operations

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and

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The Beginning



Acknowledgements and Resources

Iowa State University

Dr. Lester Wilson

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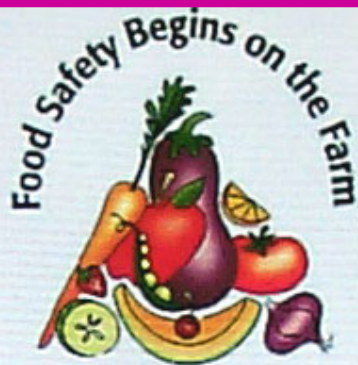
Dr. Jason Ellis (now at Univ. Nebraska – Lincoln)

Dan Henroid

Extension publications – 1974 a, b, c

Cornell University – GAPs Project

University of California – Davis



CORNELL UNIVERSITY

GOOD AGRICULTURAL PRACTICES PROJECT

BACKGROUND

PUBLICATIONS

- [Food Safety Begins on the Farm: A Grower's Guide](#)
- [Reduce Microbial Risks with Good Agricultural Practices - \(Spanish version\)](#)
- Farm Checklist
- GAPs CD (PowerPoint Presentations)

CONTACT US

Welcome to the Good Agricultural Practices (GAPs) Project. The goal of the GAPs project is to reduce microbial risks in fruits and vegetables by developing a comprehensive extension and education program for growers and packers.

The GAPs project has collaborators in 16 states throughout the nation and has created many educational materials to help promote the use of good agricultural practices on the farm. This project is funded by CSREES-USDA and US-FDA and the program is based at Cornell University.

We hope you find this website interesting, informative, and easy to use. If you are having difficulty locating specific information, please contact us. Thank you for your interest in produce safety and for working to reduce the microbial risks to fruits and vegetables.

UPCOMING MEETINGS



COLLABORATORS



WEBSITE LINKS

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<http://www.gaps.cornell.edu>

Postharvest Technology Research and Information Center Home Page - Microsoft Internet Explorer

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Address <http://postharvest.ucdavis.edu/> Links



**POSTHARVEST
TECHNOLOGY**
Research and Information Center

Goals:
Improving the quality and value of horticultural crops available to the consumer
Reducing postharvest losses and improving marketing efficiency
Solving particular problems in handling fruits, vegetables, and ornamentals to maintain their quality and safety

Postharvest Technology Research and Information Center

- [About the Center](#)
- [Endowment Fund](#)
- [Short Courses and Workshops](#)
- [Announcements and Meetings](#) **NEW** [SEARCH!](#) **NEW**
- [Center Publications](#) - list and order form

Online UC Postharvest Information

- [Produce Facts](#)
- [Physiological Disorder Fact Sheets](#)
- [Properties and Recommended Conditions for Storage of Fresh Fruits and Vegetables](#)
- [Additional Information](#)

Department of Plant Science

Where can Contamination With Microbial Pathogens Occur?

In fields or orchards

During harvesting and transport

During processing or packing

In distribution and marketing

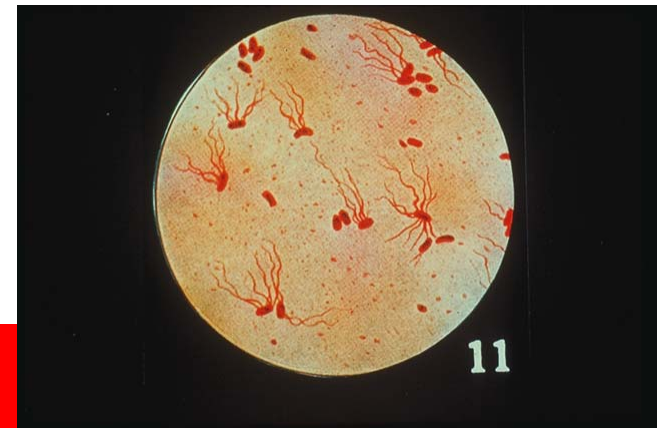
In restaurants and food service facilities

In the home

FARM to FORK

Sources of Foodborne Microorganisms

- Soil and water
- Plants and plant products
- Air and dust
- Wild and domestic animals
- Insects and birds
- Compost
- Containers for harvesting produce
- Packing materials
- Food handlers



Fruits and vegetables

Agricultural products can be exposed to microbial contamination through a variety of sources



Once contaminated, fresh produce often not heated to destroy pathogens



Concerned about contamination? What Can You Do?

Learn about the risks.

Develop a plan – focus each step

Provide tools for staff

Document your actions.

Strive to reduce risks.



Getting Started on Producing Safe Food

- Ensure clean and appropriate food contact surfaces and packages are used
- Establish system to document use of GAPs on farm and during transit along the food chain
- Be able to provide certification and/or evidence of liability protection

On-Farm Food Safety

Production – GAPs

Includes attention to use of safe water
“stealth ingredient”

Harvest

Post-Harvest

Processing

Packing

Transportation



On-Farm Food Safety Focus

Workers:

- Health
- Practices
- Training

Training Focus:

- Handwashing
- Cleaning and Sanitizing
- Contamination
- Cross-Contamination



**Fresh Produce Growers
and Packers
ARE Food Handlers !!!**

Proper Facilities, Education, and Training Training Training



Harvest Considerations

Ideally pick dry fruits or vegetables.

Leave produce that has bird droppings on it.

Clean and sanitize totes/containers daily.

Cool product quickly.

Teach workers about proper handwashing and provide proper facilities.



Harvest Sanitation

Clean and sanitize storage facilities prior to harvest.



Clean and sanitize harvest bins daily.



Avoid standing in harvest bins.

Clean and sanitize packing area, equipment, and floors daily.

Farm Labor/Harvester Sanitary Facilities & Personal Hygiene

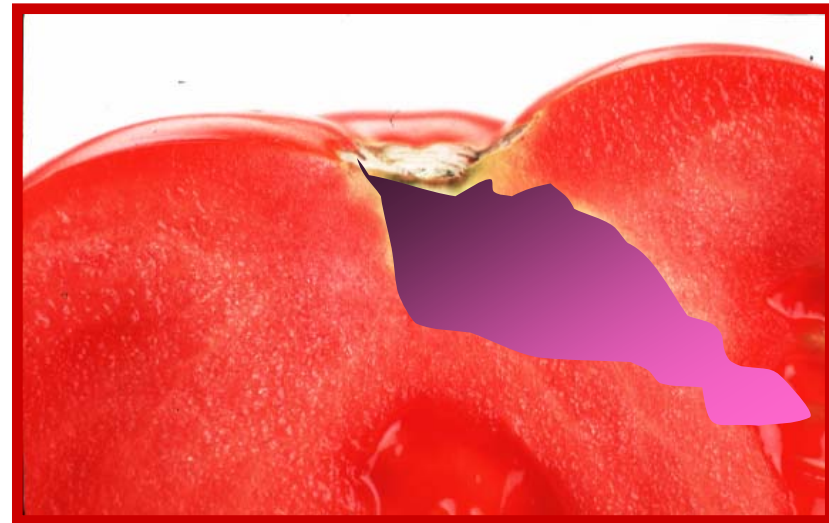


Field Lavatories



Bacteria can enter the stem scar with improper handling or wash water management

Fruit pulp must be $< 10^{\circ}\text{F}$ warmer than water temperature to prevent infiltration.



Postharvest water disinfection is important preventive practice, even for an acid vegetable like tomatoes. Historically thought to be safe, outbreaks in 1990, 1993, and 1999 were caused by *Salmonella* spp.

Reduce Post Harvest Loss

Post-harvest management practices that reduce loss to spoilage or shrinkage will reduce risks.

These include sorting, quick cooling, chlorinated wash water, and good refrigerated storage and shipping.



Processing and Packing in the Field

Product washing - water source,
renewal

Temperature control – cooling

Sanitation

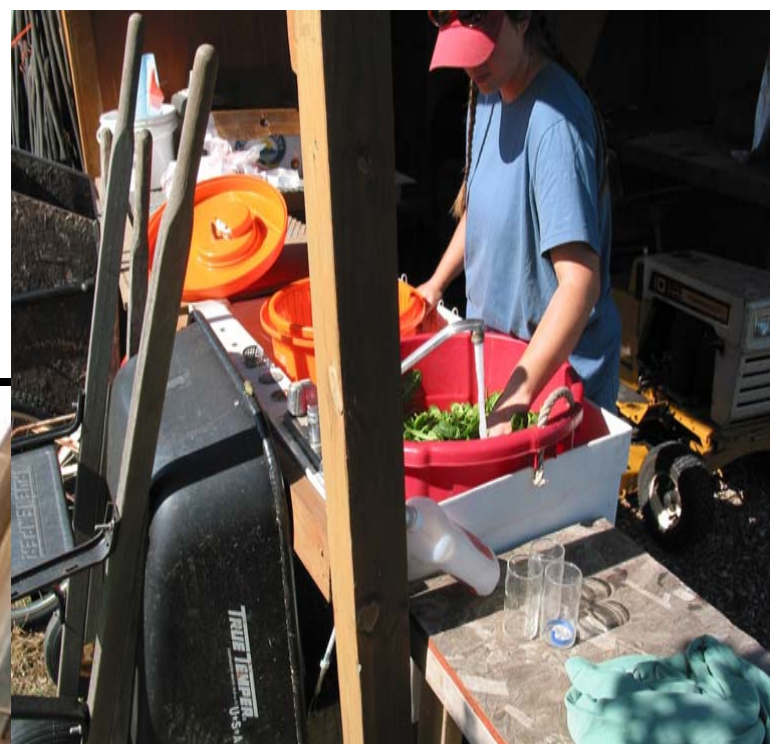
Product

Facilities

Equipment

Hands

Attire



“Cooling” of product

Wet produce can allow rapid bacterial growth if not cooled.

Critical temperatures are:

41°F – 135°F

70°F – 100°F



Processing and Packing Sheds

Cooling

Temperature control

Storage

Facilities

Packaging:

containers – must be
food grade quality
storage



Packing House Sanitation

- Proper sorting and culling of produce.
- Detectable Free Chlorine in Wash Waters.
- Enforce Good Worker Hygiene.
- Supplies and facilities for handwashing
- Exclude all animals from Packing House
insects, birds and rodents.
- Clean and Sanitize Equipment.





Attention to Cleanliness and Sanitation of Packing Shed

1. Work tables/product preparation surfaces – food contact surfaces
 - Smooth surfaces (stainless steel) allow easy cleaning, rough surfaces harbor dirt and microorganisms
 - Important to clean and sanitize DAILY or AS NEEDED
 - Rinse, Wash, Rinse and Sanitize (food contact approved agent)
2. Storage of packing containers – away from debris?
3. Close doors at night.

Control Sources of Rodent and Bird Contamination



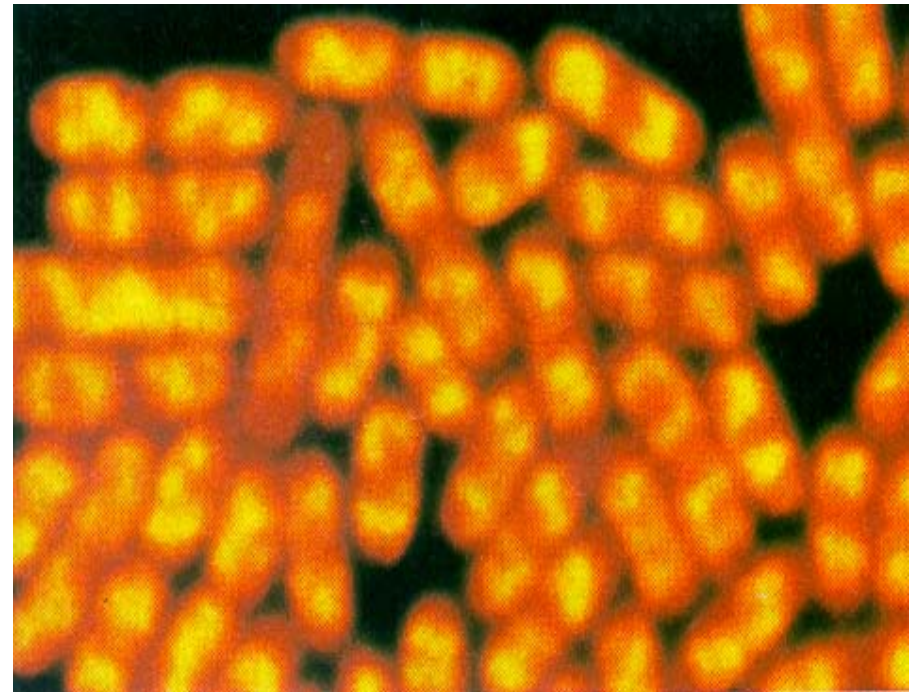
Storage of packing material

Prevent contamination





E. coli



Salmonella

Good Agricultural Practices Can Reduce Food Safety Risks

Good Agricultural Practices (GAPs) for food safety include Best Management Practices (BMPs) to protect the environment.

These same practices that reduce losses of soil and nutrients can reduce risk of microbial contamination of produce.

Keeping records of production practices allows regular updates of plans.

So What?

- Local sources of fresh produce are popular
- Customers have awareness of potential risks
- Producers must practice precautions and ask questions!
- Producers should keep documentation (i.e. insurance, water tests, temperature logs, employee health records, etc.)
- See Checklists for Buyers and Sellers in binder
- Foodservices will often request this information, especially if serving elderly or children
- Producers can market quality aspects of products but also their food safety standards and practices

Be Active and Be Ready

- Make changes to practices as needed.
- Keep good records of all production practices, especially manure use and water tests.
- Teach employees the importance of prevention strategies.
- Work with upstream neighbors and local watershed committees on management goals
- Update your plan regularly.



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