On Farm Food Safety

Presented by: USDA, RMA, and FamilyFarmed.org

Trainer: Atina Diffley

WHOLESALE SUCCESS

Why Care About Postharvest Handling and Food Safety?

- Quality of Your Produce
- Shelf Life of Your Produce
- Nutrition and Taste
- Your Reputation
- Wellness of Your Customers
- Farm Liability

*On-farm food safety and good postharvest practices **protect farmers** as much as they **protect customers.***

WHOLESALE SUCCESS

Foodborne Illness

Center for Disease Control and Prevention (CDC)

- 47.8 M cases of food poisoning, (1 in 6 Americans)
- 128,000 hospitalizations
- 3,037 deaths

Among 17 main produce crops, 2.1 million illnesses were associated with leafy vegetables (23%), more than any other produce category.

WHOLESALE SUCCESS

Why the Increase in Foodborne Illness and who is most sensitive?

- More at-risk people
  - Elderly
  - Auto-immune diseases
  - Organ transplants
  - Pregnant women and children
- Increasingly complex food distribution
- More food eaten uncooked
- Bacteria, viruses, and parasites evolving
- Lack of resistance from evolved pathogens

WHOLESALE SUCCESS

You are a Food Handler

- Regulatory Requirements
- Buyer's Demands
- Commitment to Food Safety

Every farm needs safe food handling

Food safety is a management commitment. You evaluate your systems and make improvements.

You are Responsible for the "Wellness" of your Product!

WHOLESALE SUCCESS

Food Safety Modernization Act - FSMA

- Produce Rule
- Virtually all fresh produce is "covered"
- Produce exemptions (rarely eaten raw)
- Only deals with biological hazards
- Does not require 3rd party certification or FSP.

(But many buyers require a FSP or 3rd party cert.)

- *DOES REQUIRE RECORD KEEPING.*
- Bottom Line: Good Agricultural Practices will be a buyer expectation and for many a requirement.
- Preventive Controls Rules

WHOLESALE SUCCESS

Food Safety Modernization Act - FSMA

"Qualified Exemption"

- Less than $25,000 per year over past 3 years
- Less than $500,000 per year IF
  - More than ½ of sales direct to consumers (includes restaurants/retailers that sell direct.), AND
  - In same state OR within 275 miles of farm, AND
  - Packaging / placards indicate source

Not exempt from safe food practices or state and local requirements. Exemption can be lost.

Compliance	
Over $500,000 in sales	= 2 years + 1
$250-$500,000 in sales	= 3 years + 2
$25,000-$250,000 in sales	= 4 years + 2

Stages of Food Safety Attitudes

Denial

- We haven't had a problem in the 40 years I've been in the business

Anger

- You %@!!!))^ are just looking for problems that aren't there

Bargaining

- Maybe if I just sit here and get this training certificate we'll be OK

Sadness

- Its no use, I should just get out of the business

Acceptance

- We can make it work!

Penn State extension

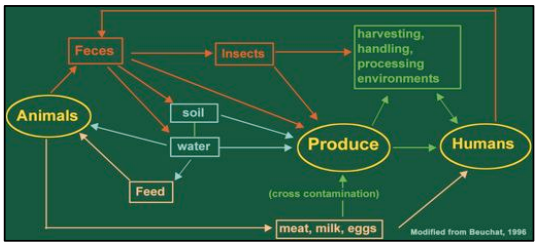
Sources Of Produce Related Illness

1. Physical: such as glass, metal, stones, plastic, bone, or bullets
2. Chemical: such as pesticides, lubricants, or cleaners
3. Biological: such as bacteria, viruses, fungi, or parasites

The most significant carriers of biological contaminants are water and fecal matter.

USDA WHOLESALE SUCCESS

Feces, Poor Sanitation, Soil, Water



Contamination can happen at every stage of the produce handling process.

USDA WHOLESALE SUCCESS

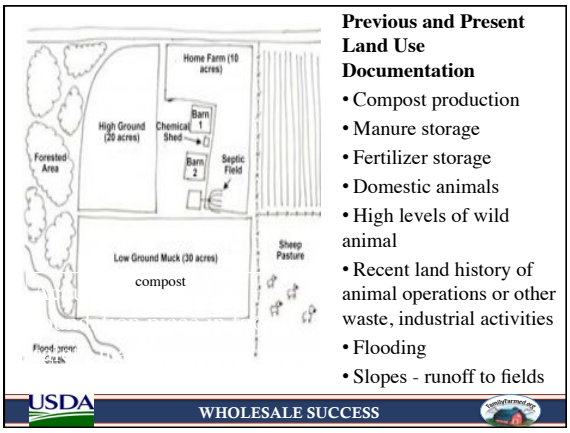
Fecal Matter Is Present On All Farms

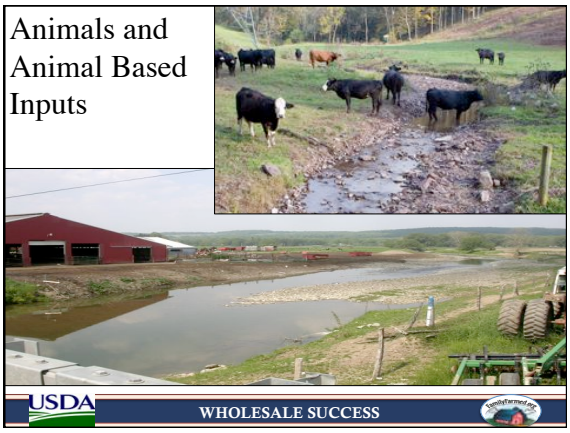
1. Identify Pathogen Sources
2. Prevent Contamination of Produce
3. Prevent Spreading of Fecal Matter between Produce
4. Prevent Pathogens on Produce From Growing

USDA WHOLESALE SUCCESS

How Pathogens Get On The Farm

USDA WHOLESALE SUCCESS


Home Farm (10 acres)
High Ground (20 acres)
Chemical Shed
Barn 1
Barn 2
Septic Field
Forested Area
Low Ground Muck (30 acres)
compost
Sheep Pasture
Flood zone: Creek
Previous and Present Land Use Documentation
• Compost production
• Manure storage
• Fertilizer storage
• Domestic animals
• High levels of wild animal
• Recent land history of animal operations or other waste, industrial activities
• Flooding
• Slopes - runoff to fields
USDA
WHOLESALE SUCCESS


Animals and Animal Based Inputs
USDA
WHOLESALE SUCCESS

Animal Manures and Compost Sites
USDA
WHOLESALE SUCCESS

USDA
WHOLESALE SUCCESS

USDA
WHOLESALE SUCCESS

USDA
WHOLESALE SUCCESS

USDA WHOLESALE SUCCESS

When and Where Manure is Used.

- Manure is applied [_days] before harvest and applications documented in the Manure Application Log.
- Handling equipment is cleaned [where, when and how].
- Manure is stored away from crop production areas [where, mark the location on your maps].

USDA WHOLESALE SUCCESS

Keep Records of Manure and Compost Use

- Source and methods used to produce compost or the manure storage time.
- Application rates, timing, and fields receiving manure or compost.

Manure Applications log

Name of operation:

Please see the food safety plan for overall manure application procedures

Date	Field Applied	Rate	Incorporated (Yes or No)	Supplier	Crop Planted (Type and Date)	Crop Harvested (Date)	Initials

Reviewed By: Title: Date:

Compost Definition (NOP)

Temperature maintained between 131 and 170° F for 15 days using a windrow that has been turned at least 5 times.

High Risk Crops

- Leafy Greens
- Cantaloupe
- Tomatoes
- Root Vegetables
- Berries
- *Clay vs. Sand*

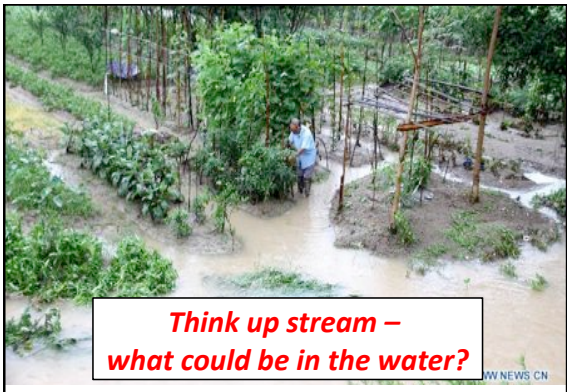
USDA WHOLESALE SUCCESS

USDA WHOLESALE SUCCESS

USDA WHOLESALE SUCCESS

Scout – Manage – Record

Deer droppings can contain the strain of E. coli, O157:H7, that sickened 15, and killed one.



WHOLESALE SUCCESS

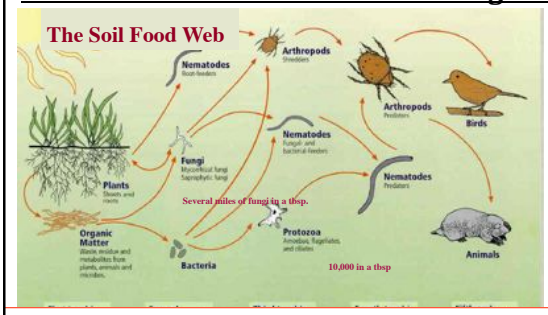
Factors in Survival of Human Pathogens

- **Direct Sunlight**: UV rays and drying can decrease pathogens
- Pathogens persist longer **in cool/moist conditions**
- **Freezing** by itself does not completely kill pathogens
- **Rapid freeze-thaw cycles** can cause rapid death of pathogens in soil

Source: Wild Farm Alliance
A Farmer's Guide to Food Safety and Conservation

WHOLESALE SUCCESS

Factors in Survival of Human Pathogens



Microbial Diversity helps to reduce some food borne illness pathogens

A buffer zone between potential pathogen areas and crops/water can protect against contamination.

WHOLESALE SUCCESS

Jensen Farms Listeria Case

- **33 + 10 dead**
- **1 miscarriage**
- **147 infected**

A truck used to haul culled cantaloupe to a cattle operation was parked adjacent to the packing facility

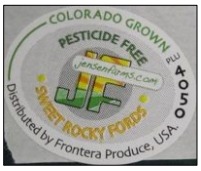
The Jensen brothers filed a plea of guilty

Six misdemeanor counts of introducing adulterated food into interstate commerce.

WHOLESALE SUCCESS

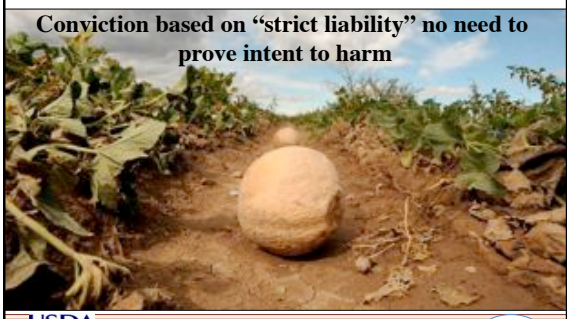
Jensen Farms Facility Design

-Pooling of water on packing facility floor adjacent to equipment and employee walkway access to grading stations
-Packing facility floor not easily cleanable;
-Packing equipment not easily cleaned and sanitized



USDA WHOLESALE SUCCESS

- Potato packing equipment allowed water to pool
- No sanitizer was used in the wash water



USDA WHOLESALE SUCCESS

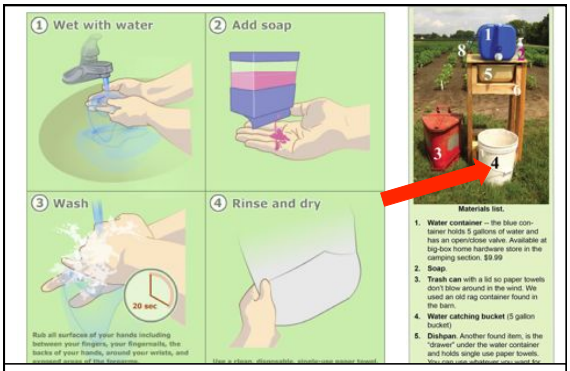
USDA WHOLESALE SUCCESS

Worker Sanitation

• Toilets and hand washing facilities should be within a quarter-mile of the work site.

• Depending on your state and the # of workers, you may be subject to state laws or federal OSHA regarding toilets to workers ratio.

• If not, one toilet and hand washing station for every ten workers is a good place to start.



Sanitizers can be used but are not a substitute for hand washing.

USDA WHOLESALE SUCCESS

Wash Hands:

• Before beginning or returning to work

• After visiting the bathroom

• Before and after eating, smoking and other breaks

• After any other activities besides produce handling

• Anytime hands become dirty

USDA WHOLESALE SUCCESS

Cornell University National GAPS Educational Materials

- Provide Sanitary Facilities
- Train Workers on Sanitation
- Document Training and Cleaning
- Have Illness Policy

http://www.gaps.cornell.edu/videoclips.html

USDA WHOLESALE SUCCESS

If someone has any of these symptoms:

- Nausea
- Vomiting
- Diarrhea
- Stomach cramps or pain
- Fever, chills
- Skin infections, wounds or sores containing pus
- A cold, runny nose, frequent coughing or sneezing

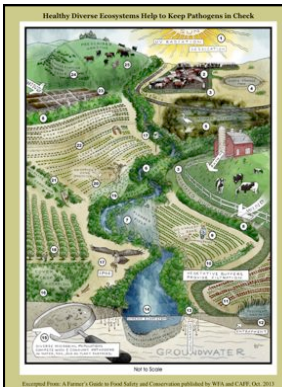
- They should not pick, pack, or handle fruits or vegetables.
- They should not prepare food for others.

- Train employees to identify illness
- Document worker illnesses

USDA WHOLESALE SUCCESS

Date of Visit	Name	Email	Phone

USDA WHOLESALE SUCCESS



Map Your Farm

Previous and Present Land Use Documentation

- Compost production
- Manure storage
- Fertilizer storage
- Domestic animals
- High levels of wild animal
- Recent land history of animal operations or other waste, industrial activities
- Flooding
- Slopes - runoff to fields
- Prevailing wind
- Roads

USDA WHOLESALE SUCCESS

Did you find anything that surprised you?

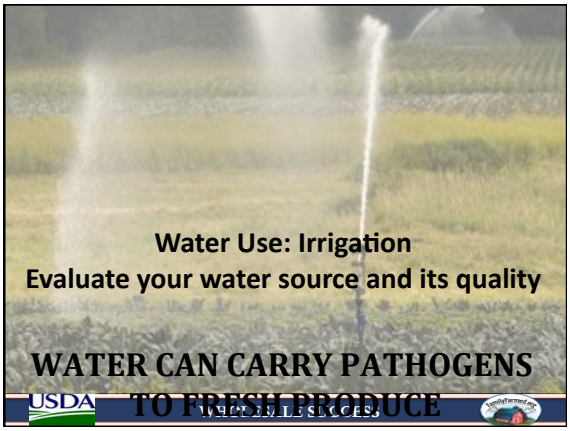
Are there any potential contamination risks you need to change or mitigate?

Are their potential risks you can't change and so you will change your farming practices to reduce the chance of contaminating your produce?

USDA WHOLESALE SUCCESS

WATER CAN CARRY PATHOGENS TO FRESH PRODUCE

WHOLESALE SUCCESS



Evaluate your water source and its quality

"Agricultural Water" Test

Quantified Generic E.Coli (Not absence/presence)

Leafy greens commodity groups and the proposed FSMA use:

126 CFU/100 mls average with no single sample higher than 235 CFU/100 mls E.coli).

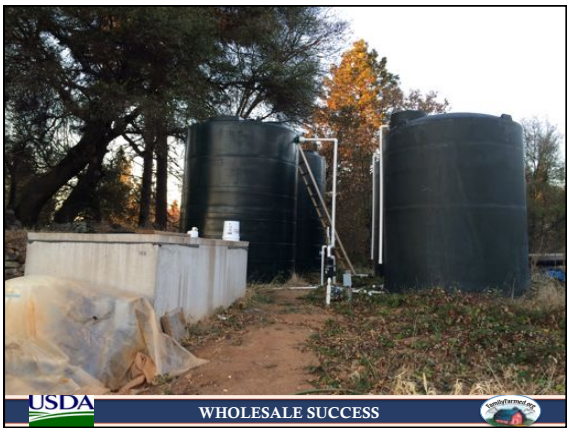
Surface: 3 times a year (4 south)
Ground: Once a year at point of use
Municipal: Once a year at point of use

Cryptosporidium Gastrointestinal Illness	Human and animal fecal waste
Giardia lambila Gastrointestinal Illness	Human and animal fecal waste
Legionella Type of Pneumonia	Naturally in water, multiplies in heating systems
Total Coliforms, including fecal coliform and E. coli Indicates other harmful bacteria may be present	Coliforms naturally in environment Fecal Coliforms and E. Coli from human and animal fecal waste.
Turbidity – Water Cloudiness Associated with higher levels of microorganisms	Soil runoff
Viruses Gastrointestinal Illness	Human and animal fecal waste
Nitrates	Only need for drinking water

WHOLESALE SUCCESS

WHOLESALE SUCCESS

WHOLESALE SUCCESS



Inspect and Record Routinely

Contamination can occur:

- **at the source**
  - biological: livestock or wildlife
  - chemical: running into water source
- **within the conveyance**
  - biological: microbes can grow inside irrigation systems
  - chemical: an irrigation system inadequately flushed after chemigation
- **at the point of emission**
  - irrigation systems can allow contamination entry

What if Your Water is Contaminated?

- Conduct an environmental survey to find the cause
- Repair cause if possible
- Do not use water from that source, in direct contact with edible portions of the crop, until the water is OK.
- Seek input from your local extension agent or microbiologist.

Improving Your Water

- Filtration or Disinfection
- Contact your irrigation dealer for specific information

An Agricultural Water Photo Story

Sediments and algae blooms can be a key site for pathogen persistence in water bodies.

USDA WHOLESALE SUCCESS

USDA WHOLESALE SUCCESS

USDA WHOLESALE SUCCESS

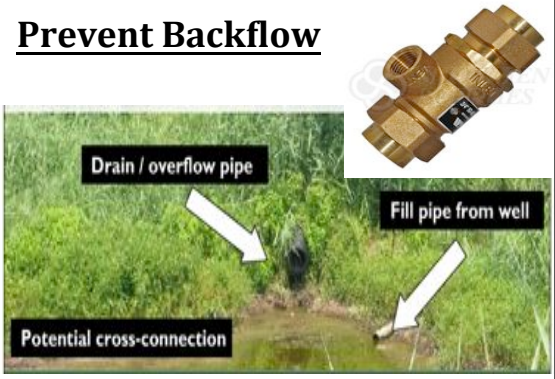
USDA WHOLESALE SUCCESS

USDA WHOLESALE SUCCESS

For spray applications, use potable water (zero)

USDA WHOLESALE SUCCESS

Prevent Backflow



USDA WHOLESALE SUCCESS

USDA WHOLESALE SUCCESS

USDA WHOLESALE SUCCESS

Perform A "Sanitary Survey" of the Water Sources and Distribution Systems on Your Farm.

- Identity the water sources that are available to your farm: wells, irrigation hydrants, streams, ponds.
- With arrows show water flow and wind direction.
- Identify any potential contamination risks that may exist for these sources.
- Describe or diagram how water is used for irrigation on your farm.

USDA WHOLESALE SUCCESS

Are there agricultural water issues you need to change or mitigate?

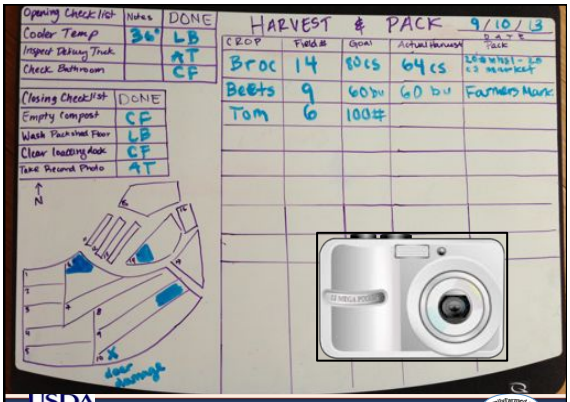
USDA WHOLESALE SUCCESS

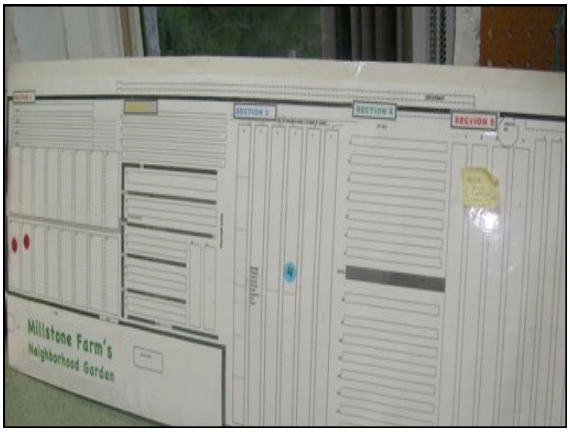
Develop record-keeping systems and habits during the off season

Design Record Keeping to:

- Avoid duplication of effort.
- Provide instruction to staff at the same time as creating a record.
- Enhance staff accountability.

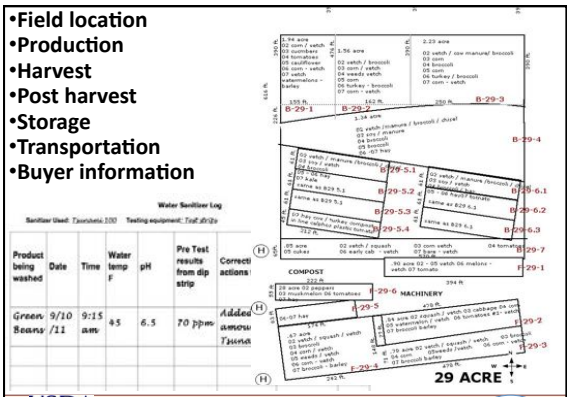
Documentation occurs in line with the work
Not as a separate activity.





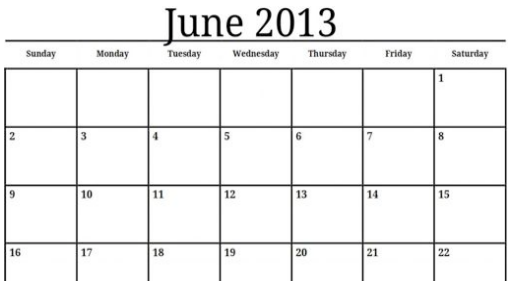
Periodically monitoring for animal damage or feces in the production field ensures a safe harvest.

- Field location
- Production
- Harvest
- Post harvest
- Storage
- Transportation
- Buyer information



Significantly Raised the Risk of Listeria Monocytogenes:

- Irrigating fields within three days of harvest
- Cultivating fields within a week of harvest



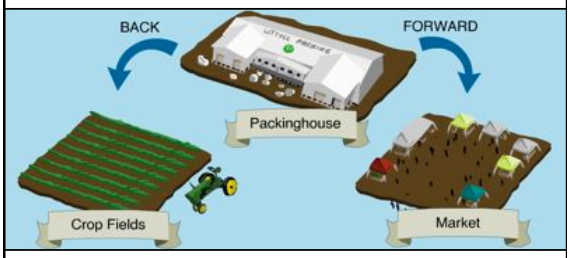
Cornell University Research

Production Records Do Double Duty

1. Field map
2. Land history
3. Seed stock documentation
4. Manure application records
5. Compost monitoring records
6. Cleaning records
7. Traceability system records

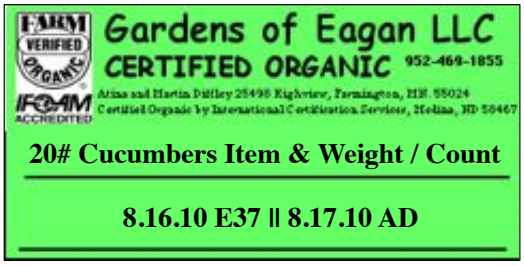
WHOLESALE SUCCESS

Traceability is key! FSMA requirement!



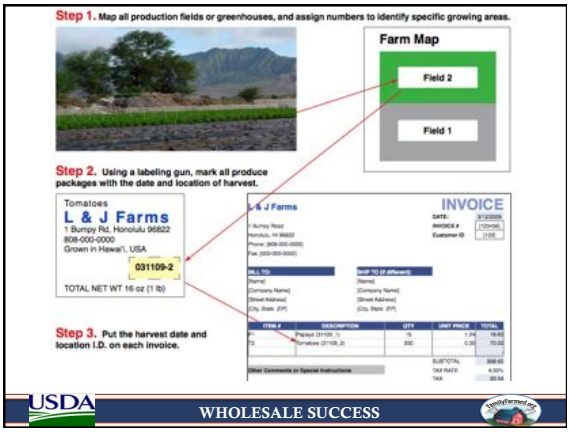
Records: Bills of lading, invoices, worker pay sheets/time cards, harvest records, pack shed, fertility, irrigation, pesticide.

Lot Numbers & Traceability



Account For Product – One Step Forward / One Step Back

WHOLESALE SUCCESS



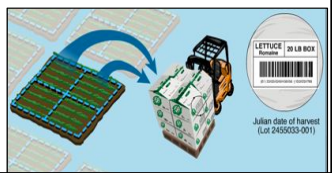
WHOLESALE SUCCESS

If You Didn't Record It - It Didn't Happen

"If you have only a **General Liability Policy** on your farm, your ***for-sale food is not covered***, and this exposes your assets should you get into a lawsuit.

If you have a **Product Liability Policy**, your food is covered, **IF** you can prove that you were not negligent, i.e., that you were actively using best practices like GAPs.

Documentation Is Supporting Evidence That You Are Doing The Best You Can.



RECALL

1. What portion of your farm is vulnerable in the event of a recall?

2. For how long?

WHOLESALE SUCCESS

Start Where You Are: Self-Assessment

1. **Evaluate current management strengths** & **weaknesses** to minimize food safety risks.

2. **Identify changes** in management and production practices that can reduce risks.

3. **Develop action plans** to improve the food safety of produce grown/packed on your farm.

Assess risk from all sources: Physical – Chemical – Biological

USDA WHOLESALE SUCCESS

Food Safety Manual

Operating system written beforehand

- Templates and tools available to guide you.
- Not Regulated—You Are In Control. Free!
- A FSM will help your farm learn and implement and train on safe food handling practices.
- A FSM will help you develop a record keeping system that documents farm actions.

Smart Business – Protects Farmers

USDA WHOLESALE SUCCESS

This is YOUR Manual and Must Fit YOUR Farm

1. **Maps / Farm Description**
2. **Policies**
3. **SOPs - Standard Operating Procedures**.
4. **Records & Log Sheets - farm's audit trail.**
   - Water test results
   - Employee training programs
   - Employee injury and illness
   - Equipment cleaning and maintenance

USDA WHOLESALE SUCCESS

"A Food Safety Manual for You" Templates and Log Sheets

Wash tank water is changed [how often] and water sanitizer [product] levels are maintained at [insert levels], and tested [testing method and how often] and documented on the Water Sanitizer Log.

http://safety.cfans.umn.edu/

USDA WHOLESALE SUCCESS

OnFarmFoodSafety.org Safety Tool

- Free, easy to use online tool
  Based on Harmonized GAP Standards
- Includes record keeping log templates
  Simplifies complex food safety guidelines
- Not regulated—self-directed and confidential
- Can be used to:
  - **LEARN** about food safety risks
  - **ASSESS** and **REDUCE** your farm's risks

•Risks can't be completely eliminated, but they can be identified, documented, and reduced!

USDA WHOLESALE SUCCESS

Action Plan

STEP 1: Set a commitment and time for self-assessment and writing a Food Safety Manual

USDA WHOLESALE SUCCESS

Action Plan
State clearly what you plan to do

Action Step	Who	When	Resources	Prioritize
Water Test	ME!	1st test in April	Need to research	#1 Write dates on calendar
Buy Sanitizer	. . .			

WHOLESALE SUCCESS

Food Safety Take-Away

Something you believed about food safety and your farm that changed this morning.

A food safety practice that you will implement on your farm.

Acceptance - *We can make it work!*

WHOLESALE SUCCESS

THANK-YOU

1. **Evaluations**
2. **Internet links**

www.familyfarmed.org
www.atinadiffley.com

WHOLESALE SUCCESS

Record Keeping, Worker Hygiene, Herd Healthy, Wild Animals, Harvest Sanitation, Direct Marketing, Crisis Management

Food Safety Begins on the Farm

Action Plan:

Harvest and Field Sanitation

Good Agricultural Practices → Practices Requiring Attention

Management Area	Best Practice	Minor Adjustments Needed	Concerns Exist; Examine Practice	Needs Improvement: Prioritize Changes Here
Grading and quality during harvest of crops	Workers are trained to avoid harvesting bruised or dropped fruit **AND** any produce with evidence of animal or bird feces or feeding marks.	Bruised or dropped fruit or crops with evidence of animal or bird feces or feeding may be harvested (e.g. by machine), but these are heat processed or pasteurized prior to sale.	Workers are told but not specifically trained to avoid bruised, dropped or feces contaminated produce which may result in occasional harvest of damaged pieces.	There are no standards or instructions to workers to avoid bruised or dropped fruit or produce with evidence of animal feces or feeding.
Washing and sanitation of harvest aids (e.g. knives, aprons, containers)	All harvest aids are washed, rinsed and sanitized at the start of each work session, and after breaks or as needed throughout the day.	All harvest aids are washed, rinsed and sanitized daily.	All harvest aids are washed, rinsed and sanitized once per week.	Harvest aids are not washed, rinsed or sanitized except at beginning of the season.

WHOLESALE SUCCESS

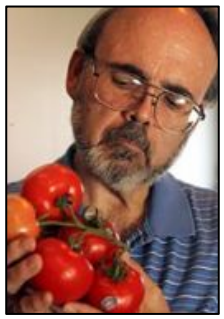
Safe Food Checklist – For use by Farm Reviewer

Instructions: Indicate YES, NO or N.A. to each of the food safety practices. The farm owner must be able to demonstrate or document that the farm operation implements ***at least 80 percent*** of the applicable food safety practices to receive a Safe Food Farm certificate of completion.

Food Safety Practice	Farm Review YES	Farm Review NO	Safe Food Review requirement
1.01 Food safety plan	required		A written plan or conformance with Cornell bulletin, "Food Safety Begins on the Farm"
1.02 Designated food safety individual for the farm	required		A person that is responsible for all food safety matters on the farm
2.01 Potable water for workers			Water test reports indicate water is safe to drink.
2.02 Staff training on food safety			Workers are adequately trained on sanitation and hygiene.
2.04 Employee/worker hand washing			Employee/worker interview(s) indicates satisfactory hand-washing practices.
2.04 Toilets and restroom facilities			Clean and properly supplied toilets and restroom facilities confirmed
2.07 Sick worker policy			Sick workers are not allowed contact with produce.
3.01 Water quality for irrigation			Water test reports indicate water is safe for irrigation.
3.02 Water quality for fertilizer and chemical application			Water test reports indicate water is safe for chemical application.
6.01 Raw manure use			Manure use records indicate proper food-safety use practices.
6.02 Manure storage			Proper manure storage is demonstrated or indicated in records.
6.03 Composted manure and/or biosolids use			Compost/biosolids use records indicate proper food-safety use practices.
6.04 Composted manure and/or biosolids storage			Proper compost storage is demonstrated or indicated in records.
8.02 Field sanitation unit			Convenient field sanitation unit(s) confirmed.
8.03 Toilet facility			Convenient toilet facility confirmed for field work.
9.01 Clean bulk harvesting containers			Clean bulk harvest containers confirmed.
9.02 Clean bulk hauling vehicles			Clean harvest vehicles confirmed.
9.03 Harvesting implements			Clean harvest implements confirmed.
9.11 Water used post harvest			Water test reports indicate water is safe.
9.13 Transportation equipment			Clean transport equipment confirmed.
10.01 Food containers			New, sanitized or clean consumer containers confirmed.
10.02 Container storage			Proper storage of containers observed.
10.03 Food contact surfaces			Clean food contact surfaces observed.
11.01 Produce traceability			Produce or produce container uniquely identified.
12.08 Pesticide application records			Adequate pesticide records confirmed or plans to maintain complete application records.
Total YES			Total YES ÷ Total applicable question = percent of safe food practices implemented

FARM NAME and OWNER

Food Safety Concerns Are A Primary Barrier To Local Foods Making Significant Inroads Into Supply Chains



WHOLESALE SUCCESS

This institution is an equal opportunity provider.