Food Safety for Small Farmers

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MSU Extension
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Objectives

- Understanding Risks
- Worker health and hygiene
- Postharvest sanitation
- FSMA: Tell me what I’ve got to do.
Every Year…

• One in Six will get sick
• 47.8 Million episodes annually
• 127,839 Hospitalizations
• 3,037 Deaths

Inspiration from Chapman, info from Scallan et al. 2011
Protecting Real People

22 year-old Stephanie Smith
“Why me?  Why from a hamburger?”

Travis Cudney
2010 Champion Child
Blind since age 2
Complications from a pathogenic E. coli infection
“Chipotle Mexican Grill will soon have stricter guidelines for its suppliers that will mean the chain will be using local produce less often.”

-USA Today, Dec 2, 2015
What constitutes a vulnerable population?
What Specific Foods Cause Illness?

What people thought:

1: Chicken
2: Meats
3: Ground meats
4: Fin fish
5: Shellfish

Actual causes of illness:

1: Produce
2: Poultry
3: Beef
4: Eggs
5: Seafood

Environics, 2005

CDC, 2009
What Constitutes Crop Risk?
CDCs Five Risk Factors
from a food preparation perspective

- Improper hot/cold holding temperatures of potentially hazardous food
- Improper cooking temperatures of food
- Dirty and/or contaminated utensils and equipment
- Poor employee health and hygiene
- Food from unsafe sources
**CDCs Five Risk Factors**

from a food production perspective

- Improper cold storage temperatures of raw consumables (i.e. leafy greens, et al.)
- Improper cooking temperatures of food
- Dirty and/or contaminated equipment
- Poor employee health and hygiene
- Inputs from unsafe sources
- *Environmental Contamination (Microbial or Pesticides)*
Contamination With Microbial Pathogens: Where Can It Occur?
Five Risk Factors
from a food production perspective

• Manure
• Water quality
• Worker and field sanitation
• Post harvest handling
• Transportation
Bacterial Reproduction

- Bacteria double over a given period making a small problem really big, really fast.
Hazard Analysis Critical Control Points (HACCP)

• A process that looks at all the possible hazards at every step in your operation.

• Where the hazards are probable, controls are put in place to reduce/eliminate the risks.
Following the Flow of Food

1. Get buckets
2. Fill buckets
3. Transport to cleaning station
4. Wash and pack greens
5. Transport to refrigerator
6. Refrigerate until sale
Following the Flow of Food

- What are the Chemical, Physical and Biological hazards in each of these steps?

- How can their impact be reduced?

- How can they be prevented?
What policies, procedures and records can you put in place to mitigate, reduce or eliminate the risks?
## Preharvest Checklist

<table>
<thead>
<tr>
<th>Field______________</th>
<th>Harvest Date____</th>
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<tr>
<td>Last spray applied______________</td>
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- Are the totes clean, sanitized and free of foreign objects?
- Is there potable drinking water on site?
- Is the toilet clean and stocked?
- Is the handwashing station cleaned and stocked?
- Are the harvest workers healthy?

Signed___________________
Seven Steps to HACCP

• Conduct a Hazard Analysis
• Identify Critical Control Points
• Establish Critical Limits
• Establish Monitoring Procedures
• Establish Corrective Actions
• Establish Verification Procedures
• Keep a Record of Activities
Operationalizing HACCP

Responsible Party (Driver)

Feedback (Speedometer)

Management Tool (Brakes)

Enforcement (Grumpy Dad Farmer)
Developing a Farm Food Safety Plan

• Consider what you do from planting preparation to postharvest handling

• Pay attention to where contamination is a risk.
  • Work through a self assessment like the Safe Food Risk Assessment.
  •Enumerate the issue areas and how risky your practices are compared with best practices.
Developing a Farm Food Safety Plan

- Of the areas that are high risk, how can you monitor or measure risk?
  - Regular testing?
  - Regular self-inspections?
  - Change the way something is done?
- Consider changes in terms of time and money that reduce risk.
- Document changes and continue to measure or monitor the risk.
Operationalizing HACCP

Harvest Prep

Harvest

Cool

Sort by Size

Shipping
Operationalizing HACCP

Harvest

- Sanitary Surfaces
- Healthy Workers
- Trained Workforce
Operationalizing HACCP

- Sanitary Surfaces
- Packing Container Policy
- OR
- Cleaning SOP
- Log of cleaning
Operationalizing HACCP

Packing Container Policy

It is the policy of Good Earth Farms to use only new cardboard boxes for field packing melons.
Cleaning SOP

Standard Operating Procedure

Farm Name: _______________________

Doc.No. SOP-08
Title: Container Cleaning
Effective Date: January 1, 2013
Developed by: Phil Tocco, Michigan State University
Reviewed by: GAP Coordinator, Date: __________

1. Containers are pre-rinsed with water to remove visible soil particles.

2. Containers are then washed with a food grade surfactant applied to the surface, either in dispersion or directly, to break down contaminants and soil. A brush is used to scrub the containers while they are soapy to further remove soil and other possible particles from the inside and outside surfaces.

3. Containers are then rinsed with water to remove soil particles, contaminant particles and any soap residues.

4. Containers are sanitized with sanitizer inside and outside (Grower’s choice, explain the type and concentration of the sanitizer here).

5. Containers are air dried then maintained in a sanitary situation until ready for use.
Operationalizing HACCP
Food Safety Tactics

- Water quality verification and assurance
- Worker Training
- Traceback and Positive Lot ID
Recall our discussions about bacteria.

When it comes to control points, water is a critical control point.

Sources of water and uses are...
Water Quality
verification and assurance

- Test to determine if the E. coli counts exceed the threshold.

- Specify in the food safety manual what the mitigation will be.

- If the test results exceed the threshold, be prepared to implement the mitigation.
Water Quality
verification and assurance

Type of irrigation affects potential contamination risks.

• Overhead irrigation is high risk.
• Drip under plastic is low risk
**Water Quality**

verification and assurance

- Surface water is a high risk source.
- Streams are considered the highest risk source, with ponds being somewhat less risky.

- Wells are considered low risk.

Patrick Hartmann, Trueblue Farms
Water Quality
verification and assurance

- Irrigating plants that are not nearing harvest or are postharvest are low risk.

- Irrigation events near harvest or between harvest events is high risk
Irrigation Water

Agricultural Water

Indirect Water
Irrigation Water

Indirect Water

- Indirect water is not regulated.
- No need to test indirect water.
- Can apply over threshold water indirectly.
Irrigation Water
Agricultural Water from Surface Sources

• Growers must establish a water profile of 20 samples by full implementation of the rule (Compliance + 2 yrs)

• Profile must have no more than:
  – Geometric Mean (GM) of 126 CFU/100 ml
  – Standard Threshold Value (STV) of 410 CFU/100ml
Irrigation Water
Agricultural Water from Wells

• Growers must establish a water profile of 4 samples by full implementation of the rule (Compliance + 2 yrs)

• Profile must have no more than:
  – Geometric Mean (GM) of 126 CFU/100 ml
  – Standard Threshold Value (STV) of 410 CFU/100ml
Irrigation Water
Establishing a Profile

- 5 samples (2016)
- 5 samples (2017)
- 5 samples (2018)
- 5 samples (2019)
Irrigation Water
Handling an Exceedance

• Growers have options if their water tests exceed the thresholds. These can include:
  – Water Sanitizers (UV, Chlorine, Hydrogen Peroxide, and others)
  – Waiting a number of days to bring it into compliance. (0.5 log/day up to 4 days)
  – Washing or produce storage*
  – Alternative water supplies (Municipal water, well water, etc.)
  – Changing method of irrigation to make it indirect water
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<th>Drip at harvest</th>
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Worker Training
Employee and Volunteer Training

• Everybody needs to know:
  – Proper hygiene.
  – Signs and symptoms of illness.  
    (If you’re sick, don’t pick)
  – When not to harvest produce.  
    (Don’t pick poopy produce)
  – Inspecting containers
  – Handling contaminated produce.
  – Report issues to the person in charge.
Employee and Volunteer Hygiene

• Wash your hands…
  – Before you handle produce
  – After you eat
  – After you smoke
  – After going to the bathroom
  – After breaks.

• Wear clean clothes

• Avoid jewelry

• Minimize kids under 12 handling/harvesting produce
Health Symptoms of Concern

- Diarrhea
- Vomiting
- Jaundice
- Open Wounds
Traceback and Positive Lot ID
Traceback Info Needed

- Date of Harvest
- Crop and Variety Harvested
- Field Location
- Harvest Crew

- Evidence that the system works
Traceback Info Needed

- Date of Harvest
- Crop and Variety Harvested
- Field Location
- Harvest Crew

- Evidence that the system works
Traceback Info Needed

• Keep it simple
• Keep it short
• Be prepared to add to it if necessary

On date & year, I harvested crop from field number
Creating a Traceback Program
Creating a Traceback Program
Creating a Traceback Program

### TRACENBACK DATE CODES

Based on Julian Calendar - Regular Year

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Note: The table continues with similar entries for each day of the month.
Traceback Info Needed

Roger’s Farm
8072 S. Jackson Rd.
Liberty Michigan
213-11-03-03

First set of numbers is Julian Date of harvest

Third set of numbers is the crop and variety
1=Chestnut, Chinese
2=Chestnut, Collosal
3=Pawpaw, Pennsylvania Golden

Second set of numbers is the year (ie. 2011)

Last set of numbers is the field
01=A
02=B
03=C
Food Safety Modernization Act

- Produce Safety
- Human and Animal Food Preventive Controls
- Foreign Supplier Verification
- Third Party Verification
- Sanitary Transportation
Food Safety Modernization Act (FSMA)

Produce Rule includes:

• Manure Source, Use, and Handling
• Irrigation and Wash Water Sources
• Employee Training and Hygiene
• Wild and Domesticated Animals
• Farm and Equipment Sanitation
FSMA Implementation

Two years for firms over $500,000.

Three years for firms $250,000.

Four years for firms above $25,000.

All farms above $25,000 are subject to the rule. Farms below $500,000 are qualified exempt IF more than half of gross sales are sold to the end user or within 275 miles from where it’s grown.
The Future of FSMA

- Determine if you’re Exempt.

- **IF** you’re exempt, fill out an Annual Review of FSMA Exemption by 2018 at the earliest.

- If you’re **NOT** exempt, begin complying and be aware of your full compliance date.
Phil Tocco
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Cell (517) 416-5314