

Food Safety County Extension Agent Training, December 4, 2013

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SRSFC SPONSORED FOOD SAFETY COUNTY EXTENSION AGENT TRAINING

December 4, 2013

Royal Room

Sheraton Imperial Hotel, Durham, NC

Food safety begins on the farm, but identifying and controlling food safety risks is a complicated undertaking particularly for fresh produce growers who do not feel as though they possess the necessary scientific expertise. Unintentional microbial contamination of fresh produce in the field can come from many sources, including water, soil and soil amendments, workers, wildlife, and adjacent land. Currently, most educational programs and guidance documents outline these risks but do not assist growers with understanding and prioritizing them in terms of what risks should be mitigated first. The on-farm decision trees will allow growers to assess their own unique operations, prioritize the implementation of practices that would most effectively reduce the microbial risks that have been identified, and develop a written farm food safety plan.

Decision Tree Exercise

Agenda

Presenters: Dr. Betsy Bihn, Cornell University and Dr. Annette Wszelaki, Univ of TN

1:00 p.m. Introduction and Description of Need to for On-Farm Risk Assessment (30 minutes)

- 1:30 p.m. Decision Tree Areas and Review of Portfolio Format (30 minutes)
- 2:00 p.m. Red Yellow Blue: A Quick Assessment of On-Farm Risks (30 minutes)
- 2:30 p.m. Review One Entire Decision Tree (chosen through exercise above) (30 minutes)
- 3:00 p.m Break
- 3:30 p.m. Write a SOP activity (20 minutes)
- 3:50 p.m. Why a Farm Food Safety Plan is Critical (20 minutes)
- 4:10 p.m. How to incorporate the Decision Trees into Training Programs (20 minutes)
- 4:30 p.m. Q and A, Wrap Up, and Evaluation (30 minutes)



Need for On-Farm Risk Assessment

Betsy Bihn December 4, 2013 Durham, NC













Knowledge matters because...

- Farmers can prevent and reduce risks on the farm
- They know their farm and practices better than anyone
- Their actions directly impact safety and financial viability
- They determine the direction of your farm and what gets done

FDA-regulated foods linked to reported *outbreaks*, 1996-2006 (N=454 outbreaks)



Outbreaks associated with FDA/CFSAN-regulated foods: 1996-2006, Vierk et al., CFSAN, College Park, MD

FDA-regulated foods linked to reported *illnesses*, 1996-2006 (N=23,428 illnesses)



Outbreaks associated with FDA/CFSAN-regulated foods: 1996-2006, Vierk et al., CFSAN, College Park, MD

Types of produce associated with outbreaks, 1996-2006 (N=71)



Outbreaks associated with FDA/CFSAN-regulated foods: 1996-2006, Vierk et al., CFSAN, College Park, MD

Fresh Produce Food Safety Challenges

- Low levels of sporadic contamination on a variety of crops
- Often eaten uncooked: a ready to eat food
- Fresh produce associated pathogens have a low infectious dose
- Difficult to remove pathogens once they adhere to surface



 Infiltration and internalization of water well documented for a variety of produce





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Foodborne Illnesses associated with Fresh Produce...

- Impact marketability and profitability
- Impact regulatory agencies
- Impact industry standards
- Impact consumer confidence
- Impact consumer buying preferences
- Are not easily forgotten















"It's a good thing I had a bag of Marijuana instead of a bag of spinach. I'd be dead by now."

Willie Nelson



What Can We Do To Minimize the Risks?

Focus on risk reduction, not risk elimination.

"Current technologies cannot eliminate all potential food safety hazards associated with fresh produce that will be eaten raw."

> *Guide to Minimize Microbial Food Safety Hazards for Fresh Fruits and Vegetables*











PREVENTION is the Key to Reducing Microbial Contamination of Fresh Fruits and Vegetables









Assessing Risks I am a farmer, not a microbiologist

- Basic understanding of microbiology is needed
- Never made anyone sick? There may be reasons for that, some good, some bad
- Whenever something changes or new equipment is added, you must assess the risks it could bring!
- May need to seek help
 - ✓ Make sure it is qualified help!











Unlimited Time and Money No, quite the contrary

Food safety focus means investing limited resources (time, money, people) to reduce risks

- Reduce biggest risks first
- Biggest risk reduction for the money
- Focus people hours on tasks that matter

Best farm gains possible (win-win) – Open markets, improve shelf-life



Good Agricultural Practices









Any procedure or activity that reduces microbial risks to fruits and vegetables on the farm or in the packinghouse.





Energy of Activation Graph from benhoffmanracing.blogspot.com













Thank you for your participation today!

















³University of Tennessee, Department of Plant Sciences

¹Cornell University, Department of Food Science



Assess Risks and Prioritize Implementation of Food Safety Practices

Developing an On-farm Decision Tree

for Fresh Produce Growers to

Elizabeth A. Bihn¹, Michele A. Schermann², Annette L. Wszelaki³, Gretchen L. Wall¹ and Susannah K. Amundson³

²University of Minnesota, Dept. of Bioproducts & Biosystems Engineering











Objectives

Develop Decision Trees to help farmers:

- Assess produce safety risks on their farms and identify practices that can reduce risks
- Prioritize where resources are best used to
 - reduce risks
 - Money
 - People
 - Time





- Build a farm food safety plan and implement practices
 - Sample SOPs and record keeping logs
 - Template language for farm food safety plan





















Decision Tree Design Goals

- Basic produce safety questions all growers could answer with <u>Yes</u> or <u>No</u>
- Clear flow so using the trees is easy
- Science-based information to help guide modification of practices to reduce food safety risks

Decision Trees...One first attempt...



Because, let's face it, this is complicated!



Oh, but there were more!

Decision Tree

Assessing Wild and/or Domestic Animal Activity in the Field

Q	Question	YES	NO
1	Do you monitor for the presence or signs of wild or domestic animals entering the production land?	Document your findings through periodic monitoring during pre- season, pre-harvest, and harvest.	Evaluation, monitoring, and documentation of animal intrusion into fields and production environments must be completed for an audit. See Q9.
2	Is there physical evidence of animal intrusion into fields and production areas (ie. Downed fences, animal tracks, animal feces or urine, eaten plants)?	An assessment must be conducted to determine the allowable harvest distance from evidence of intrusion. (See Q3-Q6)	Continue a periodic monitoring plan for animal intrusion into the field or production areas.
3	is fecal matter found in direct contact with produce?	 Do not harvest produce that has come in direct contact with fecal material. Remove fecal material from field and dispose of property. Do not harvest any crop found within a 5 foot radius buffer from 	Continue to monitor for other signs of wildlife or domestic animal intrusion.

Pre-Harvest Water





Section 1 of Postharvest Water

1. Do you use water on your produce after it has been harvested?

Yes. Go to Question 2.

No. You are done because you don't use water. Go to [Manure Tree].

Source of Water

2. Do you use Municipal water?

Yes. Go to 3.

No. Go to 4.

3. Do you have a current water bill and keep it as part of your food safety recordkeeping system?











But Luckily, we have an Advisory Group

- Composed of growers who operate different types and sizes of farms from three states as well as research scientists, extension specialists, and government personnel
- Advisory Group Meeting was held in 2011 to review draft decision trees
- Results: No one tree was the distinct winner <u>and</u> it was suggested we add other parts...



Decision Tree Portfolios









- Decision tree
- Sample Standard Operating Procedures (SOPs)
- Sample log sheets
- Template food safety language

















Decision Tree Nuts & Bolts

Other key features:

- How to Use These Decision Trees Guide
- Checklist for Prioritizing Practices
- Glossary
- *In development:* How to Write an SOP Guide Document













What? In Development?

- Decision Trees are still being reviewed by Advisory Group
 - Find something you think needs changed?
 - Something missing?
- Plan to have 4 Focus Groups with farmers in NY and MN this winter
- All feedback and comments welcome!











How to Use These Trees

How to Use These Decision Trees

Decision making can be overwhelming. At our disposal, we have infinite sources of advice and information—credible and not—from the internet, friends, colleagues, grower organizations, and federal agencies. Information can be confusing and contradictory no matter what the topic.

Food safety is in the news daily. Many growers are overwhelmed with how to implement food safety practices on their farms including how to prioritize practices and how to do get it all done with limited resources. These **On-Farm Food Safety Decision Trees** were designed to make it easy for you to get started on your farm food safety plan.

Think of your farm food safety plan as the trunk of a tree with many branches. Each branch represents a specific area of food safety. The branches and trunk are not pieces that get stuck together, but grow together as a whole tree. You cannot sustain the tree without the trunk and branches just as you cannot make your entire farm safe by doing some food safety practices and not others.

> The **purpose** of the Decision Trees is three fold – first, to help you begin to identify risks and practices that reduce risks; second, help you prioritize the implementation of practices to use limited resources wisely; third, to familiarize you with the terms and methods necessary to understand and follow requirements and expectations for food safety from buyers, farm markets, schools, and federal regulations.

All of the Decision Trees follow simple 'YES or NO' pathways to aid you in assessing your current practices.

Each Decision Tree is composed of a number of sections:

- 1. Overview
- 2. Decision Tree
- 3. Sample Standard Operating Procedures (SOPs)
- 4. Sample Recordkeeping Logs
- 5. Template Food Safety Plan Language











On Farm Food Safety Decision Tree Prioritization of Practices Checklist

Highest Priority GAPs					
If your answer is in a shaded box, please refer to decision trees listed to address produce safety risks that may exist.	Yes	No	Decision Trees		
Do you Deniida faad aafatu teriaina ta alluurdana?		-	We dow that the training and Training		
Provide rood safety training to all workers?			worker Health, Hyglene, and Training		
Irain all workers about produce safety in a language they understand?	-		Worker Health, Hygiene, and Training		
Prohibit workers who are sick from handling fresh produce?	-		Worker Health, Hygiene, and Training		
Provide clean toilets and handwashing facilities within 1/4 mile walk from fields?			Worker Health, Hygiene, and Training		
Monitor toilet and hand washing sinks and clean and restock when needed?			Worker Health, Hygiene, and Training		
Use water to irrigate, frost protect, cool, or apply sprays during the production of fresh produce?			Agricultural Water for Production		
Allow any water (besides rain) to contact the edible portion of the crop?			Agricultural Water for Production		
Test your agricultural water for quantified generic E.coli?	1		Agricultural Water for Production		
Use raw untreated manure on the farm?	1	-	Soil Amendments		
Incorporate raw, untreated manure into the soil less than 1 year before harvest?	1	1	Soil Amendments		
Conduct field assessments before harvest to look for fecal contamination?			Wildlife and Animal Management		
Train workers to follow company policies regarding proper harvest procedures if fecal material is found in the field and to to wash their hands and change clothing if contaminated?			Wildlife and Animal Management		
Establish buffers zones around fecal contamination and signs of significant animal activity (such as damaged product or extensive tracks) found in the field?			Wildlife and Animal Management		
Clean and sanitize any tools or equipment used to handle feces or contaminated produce?			Wildlife and Animal Management		
Keep farm animals and livestock near produce production areas?	ji j		Wildlife and Animal Management; Land Use		
Grow crops on land that had previous use that may present a food safety risk to the crop?			Land Use		
Grow crops on land that was used as a feedlot in the last 2 years?	1	1	Land Use		
Have produce fields near a Confined Animal Feeding Operation (CAFO)?	1	1	Land Use		











Nine Decision Trees

- 1. Worker Health, Hygiene, and Training
- 2. Agricultural Water for Production
- 3. Soil Amendments
- 4. Wildlife and Animal Management
- 5. Land Use
- 6. Postharvest Water
- 7. Sanitation and Postharvest Handling
- 8. Traceability
- 9. Transportation











Glossary

Decision Tree Glossary

Animal Intrusion

Significant evidence of wildlife or other animal activity in or near produce growing and handling areas. This may include animal feces, urine, tracks, or crop damage that may indicate that the crop is at high risk for being contaminated with foodborne illness causing pathogens.

Biofilm

Bacterial layers that are a mixture of different microorganisms held together and protected by glue-like carbohydrates secreted by the microorganisms. These secretions help the microorganisms attach to surfaces and make the microorganisms difficult to remove.

Buffer zone

A defined distance from which product will not be harvested if it is contaminated with animal feces or other sources of contamination that may pose a food safety risk.

Cleaning

Physically removing soil and residues from a surface.

Colony Forming Unit (CFU)

A cell or cluster of cells capable of multiplying to form a colony of cells. It is used to express the concentration of microorganisms in a sample assuming that each colony originates from an individual cell.

Co-management

Practices that minimize the risk of fecal contamination and resulting microbiological hazards associated with food production while simultaneously conserving soil, water, air, wildlife, and other natural resources.

Cross-contamination

Contamination of one food item with microbial pathogens from another food item, water, surface,

bacteria such as *Salmonella* or *E.coli* from contact with manure. Other sources of cross-contamination may include harmful pathogens transferred to produce surfaces through contaminated wash water, packing lines, worker hands, harvest bins, or trucks.

Cull pile

A pile of discarded plant material or rejected produce that may become an attractant to pests or a source of nutrients for the growth of bacterial pathogens.

Detergent

A cleaning agent that contains surfactants to reduce surface tension between food surfaces and the soil that is removed during cleaning. Detergents penetrate quickly and aid in lifting soil off of surfaces. Detergents are used in the cleaning process to remove soil before a sanitizer is used.

Food Contact Surfaces

Surfaces that come into contact with food. Food contact surfaces are considered Zone 1 and should be prioritized for cleaning and sanitation practices in the packing area.

Good Manufacturing Practices (GMPs)

Standards published in the Code of Federal Regulations (Title 21, Section 110) to ensure the safety of foods by outlining sanitary standards and practices for production and handling.

Hazard Analysis Critical Control Point (HACCP)

a process that identifies where potential contamination can occur (the critical control points or CCPs) and strictly manages and monitors these points as a way of ensuring the safety of the products being produced. HACCP requires a level of control within a facility so that processes can be monitored at all times and be corrected if the process exceeds the established critical control points. HACCP is used in processing plants but is not appropriate in fresh pro-











Overview

Worker Health, Hygiene, and Training Overview

This section outlines things you need to do and provide to make sure workers know about food safety risks, understand how they can reduce risks while they are working, and have the resources required to properly do their jobs. Because workers are present in the fruit and vegetable growing and packing environments, their health and hygiene practices and other actions directly affect the safety of produce. An effective worker health, hygiene, and training program can only happen with grower commitment and oversight.

Understand food safety risks associated with workers and how to implement training programs to effectively reduce risks

- Use a language workers understand
- Instruct how and when to properly wash their hands
- Discuss the importance of being clean and wearing clean clothes to work
- Explain why workers should not be working when ill
- Teach how to handle injuries and illnesses on the farm
- Describe which farm food safety practices and Standard Operating Procedures (SOPs) that they are responsible for completing and why these practices are important

 Make sure all workers know where all equipment and supplies are located and when they are to be used.

Encourage communication so workers will help you identify and reduce risks

- Set a good example
- Develop a system for communication that is shared during trainings
- Acknowledge proper behaviors and discourage improper behaviors when you see them

Understand food safety risks associated with workers and how to conduct effective training programs to reduce the risks

Workers are the foundation of all food safety programs because they are responsible for implementing the food safety practices. Training should be in the language workers understand to create the best opportunity for learning. Include farm specific food safety practices and Standard Operating Procedures (SOPs) in worker education programs to encourage workers to actively participate in the farm food safety program. Information should be reinforced continuously through the use of posters, refresher trainings, and by management setting a good example. Good training will help workers recognize a risk when they see it and encourage them to do something about it.











Decision Tree

Worker Health, Hygiene, and Training













Decision Tree

Key features:

- Answer Yes/No to assess risks
- Explanations of risks and practices that can reduce identified risks
- Resources to get the job done
 - Sample SOPs
 - Sample recordkeeping logs
 - References to other decision trees
 - Template language for Food Safety Plan











Sample SOPs

Sample SOP: On-Farm Hand Washing

Revision: 1.0 Date: 12/14/12

1—Purpose

This procedure describes the correct method for hand washing while working or visiting the farm.

2—Scope

This procedure applies to all farm personnel including farm owners, workers, and farm visitors.

3—Responsibility

Everyone on the farm should understand and practice proper hand washing, regardless of their job or activities on the farm.

4-Materials

- Sink
- Water
- Soap
- Single-use paper towels
- Trash can (preferably with a lid)

5—Procedure

Procedure to be completed before the beginning of work, after each break, after eating or smoking, after using the toilet, at the end of the day and at any other time hands become dirty.

- 1. Wet hands with water.
- 2. Apply soap and lather. Be sure to wash the front and backs of hands as well as in between the fingers. Rub hands together for AT LEAST 20 seconds.
- 3. Rinse hands thoroughly.
- 4. Dry with a paper towel (and turn off faucet with used paper towel).
- 5. Throw the paper towel in the trash can.



Sample Record Keeping Logs

Sample Field Sanitation Unit Service Log

Please see the food safety plan for overall information on field sanitation unit service procedures. If contracted with a sanitation company, attach service/cleaning receipt.

Serviced by

(name)

Supplies stocked**

(list sunnlies)

Date of

servicing

Name of farm: Pleasant Valley Farm

Date of

cleaning

Cleaned by (name)

Sanitation

unit #*





une »	oroaning		Servicing	(name)	(not cuppined)
5	6/12/13	Joe Anderson	5/8/13	Tom Miller	Paper towels, toilet paper, soap
		1			

* See field map for locations of each unit in fields.

** Sanitation supplies are single-use towels, toilet paper, hand or anti-bacterial soap, potable water for hand washing.



Reviewed by:	Title:	Date:

On-Farm Decision Tree Project: Worker Health, Hygiene, and Training—v12 11/18/2013 E.A. Bihn, M.A. Schermann, A.L. Wszelaki, G.L. Wall, and S.K. Amundson, 2013











Template Language for Food Safety Plans

Template Language for Worker Health, Hygiene, and Training Section of a Farm Food Safety Plan

Risk Assessment

Workers' health and actions directly impact the safety of produce because of their presence in the growing and packing environment where they handle fresh fruits and vegetables. If workers are sick, do not wash their hands properly, or are not aware of food safety risks, they could contaminate fresh produce while they work.

Actions to Reduce Risks

All workers on the farm are trained to follow the farm food safety plan. Worker training includes instructing workers to stay home if they are sick and to report any illnesses or injuries that occur while working. Workers are instructed to wash their hands before handling produce, after using the toilet, before starting or returning to work, before and after eating or smoking, and whenever their hands are dirty. This is important both for their health and for the safety of the fresh produce.

First aid kits are provided and the location of all first aid kits is reviewed during the training programs. First aid kits are regularly monitored and restocked when needed. This information is kept in the first aid log located *[enter location here]*. Workers are also instructed how to bandage minor cuts, cover them with a secondary barrier, and how to dispose of produce that may have been contaminated with bodily fluids such as blood. All injuries and accidents are written in the illness/injury reporting log located *[enter location here]*.

Visitors also represent a food safety risk, so all visitors are required to review the visitor policy and follow company food safety policies outlined in the Standard Operating Procedures (SOPs). Visitors are asked to sign in when entering the farm and verify that they have read the policy. The Visitor Log is located *[enter location here]*.

All workers and visitors have access to conveniently located, clean, and well-stocked toilets and hand washing facilities. Facilities are within a 5 minute or ¼ mile walk of the work locations. These facilities are monitored to ensure that they are clean and well-stocked. Actions to maintain all toilet and hand washing facilities are documented and located *[enter location here]*.

Finally, all logs and record keeping sheets are reviewed by management *[Can enter name of individual here if only one person]* and kept on file for at least 2 years *[enter location here]*.











- -USDA National Integrated Food Safety Initiative for funding;
- The Advisory Group for insights and dedication to this project;
- –The farmers who have shared their advice, farms, and experiences.













Questions?

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- Gretchen Wall
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- Michele Schermann
 - -scher019@umn.edu
- Annette Wszelaki –annettew@utk.edu























Importance of a Farm Food Safety Plan























Reasons for a Food Safety Plan

- Get organized and focused on food safety
- Define their practices
- Efficient use of energy
- Best way to be prepared
 - Food Safety Regulation
 - Audits
 - Buyer questions/requirements













Important Things to Consider...

- Not everyone needs an audit
- Everyone needs a farm food safety plan
- Farm food safety plans do not have to be novels
 - Remember simple is ok AND productive
- This is not rocket science, but knowledge and information are your friend
- There are lots of resources out there to help











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Food Safety for a Day versus Food Safety Everyday

- An audit is a day or several day event
- Must commit to food safety being part of the operation
- Monetary and time investment
- Continued training and implementation













Farm Produce Safety Plan

- More likely to result in action...yes, that means more GAPs on the farm!
- Critical to passing a third party audit because it creates a physical document with records that can be audited
- Should be based on risk assessment
- Must be developed by someone who knows the operation well
- Describes what is happening
- Should <u>not</u> include things farmers wish they were doing













Full Disclosure

 Writing the plan is just part of implementing a farm food safety plan



- Must be updated as practices or situations change
- Our goal is produce safety, but recognize the importance of keeping growers' operations viable SO if an audit is needed...
- Must be supported with record keeping if the point is to pass an audit!











The Right Mind Set

- Start small
 - Unless an audit is needed NOW!
- Each operation is unique
- Each commodity is different
 - Netted outside or smooth outside
 - Grows on the ground or grows on a tree
 - Postharvest handling involves water or NOT
 - Past history of problems/priority list
- "What is your biggest food safety risk?"











The Necessary and Mundane

- How do you envision the plan looking?
- Who is in charge?
 - Of writing, implementing, and documenting
- How will they manage record keeping on a daily basis?
- How will they keep all the record keeping organized in short/long term?











Step 1: Risk Assessment

- Understand what needs to happen to reduce risks
 - What are the employees responsibilities
 - What are the growers responsibilities
- Understand the resources that may be required
 - Human resources (time)
 - Equipment
 - Infrastructure













Step 2: Develop a Plan to Reduce Risk

- Develop a list of things that should be done
- Review current actions
 - Many GAPs are already in place on the farm, but not written in the plan
- Consider resources and how they can be utilized to meet food safety goals
- Designate a person who is in charge of making sure the action gets completed









Step 3: Include in Plan and Document

- A well written farm food safety plan is a guide to implementation practices
- The more specific it is the more the grower understands the purpose of the activity
 - These specific details should be outlined in SOPs
- Record Keeping must go in a logical flow of the operation or it will not happen!













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Welcome to the GAPsNET

SEARCH CORNELL:

Pages

People

Good Agricultural Practices Network for Education and Training



www.gaps.cornell.edu

go

more options











Template Food Safety Plan 4 U



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The PSA Website

http://producesafetyalliance.cornell.edu/

- All educational materials, progress, updates, and outcomes are available
- Provides a way for people to join and be involved with the PSA
- Educators listserve
 - Email glw53@cornell.edu
- Easy way to reach us!

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Sister Alliances









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Food Safety Preventive Controls Alliance http://www.iit.edu/ifsh/alliance/

Sprout Safety Alliance http://www.iit.edu/ifsh/sprout_safety/







Comprehensive Food Safety Program for Growers, Packers, and Farm Workers



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Fruits, Vegetables, and Food Safety: **Health and Hygiene** on the Farm



National GAPs Program at Cornell University



Did you know?

Your kitchen could be a source of illness!

> Ingratement of Fried Science + Costarli University If thisking Hall + Mann, WY 14831



;Sabía usted?



En el campo también se necesita higiene!



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POR FAVOR, LÁVESE LAS MANOS FRECUENTEMENTE





Food Safety **Begins** on the Farm

A Grower Sell Assessment of Food Safety Risks

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http://ncfreshproducesafety.ncsu.edu/

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	FSMA Rules Released – Comments Due by September 16, 2013! Read about the new rules here.	
S 2 3	Search this site Human Noroviruses, Berries, and Resources	
PXD-::	GOOD AGRICULTURAL PRACTICES With the recent recall of frozen berries, implicating pomegranate seeds with Hepatitis A it is even more important to be aware of noroviruses. Human noroviruses are the most common cause of food borne disease, responsible for more than 5 million cases in the United States each year. GROWERS Learn more INDUSTRY TRAINERS SPANISH RESOURCES Vient the recent recall of frozen berries, implicating pomegranate seeds with Hepatitis A	
	FEATURED RESOURCES	
	TRAININGS & EVENTS LEGISLATIVE UPDATES GLOSSARY AND FAQS CONTACT US HOME	
		36

http://ucfoodsafety.ucdavis.edu/













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Discussion and Questions

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