Cooperative Extension

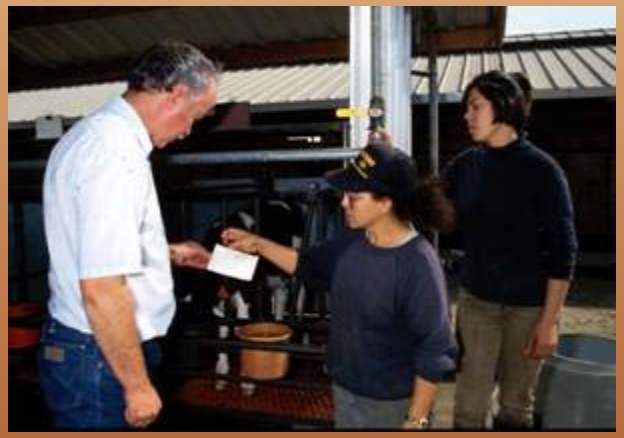
Your local door to resources of the University of California

Food Safety Meeting
June 4, 2012

University of California

Research and Education

Advisors collaborate with Specialists & AES Scientists



UCCE Food Safety Team


Brenna Aegerter


Aziz Baameur


Jose Fernandez de Soto


Ramiro Lobo


Cindy Fake


Shermain Hardesty


Ben Faber


Paul Vossen


Glenn McGourty


Richard Molinar


Trevor Suslow

On-farm Produce Food Safety

We will cover:

PRODUCE

- ✓ Growing
- ✓ Harvesting & Packing
- ✓ Transporting

We won't cover:

Food preparation

- – Fresh cut produce
- – Processing
- – Food preservation

Meat, eggs & dairy

University of California
UC Food Safety

SKIP TO CONTENT SITE MAP Enter Search Term

http://ucfoodsafety.ucdavis.edu

- Home
- Consumer Advice
- Home Food Preservation
- Food Industry Contacts
- Food Safety Modernization Act
- Retail and Food Service
- Processing Foods
- Process Validation
- Produce - Preharvest
- Produce - Postharvest
- Low Moisture Foods
- UC Publications
- Food Safety Links
- Group Info

UC Food Safety Home

Welcome to the University of California Food Safety website. Research and Extension faculty at
(Drs. Linda Harris and Trevor Suslow) are the hosts for this site but current information from
will be included. From here link to presentations, publications, and other websites with informa
the production, harvest, and processing of foods. The emphasis is on microbial food safety bu
subjects related to food such as biotechnology, food quality and food security are also addres

Newly Added to Website - April 2012

The Bad Bug Book (FDA, 2nd edition)

USDA.gov Flickr Photostream

Calendar

Event Name	Date
Microbial Challenge Testing for Foods Workshop	5/1/2012

UC Food Blog

Cultivating
Posted 5/1,
California c

www.cdfa.ca.gov/ahfss/

CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE

ANIMAL HEALTH & FOOD SAFETY SERVICES DIVISION

Search

This Site | California

CDFA Home | AHFSS Home | Licenses/Permits | Animal Health | Food Safety | Livestock | Emergency Mgmt

Animal Health | Emergency Preparedness Support Unit | Livestock ID | Meat, Poultry & Eggs | Milk & Dairy Food Safety

CDFA Home > AHFSS

Director/State Veterinarian
Annette Whiteford
View her Video

ANIMAL HEALTH AND FOOD SAFETY SERVICES (AHFSS)

1220 N Street, Sacramento, California 95814 • 916-900-5000 • Fax: 916-900-5332

We serve the citizens of the State and consumers of California agricultural products to assure the safety, availability and affordability of agricultural products by promoting California agriculture, protecting public and animal health while enhancing stewardship of the environment.

AHFSS Protects....

- **The safety and security of meat, poultry, dairy products, and other foods of animal origin**
- **Public and animal health through the prevention, detection, and eradication of livestock and poultry diseases and dairy contamination incidents**
- **Cattle owners against loss of animals by theft, straying or misappropriation through ongoing inspections and investigative services**

QUICK LINKS

- Bovine Spongiform Encephalopathy (BSE)
- Equine Herpes Virus (EHV-1) Alert
- Bovine Tuberculosis Updates
- Exotic Newcastle Disease (END)
- FAQs
- Foot & Mouth 2011 Update
- Highlights May '09 (PDF)
- H1N1 Flu
- Offices & Locations
- Forms & Publications
- Regulations
- Public Meetings
- 09-10 Cal Ag Highlights
- Kids' Corner


Announcements


Livestock


Pets

Milk & Meat Safety


Employment

animalscience.ucdavis.edu/avian/qap.htm

- Home
- Program Information
- HACCP
- Implementation
- California Egg Quality Assurance Plan
- California Poultry Meat Quality Assurance Plan
- Forms
- Video
- Contact Information
- Training Material

Animal Production Food Safety Education Programs for the Poultry Industry

Sponsored by
United States Department of Agriculture, Food Safety and Inspection Services

California Egg Quality Assurance Plan

California Poultry Meat Quality Assurance Plan

Developed by the California egg and poultry meat industries in cooperation with the California Department of Food and Agriculture; U.S. Department of Agriculture; University of California Cooperative Extension; California Veterinary Diagnostic Laboratory System; California Department of Health Services; and the U.S. Food and Drug Administration

The California Egg and Poultry Meat Quality Assurance Plans are voluntary producer oriented animal production food safety programs designed to ensure the highest quality and safety of poultry and poultry products. These programs utilize Hazard Analysis Critical Control Points (HACCP) principles on the farm to maintain a safe and wholesome product. Training, record keeping, testing and research are integral components in documenting the success of the plan.

Each farm participant designs their own monitoring plan applicable to their specific operation. Farms and processing facilities are periodically reviewed by California Department of Food and Agriculture veterinarians to ensure compliance with all program requirements.

The California Egg and Poultry Meat Quality Assurance Plans enjoy a high level of participation. The enrolled farms in about 95 percent of the state's egg and poultry meat production. No other state or national voluntary quality assura that level!

http://cesonoma.ucdavis.edu

Meat Milk Eggs Safety Info

FOOD SAFETY: SALE OF MEAT, MILK AND EGGS

April 2012

- **MEAT** - two linked papers:
  ANR publication "Selling Meat and Meat Products"
  http://ucfoodsafety.ucdavis.edu/files/26481.pdf
  "Livestock Slaughter and Meat Processing Requirements in CA" (from Marin UCCE)
  http://ucanr.org/sites/Grown_in_Marin/files/83682.pdf

  These outline the requirements for selling red meat and poultry. Basically, red meat animals must be slaughtered and processed in USDA inspected plants. Poultry, other fowl and rabbits must be slaughtered in processed in CDFA inspected plants.

- **MILK** – Per CDFA "A person shall not engage in any of the following businesses unless he has obtained a license from the secretary for each separate milk products plant or place of business:
  - Dealing in, receiving, manufacturing, freezing, or processing milk, or any product of milk.
  - Manufacturing, freezing, or processing imitation ice cream or imitation ice milk."

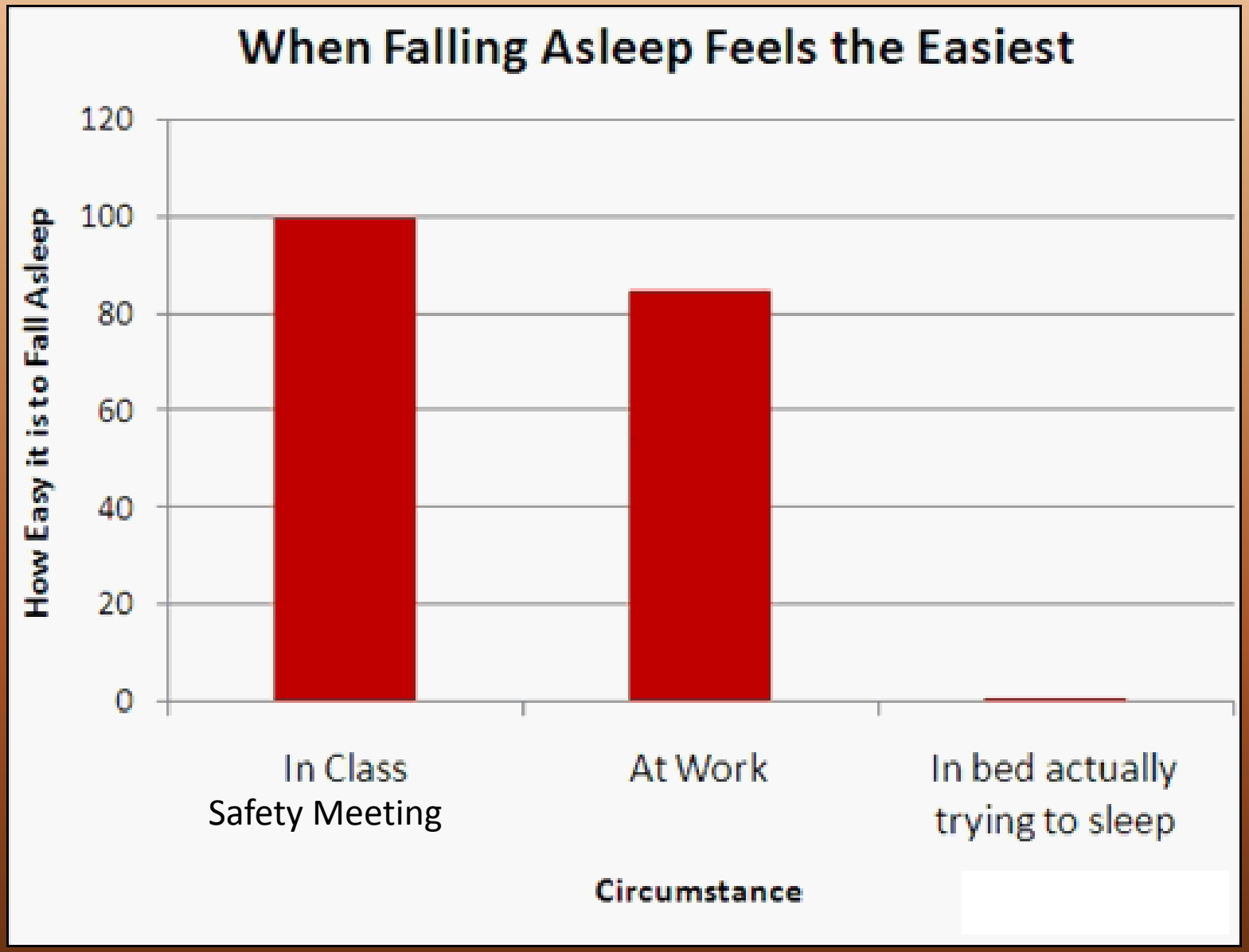
  Licensing is required for sale of all milk and milk products from the CDFA:
  http://www.cdfa.ca.gov/ahfss/Milk_and_Dairy_Food_Safety/Milk_Product_Licenses.html

- **EGGS** – Sale of eggs in California requires an Egg Handler Registration Form - this is basically a tracking device:
  http://www.cdfa.ca.gov/ahfss/mpes/pdfs/In_State_Egg_Handlers_Registration_Form.pdf
  This form can be turned into the County Ag Commissioners office.

  Some of the requirements for egg handlers are:
  From CDFA http://www.cdfa.ca.gov/ahfss/mpes/esqm.html

  - **Labeling:** Consumer-grade packages or containers of eggs must state all of the following: name, address, zip code, size, grade, quantity, the words "keep refrigerated," and either the USDA plant of origin code number, the USDA Shell Egg Surveillance number, (if applicable) or California state handler code, sell-by date, Julian date of pack (the consecutive day of the year that the eggs were packed, in Julian date format. Example-The Julian date for January 1 is 001, the Julian date for December 31 is 365).
  - **Quality:** All shell eggs shall be graded and sized. The established grades of eggs are:

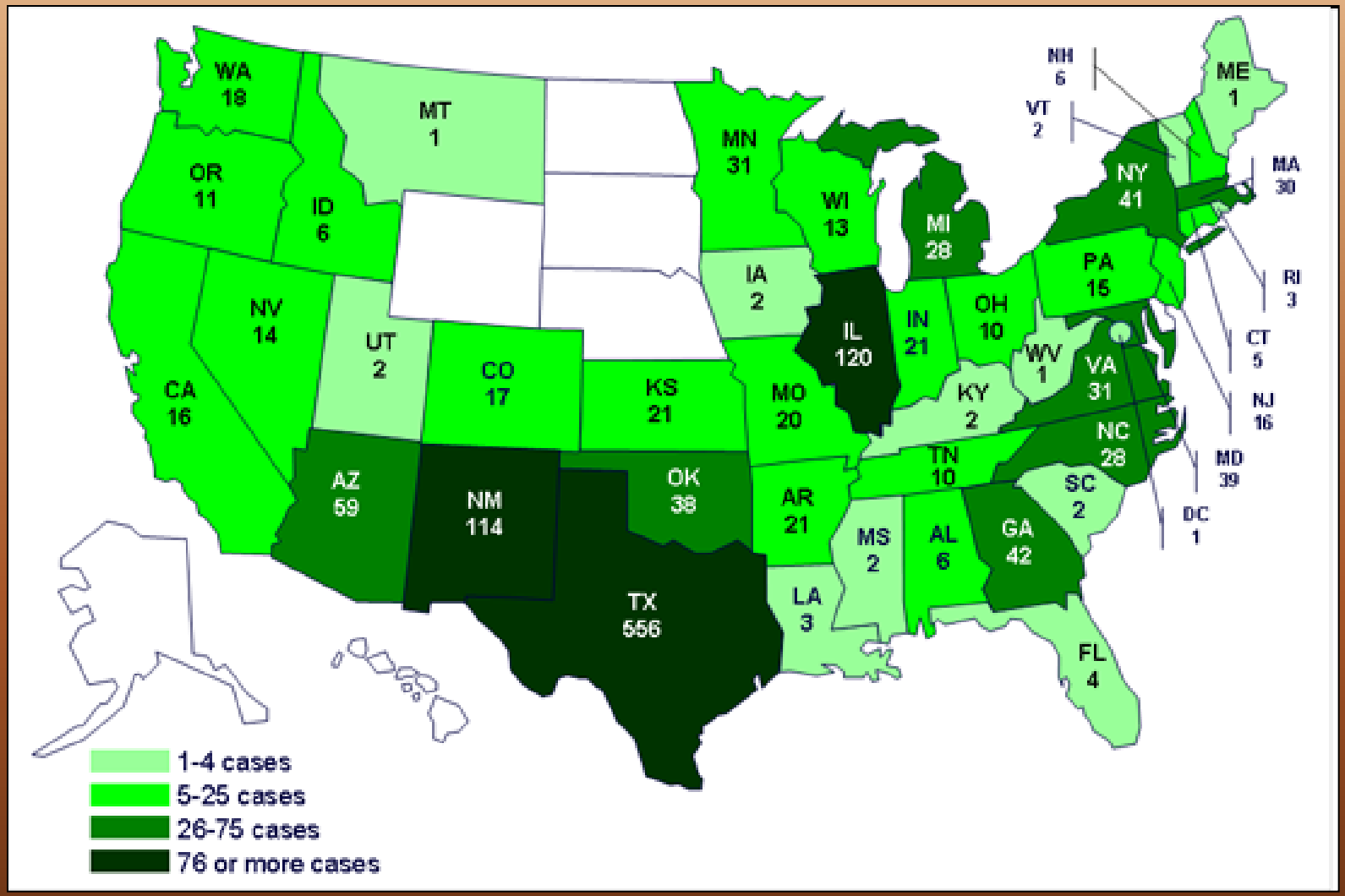
Is there anything more boring than safety?



Is this safe to eat?

Is there anything more important than safety?

Number of Sickened People - *Salmonella* Saintpaul by state, as of August 19, 2008



“Small Farms” May Be Responsible for Large Multi-State Outbreaks

Local Fresh Strawberries Tainted With E. coli O157:H7 Sicken 14, One Dies

- Locally grown berries in NW Oregon, 2011
- Sold at U-pick, farm stands, farmers markets
- Consolidated berries from several farms

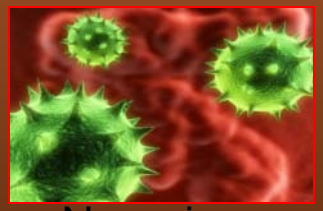



Reported *outbreaks* linked to FDA-regulated foods, *by agent*, 1996-2009 (N=532 outbreaks)

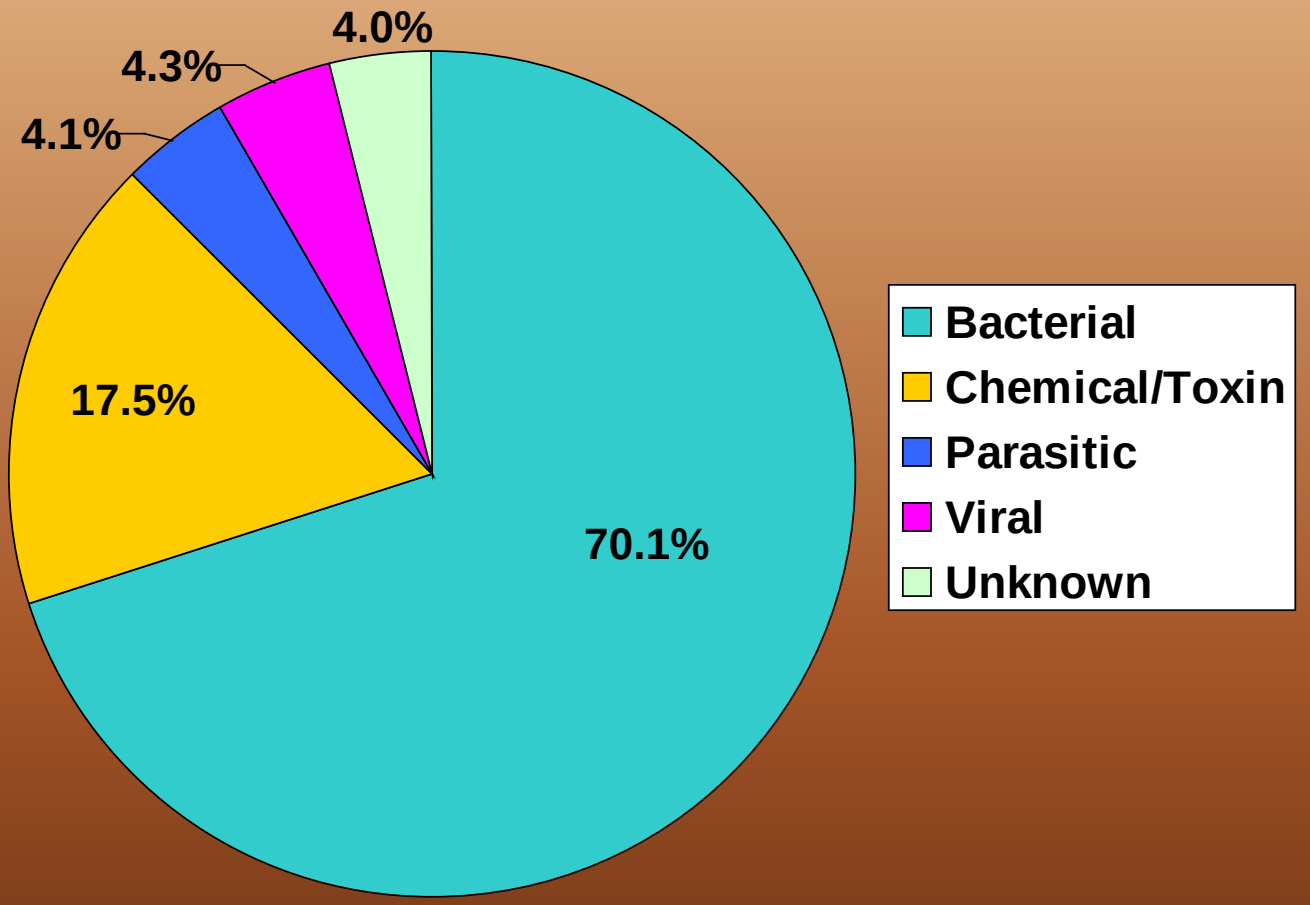
E. coli O157:H7

Salmonella

Cryptsporidium

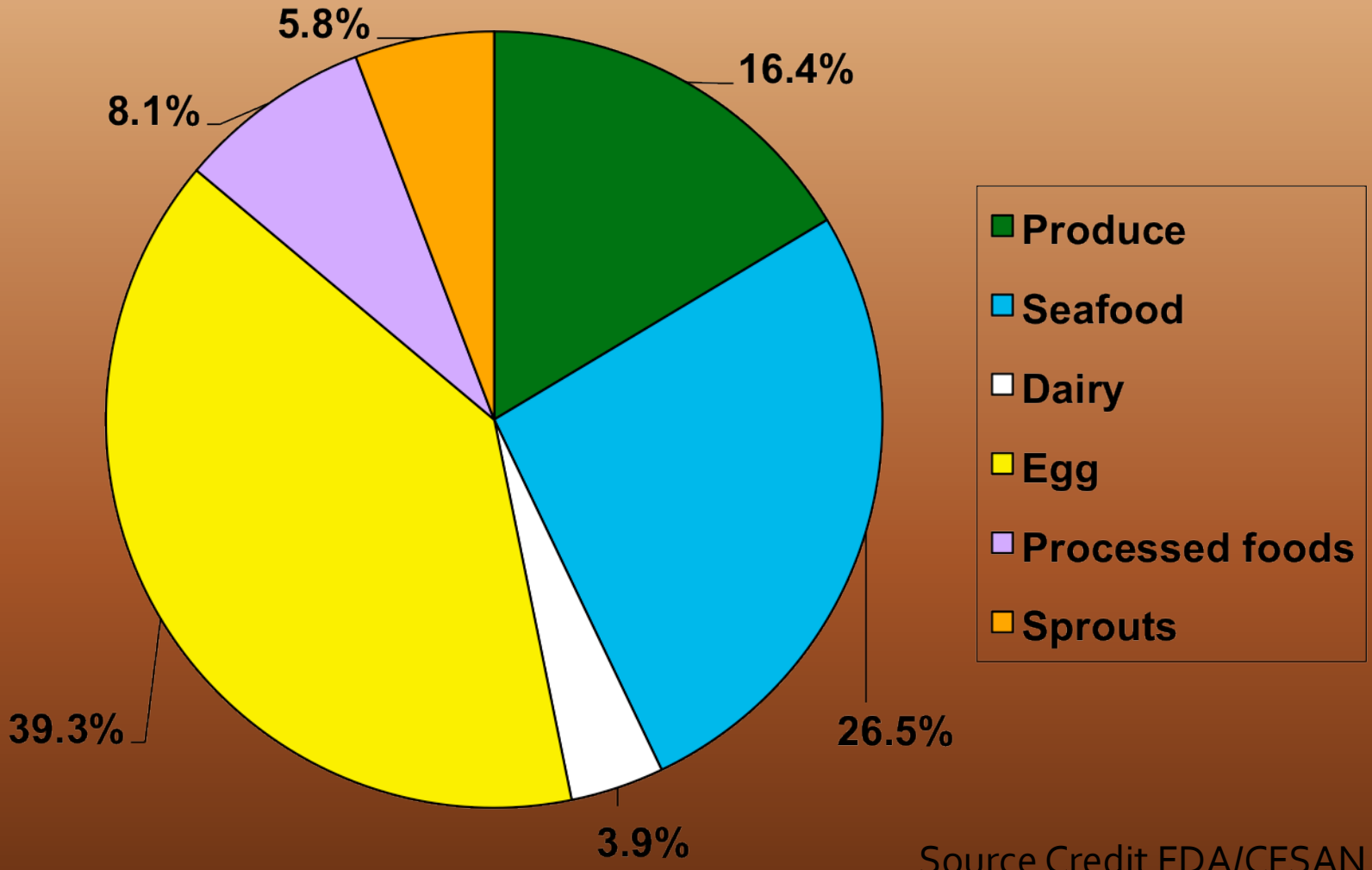


Norovirus



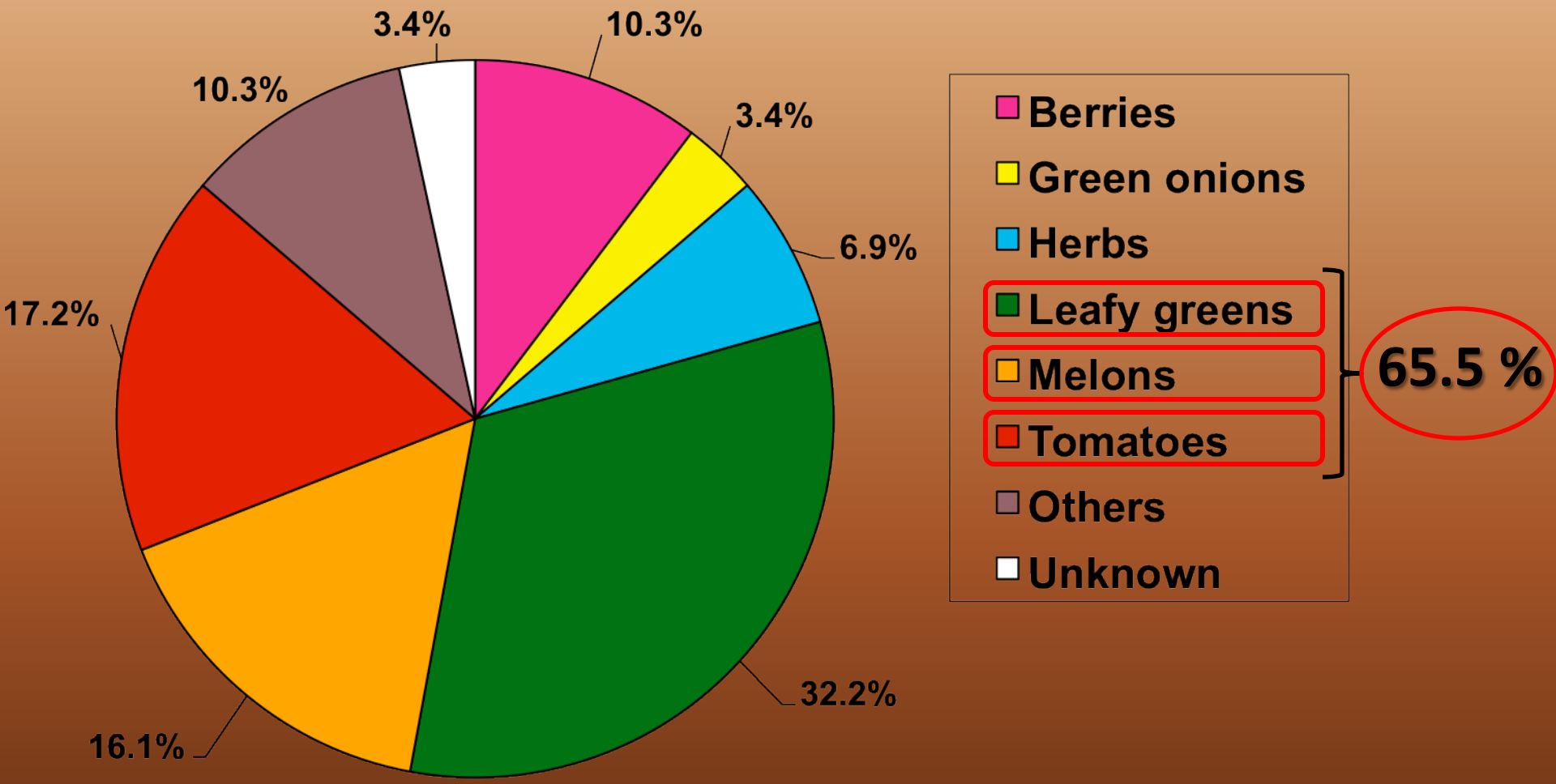
Source Credit
FDA/CFSAN 2011

Reported *outbreaks* linked to FDA-regulated foods, by vehicle, 1996-2009 (N=532 outbreaks)



Source Credit FDA/CFSAN 2011

Types of produce Associated with Outbreaks, 1996-2009 (N=87)



Source Credit FDA/CFSAN 2011

Salmonella and *E. coli*:
30 minute doubling time at 80°F

- 8 am — 1 cell
- 9 am — 4 cells
- 10 am — 16 cells
- 11 am — 64 cells
- 12 pm — 256 cells
- 1 pm — 1024 cells
- 2 pm — 4096 cells
- 3 pm — 16,384 cells
- 4 pm — 65,536 cells
- 5 pm — 262,144 cells
- 6 pm — 1,048,576 cells

Fast growth rate

Medium growth rate

Why is produce getting so much attention now?

- Produce-related outbreaks in mid-'90s
- 1998: FDA created voluntary guidelines "Good Agricultural Practices" (GAPS)
- Multi-state outbreaks associated with spinach and tomatoes (2006), cantaloupes (2008), hot peppers? (2009)
- 2010: Federal legislation passed by Congress

Food

Resources for You

- **FDA Implementation Timeline**
- **Recalls, Market Withdrawals, & Safety Alerts**

The New FDA Food Safety Modernization Act (FSMA)

The FDA Food Safety Modernization Act (FSMA), the most sweeping reform of our food safety laws in more than 70 years, was signed into law by President Obama on January 4, 2011. It aims to ensure the U.S. food supply is safe by shifting the focus from responding to contamination to preventing it.

Get FSMA Updates by E-mail

Focus on Sprout Producers

Through the new Sprouts Safety Alliance, FDA is helping producers identify and implement best practices in the safe production of sprouts.
More >

1 of 3

What's New | How to Participate | Main Topics

- Role of the Food Safety Modernization Act in Ensuring the Safety of Pet Food
  Michael R. Taylor, Deputy Commissioner for Foods
  Pet Food Forum, Schaumburg, IL
  April 4, 2012
- FDA Progress Report on Implementing the Food Safety Modernization Act: January - March 2012
- Ensuring Produce Safety in a Global Food System
  Michael R. Taylor, Deputy Commissioner for Foods
  America Trades Produce, Tubac, AZ
  March 22, 2012
- Interim Final Rule: Establishment, Maintenance, and Availability of Records: Amendment to Record
- Draft Guidance for Industry: FDA Records Access Authority Under Sections 414 and 704 of the Federal Food, Drug, & Cosmetic Act
- More on What's New...

Food Safety Modernization Act (FSMA)

http://www.fda.gov/Food/FoodSafety/FSMA/ucm298665.htm

- Passed by Congress in 2010
- Applies to fruits, vegetables, & processed food
- Does not apply to meat, poultry or dairy

- FSMA draft regulations were due out in January, 2012, but could now be delayed until after November elections

Food Safety Modernization Act

Three key areas of FSMA:

1. Practices for fruit and vegetable production & harvest
2. Food facility registration (*more to come)*
3. Traceability & Recordkeeping (*more to come*)

FSMA's Small Farm Exemption

- FSMA exempts "small farmers" from food safety regulations, if they meet ALL of the following criteria:
  - 50% direct marketed to consumers, stores and restaurants
  - Direct market in the same state or within 275 miles
  - Total farm sales less than $500,000
  - Name, address and phone # provided to customer

Local & State Food Safety Requirements

BUT: Farms exempt from FSMA must meet local and state requirements:

- **County Environmental Health Department**
- **CDFA**
- **CA Department of Public Health**

Environmental Health Department

cdfa
CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

California Department of Public Health CDPH

Industry Food Safety Requirements

- Many customers require that produce suppliers have 3rd party food safety certification (CDFA, Primus Labs, NSF Agriculture)

- Recently, insurance companies have cancelled policies or increased premiums for some smaller farms that direct market leafy greens

Probable Future Requirements

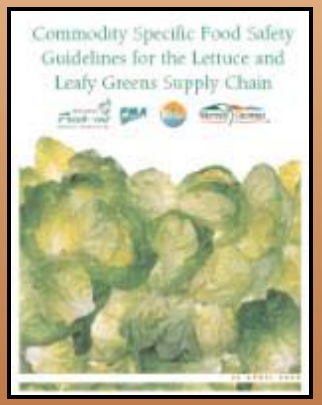
- Schools
- Farmers Markets
- Grocery Stores
- Donations to Food Banks

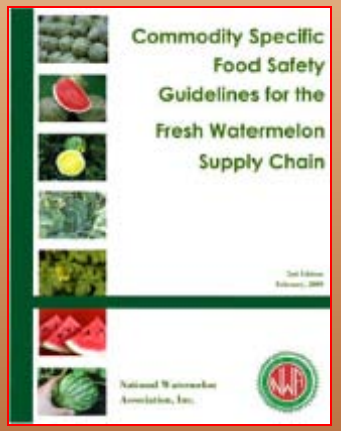
Key Food Safety Areas for All Scales of Farming and Shipping

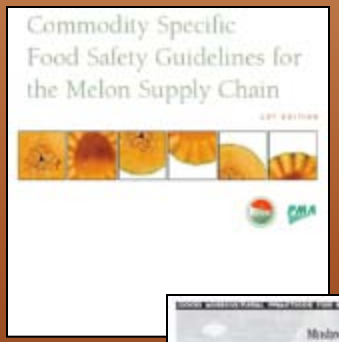
- **Water:** Pre- & Post-harvest
- **Workers:** Hygiene & Training
- **Waste:** Manure & Compost
- **Wildlife:** Intrusion & Fecal
- **Record-keeping**
- **Traceability**

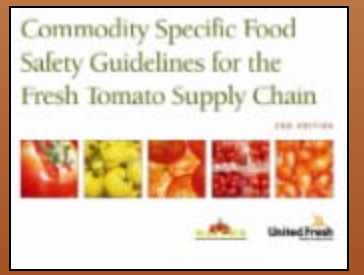
Commodity-Specific GAPs and Food Safety Audit Checklists

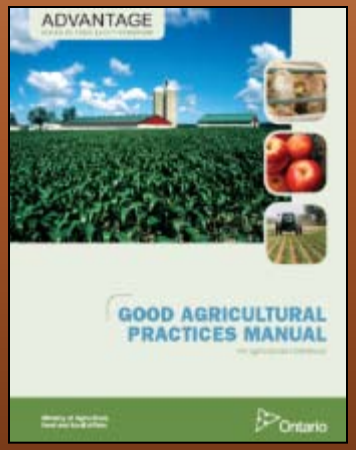
- Melon
- Tomato
- Stone fruit
- Mushroom
- Lettuce & Leafy Greens
- Culinary Herbs
- Green Onions
- Sprouts
- Almond
- Citrus
- Strawberry
- Watermelon
- Blueberries
- Asparagus











How much should I do?

- Use common sense “good agricultural practices”
- Develop a food safety plan for your farm
- Conduct a self audit (Self Certification)
- Become certified by a 3rd-party auditing company

Soils, Previous Land Use

Previous Land Use Assessment

- Write down what the land has been used for previously; and if manures were applied.

  crop land

  fallow

  dairy, livestock, poultry farms (possible contamination)

- Discuss what you have done to resolve contamination

  had the soil tested for coliforms and E. coli

- Discuss what you do to reduce the risk if there is flooding or runoff from neighbors horse pasture, hilly ground, etc.

  dug a trench or put up a berm of soil on 2 sides of my farm


Horses adjacent to a farm
Make a trench or berm

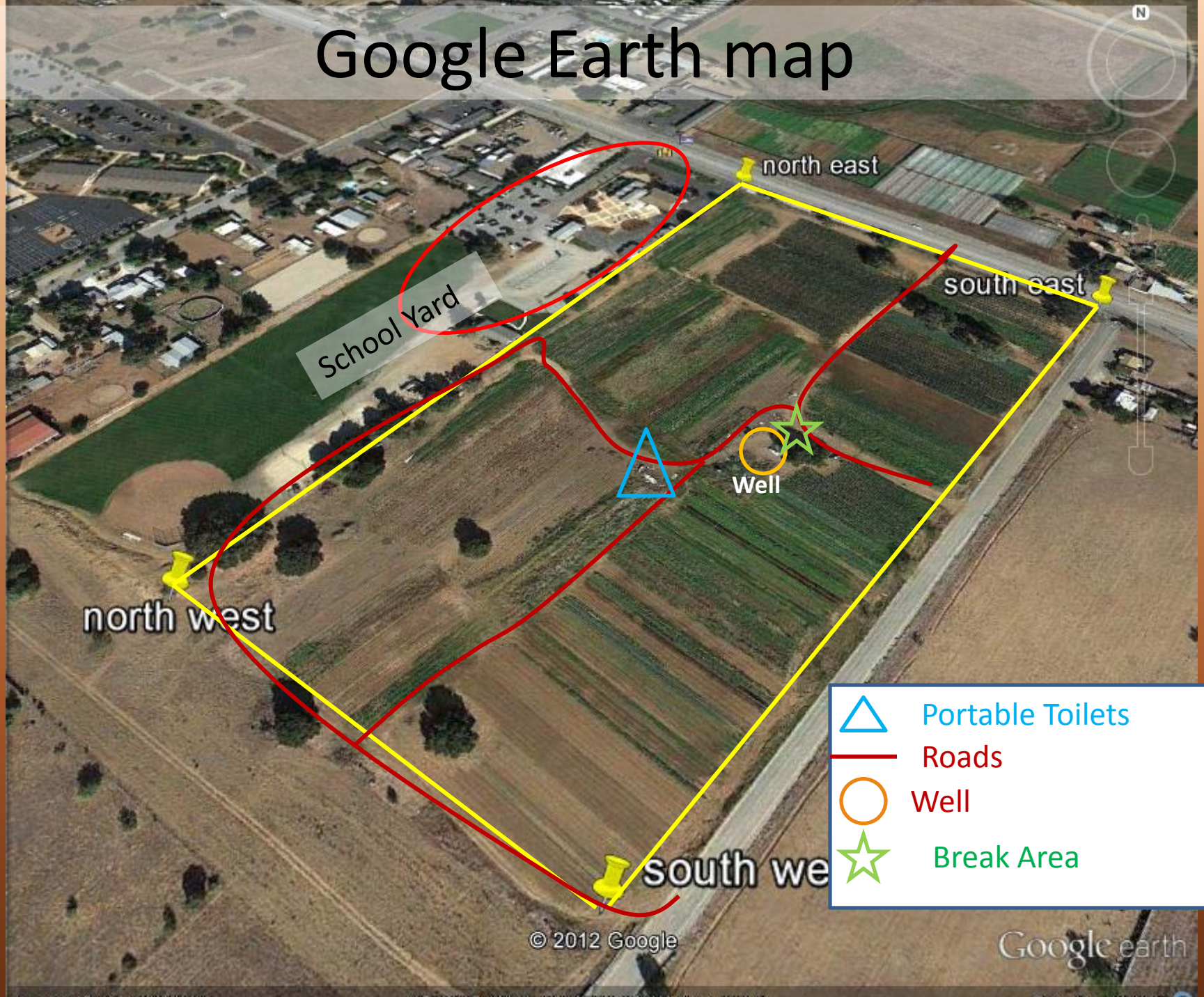
Mapping a farm

- Field map: Record activities within & adjacent to your property.
- Map should include:
  - Crops
  - Roads
  - Wells and other water sources
  - Lakes, rivers, ponds, reservoirs
  - Ditches
  - Buildings, including semi-permanent portable toilets and break areas
  - Neighboring property features

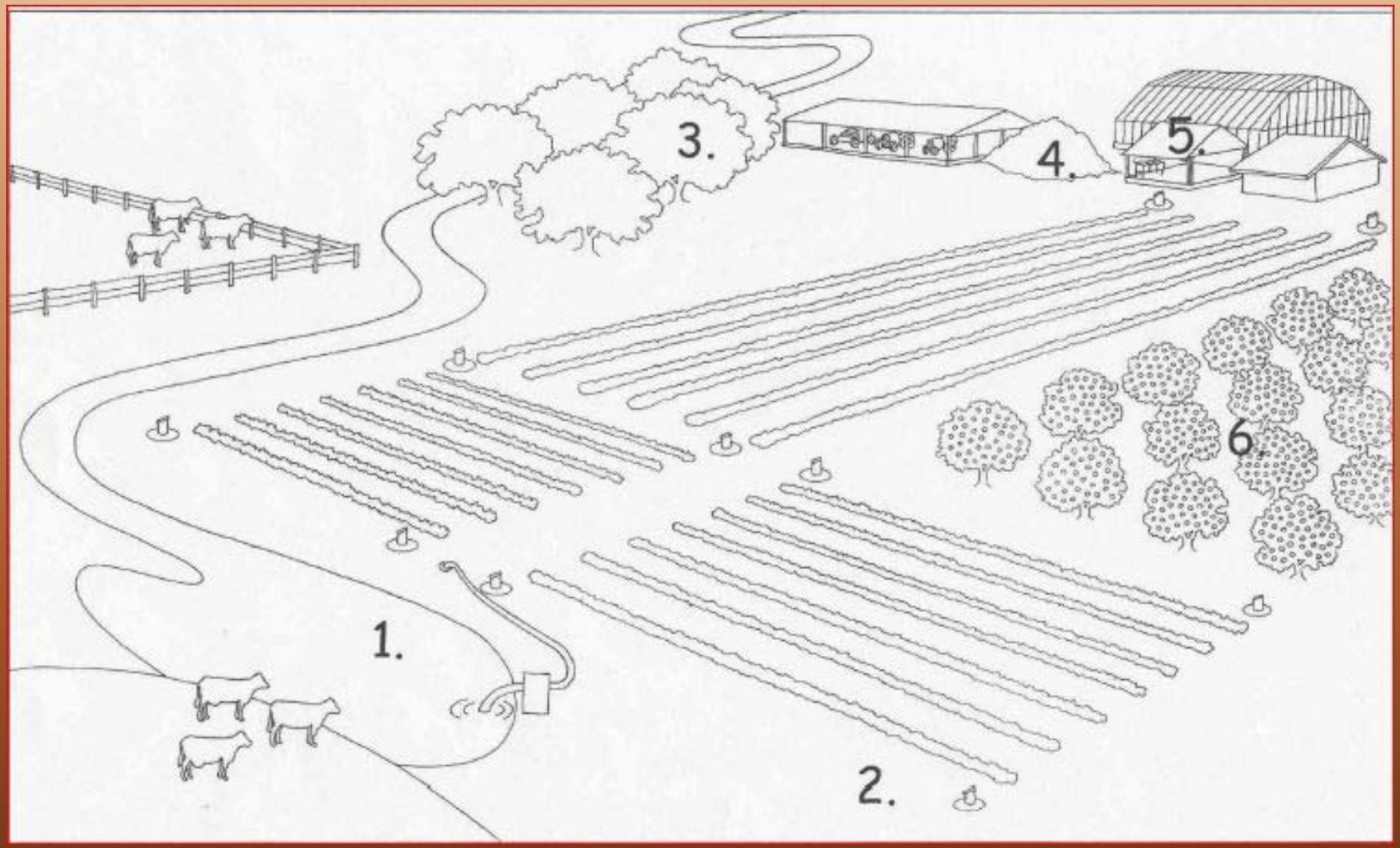
Creating a map…

1. Hand draw the map
2. Obtain one from:
   - Download one from the internet (eg, Google maps, or Google earth)
   - Contact you NRCS office for a map
3. Re-use one previously submitted to Ag Commissioner

Google Earth map



Another map



Source: U of FL IFAS Extension. ,Small Farm Food Safety, Fresh Produce, Part 4: Farm Map Activity. FCS8845

Food Safety:
Water, Waste, Wildlife, Workers

Agricultural Water

Usually ag water comes from:

*** Surface sources – canals, rivers streams**

*** Reservoirs – open or capped**

*** Wells**

*** Municipal sources**

Know source of water
Know what's upstream and intended use
Know seasonal variation (does source change?)

Source: NRCS

Irrigation Source ?

2006

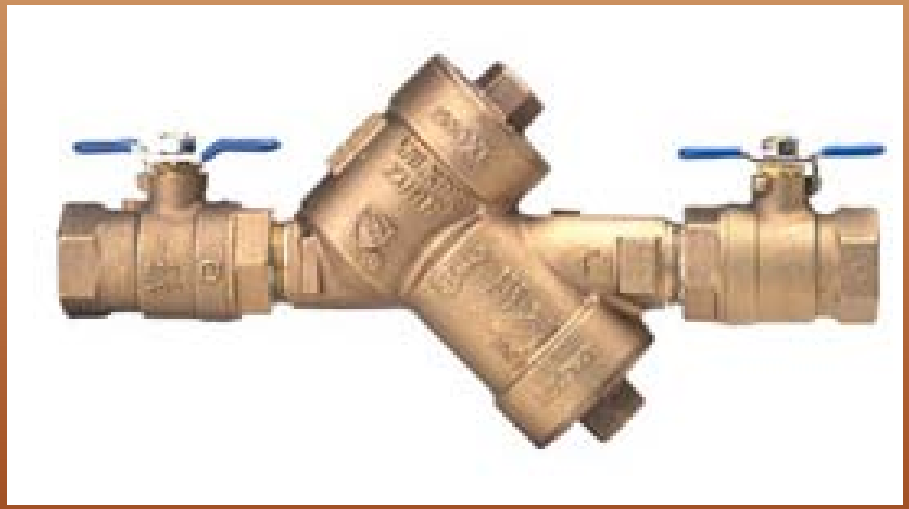
E. coli O157.H7 contamination of irrigation water by feral pigs or possibly deer - 276 sick, 3 dead from eating raw spinach

Case: Fillmore, CA.

Peppers initially irrigated with well water, then toward harvest, river water was delivered, contaminated with bacteria

UC IPM

Ensure that wells are designed and maintained in a manner that prevents contamination



Back Flow Preventer

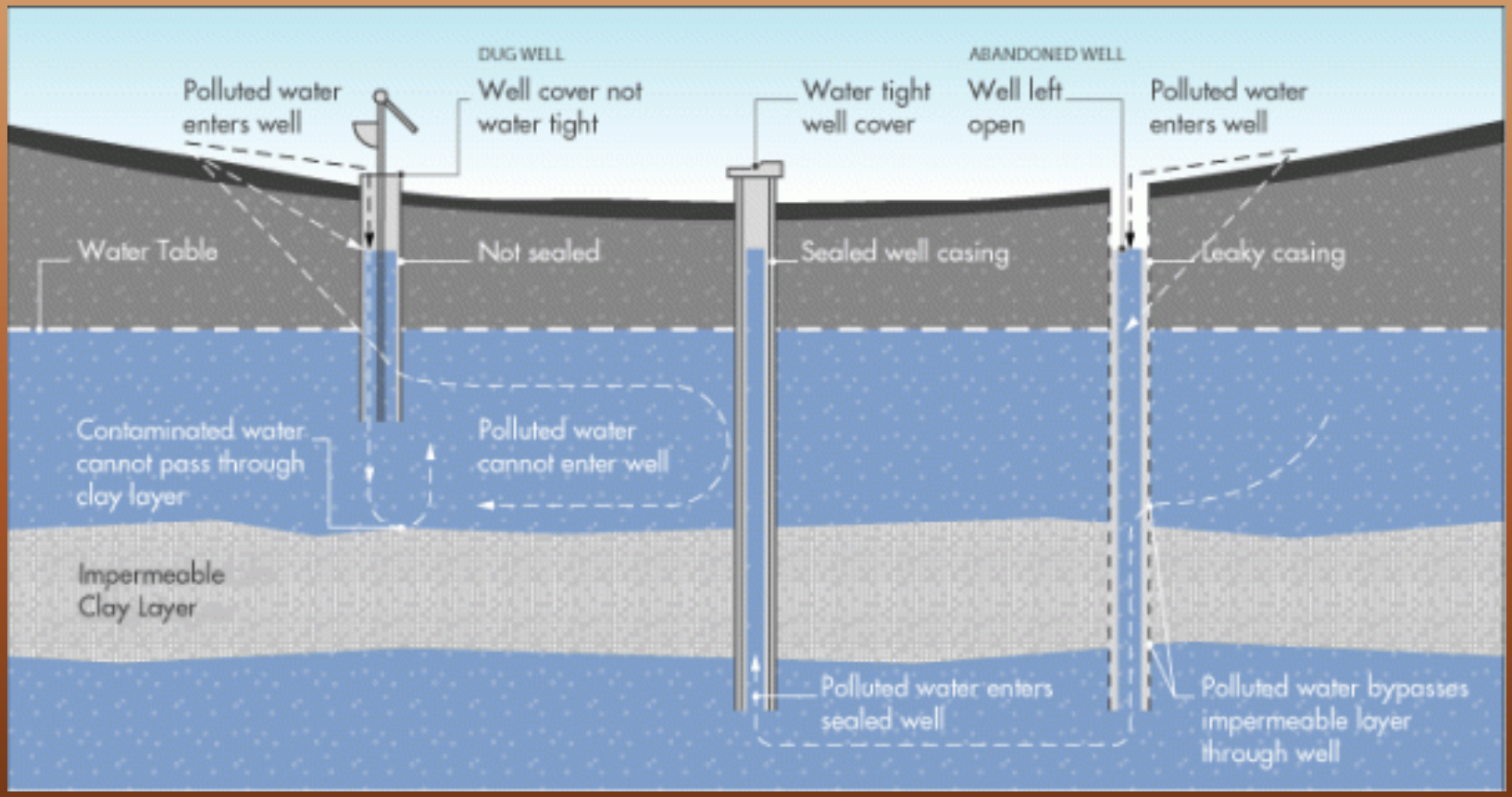
Animal burrow at well head

Potential Fertilizer Contamination

Potential Fertilizer Contamination

Ground water may be contaminated by a variety of biological and chemical hazards

*Bacteria and viruses *Domestic waste *Nitrate nitrogen
*Synthetic organic chemicals *Heavy metals *Petroleum residues
*Combustion products from roadways



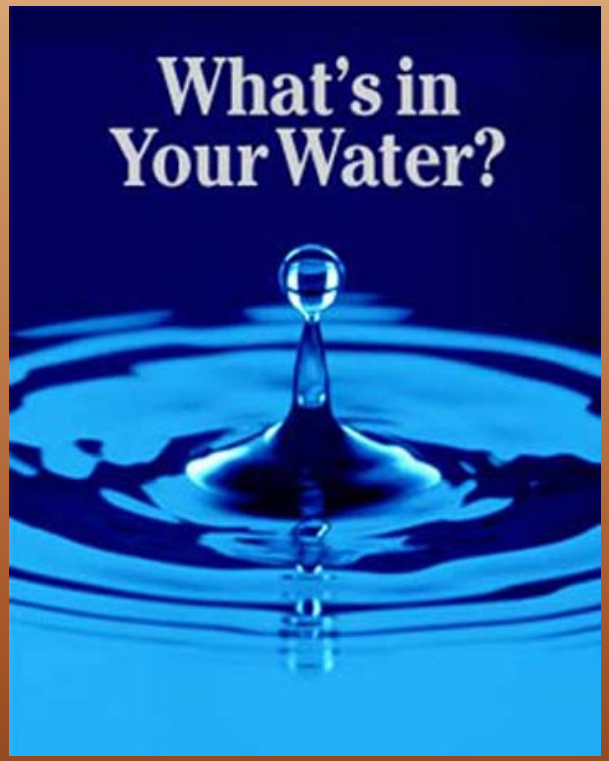
Source: Kawartha Conservation

Microbiological Testing

Water Test

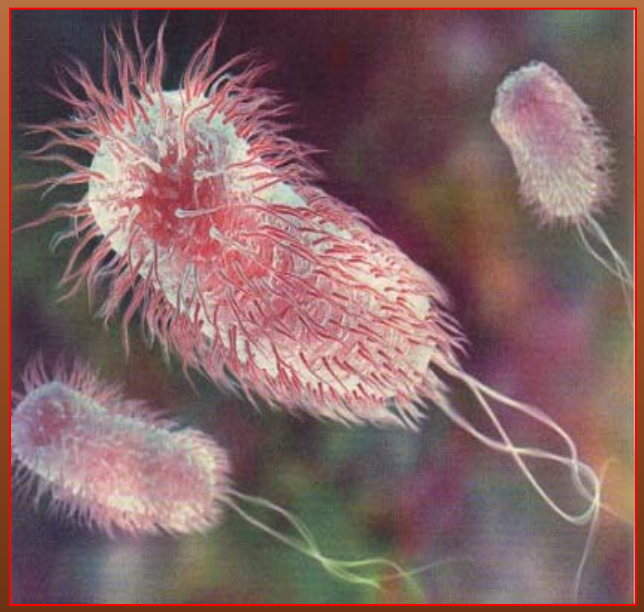
Bacteria are most important

Keep records in case of a microbiological outbreak investigation



Bacteria in Water

- **Total Coliform = Environmental Contamination**
- **Fecal Coliform = Fecal Contamination**
- **E. Coli (generic) = Fecal Contamination**
- **E. Coli 0157:H7 = Fecal Contamination with known human pathogen**



Water Source Will Determine the Possible Frequency of Testing

If water source is:		Then testing frequency is:
Closed source – well	→	Annually at beginning of season
canal, pond, river	→	Every 3 months during season
Municipal water	→	Keep records from district

* Obtained from California Strawberry Commission (1998) Quality Assurance Program

Suggested Standards for Irrigation Water Quality

Until a suitable indicator or group of indicator bacteria are identified, nonpathogenic Escherichia coli (E. coli) remain the practical indicator of microbial water quality in produce production systems. Despite the functional significance of E. coli as an indicator, there is no established or recognized limits or standards, at this time. The best available standards that might be applied to irrigation water quality are those established by the U.S. Environmental Protection Agency (EPA-823-R-03-008 revised June 2003) http://water.epa.gov/type/oceb/beaches/local_index.cfm

US EPA Bacterial Water Quality Standards for Recreational Waters: 126 CFU E. coli /100 ml sample . . . . . or 33 Enterococci CFU/100 ml sample

DELLAVALLE® Laboratory, Inc.
Chemists and Consultants

Bacteriological Water Analysis

1910 W. McKinley, Suite 110, Fresno, CA 93728
FAX (559) 268-8174 - (800) 228-9896 - (559) 233-6129

Univ of Calif Coop Ext %Richard Molinar
1720 S. Maple
Fresno CA 93702
2652
21

Lab No. 157969
Sample Date 6/15/2011
Sample Time 13:30
Sampler
Submitted Date 6/15/2011
Submitted by Michael Yang
Reported Date 6/16/2011
Location/Project [redacted]
Copy To
Fax (559) 456-7575
email rhmolinar@ucdavis.edu

Material Submitted:

	Date Started	Time Started	Rec'd Temp °C	Total MPN Coliform per 100 ml	MPN E-Coli per 100 ml	Residual Chlorine mg/L
RL--->				< 1	< 1	
SM--->				9223	9223	Field test
Analysis Date:	6/16/2011	6/16/2011	6/16/2011	6/16/2011	6/16/2011	
001 McCall & Kings Canyon	6/15/2011	15:36	28.4	83.6	<1	

Coliform is a generalized category of bacteria that is a moderate health risk. Warnings are marked in **Orange Color.**
E-Coli is a specific strain of bacteria and is a severe health risk. Warnings are marked with **Red Color**.

When coliform bacteria is detected a full chlorination of the drinking water system is required.
If E-Coli bacteria is detected, all human consumption should stop immediately (unless boiled). An immediate chlorination of the drinking water system must occur with retesting prior to allowing human consumption.
MPN _ Most Probable Number. This is a statistical number to represent the number of bacterial colonies found in a random sample of this water. The higher the number, the greater the amount of bacteria in the sample.

MPN Coliform Description of terms: No Bacterial Contamination Found = <1
Bacterial Contamination Detected = greater than 1

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Univ of Calif Coop Ext %Richard Molinar
1720 S. Maple
Fresno CA 93702
2652
50

Lab No. 154376
Sample Date 4/6/2011
Sample Time 10:30
Sampler Richard Molinar
Submitted Date 4/6/2011
Submitted by Richard Molinar
Reported Date 4/8/2011
Location/Project
Copy To KMB
Fax (559) 456-7575
email rhmolinar@ucdavis.edu

Material Submitted:

	Date Started	Time Started	Rec'd Temp °c	Total MPN Coliform per 100 ml	MPN E-Coli per 100 ml	Residual Chlorine mg/L
RL--->				< 1	< 1	
SM--->				9223	9223	Field test
Analysis Date:	*4/7/2011*	*4/7/2011*	*4/7/2011*	*4/7/2011*	*4/7/2011*	
001 [redacted]awberry Farm	4/6/2011	16:23	12.6	2.0	<1	

ND = None Detected
SM = Standard Methods for the Examination of Water and Wastewater, 19th ed., 1995
Records retained for 5 yrs.
mg/L = ppm

Approved By: _____

ELAP Certification #1595

BSK Associates
Engineers & Laboratories

Certificate of Analysis

[redacted]
P.O. Box 828
Selma, CA 93662

Report Issue Date: 03/21/2012 14:39
Received Date: 03/13/2012
Received Time: 10:42

Lab Sample ID: A2C0852-01
Sample Date: 03/13/2012 10:42
Sample Type: Routine
Sample Control Qualifiers: SC02
Sampled by: [redacted]
Matrix: Water
Sample Description: Water Canal MID

Microbiology

Analyte	Method	Result	RL	Units	Batch	Prepared	Qual
E.Coli by 1x10 MTF							
*E. Coli	SM 9221 B/F	>23	1.1	MPN/100 mL	A202592	03/13/12 15:18	

Spray Water Quality

- Make sure spray water quality is safe
- Keep spray & water quality records
- Low water volumes reduce risk

Evaluate Irrigation Method

Drip—Spray—Furrow—Flood

Water with less chance to contact plants has fewer problems of contamination

Food Safety:
Water, Waste, Wildlife, Workers

- Agricultural products can become contaminated at any point along the farm-to-table food chain

- A major source of microbial contamination is associated with animal feces

- Growers need to identify obvious sources of fecal matter that could be a source of contamination

Potential Sources of Contamination

- Untreated or improperly treated manure
- Manure composting or storage areas
- Livestock or poultry operations

Potential Sources of Contamination

Nearby municipal wastewater or biosolids storage, treatment or disposal areas

Potential Sources of Contamination

High concentration of wildlife

Even Domestic Pets

Livestock nearby = runoff

Pasture runoff after a rain to ???

Potential Sources of Contamination

Worker hygiene

&

Sanitary Facilities

Handling and application

- As far as possible from production/handling areas
- Use barriers or physical containment
- Properly made compost - mature
- Maximize time between application and harvest
- Incorporate manure 2 weeks prior to planting OR Prior to harvest: (>45 days for composted and 120 days for un-composted manure—CAFF GAPs & SOPS p: 7, 9)

Compost Application

Livestock in the field

What can Farmers Do?

- **Prevention:** If possible avoid growing crops that are eaten raw near animal facilities, in areas where birds perch over the crop, or too close to wildlife habitat

Keep dogs in the yard –not roaming

Reduce mouse habitat

What can Farmers Do?

- **Monitoring:** monitor fields for wildlife intrusion and define a no-harvest zone if fecal matter present

Deer droppings

What can Farmers Do?

- **Exclusion:** If problem persists, fences, netting or other physical barriers can be used to exclude wildlife

What can Farmers Do?

- **Management:** Deter wildlife with scare devices, attractants, or other tools which may be effective.

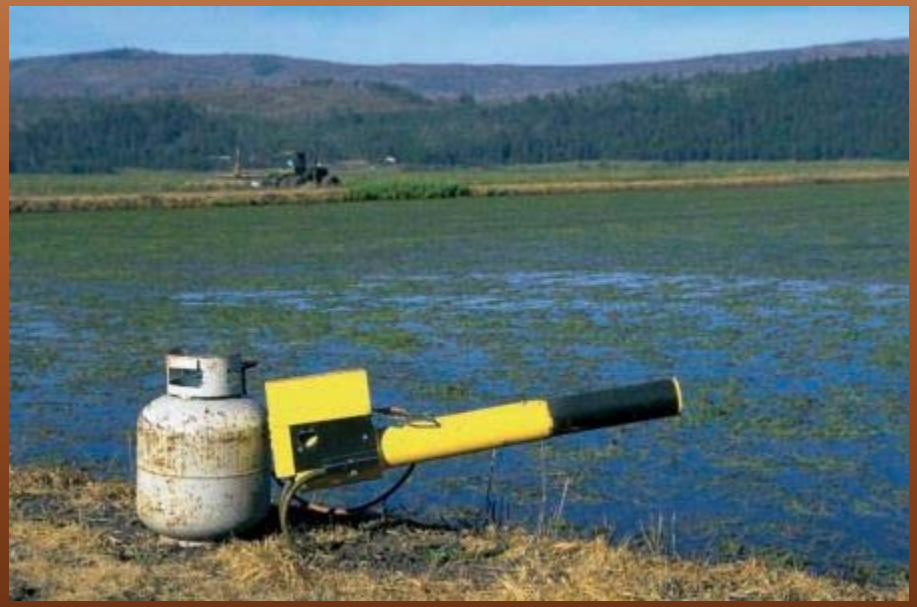
  trapping (mouse)

  baits (squirrels)

AV Alarm to scare birds

Management


UC Statewide IPM Project
© 2000 Regents, University of California

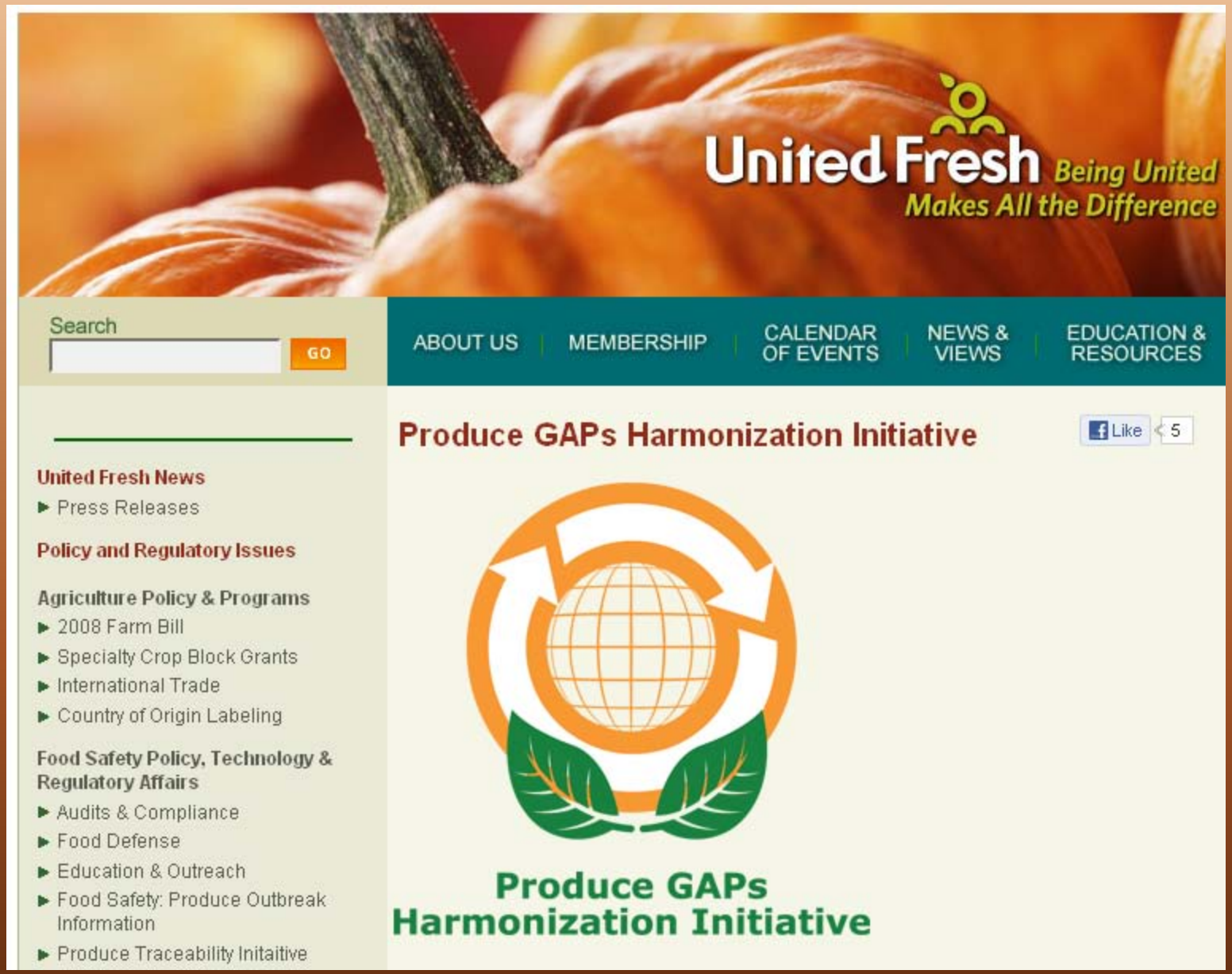


What can Farmers Do?

- **Removal:** If possible and allowed, hunt or physically remove wildlife.

Some things you can't control

USDA Video


United Fresh
Being United
Makes All the Difference
Search
GO
ABOUT US
MEMBERSHIP
CALENDAR OF EVENTS
NEWS & VIEWS
EDUCATION & RESOURCES
Produce GAPs Harmonization Initiative
Like 5
United Fresh News
Press Releases
Policy and Regulatory Issues
Agriculture Policy & Programs
2008 Farm Bill
Specialty Crop Block Grants
International Trade
Country of Origin Labeling
Food Safety Policy, Technology & Regulatory Affairs
Audits & Compliance
Food Defense
Education & Outreach
Food Safety: Produce Outbreak Information
Produce Traceability Initaitive
Produce GAPs
Harmonization Initiative

Worker health and hygiene

How do workers pose a risk?

- Human bodies carry a variety of bacteria and viruses, greatest risk is human feces
- Even if somebody is not sick, they may still be able to contaminate produce and others
- Workers often must have close contact with produce as part of their job

Some outbreaks associated with infected workers

Date	Produce	Pathogen	# of cases	Produce origin
1987	raspberries	Hepatitus A virus	92	United Kingdom
1990	strawberries	Hepatitus A virus	53	United States
1994	green onions	Shigella	72	CA
1996	leaf lettuce	E. coli 0157:H7	49	United States
1997	strawberries	Hepatitus A virus	250	CA
1997	green onions	Cryptospordium	55	United States
1997	basil	Cyclospora	341	United States
1998	green onions	Hepatitus A virus	43	United States/CA
1999	parsley	Shigella	486	United States
2003	parsley	enterohemorrhagic E. coli	77	United States

Worker Illness

- 93% of outbreaks related to food handlers involved sick workers
- Sick workers must tell supervisor; supervisor may give alternative work or ask them to stay home

  - Vomiting
  - Diarrhea
  - Jaundice (yellow skin or eyes)
  - Fever
  - Sore throat

First aid/ open cuts

Train workers on:

- First aid kit location
- First aid for cuts and other injuries
- Wounds must be properly covered or worker should be reassigned to another job
- Throw away produce that could have been contaminated by blood or other body fluids

Follow OSHA regulations regarding toilet facilities

Provide toilets: 1-male and 1-female for every 20 employees

For less than 5 employees, 1 lockable toilet is OK

Supplied with toilet paper

Cleaning dates posted

Toilet must be located within ¼ mile or no more than of 5 minutes walk from the work site

Don’t allow toilets to become a source of contamination

- They must be cleaned on a regular schedule
- If you have toilet cleaning equipment, then it must be labeled and stored separately
- Have a plan in the event of a leak or spill

Nice and Clean at all times

Located where water for cleaning does not get into the field

Handwashing facilities

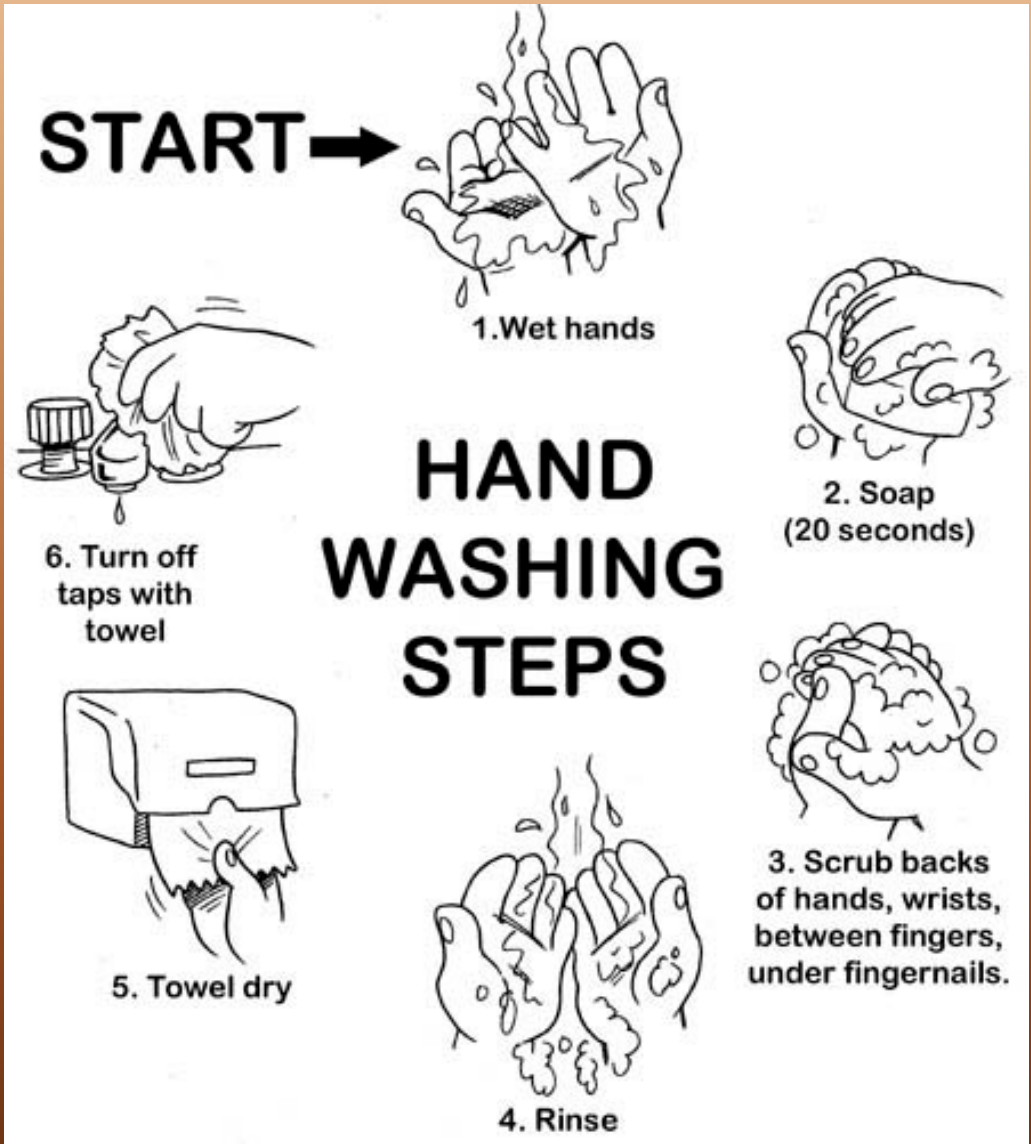
- Near toilet facilities
- Potable water only
- Liquid soap dispensers, Single-use paper
- Containers need to be emptied, cleaned and sanitized regularly
- Collection of drain water
- Trash can with lid

Hand washing policy

- Before starting work
- After breaks
- After using toilet
- After handling garbage
- After working with soil or rotten produce
- After sneezing or coughing on hands

Proper Handwashing Technique

Sanitizers may be used in addition, but not instead of soap and water



Proper use of gloves

- Gloves are not a substitute for proper handwashing
- Wash hands before putting on gloves
- Change gloves anytime they might have gotten dirty (i.e. anytime you would wash your hands)
- For reusable gloves, clean/sanitized pair should be issued to employee as needed

Break areas

- Designated area away from where produce is being handled
- Handwashing facilities close by
- Marked on farm map
- Cleaned regularly so rodents do not become attracted to the area
- No smoking, chewing tobacco or gum, or eating outside break area

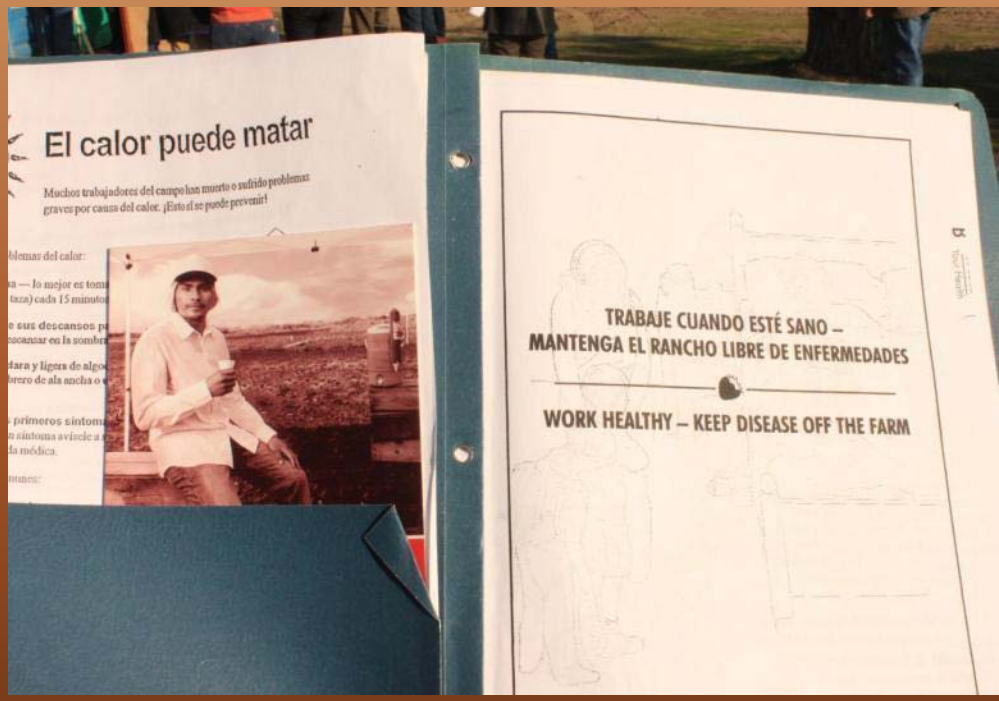

AREA PARA COMER

Other worker and hygiene issues

- Have a policy which limits jewelry
- No false nails, nail polish, keep pockets empty above the waist
- Request nails be trimmed short, wear clean clothes, bathe daily
- Drinking water containers: empty, clean and sanitize daily

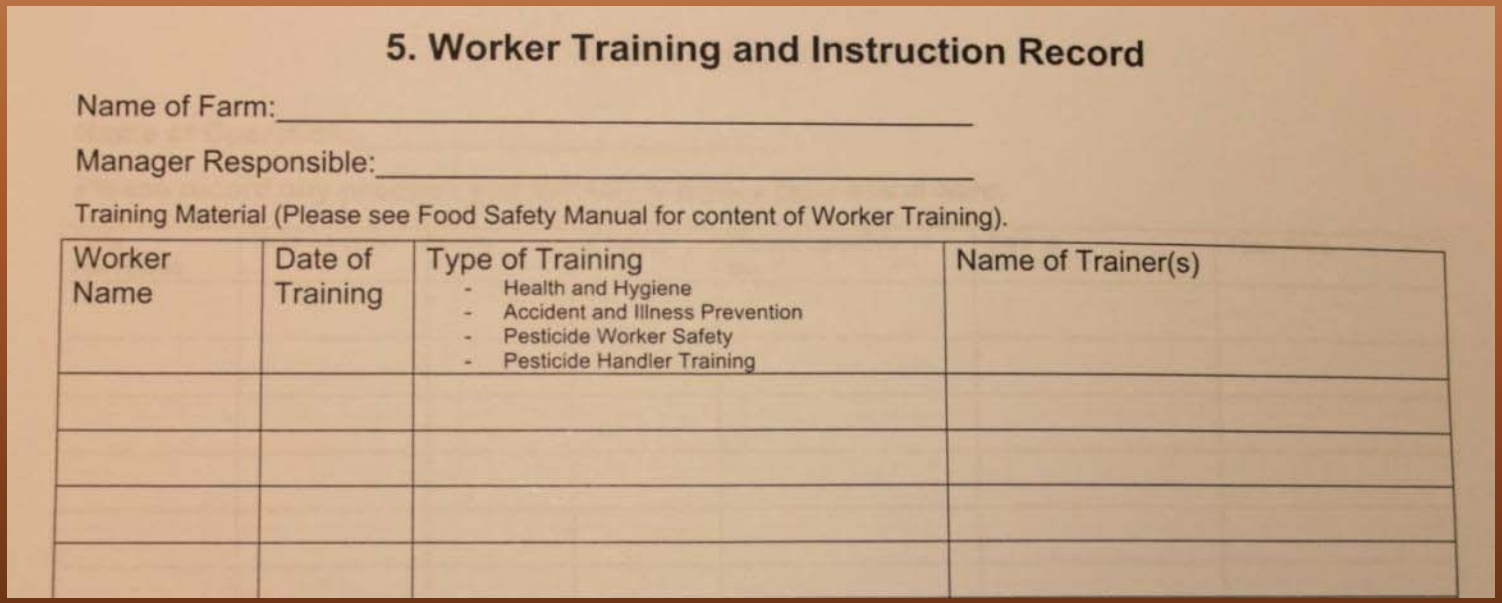
Worker training

- Train everyone!
- Training materials (videos, posters – see resource list)
- Topics:
  - Health and hygiene
  - Illness and accidents
  - Pesticide safety



Training and recordkeeping

- Documentation of worker trainings
- Record maintenance of toilet and handwashing facilities
- Records of illness and injuries



5. Worker Training and Instruction Record

Name of Farm:_____

Manager Responsible:_____

Training Material (Please see Food Safety Manual for content of Worker Training).

Worker Name	Date of Training	Type of Training - Health and Hygiene - Accident and Illness Prevention - Pesticide Worker Safety - Pesticide Handler Training	Name of Trainer(s)

Easy things to reduce risk

- Keep toilet and handwashing facilities clean and easily accessible
- Training and signs showing proper procedures
- Do not allow sick employees to handle produce

FOOD SAFETY

Field Harvesting and Transportation

Post Harvest Water Use

Worker health & hygiene

During harvest, worker health and hygiene policies should be strictly enforced

Potable drinking water in clean containers

During Harvest

- Keep equipment clean and free from oil, grease, broken glass or other contamination
- All contaminated produce is thrown away
- Inspect field and remove glass, metal, dead animals or any other toxic items

Cleaning and sanitizing harvest bins

- See handout for sanitizing procedure

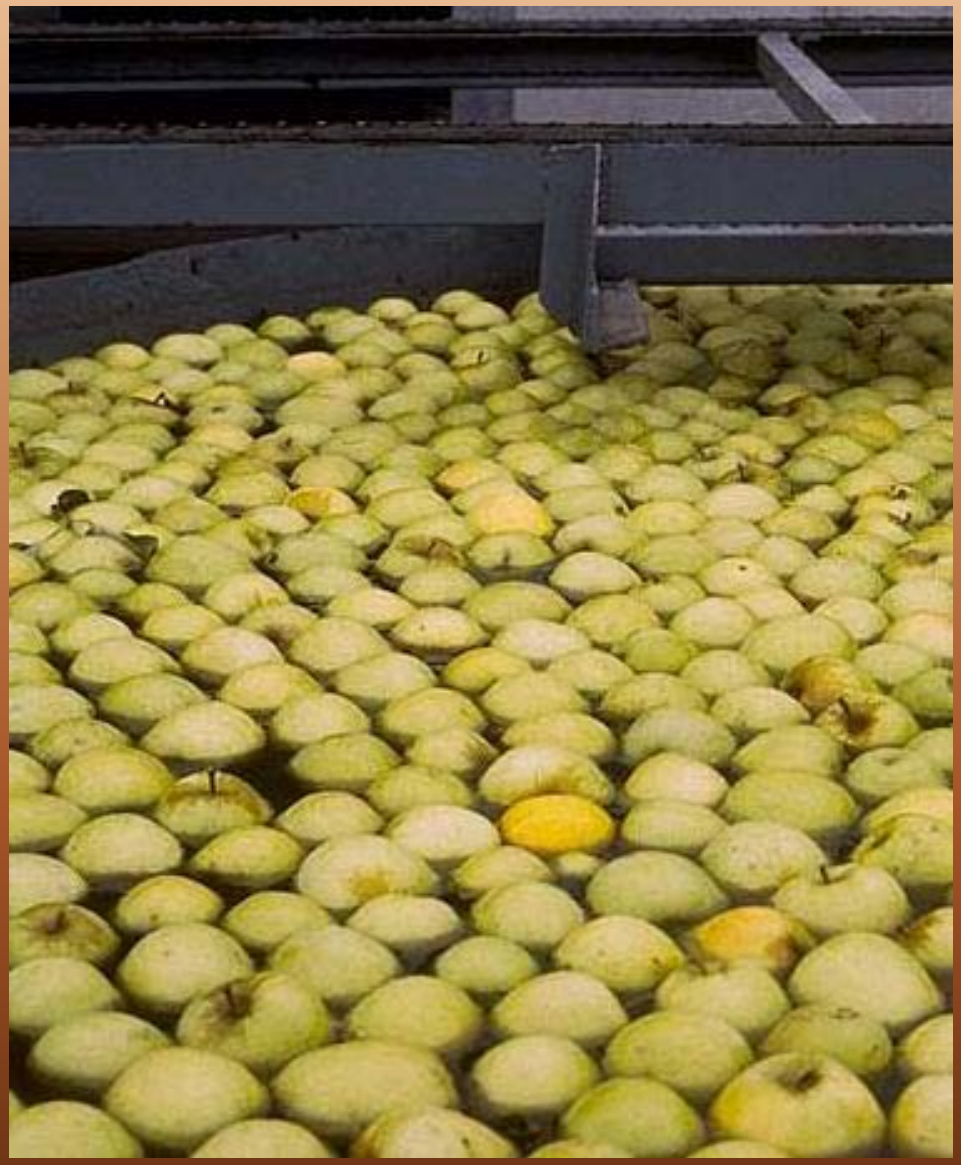
Clean Field Harvesting Equipment

with 1 Tbs. chlorine bleach(5.25%)/gallon

- Step 1: Place harvest containers next to sanitized surface (plastic) that has been pre-rinsed, scrubbed with detergent, rinsed & sanitized.
- Step 2: All buckets are pre-rinsed to remove visible soil.
- Step 3: Buckets will be scrubbed with detergent and rinsed.
- Step 4: Scrub buckets and dip in bleach then air-dried and stack.
- Step 5: Check water with chlorine test strips for proper strength.

- Dispose of wastewater daily away from production areas.
- All cleaning is labeled “Harvest Equipment Only”.
- Workers must wear water proof aprons, rubber gloves, & goggles.
- Maintain a written Farm Cleaning Record

Wash Water



Washing Produce

- Water must be potable or microbially safe
- Wash tanks, tubs and food contact surfaces are cleaned and sanitized regularly
- Chlorine will not sterilize produce

Washing Produce

with chlorine solution

½ tsp. bleach (5.25%) in 6 gallons of water = 5 ppm Use chlorine test strips to determine chlorine content

- Start with potable water - pH of between 6 and 7.5
- Use pH test strips to determine pH
- Change water in the dump tanks at least daily
- Change water when chlorine content is below 5ppm
- Rinse produce with potable water before packaging

Produce Sanitizers

Trevor Suslow
Department of Plant Sciences
Center for Produce Safety Advisory Board & Technical Committee
tvsuslow@ucdavis.edu 530-754-8313

Use of Chlorine on Organic Produce

- Organic growers, shippers, and processors may use chlorine within specified limits
- All forms of chlorine are restricted materials as defined by existing organic standards
- California Certified Organic Farmers (CCOF) recently modified the threshold to permit 10 ppm residual chlorine measured downstream of the wash step
- Growers certified by other agencies should check with their certifying agent

Peracetic Acid

Processing

Identification

Chemical Name(s):
peroxyacetic acid, ethaneperoxic acid

CAS Number:
79-21-0

Other Names:
per acid, periacetic acid, PAA

Other Codes:
NIOSH Registry Number: SD8750000
TRI Chemical ID: 000079210
UN/ID Number: UN3105

Summary Recommendation

Synthetic / Non-Synthetic:	Allowed or Prohibited:	Suggested Annotation:
Synthetic (consensus)	*Allowed (consensus)*	Allowed only for direct food contact for use in wash water. Allowed as a sanitizer on surfaces in contact with organic food. *(consensus)* From hydrogen peroxide and fermented acetic acid sources only. *(Not discussed by processing reviewers--see discussion of source under Crops PAA TAP review.)*

Characterization

Composition:
$C_2H_4O_3$. Peracetic acid is a mixture of acetic acid (CH_3COOH) and hydrogen peroxide (H_2O_2) in an aqueous solution. Acetic acid is the principle component of vinegar. Hydrogen peroxide has been previously recommended by the NOSB for the National List in processing (synthetic, allowed at Austin, 1995).

Properties:
It is a very strong oxidizing agent and has stronger oxidation potential than chlorine or chlorine dioxide. Liquid, clear, and

PEROXYACETIC ACID

$H_2O_2 + CH_2COOH \rightleftharpoons H_3COOH$

Hydrogen Peroxide	Acetic Acid	Peroxyacetic Acid

- Break-down products: acetic acid, O_2, CO_2, H_20

- Permitted dosage (FDA):
  - Cleaning surfaces 85 – 300 ppm
  - Contact with food 85 ppm maximum
    - Typical rates 30-35 ppm

Peroxyacetic Acid (PAA) - Advantages

- Less impacted by organic matter and soil
- Low foaming
- Very good biofilm penetration
- Very good on molds and spores

Peroxyacetic Acid - Disadvantages

- More expensive than hypochlorite at effective dose
- Corrosive to soft metals and skin
- Strong, pungent odor of concentrate and dilute forms (worker discomfort & safety)
- Varied activity against fungi
- Prolonged exposure may cause product damage
  - build up of acetic acid in water
  - may cause sliming, browning, translucency
- Need to monitor water turn-over closely

Transporting Produce

- Vehicles have not carried sewage, manure or hazardous materials
- Keep vehicles clean
- Keep pallets, scales, carts, & forklifts clean

Standard pack = new box

Traceability

Why is Traceability important?

- Reduces public health risk by pinpointing the source of contamination
- So that it can be removed from the food chain

USDA--GAPs Traceability Requirements

- G-1 Documented traceability program has been established
- G-2 Operation has performed a “mock recall” that was proven to be effective
- 1-26 Each production field is identified to enable traceability in event of a recall
- 2-21 Product moving out of the field is uniquely identified to enable traceability in event of recall

How to ensure traceability

- When direct marketing, traceability requires:
  - 1 link back (*suppliers*)
  - 1 link forward (*customers*)
- Record harvest date on every harvest bin as crop is harvested
- If multiple fields of same crop, also record field # & harvest crew

ATS
Advanced Traceability Solutions

ScoringAg
Point-to-Point Traceback™ —— Site-Specific Recordkeeping™

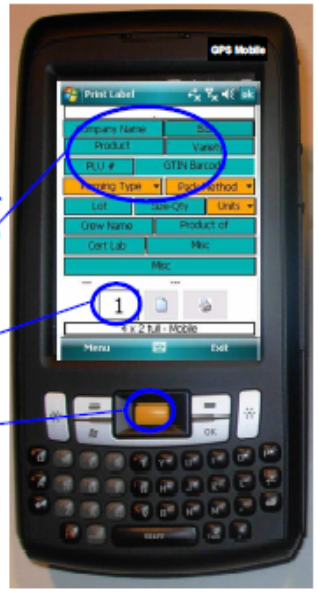
Automated Data Collection & Tracking

GPS Mobile Printing System

Harvest

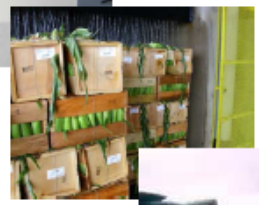
On Demand Labeling of Items & Containers in Exact Location

Without Electricity or Cell tower or Network Available!!



4) Poly Label with 2D barcode is printed in Seconds

5) Affix Label to container



* Easily & Quickly enter info – ANYWHERE in world
* SmartPDA Automatically prints very accurate GPS coordinates, date and time plus user info.
* Durable poly label is easy to read & has *UNIQUE* SN
* Every Container is NOW uniquely marked for traceback
* Special adhesive enables label to stick to any container
* Multiple counterfeit prevention functions

Traceability & Your Farm Map

- Have map of farm showing fields & crops
- Keep map updated
- Ensure that all farm personnel (particularly harvest crews) know codes for different fields
- Field number should be recorded on each harvest bin

Traceability for Farmers Markets

- When selling at farmers market, record:
  - harvest date (& field number, if harvest crop from 1+ fields)
  - crops sold
  - market name & date

- Consumers more likely to remember you if your stall signage is prominent

- Usually impractical to give receipts at farmers markets, but you can have business cards or stickers
  - Some farmers have bags with name & contact information

Traceability for a CSA

- CSA customers have your contact information
- Crops from multiple fields: record harvest date & field number on box, & keep a record by CSA delivery date
- Sourcing from other farms: record source farm by crop and CSA delivery date

Traceability for Farmstands

- Put your name & contact information on receipt
- Record harvest date & field# for crop
- Sourced products: record date & source farm for each crop sold

Traceability For Wholesale

- In California, produce sold through wholesale channels must have:
  - standard container for particular crop
  - farm name & location (printed or sticker)
  - date stamp (actual date or Julian date)
  - required crop name, pack, grade & size
  - can be hand written, printed on stickers, or stamped on box w/hand-held labeling gun

12/2 Bags


Amount and weight of bags
Type of cherry
Row Size
12/2 LBS: ZIP
BAGS
BING
10999366
10 ROW SIZE
Federal State Inspection lot
Net Weight

Traceability For Wholesale

- Placing a label on wrapped pallet is not sufficient.
- Use hand-held labeling gun to code each box: e.g.,lot code – 020-16756170 indicates:
  - 020 = box number
  - 167 = (date harvested) Julian calendar date (such as 167 for June 13) or use the calendar date 613--reserves the first 3 digits for dates
  - 5 = grower
  - 6 = field picked or picker
  - 170 = packing date

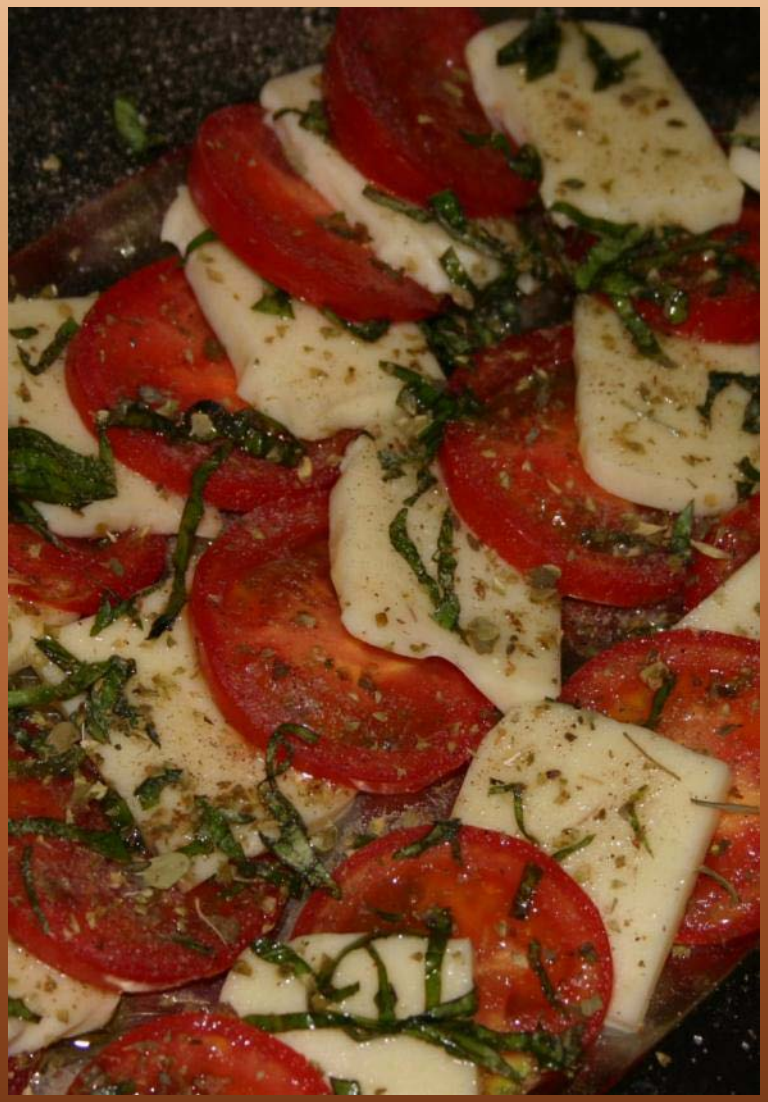
Traceability For Wholesale

- At end of each packing day, record beginning & ending box numbers in book
- Code for these numbers needs to be recorded once & filed
- When you ship products, keep log by box number of which box was shipped where, with shipping date

Name – Address - Phone

Can this be traced back to a specific farm, specific field, and specific date?

Safety: From Field to Table



Self Certification

Farm Safety Manual

[Change, delete, or fill-in parts in yellow highlight, remove highlights]

Good Agricultural Practices (GAPs) Manual

FARM SAFETY MANUAL: ABC FARMS

STANDARD OPERATING PROCEDURES (SOP's)
Checked boxes indicate I have read documentation to support this ☑

Table of Contents

Website:

- Handouts
- Reference materials
- Resources
- GAP's Manual Self Certification

http://cesonoma.ucdavis.edu/SpecialtyCrops/

4 levels of Safety Plan

1. Use common sense “good agricultural practices”
2. Develop a food safety plan for your farm
3. Conduct a self audit (Self Certification)
4. **Become certified by a 3rd-party**

USDA Good Agricultural Practices Good Handling Practices
Audit Verification Checklist

USDA

USDA Audit Verification

USDA Good Agricultural Practices Good Handling Practices
Audit Verification Checklist

USDA

This program is intended to assess a participant's efforts to minimize the risk of contamination of fresh fruits, vegetables, nuts and miscellaneous commodities by microbial pathogens based on the U.S. Food and Drug Administration's *"Guide to Minimize Microbial Food Safety Hazards for Fresh Fruits and Vegetables,"* and generally recognized good agricultural practices.

Firm Name: _____

Contact Person: _____

Audit Site(s): _____

Main Address: _____

City: _____ State: _____ Zip: _____

Telephone No: _____ Fax: _____

E-mail: _____

Auditor (s): (list all auditors with the lead listed first) _____

_____

USDA or Fed-State Office performing audit:

Arrival Date: _____ Time: _____

Departure Date: _____ Time: _____

Travel Time _____ Code _____

Person(s) Interviewed (use back of sheet if necessary to list all persons interviewed) _____

_____

Example Inspection

Food Safety Inspector

SUNNYSIDE PACKING COMPANY

Finest Quality California Fruits and Veget

P.O. BOX
Se
phone (559) 896-
ww

SUNNYSIDE PACKING COMPANY

TRACEBACK POLICY AND PROCEDURES

All product from ranch # 999, is marked with a grower number stamp representing tha

The company, commodity, size, and weight are clearly marked on the carton or contai

Individual labels are adhered in the field that represents the labor crew, julienne date,

ranch field ID. These labels are adhered to each carton or container.

The product is delivered to Sunnyside Packing Company's shed. A grower receipt is giv

detailing the grower name, grower number, date received, commodity, size and quanti

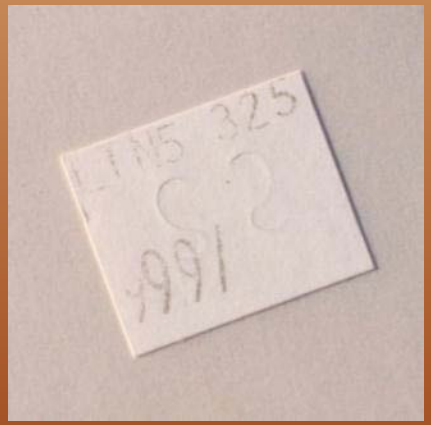
received.

Pallet tags and GTIN labels are adhered to each pallet and and container for further trac

and recall in the case of product contamination. Pallet tags and GTIN can be recalled in

computer database immediately for further traceback.

Written Traceback Policy



All paperwork in order?

USDA Audit Verification

Worker Health & Hygiene

Questions		Points	Yes	NO	N/A	Doc
G-3	Potable water is available to all workers.	10				R
G-4	All employees and all visitors to the location are required to follow proper sanitation and hygiene practices.	10				P
G-5	Training on proper sanitation and hygiene practices is provided to all staff.	15				D
G-6	Employees and visitors are following good hygiene/sanitation practices.	15				
G-7	Employees who handle or package produce are washing their hands before beginning or returning to work.	15				
G-8	Readily understandable signs are posted to instruct employees to wash their hands before beginning or returning to work.	10				
G-9	All toilet/restroom/field sanitation facilities are clean. They are properly supplied with single use towels, toilet paper, hand soap or anti-bacterial soap, and potable water for hand washing.	15				
G-10	All toilet/restroom/field sanitation facilities are serviced and cleaned on a scheduled basis.	10				R

USDA Audit Verification

Questions		Points	Yes	NO	N/A	Doc
G-11	Smoking and eating are confined to designated areas separate from where product is handled.	10				P
G-12	Workers with diarrheal disease or symptoms of other infectious diseases are prohibited from handling fresh produce.	15				P
G-13	There is a policy describing procedures which specify handling/disposition of produce or food contact surfaces that have come into contact with blood or other bodily fluids.	15				P
G-14	Workers are instructed to seek prompt treatment with clean first aid supplies for cuts, abrasions and other injuries.	5				P
G-15	Company personnel or contracted personnel that apply regulated pre-harvest and/or post harvest materials are licensed. Company personnel or contracted personnel applying non-regulated materials have been trained on its proper use.	10				R

USDA Audit Verification

Part 2 - Field Harvest and Field Packing Activities

Field Sanitation and Hygiene

	Questions	Points	Yes	NO	N/A	Doc
2-1	A documented pre-harvest assessment is made on the crop production areas. Risks and possible sources of crop contamination are noted and assessed.	15				D
2-2	The number, condition, and placement of field sanitation units comply with applicable state and/or federal regulations.	10				
2-3	When question 2-2 is answered "N/A" (sanitation units are not required), a toilet facility is readily available for all workers	10				
2-4	Field sanitation units are located in a location that minimizes the potential risk for product contamination and are directly accessible for servicing.	10				
2-5	A response plan is in place for the event of a major spill or leak of field sanitation units or toilet facilities.	10				P

USDA Audit Verification

Field Harvesting and Transportation

	Questions	Points	Yes	NO	N/A	Doc
2-6	All harvesting containers and bulk hauling vehicles that come in direct contact with product are cleaned and/or sanitized on a scheduled basis and kept as clean as practicable.	10				D
2-7	All hand harvesting equipment and implements (knives, pruners machetes, etc.) are kept as clean as practical and are disinfected on a scheduled basis.	10				D
2-8	Damaged containers are properly repaired or disposed of.	5				
2-9	Harvesting equipment and/or machinery which comes into contact with product is in good repair.	10				
2-10	Light bulbs and glass on harvesting equipment are protected so as not to contaminate produce or fields in the case of breakage.	10				

USDA Audit Verification

	Questions	Points	Yes	NO	N/A	Doc
2-11	There is a standard operating procedure or instructions on what measures should be taken in the case of glass/plastic breakage and possible contamination during harvesting operations.	5				P
2-12	There is a standard operating procedure or instructions on what measures should be taken in the case of product contamination by chemicals, petroleum, pesticides or other contaminating factors.	5				P
2-13	For mechanically harvested product, measures are taken during harvest to inspect for and remove foreign objects such as glass, metal, rocks, or other dangerous/toxic items.	5				
2-14	Harvesting containers, totes, etc. are not used for carrying or storing non- produce items during the harvest season, and farm workers are instructed in this policy.	5				P
2-15	Water applied to harvested product is microbially safe.	15				R

USDA Audit Verification

2-16	Efforts have been made to remove excessive dirt and mud from product and/or containers during harvest.	5				
2-17	Transportation equipment used to move product from field to storage areas or storage areas to processing plant which comes into contact with product is clean and in good repair.	10				
2-18	There is a policy in place and has been implemented that harvested product being moved from field to storage areas or processing plants are covered during transportation.	5				P
2-19	In ranch or field pack operations, only new or sanitized containers are used for packing the product.	10				D
2-20	Packing materials used in ranch or field pack operations are properly stored and protected from contamination.	10				
2-21	Product moving out of the field is uniquely identified to enable traceability in the event of a recall.	10				D

USDA Audit Verification

Washing/Packing Line

	Questions	Points	Yes	NO	N/A	Doc
3-3	Source water used in the packing operation is potable.	15				R
3-4	If applicable, the temperature of processing water used in dump tanks, flumes, etc., is monitored and is kept at temperatures appropriate for the commodity.	10				D
3-5	Processing water is sufficiently treated to reduce microbial contamination.	10				D
3-6	Water-contact surfaces, such as dump tanks, flumes, wash tanks and hydro coolers, are cleaned and/or sanitized on a scheduled basis.	10				D
3-7	Water treatment (strength levels and pH) and exposure time is monitored and the facility has demonstrated it is appropriate for the product.	10				D
3-8	Food contact surfaces are in good condition; cleaned and/or sanitized prior to use and are maintained.	15				D
3-9	Product flow zones are protected from sources of contamination.	10				
3-10	The water used for cooling and/or to making ice is potable.	15				R
3-11	Any ice used for cooling produce is manufactured, transported and stored under sanitary conditions.	10				R

USDA Audit Verification

Transportation

	Questions	Points	Yes	NO	N/A	Doc
4-24	Prior to the loading process, conveyances are required to be clean, in good physical condition, free from disagreeable odors, and from obvious dirt/debris.	10				P
4-25	Produce items are not loaded with potentially contaminating products.	10				P
4-26	Company has a written policy for transporters and conveyances to maintain a specified temperature(s) during transit.	10				P
4-27	Conveyances are loaded to minimize damage to product.	5				P

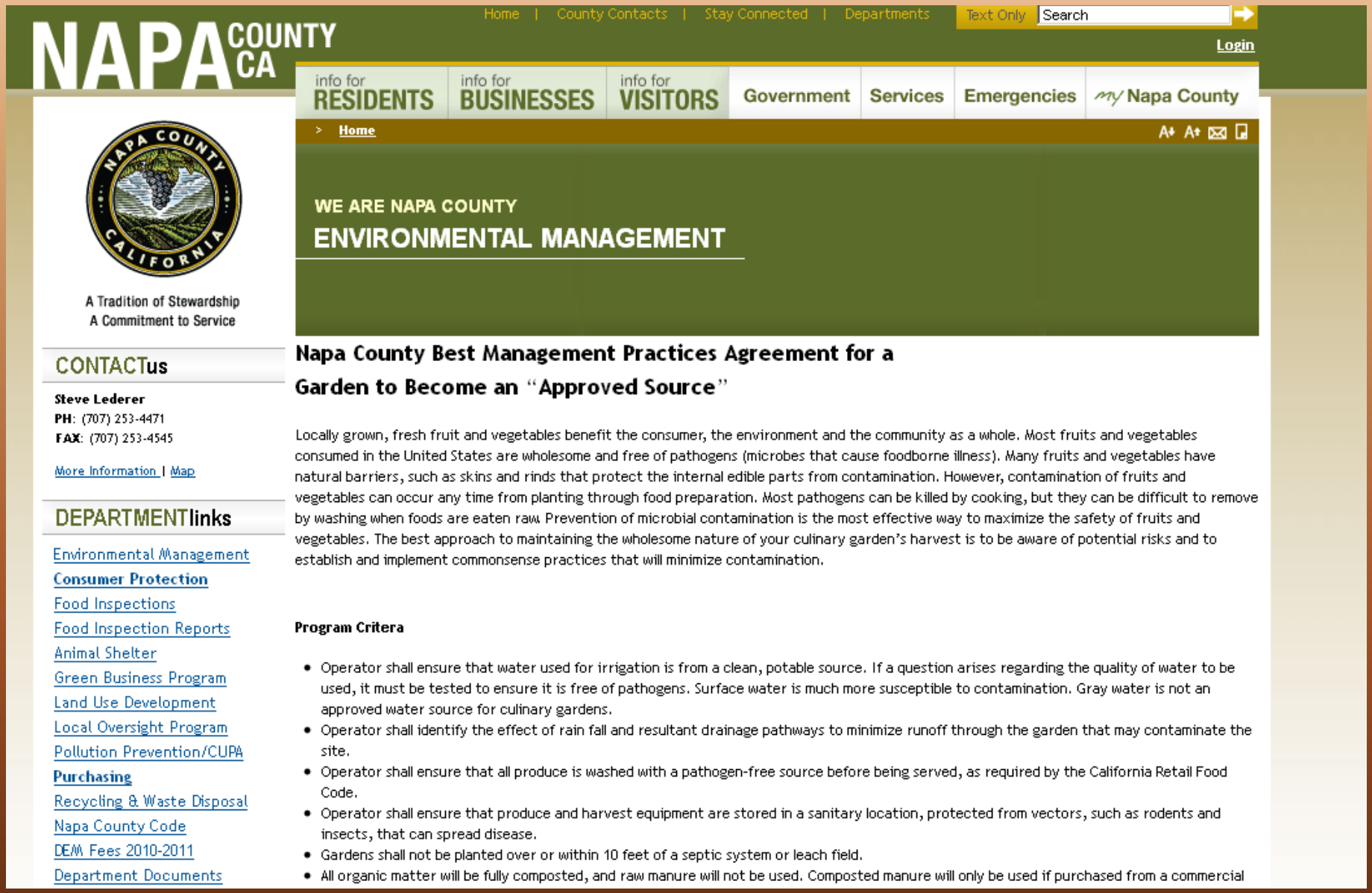
Website Resource

Companies and Agencies that will do 3rd Party Audits

Good Agricultural Practices **(GAP's)**

- ***California Department of Food and Agriculture - Inspection and Compliance***
  Dinuba, California Telephone: 559-595-8000
- ***AIB International –*** *Kansas, Telephone 800-633-5137*
- ***NFS Davis Fresh Technologies –*** *Watsonville, CA Telephone 831-768-7951*
- ***Primus Labs –*** *Santa Maria, CA Telephone (805) 922.0055*
- ***Scientific Certification Systems –*** *Emeryville, CA Telephone 510.452.8024*

Napa Program for Gardeners



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info for RESIDENTS | info for BUSINESSES | info for VISITORS | Government | Services | Emergencies | my Napa County

> Home

A Tradition of Stewardship
A Commitment to Service

CONTACTus

Steve Lederer
PH: (707) 253-4471
FAX: (707) 253-4545

More Information | Map

DEPARTMENTlinks

Environmental Management
Consumer Protection
Food Inspections
Food Inspection Reports
Animal Shelter
Green Business Program
Land Use Development
Local Oversight Program
Pollution Prevention/CUPA
Purchasing
Recycling & Waste Disposal
Napa County Code
DEM Fees 2010-2011
Department Documents

WE ARE NAPA COUNTY
ENVIRONMENTAL MANAGEMENT

Napa County Best Management Practices Agreement for a Garden to Become an "Approved Source"

Locally grown, fresh fruit and vegetables benefit the consumer, the environment and the community as a whole. Most fruits and vegetables consumed in the United States are wholesome and free of pathogens (microbes that cause foodborne illness). Many fruits and vegetables have natural barriers, such as skins and rinds that protect the internal edible parts from contamination. However, contamination of fruits and vegetables can occur any time from planting through food preparation. Most pathogens can be killed by cooking, but they can be difficult to remove by washing when foods are eaten raw. Prevention of microbial contamination is the most effective way to maximize the safety of fruits and vegetables. The best approach to maintaining the wholesome nature of your culinary garden's harvest is to be aware of potential risks and to establish and implement commonsense practices that will minimize contamination.

Program Critera

- Operator shall ensure that water used for irrigation is from a clean, potable source. If a question arises regarding the quality of water to be used, it must be tested to ensure it is free of pathogens. Surface water is much more susceptible to contamination. Gray water is not an approved water source for culinary gardens.
- Operator shall identify the effect of rain fall and resultant drainage pathways to minimize runoff through the garden that may contaminate the site.
- Operator shall ensure that all produce is washed with a pathogen-free source before being served, as required by the California Retail Food Code.
- Operator shall ensure that produce and harvest equipment are stored in a sanitary location, protected from vectors, such as rodents and insects, that can spread disease.
- Gardens shall not be planted over or within 10 feet of a septic system or leach field.
- All organic matter will be fully composted, and raw manure will not be used. Composted manure will only be used if purchased from a commercial

Sonoma County Approved Produce Grower Certificate *DRAFT* 3.29.12

Jana Hill

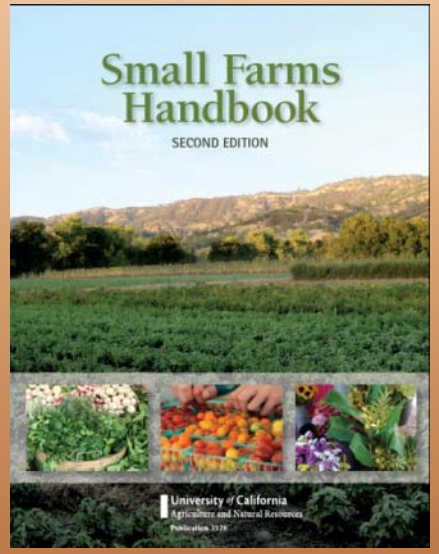
Health Information Specialist
Sonoma County Dept of Health Services
707-565-6642
jhill@sonoma-county.org

Resources

FREE PUBLICATIONS

- Good agricultural practices (GAPs) http://ucanr.org/uc_gaps
- Las Publicaciones en Español (in Spanish) http://ucanr.org/gaps_espanol
- Post-harvest chlorination http://ucfoodsafety.ucdavis.edu/files/26414.pdf
- Water disinfestation for pre-harvest and post-harvest applications http://anrcatalog.ucdavis.edu/pdf/7256.pdf
- Post-harvest handling of organic crops http://ucfoodsafety.ucdavis.edu/files/26413.pdf

ANR 3526 • Small Farm Handbook • Chapter 8



Postharvest Handling and Safety of Perishable Crops

Trevor Suslow, Elizabeth Mitcham, and Marita Cantwell

Faber, B. and L. Tourte (eds). In press. Small Farm Handbook. University of California, Division of Agriculture and Natural Resources, Oakland, CA. Publication 3526.

ANR 3509 • Organic Vegetable Production Manual • Chapter 8

Postharvest Handling for Organic Vegetable Crops

Trevor Suslow

McGiffen, M. E. In press. *Organic Vegetable Production Manual.* University of California, Division of Agriculture and Natural Resources, Oakland, CA. Publication 3509.