

# Produce Safety Grower Training

**Understanding FSMA:  
Food Safety Modernization Act**

**The law for the prevention of  
foodborne illness outbreaks in the U.S.**



Ashley Jeppson, Jake Dick, Adriana Marin-Herrera  
Agriculturists

January 2019

# What is FSMA?

- Signed into law in 2011
- **Objective:** to prevent food contamination for humans and animals in the U.S., specifically regarding raw produce
- It requires **inspections** and keeping **records**
- Learning each time is what counts, and preventing the next one is even better!
- **It can change over time**



# Prevention Vs. Reaction

FSMA has 5 foci:

- **Water** sources for agricultural use
- Intrusion of **animals** in the agricultural area
- Soil **amendments**
- **Worker education** about the hygiene and sanitation needed for a healthy agriculture
- Food-contact surfaces

# Who falls under FSMA?

Who is regulated by the FSMA PSR?

These new regulations impact produce farms and packing houses of a designated size (produce sales more than **\$26,999** on average over a **three** year period with distribution more than **275 miles** from the facility or outside the state; **or** all farm sales more than **\$500,000** with product distribution **outside the state** or more than 275 miles from the farm) that handle crops **commonly consumed raw** such as leafy greens, melons, microgreens and tomatoes.

# Why do outbreaks happen?

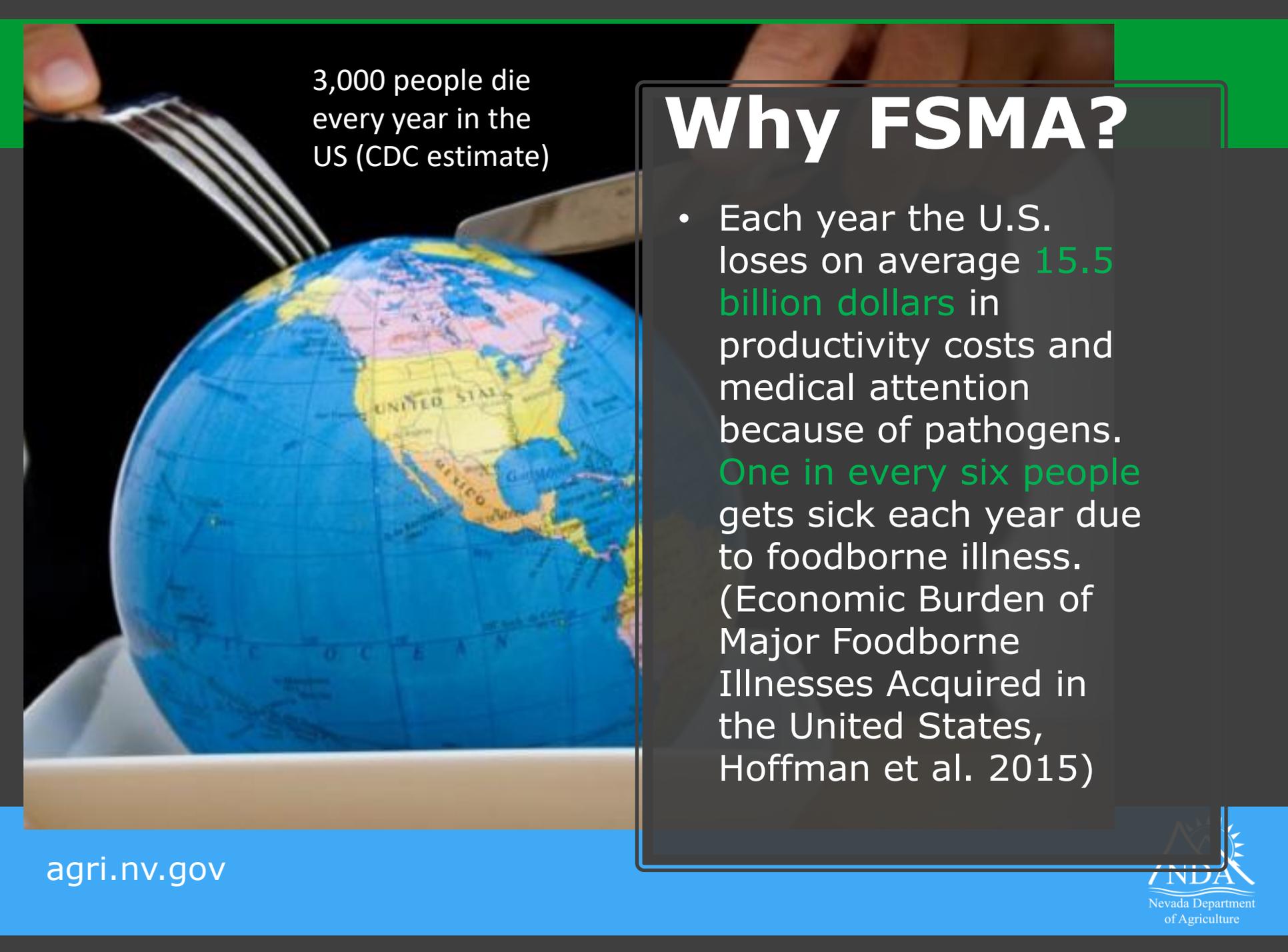
- Absence of education on **microbes** lead to mixing water from non-potable sources, sometimes causing death.
- In many parts of the world this **problem still happens** due to the **inexistent or fragile infrastructure** that fails to separate the waste water from the potable water and because of **lack of hygiene** education.



# Before...

- We would wait for an outbreak to happen to start investigating the source of the problem. This **lost time** meant:
- **Loss of lives** or many hospitalizations (quality of life).
- **Economy loss** by absence to work and when people decide not to buy any product related to the same name of the product recalled, therefore causing:
- **Decrease in jobs** while the farm owners try to balance the lost income.





3,000 people die  
every year in the  
US (CDC estimate)

# Why FSMA?

- Each year the U.S. loses on average **15.5 billion dollars** in productivity costs and medical attention because of pathogens. **One in every six people** gets sick each year due to foodborne illness. (Economic Burden of Major Foodborne Illnesses Acquired in the United States, Hoffman et al. 2015)

# In the present and in the future there is FSMA

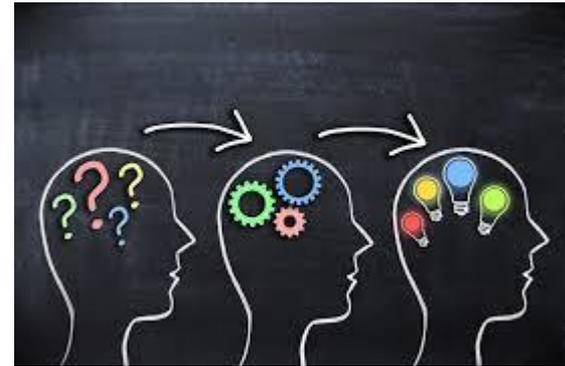
- Goal:

To get the agricultural industry to have **records** in order to **trace** through the processes of harvesting, treatment, packaging and manufacturing up to the sale of the product to the store and to the client, any **outbreak** case in a **reasonable and effective time** to prevent death or further contamination to other people or animals.



# Locally...

- Nevada Department of Agriculture (NDA) has **resources to develop a regulative and educational program** about FSMA to help growers and their employees become more aware of the security of their products and to comply with the law.



# Who does outbreaks affect the most and why?

- The **most vulnerable** lives are infants, children, elderly, and people who have fragile immune systems (pregnant women, organ transplant patients, HIV patients...)
- **Increasing degree of production and automatization:** necessity to make food transitions safer.
- **Local and/or organic** food can also be contaminated.
- Even if we grow our own food, there are **basic steps to keep it safe.**

**This is for our future!**





# THE FOOD SAFETY MODERNIZATION ACT AFFECTS WORKERS, FARMERS AND CONSUMERS!

[agri.nv.gov](http://agri.nv.gov)



# FSMA

- This law affects all U.S. and also those countries that want to sell their products to the U.S.
- It will be fully implemented by January 2020.
- This presentation focuses on education and outreach, which is key to creating a most effective prevention system.

# What we will talk about...

- **Statistics on food outbreaks**
- **Agricultural Water**
- **Cross-contamination**
- **Alaska Farmers' Market Case**
- **Useful forms for documentation**
- **Desert Farming Initiative (DFI)**
  
- What are **pathogens**, where do we find them and how do they get transferred?
  
- How to use **tools**, personal protection equipment, and chemicals properly to prevent contamination
  
- **Hygiene** practices, records and routine checks
  
- How to be **aware** of possible means of contamination and how to **report** them
  
- How to **appreciate** the employee who prevents and applies team work

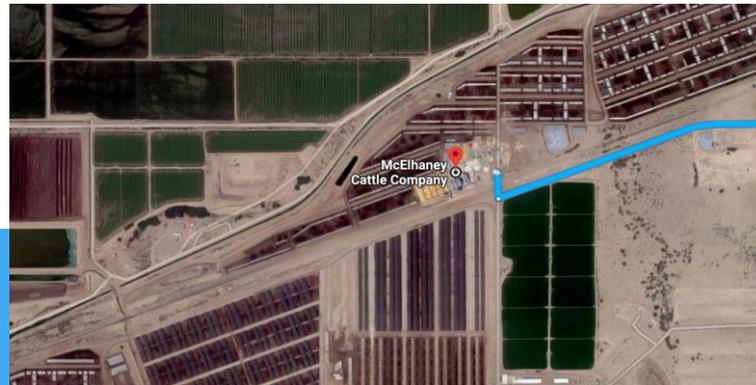
# Food Outbreaks: manure, animal intrusion...freeze and wind factors

Some of the most recent outbreaks have been traced back to *E.coli* from cattle feedlots. (NPR Aug. 29, 2018)

"*E. coli* bacteria live in cattle. The FDA thinks that *E. coli* in manure from these cattle probably washed into the irrigation ditch, or blew into it, and water carried those bacteria into vegetable fields."

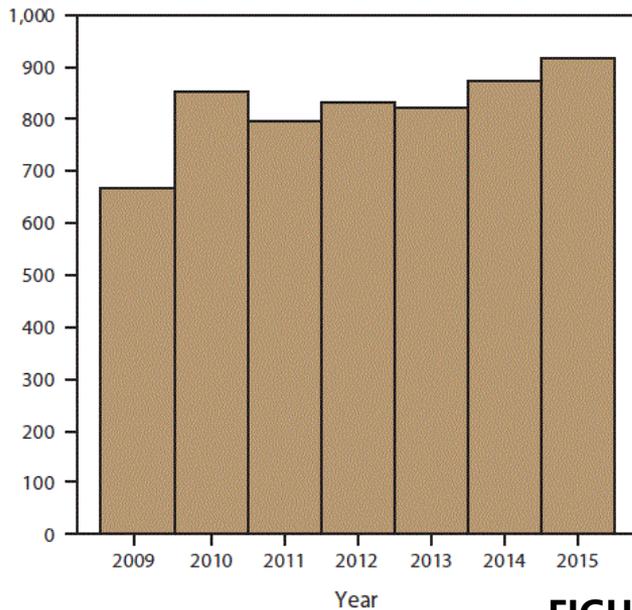
Still, "irrigation water doesn't typically **touch** the lettuce leaves, so how did the contamination happen? Why did it affect **romaine lettuce and not the other** kinds of lettuce and vegetables growing in those fields? And what happened this **spring**? After all, the **cattle have been there for decades**."

Possible Theory: "**dust** from the feedlot might have blown in the wind and settled on romaine leaves that had been damaged by an **unusual freeze**, causing the leaves to "blister." Perhaps, she says, those damaged leaves were particularly vulnerable to *E. coli* contamination."

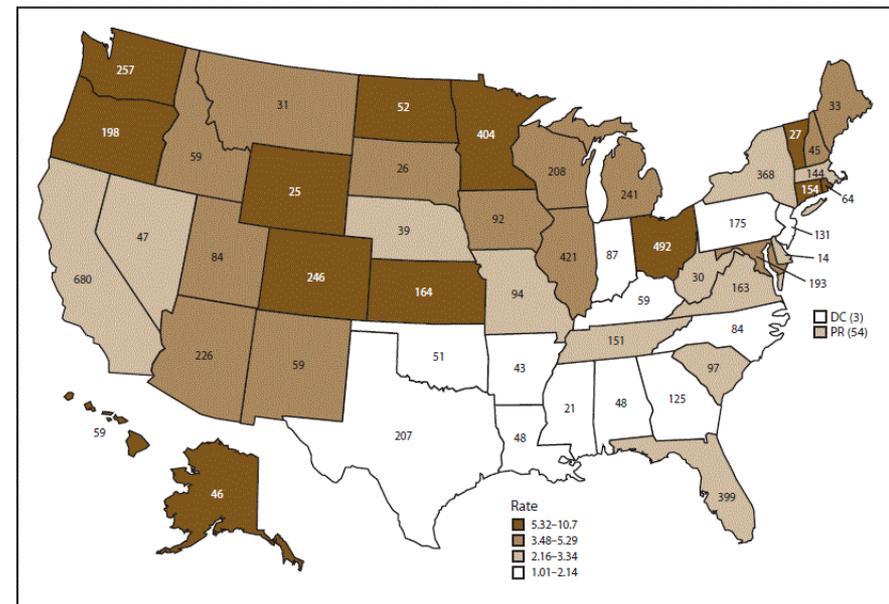


# Food Outbreaks

**Technology is helping:** Whole-Genome Sequencing (WGS) is revolutionizing our understanding of the bacterial genome and is increasingly being used to improve food safety. WGS has been used...to trace the source of outbreaks. (Institute for Food Safety & Health)



**FIGURE 1. Number of foodborne disease outbreaks, by year — Foodborne Disease Outbreak Surveillance System, United States and Puerto Rico, 2009–2015**



**FIGURE 2. Number\*and rate<sup>†</sup> of reported foodborne disease outbreaks — Foodborne Disease Outbreak Surveillance System, United States and Puerto Rico 2009–2015**

# What are pathogens?

- Pathogens are microscopic **living** organisms. They are so tiny we cannot see them with our naked eye.
- This “**invisibility**” is why they can be so dangerous.
- Pathogens can **reproduce very rapidly** in perfect conditions, such as humidity or heat.



## Bacterial Growth (under ideal conditions)

Note: it only takes 30,000 to 32,000 bacteria to give food poisoning to an average human being!

0.1 Hour	1
1 Hour	16
2 Hours	256
3 Hours	1,100
4 Hours	4,096
5 Hours	65,536
6 Hours	1,048,576
7 Hours	16,777,216
8 Hours	536,870,912



*If happy, they could go from 1 to over 1/2 billion in 8 hours!*

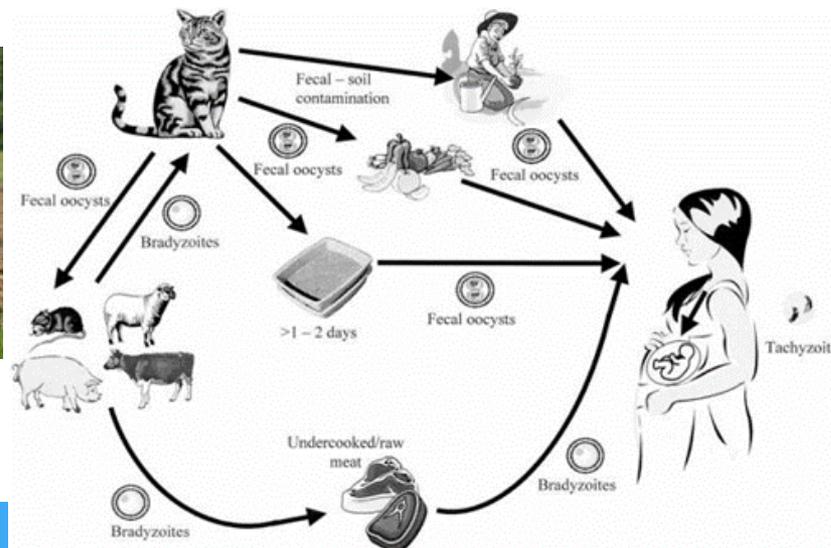
CRICOS Provider Code: 01505M  
RTO Number: 3045

DHS V3 2011



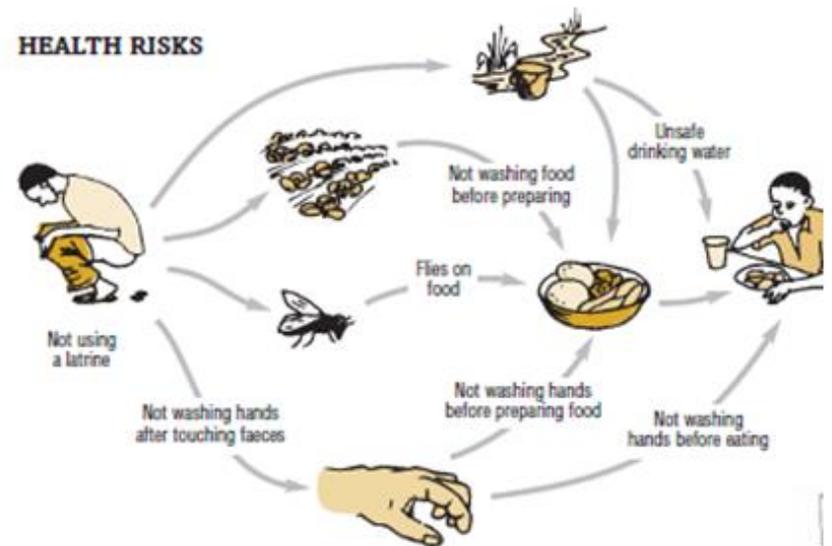
# Where do they live? How do they get transferred?

- Inside our bodies they **can take hours, days or weeks to cause illness**. This makes us **transfer** them to others **inadvertently** before we know we are sick.
- Pathogens can live in animal intestines too.
- **Domesticated animals** can have more pathogens harmful to humans because of their proximity to us.
- **Manure** used to fertilize soil can also have pathogens. Wind, rain, or a flood can also help spread them.



# Ways of transmission

- When animals or people **excrete**, pathogens come out of their bodies and can be **active** in the excrement for a **long time** before dying.
- During this time if someone or something related to agriculture (a worker, a box, a tool, or another animal) **touches** it, it gets **contaminated**.
- **Another way of transferring** pathogens is when a person vomits, coughs, or any other bodily fluid comes out and touches another bodily fluid of another person.



# Animal Intrusion



# Co-Management: Striking a Balance

- Farmers **must** address food safety requirements, but **should** keep the conservation of natural resources in mind
- Farmers also have stewardship, aesthetic, and business objectives of their own
- Co-management considers both food safety and conservation of natural resources

# Detering Wildlife

## Decoys



## Fencing & Netting



# Deterring Wildlife

## Visual Deterrents



## Noise Deterrents

## Tactile Repellent

## Relocation



# Soil amendments

- **Soil amendments are any chemical, biological, or physical materials intentionally added to the soil to improve and support plant growth and development**
- **May reduce soil erosion and sediment runoff**
- **Many different types of soil amendments are available**
- **Soil amendments can present produce safety risks**
- **Assessing risks and implementing GAPs can reduce risks**

# Soil Amendments & Food Safety Risks

- **Biological soil amendments, especially those that include untreated (raw) manure, pose significant microbial risks**
- **Synthetic (chemical) soil amendments can also impact food safety, if not prepared and applied properly**
- **Risks should be assessed when selecting and applying all soil amendments on produce fields**

# Assessing Your Risks

- **What type of soil amendments do you use?**
  - Raw manure, composted manure, chemical, etc.
- **What crops receive soil amendments?**
  - Fresh produce or agronomic crops
- **When do you apply them?**
  - Days to harvest, time of year
- **How do you apply them?**
  - Incorporated, injected, surface applied
- **How much and how often do you apply them?**
  - Excessive application can lead to environmental impacts

# Soil Amendments Supplied by a Third Party

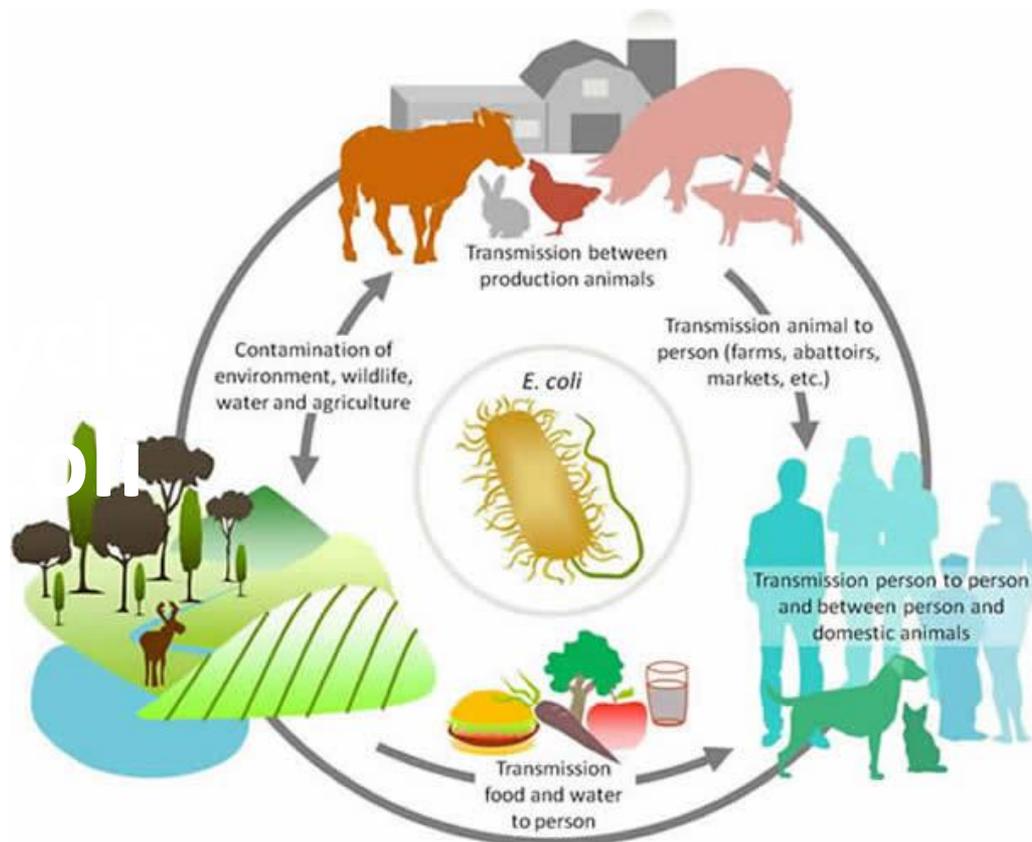
## **Documentation should be kept of:**

- The name and address of the supplier
- What soil amendments were purchased
- The date and amount purchased
- Lot information, if available

## **Documentation must be collected from the supplier:**

- To ensure the supplier has used scientifically validated treatment processes and monitoring during the production of the treated amendment (including compost)
- To ensure proper handling requirements have been met

# E. Coli Life Cycle



# Agricultural Water

**Definition:** Water used in contact with produce during growth and harvest. It must be safe and of adequate sanitary quality for its intended use. No detectable generic *E. coli* in 100 mL of sample!

**Examples:** irrigation, fertigation, foliar sprays, frost protection, dust abatement...

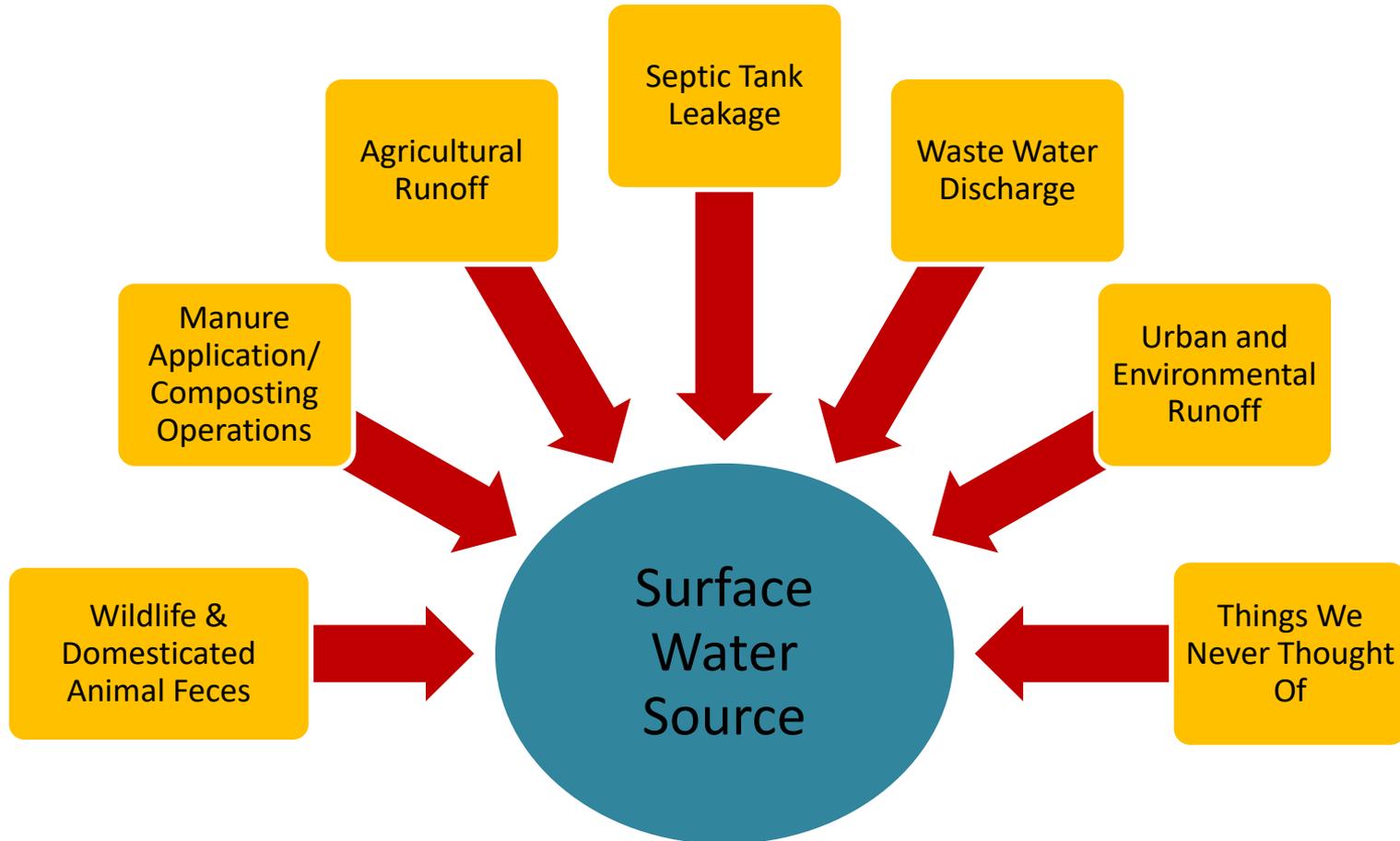
## Think about it and through it...

1. Production water source and quality (public, ground, surface? Testing and sampling location?)
2. Application method (contact harvestable portion?)
3. Timing of application (planting or close to harvest?)

**Inspect:** well, land slopes, backflow, animal access, irrigation methods, map water distribution systems

- Know where and how to collect **samples**. Which **labs** do the job required by FDA?
- Know how to perform **corrective measures** before you have to do so.
  - **Learn how to do a water quality profile:** determine if corrective measures are needed (GM and STV criteria) *E. coli* is indicator in FSMA PSR:
  - **126 or less** colony forming units (CFU) generic *E. coli* per 100 mL water geometric mean (GM)
  - AND**
  - **410 or less** CFU generic *E. coli* per 100 mL water statistical threshold value (STV)
- **Be aware of die off:** desiccation, sunlight, temperature and humidity, starvation and competition.

# Potential Sources of Water Contamination





# Microbial Water Quality Profile: Survey of Surface Water Sources

Source	Initial and Annual Testing Requirement
Surface	20 or more times over a period of 2 to 4 years 5 or more samples rolled into profile every year after initial survey

- Profile samples must be representative of use and must be collected as close in time as practicable to, but before, harvest



# Microbial Water Quality Profile: Survey of Ground Water Sources

Source	Initial and Annual Testing Requirement
Ground	4 or more times during the growing season or over the period of a year 1 or more samples rolled into profile every year after initial year

- Profile samples must be representative of use and must be collected as close in time as practicable to, but before, harvest



# Requirements for Public Water Sources

Source	Testing Requirement
<b>Public Water Supply</b>	Copy of test results or current certificates of compliance

- With appropriate documentation, there is no requirement to test water that meets the requirements for public water supplies.



# Microbial Water Quality Profile: Surface Water

## START:

Establish initial water quality profile  
At least 20 samples over 2-4 years



## ANNUALLY AFTER START:

Collect at least 5 samples for analysis  
Insert annual data into rolling data set



## IF YOUR WATER CHANGES:

If the water quality profile no longer represents the quality of the water source, establish a new profile

## IF YOUR PROFILE DOES NOT MEET GM OR STV CRITERIA:

As soon as practicable and no later than the following year, discontinue use of the water unless an allowed corrective measure is applied



## ALLOWED CORRECTIVE MEASURES:

1. Apply a time interval to allow die-off (before harvest or end of storage) or removal
2. Re-inspect the water system, identify problems, and make necessary changes
3. Treat the water



# Microbial Water Quality Profile: Ground Water

## START:

Establish initial water quality profile  
At least **4 samples over 1 year**



## ANNUALLY AFTER START:

Collect at least **1 sample** for analysis  
Insert annual data into rolling data set



## IF YOUR WATER CHANGES:

If the water quality profile no longer represents the quality of the water source, establish a new profile

## IF YOUR PROFILE DOES NOT MEET GM OR STV CRITERIA:

As soon as practicable and no later than the following year, discontinue use of the water unless an allowed corrective measure is applied



## ALLOWED CORRECTIVE MEASURES:

1. Apply a time interval to allow die-off (before harvest or end of storage) or removal
2. Re-inspect the water system, identify problems, and make necessary changes
3. Treat the water

# Is this Agricultural Water?



**Citrus**



**Drip irrigation**

**SUPPLEMENTAL MATERIAL**

# Is this Agricultural Water?



**Apples**



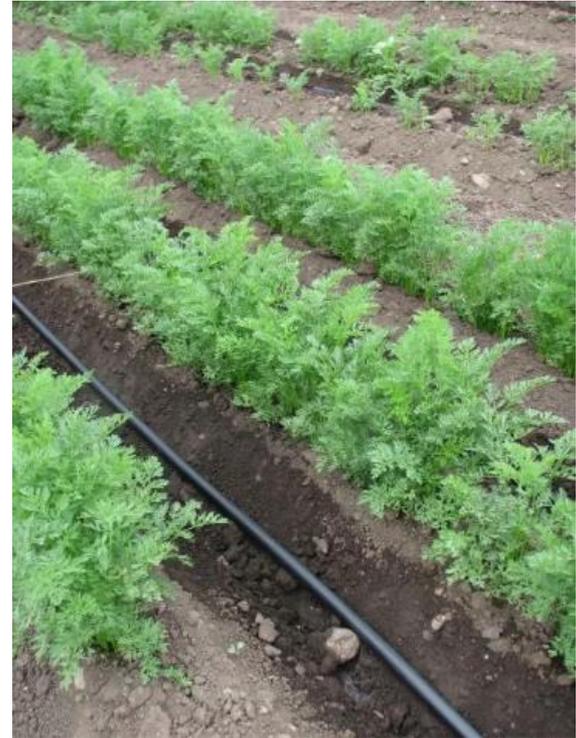
**Pesticide application**

**SUPPLEMENTAL MATERIAL**

# Is this Agricultural Water?



**Carrots**



**Drip irrigation**

**SUPPLEMENTAL MATERIAL**

# Cross-contamination

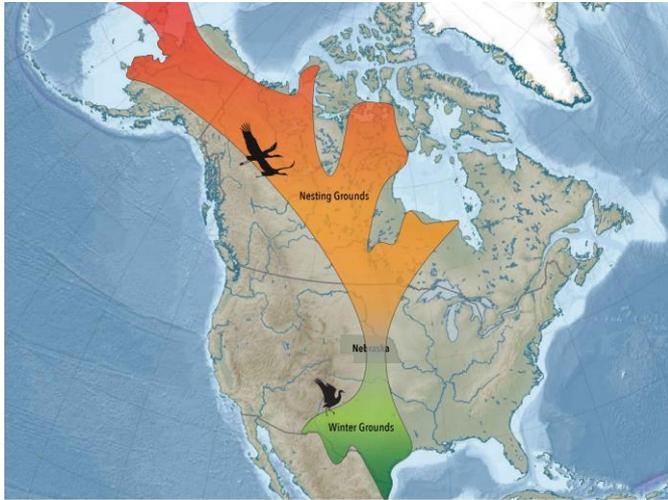
## **Pathogens can be introduced by:**

- other produce,
- ice,
- containers,
- visitors,
- pets,
- water,
- food contact surfaces,
- conveyor belts,
- workers' hands,
- clothes,
- aprons,
- shoes,

- Tools (such as shovels used for cleaning feces and not marked or cleaned and sanitized)
- Cutting boards & utensils (separate vegetables from meats)
- Transportation vehicles (coming from one field to another or not cleaned before)

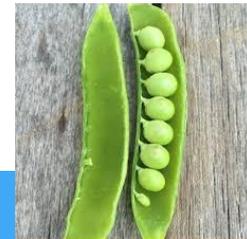
**Be aware of:** infiltration to pulp (changes in temperature), turbidity, pH, used water disposal, antimicrobial/sanitizer..

# Example of food outbreak at a farmers' market



In 2008, a farm in Alaska participated at a Farmers' Market. It gave pea samples to sellers who **repackaged** them and left out cooking instructions.

- **Germ:** Campylobacter
- 98 people sick, 5 hospitalized, no deaths.
- 1 patient had **Guillain-Barre syndrome:** paralysis, 31 days hospitalized, neurologic rehabilitation.
- **Cause:** wildlife refuge nearby, cranes in fields during harvest.



# Useful Forms/Records

## These are some forms that might help keep outbreaks away:

- Mock Recall Record
- Pest/Rodent Control Log
- Water Source Inspection Log
- Water Testing Log
- Qualified Exemption Review
- Worker Training Record
- Water System Inspection Record
- Water Treatment Monitoring Record
- Agricultural Water Die-Off Corrective Measures Record
- Compost Treatment Record
- Food-contact Surfaces Cleaning and Sanitizing Record
- Site Selection Review
- Soil Amendment Application
- Washing/Cooling/Sanitizing Water Treatment Log
- Pre-Harvest Field Assessment Log
- Wildlife and Domestic Animal Monitoring Log
- Field Sanitation Unit Service Log
- Illness/Injury Reporting Log
- Restroom Monitoring and Cleaning Log
- Pesticide Application Log
- **Log of the Log...But it is worth it in case of an outbreak!**



# Recordkeeping

- Keep required records such as:
  - Findings of the inspection of water system
  - Water test results
  - Monitoring of water treatments
  - Corrective measures taken, if any
  - Scientific data or information to support compliance including treatment, calculations, and testing
  - Scientific data or information to support alternative indicators, criteria, or sampling frequencies

# Desert Farming Initiative

**NDA is partnering with DFI to provide:**

- Education,
- Technical training, and
- One-on-one assistance

**And to help producers implement produce safety programs.**

Both organizations will be encouraging **all farms** to adopt best practices for minimizing microbial contamination when growing and handling produce.

**More information about developing a farm food safety program:**

Jill Moe, DFI

[jmoe@cabnr.unr.edu](mailto:jmoe@cabnr.unr.edu)

775-682-9782

## The use of tools, chemicals, and personal protection equipment

- **To clean is not the same as to disinfect.** We must first clean with water and soap and then disinfect and let it air dry.
- **Clothes** can get contaminated in different facility areas.
- **Chemicals** should be used according to their labels **ONLY**: these are the law.
- **Materials to protect yourself from chemicals** should be properly used. For example, if the chemical corrodes vinyl gloves, another kind of glove should be used. Follow the label.



<https://iaspub.epa.gov/apex/pesticides/f?p=CHEMICALSEARCH:1:0::NO:1::>

# How to read a label

- A **pesticide** is a substance used to prevent, destruct, mitigate or repel pests. Microorganisms such as bacteria and viruses are also pests, while they are not found on live people or animals.
- “It is a **violation of federal** law to use this product in a way inconsistent with its label.”
- **Companies** register their products with the Environmental Protection Agency (EPA) and it experiments to confirm what the company claims.
- There are **organizations** that work with EPA investigating, reporting and making sure the products are being used like they should.

Who is in charge of pesticide applications?

When will the worker be able to re-enter the application place?

What are the indicated uses?



**DISINFECTING WIPES,**

Toallitas Desinfectantes,

**Kills 99,999% of Bacteria\***

**Kills Cold & Flu Viruses†**

**Kills Staph,‡ E. coli,§ MRSA,†† Salmonella,‡‡ Strep.§§**

\* *Staphylococcus aureus*, *Klebsiella pneumoniae*  
† Human Coronavirus, Influenza A2 Virus  
‡ *Staphylococcus aureus*, § *Escherichia coli* O157:H7  
†† Methicillin-resistant *Staphylococcus aureus*  
‡‡ *Salmonella enterica*, §§ *Streptococcus pyogenes*

**TO OPEN PACKAGE:**



Pull out wipe from center of roll. Next sheet pops up automatically. Close lid to retain moisture.

**SPECIALLY FORMULATED FOR A VARIETY OF SURFACES**



STAINLESS STEEL



FINISHED HARDWOOD



MIRRORS & GLASS

**Directions for Use:** It is a violation of Federal law to use this product in a manner inconsistent with its labeling. **Not for cleaning or sanitizing skin. Do not use as a diaper wipe or for personal cleansing.** **To Disinfect:** Use to disinfect hard, nonporous surfaces. Wipe surface to be disinfected. Use enough wipes for treated surface to remain visibly wet for 4 minutes. Let surface dry. For highly soiled surfaces, clean excess dirt first. **To Clean and Remove Allergens:** Wipe surface clean with Clorox® Disinfecting Wipes. Let air dry. **To Sanitize:** Use to sanitize/deodorize hard, nonporous non-food contact surfaces. Wipe surface. Use enough wipes for treated surfaces to remain visibly wet for 10 seconds. Let surface dry. For highly soiled surfaces, clean excess dirt first. For surfaces that may come in contact with food, a potable water rinse is required. This product is not for use on dishes, glassware or eating utensils. Clorox® Disinfecting Wipes, will not harm most surfaces, including acrylic, sealed fiberglass, sealed granite, finished hardwood and vinyl. **Not recommended for use on unpainted wood and unfinished, unsealed, unpainted, waxed, oiled or worn surfaces. Test a small area first.**

**Modo de Empleo:** El uso de este producto de una manera diferente a la especificada en la etiqueta constituye una violación a la ley federal. **No es para limpiar ni sanear la piel. No use como toallita para limpiar a un bebé ni para limpieza personal.** **Para Desinfectar:** Use para desinfectar superficies duras y sin poros. Limpie la superficie que se va a desinfectar. Use suficientes toallitas para que la superficie tratada permanezca visiblemente mojada durante 4 minutos. Deje secar la superficie. Para superficies muy sucias, limpie primero el exceso de mugre. **Para Limpiar y Quitar Alérgenos:** Limpie la superficie con las Toallitas Desinfectantes, de Clorox.® Deje secar al aire. **Para Sanitizar:** Use para sanitizar y desodorizar superficies duras, sin poros y que no entran en contacto con los alimentos. Limpie la superficie. Use suficientes toallitas para que las superficies tratadas permanezcan visiblemente mojadas durante 10 segundos. Deje secar la superficie. Para superficies muy sucias, limpie primero el exceso de mugre.

**PRECAUTIONARY STATEMENTS: HAZARDS TO HUMANS AND DOMESTIC ANIMALS.**

**CAUTION:** Causes moderate eye irritation. Avoid contact with eyes or clothing. Wash thoroughly with soap and water after handling. **FIRST AID: IF IN EYES:** Hold eye open and rinse slowly and gently with water for 15–20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center for treatment advice. Have the product container or label with you when calling a poison control center or doctor, or going for treatment. For further information, call (800) 227-1860. **PHYSICAL OR CHEMICAL HAZARDS:** Do not use or store near heat or open flame.

**STORAGE AND DISPOSAL:** Dispose of wipe in trash after use. Do not flush. Tightly close lid between uses to retain moisture. Nonrefillable container. Do not reuse or refill this empty container. Offer empty container for recycling. If recycling is not available, discard container in trash.

**DECLARACIONES PREVENTIVAS: RIESGOS PARA LOS SERES HUMANOS Y ANIMALES DOMÉSTICOS.**

**PRECAUCIÓN:** Causa irritación moderada a los ojos. Evite el contacto con los ojos o la ropa. Lávese bien con agua y jabón después de usar. **PRIMEROS AUXILIOS: CONTACTO CON LOS OJOS:** Mantenga los ojos abiertos y enjuague con agua lentamente, con cuidado, durante 15–20 minutos. Si hay lentes de contacto, retírelos después de los primeros 5 minutos, luego continúe enjuagando los ojos. Llame a un centro de control de envenenamiento para obtener asesoría sobre el tratamiento. Cuando llame a un centro de control de envenenamiento o a un médico, o intente obtener tratamiento, tenga a la mano el envase o la etiqueta del producto. Para más información, llame al (800) 227-1860. **RIESGOS FÍSICOS O QUÍMICOS:** No use ni almacene cerca del calor o llamas.

CONTAINS NO PHOSPHORUS./NO CONTIENE FÓSFORO.

**Questions or Comments?/¿Preguntas o Comentarios?** Please visit/ Por favor visite [www.clorox.com](http://www.clorox.com) or call/o llame al (800) 227-1860. For more product ingredient information, visit [www.IngredientsInside.com./](http://www.IngredientsInside.com/) Para obtener más información acerca de los ingredientes del producto, visite [www.IngredientsInside.com.](http://www.IngredientsInside.com.)

**Mfd. for The Clorox Company, 1221 Broadway, Oakland, CA 94612. © 2008, 2015**  
Made in the U.S.A./Hecho en los EE. UU. Clorox is a registered trademark of The Clorox Company.  
EPA Reg. No. 5813-79. EPA Est. No. 56952-WI-1 (RK); 8251-WI-2 (KW), WI-3 (KV), WI-5 (UQ); 52631-NJ-1 (UW); 62401-NJ-1 (JW); 50757-WI-1 (VN). Beginning of batch code indicates Est. No.



Is Personal Protection Equipment (PPE) required?

The ratios are law, not recommendations. They are based on science.

# The tools

- **Tools should be separated** for different uses, for example, to clean the restroom versus to clean the area where we cut vegetables.
- Tools should be **properly cleaned and sanitized** after EACH different use.
- **To fix tools** versus getting new tools? Call the manufacturer or buy new?



# Hygiene practices

- Each culture has a **different perspective** towards hygiene. It is important to be together scientifically with this theme.
- **Not possible to eliminate** problem. Can be reduced significantly: strict hygiene expectations at work.
- **For example:**
  - Cut and clean nails
  - Put on hair nets
  - Don't use jewelry that might be hard to clean or might fall easily
  - Clean boots/shoes well between different areas
  - Have gloves in good condition
  - Wash after touching or potentially touching human/animal bodily fluids.





# What can help?

- Visitors, friends and family members who come into the facility should also follow hygiene rules.
- Manure used to fertilize soil can also harbor pathogens. Wind, rain, or floods can spread them too. Be aware!
- To establish a cleaning routine inside and in the perimeter of the facility (Zones).
- Have someone in charge of food safety monitoring and records kept as evidence with the initials of the worker, time and date. This is required.

# Possible means of contamination and prevention practices

Workers, visitors, people inhabiting the facility or family owners and their pets can be pathogen carriers.

**Owners have to supply** sufficient potable water, soap, paper towels, and restrooms for immediate use: one toilet and one sink for every 20 employees no further than  $\frac{1}{4}$  of a mile from the work area or 5 minutes by vehicle. Also there must be safe water to hydrate.

**First Aid Kits** must be complete and available to workers.

At least one **supervisor** has to take the food safety trainings.

**Plan for negative consequences** for workers who do not follow protocol.



Five-Shell First Aid Kit



# POSSIBLE MEANS OF CONTAMINATION AND HOW TO REPORT THEM



- Keeping records of the action needed to correct errors is important for audits, but even more important to be able to implement a better plan before the safety of the product is compromised.
- Make sure the records cannot be edited and to keep them for at least 2 years.
- Workers need to have easy access to a reporting medium to communicate possible contamination incidents. Be mindful that sometimes workers will not be able to read/write or need help translating.
- There has to be a way to put the report in records and someone in charge of receiving it.

# Appreciate the worker who prevents and works as a team member



- Workers should feel respected: their reports are useful and cause a positive change.
- Workers should feel comfortable to report they are ill.
- Beware that nausea and vomit are also caused by dehydration.
- Workers should be properly trained: they should know how to recognize a product that should not be harvested/processed.
- Plan to reassign ill workers to an area where they cannot contaminate produce.
- This is about working together to prevent foodborne illnesses!

# Other important themes



- The SOPs (Standard Operational Procedures) are the procedure rules to follow in case of contamination.
- Wild animals: present naturally, limit access without causing harm, take legal actions, use them to your convenience to limit pests, make observations before harvesting. Tools: fencing, decoys, ultrasound, relocation...
- Riparian zones are important to filter pollutants and for flood control.
- Using manure or compost: temperature, turn over, time between application and harvest (90-120 days), pathogen test records.
- Pets and petting zoos: children risks.
- Water for agricultural use: public, ground, surface; testing, application type (surface, flooding, drip system), map where water flows in the facility, supervise and maintain storage tanks and pipes.

# Other important themes



- Water for use with products: EPA regulates antimicrobial chemicals that prevent pathogens to flow, temperature control for better effect.
- Cross-contamination, turbidity, disposal of residual water.
- Pest Control: clean every day, sweep, store with lids, dispose of trash every day, check doors and windows, organize with color tape, map where the product goes through in the facility, clean biofilm inside machines, clean walls, ceiling, pipes, tubes...
- Transportation vehicle: require cleaning record before loading product, ice water source, condensation and dripping, check temperature.
- Safety Plan: not required but it is a live document, needs updating and a person in charge.
- Tracking System: separation of lots by codes/numbers/bar codes
- Mock Recall, try it to see how much time it takes
- Crisis Management Plan: emergency contact and procedures



# Conclusion

- You are the indicated person to help supervisors and industry understand how food contamination happens.
- We need your help to take preventive measures and make food healthier.
- Please, if you see a point of contamination at work, report it!

# Thank you for your attention

Questions?  
Comments?  
Suggestions?

Nevada Department of Agriculture  
405 South 21<sup>st</sup> Street, Sparks, NV 89431  
775-353-3775

Video (click on the picture) : Fruits,  
vegetables and food safety: Food Safety  
Begins On The Farm (GAPS program,  
Cornell University)

