Idaho Produce Safety Video Series
Brought to you by:
Idaho State Department of Agriculture
University of Idaho Extension

Equipment, Tools, Buildings and Sanitation

Contents

Where have your boots been today?

Introduction:

Hello! This video is part of a series of videos that covers the requirements of Food Safety Modernization Act's Produce Safety Rule.

In this video we'll cover the requirements of the Produce Safety Rule Subpart L—Equipment, Tools, Buildings, and Sanitation. This subpart establishes requirements related to equipment, tools, and buildings to prevent these sources from contaminating fresh produce.

We'll also cover parts of Subpart K—Growing, Harvesting, Packing, and Holding Activities.

Notes

In addition, we will review some good agricultural practices to help you achieve the requirements outlined in Subparts L and K of the rule.

You might be thinking – why the focus on equipment, tools, buildings, and sanitation? Since fresh fruits and vegetables do not receive processing before consumption, such as cooking or pasteurization, the steps you take to keep produce clean and safe during and after harvest may protect produce from contamination, ultimately preventing foodborne illness.

The Idaho State Department of Agriculture and University of Idaho Extension would like to help you and your farm employees understand the importance of produce safety in your operation.

Today we'll review:

- **What equipment and tools are subject to the rule?**
- **What general requirements apply to my equipment and tools?**
- **General requirements for handwashing, toilets, and plumbing.**
- **Requirements for equipment used in transportation of covered produce.**
- **What buildings are subject to the requirements of Subpart L.**
- **Risk to produce by zones to help producers better assess the most likely areas of contamination and to better prioritize food safety efforts.**

There will be definitions of important terms included in on-screen graphics throughout this video.
Feel free to pause the video at these times in order to review the definitions.

Lastly, pay attention to the words ***MUST*** and SHOULD… ***MUST*** indicates that it is required by the Produce Safety Rule. SHOULD indicates suggested good agricultural practices.

You may print out this presentation and keep it for your records to use anytime you'd like. This will be available for viewing on the ISDA and UI Extension websites. It's a good Idea to have 21 CFR Part 112 with you so you can reference the rule throughout this presentation and you may pause or rewind this video at any time.

What Equipment and Tools are Subject to the Rule?

Okay, let's get started!

Notes

Equipment and tools subject to the requirements of Subpart L—Equipment, Tools, Buildings, and Sanitation, section 112.121 include those intended to, or likely to, contact covered produce.

What might this include?

- **Knives**
- **Tools**
- **Utensils**
- **Mechanical harvesters**
- **Waxing machinery**
- **Grading belts**
- **Sizing equipment**
- **Palletizing equipment**
- **Equipment used to store harvested produce such as: bins, containers, and food-packing materials**
- **Dump tanks**
- **Flumes**
- **Refrigerators or cooling equipment**
- **Vehicles and other equipment used for transportation; and more.**

Always ask yourself this question: could this equipment or tool touch produce directly? If the answer is yes, then it is covered by the rule.

In addition to the types of equipment and tools previously listed, the Produce Safety Rule also applies to instruments or controls used to measure, regulate, or record conditions to control or prevent the growth of pathogens. This may include thermometers, pH meters, and sanitizer test strips. Instruments ***MUST*** be accurate and precise, adequately maintained, and adequate in number for their designated uses.

Notes

For example, if your walk-in storage cooler thermometer displays a reading of 65 degrees Fahrenheit and the actual true temperature of the cooler is 75 degrees Fahrenheit, your thermometer is not very accurate.

Refrigeration is not a requirement of the Produce Safety Rule, but if used, steps ***MUST*** be taken to ensure they are adequately maintained and any instrument used to monitor temperature ***MUST*** be accurate and precise.

Ice bins are also considered direct food contact surfaces if the ice is used to contact covered produce. In addition to the ice bins needing to be maintained, the water used to make the ice ***MUST*** be free of detectable generic E. coli as required by the Produce Safety Rule.

What about equipment and tools used for multiple purposes?
Or what if you grow covered produce and non-covered produce?

Subpart K of the Produce Safety Rule specifies that, if you grow covered and non-covered produce, you ***MUST*** keep covered produce separate from non-covered produce and you ***MUST*** adequately clean and sanitize any food contact surfaces that contact non-covered produce before using the surface for covered activities on covered produce.

It's good practice to consider having a different set of equipment and tools for covered activities than non-covered activities to minimize the risk of cross contamination.

What General Requirements Apply to My Equipment and Tools Subject to the Rule?

Now that you know what equipment and tools are subject to the rule, let's talk about what condition they should be in and where they should be stored.

A few questions to think about:
What shape or condition are my equipment or tools in?
What is my equipment or tools made of?

Equipment and tools ***MUST*** be of adequate design, construction, and workmanship to allow them to be cleaned and properly maintained.

So, what does this mean?
Food contact surfaces should be non-toxic, non-absorbent, easily cleanable, non-porous, and durable. If a porous material is being used, it needs to be adequately designed for proper cleaning.

Notes

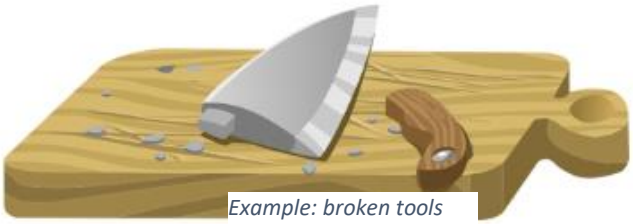
If you can't clean your equipment and tools properly, then they should not be used.

Here are a couple of examples:

A knife used for field harvest that no longer has a smooth blade, is no longer of adequate design.

A scrub brush with bristles missing and a visible biofilm layer, with mold embedded within the bristles, is no longer of adequate design or cleanable.

Biofilm is a concern because once the microorganisms attach to food contact surfaces as a biofilm, they are very difficult to completely remove.



Example: broken tools

Roller brushes on a fruit production line, that are worn or cannot be cleaned anymore are inadequate.

A stainless-steel table that is corroded from chemical sanitizers with visible debris embedded in rough edges, is no longer cleanable.

A wood table with many uneven rough areas and grooves that cannot be cleaned properly can no longer be adequately cleaned. Sanding it down and refinishing it could make it of adequate design again.

Example: wooden table with a rough, uneven surface.

*The seams on food contact surfaces **MUST** be either smoothly bonded or maintained to minimize accumulation of dirt, filth, food particles, and organic material to minimize the opportunity for harborage or growth of pathogens.*

Equipment and tools ***MUST*** be:

- Installed and maintained to facilitate cleaning of the equipment and all adjacent spaces; and
- Stored and maintained to protect covered produce from being contaminated with known or reasonably foreseeable hazards and to prevent attraction and harborage of pests.

Notes

For example, storage areas or bins stacked under trees could increase the potential for rodent or bird infestation within your produce bins, potentially leading to contamination of the produce.

General Requirements for Handwashing, Toilets, and Plumbing:

*You **MUST** provide personnel with adequate, readily accessible toilet facilities, and handwashing facilities.*

Toilet facilities ***MUST*** be cleaned frequently to prevent contamination of produce. Restrooms should be located and maintained so they do not become a source of contamination to produce. Restrooms ***MUST*** be accessible to growing areas during harvest activities.

In addition, you ***MUST*** control and dispose of sewage properly. Sewage and septic systems need to be adequate and maintained in a manner that prevents them from becoming a source of contamination.

The plumbing ***MUST*** be of adequate size and design and be adequately installed and maintained to:

Distribute water under pressure as needed, in sufficient quantities, in all areas used for covered activities, for sanitary operations, or for handwashing and toilet facilities;

Properly convey sewage and liquid disposable waste;

Avoid being a source of contamination to covered produce, food contact surfaces, areas used for a
covered activity, or agricultural water sources; and

Not allow backflow from, or cross connection between, piping systems that discharge waste water or sewage and piping systems that carry water used for a covered activity, for sanitary operations, or for use in handwashing facilities.

Equipment used in Transportation of Covered Produce:

All equipment and/or vehicles used to transport covered produce ***MUST*** be adequately cleaned before use and adequate for use in transporting covered produce.

There are many different types of vehicles used for transporting produce including open, closed, or partially-open trucks. All of these vehicles should be inspected and ***MUST*** be cleaned before use in transporting covered produce.

If a vehicle is used for multiple purposes such as personal use, transporting animals, and transporting produce, the vehicle ***MUST*** be cleaned before transporting covered

Notes

produce to prevent cross-contamination. In certain instances, it may be appropriate to clean and sanitize a vehicle before transporting covered produce.

Before loading equipment or a vehicle with produce always inspect first. An inspection should include looking for: physical hazards such as loose nuts, bolts or any foreign objects loosely hanging from the equipment or vehicle; evidence of animals; And Smelling for odors—if you suspect the truck was carrying something like chemicals, consider first if it's safe to put produce in it.

Buildings Subject to the Requirements of Subpart L:

Now that we have a handle on equipment and tools, let's discuss buildings.

There are many different packing house designs and uses on the farm. Some are fully enclosed, some are partially enclosed, and some are open, including produce that is packed right out of the field. Each type will have a different set of risks.

Buildings subject to the requirements of Subpart L, include any fully- or partially-enclosed building used for covered activities, including minimal structures that have a roof but no walls; and storage sheds, buildings, or other structures used to store food contact surfaces (such as harvest containers, and food-packing materials).

Buildings ***MUST*** be suitable in size, construction, and design to facilitate maintenance and sanitary operations for covered activities to reduce the potential for contamination.

This includes providing adequate space for equipment and storage, keeping floors, walls, ceilings, fixtures, ducts, and pipes clean and in good repair, taking precautions to separate produce and food contact surfaces from potential contamination.

It is important to keep buildings clean and free of debris, keep produce packing areas separate from other activities such as chemical stations, vehicle storage or repair areas, bathroom areas, and storage.

Notes

You ***MUST*** implement measures to prevent contamination of your covered produce and food contact surfaces from drips or condensation from the ceiling, pipes, or areas of the building.

In a closed packing house, it may be important to ensure there is good airflow to prevent the buildup of condensation, which can lead to contamination of covered produce or food contact surfaces.

Floors should be designed in a way to prevent the buildup of standing water. Standing water can splash on produce and food contact surfaces. Standing water can also harbor pests and be a perfect growth medium for pathogens.

Zones:

To help prioritize cleaning and sanitizing efforts and to better assess the most likely areas of risk for contamination, we will address risk in terms of zones.

Within each zone we will discuss the importance of produce safety and how to keep produce clean from harvest to when it leaves your operation.

If you are only growing, harvesting or transporting covered produce and not packing or holding covered produce, the following content section may not apply to you.

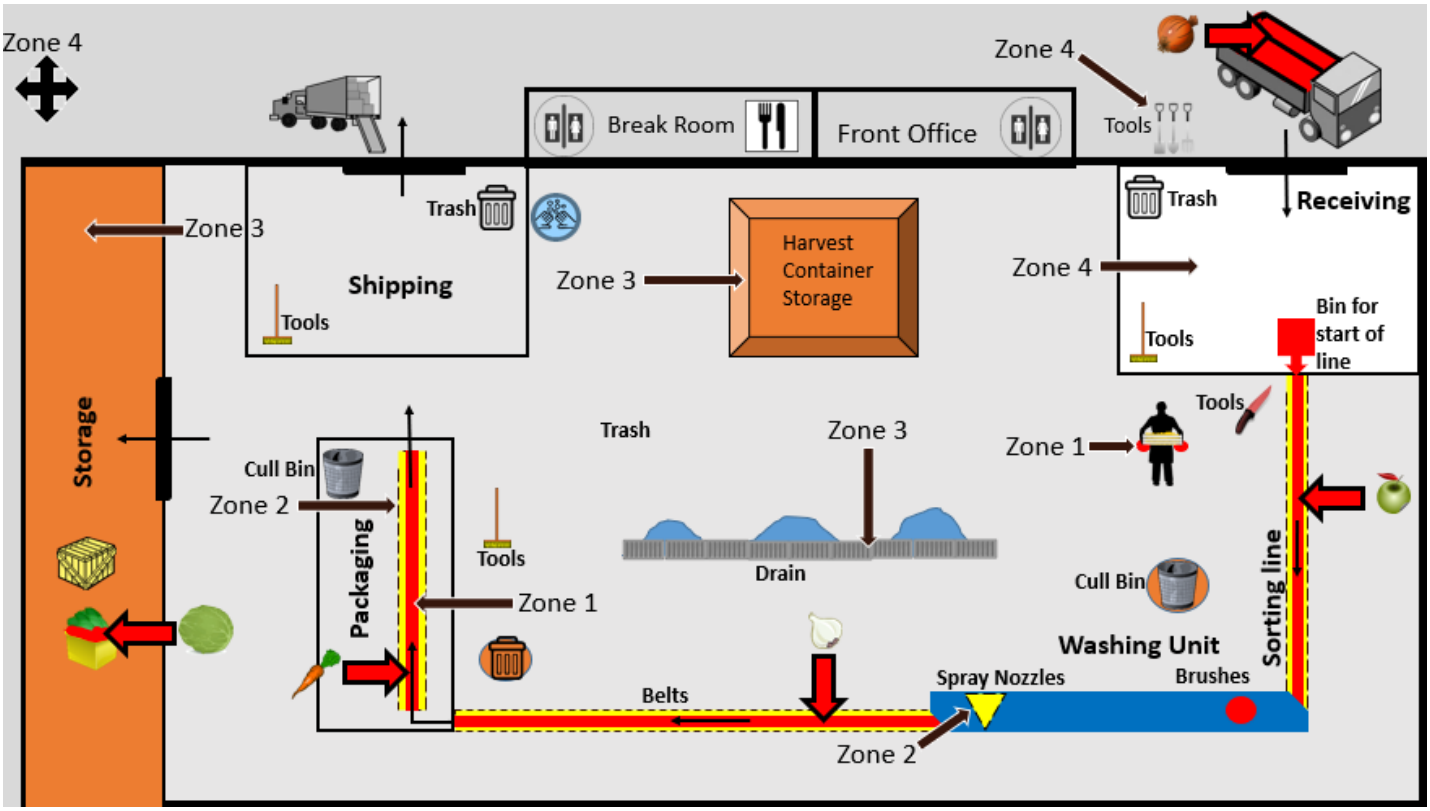
Zone 4 has the least amount of risk, but still has the potential to contaminate produce. Zone 4 areas include outside or adjacent areas to the packing house such as loading docks or warehouse areas.

Zone 3 would include areas such as the floor, drains, and trash cans.

Zone 2 has the next highest risk and includes areas adjacent to zone 1, such as external parts of washing or processing equipment, spray nozzles, and walls.

Zone 1 are areas of direct food contact surfaces.

Notes



Zone 4

Though zone 4 is outside of your packing operation, there is still potential for introducing risk from Zone 4 into your packing operation.

You ***MUST*** use equipment in a manner that minimizes the potential for contamination of covered produce or food contact surfaces with known or reasonably foreseeable hazards.

An example of this might be, if you are working with manure or compost piles, it would be important to change shoes and even clothing before entering the packing house area. Clothing and shoes are perfect vehicles for pathogen transfer from one zone to another.

Change shoes before entering the packing house area

In addition, you should avoid using equipment or tools used in zone 4 for use within other zones. Using the same tractor or vehicle to move compost, as to move produce can cause unnecessary transfer of pathogens to the

Notes

produce. Equipment and tools used in Zone 4 should be labeled and stored in a designated location within the zone.

Trash control and disposal in Zone 4 are important good housekeeping practices that reduce or eliminate pest harborage in all zones. Good housekeeping in all zones is a fundamental first step in keeping harvest and post-harvest operations from being a source of contamination.

You ***MUST*** control and dispose of trash, litter and waste in areas used for covered activities in order to:

- Minimize the potential for trash, litter, or waste to attract or harbor pests.
- Protect against contamination of covered produce, food contact surfaces, areas used for covered activities, agricultural water sources, and agricultural water distribution systems.

Other things that can reduce risks include inspecting harvest containers and equipment before they enter the packing area to ensure they are free of excess soil and debris. Harvest containers and equipment should be functioning properly, clean, and maintained to not become a source of contamination. If not, the problem ***MUST*** be corrected and reported to a supervisor before the containers and equipment are used in the operation.

Consider establishing traffic patterns that do not contaminate the packing area by separating the area where produce is being packed from the staging area.

Visually inspect the area for harborage of animals and if your packing area is in a fully-enclosed building, check the exterior of the building for ways animals and pests can enter.

Last, but not least, you ***MUST*** control your domesticated animals from contaminating covered produce.

If you have domesticated animals, you ***MUST*** control their waste.

Zone 3

Zone 3 includes areas inside the packing area such as the building itself, trash cans, cull containers, floors, drains, restrooms, walking areas, equipment such as forklifts or inside equipment, and storage areas above or adjacent to packing areas.

As discussed previously, it is important to make sure trash is picked up, garbage cans are cleaned and

Notes

emptied frequently, and floors should be maintained so they do not become a source of contamination. Standing water should be cleaned up frequently, so it does not become a harborage source for pests and pathogens.

You ***MUST*** take measures to protect covered produce, food contact surfaces, and food-packing materials from contamination by pests in buildings, including routine monitoring for pests.

You ***MUST*** exclude pests in fully-enclosed buildings. In partially-enclosed buildings you ***MUST*** take measures to prevent pests from becoming established.

You ***MUST*** establish a pest monitoring system for fully and partially enclosed buildings. Things you may want to include in your monitoring system are: checking for harborage areas, eliminating trash, checking for small holes in buildings, and using screens where possible to prevent pests from entering.

You ***MUST*** exclude domesticated animals from fully-enclosed buildings where covered produce, food contact surfaces, or food-packing material is exposed or you ***MUST*** separate domesticated animals from where a covered activity is conducted. The only exception to this is guard or guide dogs, which may be allowed in some areas of enclosed buildings if the presence of the animal is unlikely to contaminate the produce, food contact surfaces, or food-packing materials.

As previously discussed, equipment and tools that are used to keep these areas clean ***MUST*** be in good condition, cleaned and stored properly.

Zone 2

Zone 2 includes non-food contact surfaces that are located close to produce and that are not in direct contact with produce but may contribute to contamination. Examples may include the outside of a sink, sides of equipment, spray nozzles, hoses, transportation vehicles, edges of tables, and the underside of belts.

You ***MUST*** maintain and clean all non-food-contact surfaces of equipment and tools used during harvesting, packing, and holding to protect against contamination of covered produce.

Notes

Many of these places are hard to reach and often times overlooked because we don't think they could contribute to contamination of produce.

For example, the interior surface of spray nozzles used to rinse off produce as it passes on a belt. If these nozzles are not cleaned regularly, a biofilm layer could build up and potentially contaminate the water and eventually sluff off onto the produce. Hard water or organic material may clog the nozzles causing water to drip or drain down the sides of equipment, and subsequently onto produce or spread contamination.

Regularly maintain and clean equipment

Another example: The interior of a truck used to transport produce. If there is condensation or debris build-up on the interior walls and the condensation drips onto the produce, this could contaminate the produce.

Zone 1

Zone 1 areas are the most critical because they come in direct contact with produce.

Examples include belts, rollers, brushes, sorting tables, employees and visitors, wash equipment, packing containers, and tools.

Food contact surfaces ***MUST*** be inspected, maintained, cleaned, and when necessary and appropriate sanitized as frequently as reasonably necessary to protect against contamination of covered produce.

Establishing a cleaning schedule appropriate for your operation is an important part in ensuring produce does not become contaminated.

When cleaning food contact surfaces and non-food contact surfaces include the bottom of equipment, seams and hard to clean places, and when possible, equipment should be taken apart to ensure the insides of pipes, underside of brushes and crevices are adequately cleaned.

The cleaning of equipment is a good time to inspect equipment for damage or disrepair.

When establishing a cleaning schedule remember it is imperative that food contact surfaces be cleaned before they are sanitized. A dirty surface cannot be adequately sanitized. Debris ***MUST*** be removed before a sanitizer is applied.

Notes

Other food contact surfaces to consider are employee clothing, food safety equipment such as gloves, employee hands, and food-packing materials.

Employee clothing can be a source of contamination to produce and considered a food contact surface in many situations.

Question: When employees are sorting produce on belts or into packing containers, does the produce or the belts directly contact employee clothing? If the answer is yes, then that clothing is considered a food contact surface.

Clean clothes should be worn to work and when they become contaminated, changed as needed.

Gloves, if worn ***MUST*** be changed when they become contaminated or torn and inspected before each shift. Remember gloves are not a replacement for handwashing.

Gloves and other food safety equipment such as aprons should be removed before taking a break and going to the bathroom and should be stored in a designated area where they are protected from contamination.

Employee hands are considered a food contact surface if they directly contact produce.

Employees ***MUST*** wash their hands thoroughly before starting work, before putting on gloves, after using the toilet, upon returning to their work station after breaks or other absence, after touching animals or animal waste, and any other time employee hands may become contaminated.

Lastly, food-packing materials, such as boxes or bags ***MUST*** be cleanable or designed for single use and unlikely to support growth or transfer of bacteria.

If you reuse food-packing material, you ***MUST*** take steps to ensure that the food contact materials are clean before use.

Again, ask yourself; does this equipment or tool directly contact produce? If so, you ***MUST*** inspect, maintain, clean and, when necessary and appropriate, sanitize all food contact surfaces of equipment and tools used in covered activities to protect against contamination of covered produce.

Notes

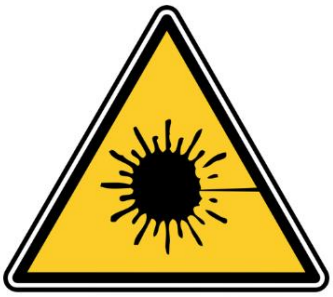
Records:

Subpart L requires one record to be kept and maintained.

You ***MUST*** establish and keep documentation of the date and method of cleaning and sanitizing of any equipment used in covered harvesting, packing, or holding activities.

For more info on recordkeeping, watch the Recordkeeping video prepared by the Idaho State Department of Agriculture and University of Idaho Extension.

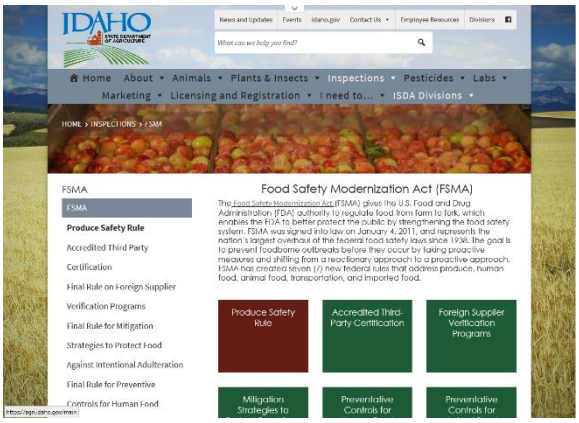
As produce moves through your operation, always ask yourself—what's the risk of contamination to the produce?

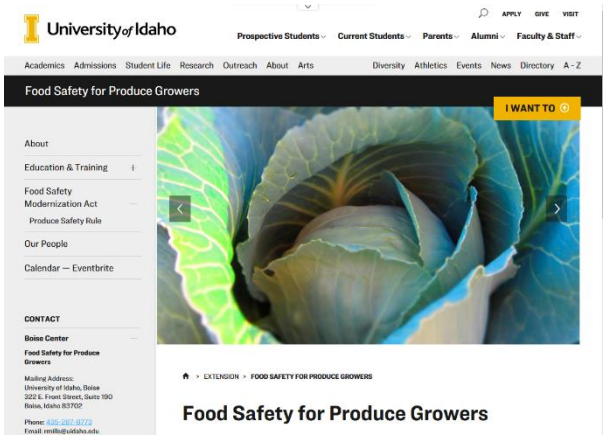


Equipment, tools, and people that come into direct contact with covered produce have the highest risk. Non-food contact surfaces can also contribute to contamination because pathogens **know no zone**.

The combination of design and maintenance of equipment and tools, proper training and mindful behavior of all individuals who step into your operation are key to reducing the risk of contamination from equipment, tools, buildings, and ultimately reducing risk to the consumers eating the produce.

Please feel free to reach out to the Idaho State Department of Agriculture or University of Idaho Extension for assistance.





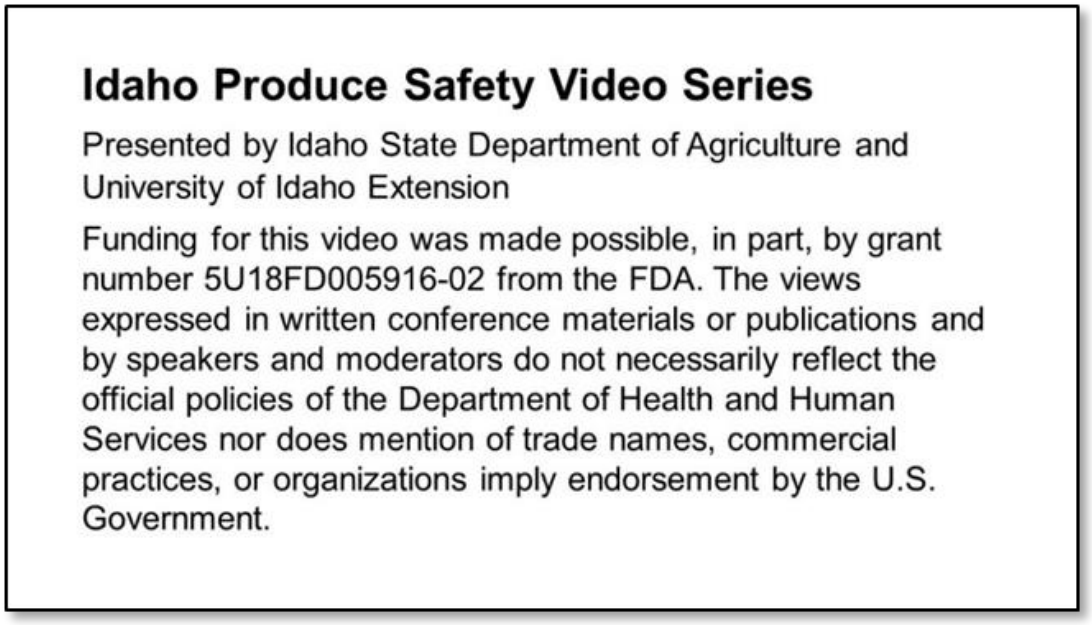
Thank you!

References:

1. "Produce Safety Alliance." *Welcome to the Produce Safety Alliance Website! Produce Safety Alliance*, www.producesafetyalliance.cornell.edu/
2. *NASDA*, www.nasda.org/

Notes

3. *US Food and Drug Administration Home Page*, Center for Biologics Evaluation and Research, www.fda.gov/
4. "UC Davis." *UC Davis*, www.ucdavis.edu/
5. ECFR.io. "e-CFR: Code of Federal Regulations." *ECFR.io*, www.ecfr.gov/
6. "Produce Safety Rule." *University of Idaho*, www.uidaho.edu/extension/food-safety-for-produce-growers/food-safety-modernzation-act/produce-safety-rule
7. "Idaho State Department of Agriculture." *Idaho State Department of Agriculture*, www.agri.idaho.gov/main/



Contact Information:

Email Address: FSMA@isda.idaho.gov

Physical Address: 2270 Old Penitentiary Road, Boise, ID 83712

Mailing Address: PO Box 7249, Boise, ID 83707

Phone Number: (208) 332-8698

Fax Number: (208) 334-2170

Notes