



# The Mango Industry Food Safety Training Kit Farm







# Introduction

The program included in the Mango Industry Food Safety Training Kit (Mango- FSTK) was created with the purpose of establishing a uniform food safety training kit for every step in the supply chain for the mango industry. Depending on the version you use, the program provides industry strategies and content that can be used to train employees in the growing and harvesting facilities, packinghouses, and importing warehouses. The Mango-FSTK covers training areas suggested by several food safety standards commonly used in the industry.

The Mango-FSTK is made up of four lessons specifically designed to give workers in the mango industry the knowledge, skills, and full explanation of the food safety procedures along with rules and/or policies that must be followed when working in the mango industry. Nonetheless, each company is different, and so different procedures and policies may apply to each workplace.

Before giving a food safety training program in a farm/packinghouse/warehouse, it is essential for instructors to familiarize themselves with the lessons and how to present them. You should carefully read this document to ensure you understand the content and the program.

The Mango-FSTK is made up of the following sections:

**Section 1.** Summary and Overview of the Mango-FSTK.

**Section 2.** Instructor’s Guide.

**Section 3.** Lesson Plans.

**Lesson 1.** The ABCs of Mango Food Safety.

**Lesson 2.** Personal Hygiene Practices.

**Lesson 3.** Hand Washing and the Use of Gloves.

**Lesson 4.** Cross-Contamination in the Field/Packinghouse/Warehouse.

**Section 4.** Additional Materials.

The lesson presentations are included in two formats: Microsoft PowerPoint Slides and a flipchart for use in the fields, packinghouses, and importing warehouses.



## Acknowledgments

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It should be noted that all the incorrect situations that are included in the photos of this program were staged.

### Disclaimer

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# **Section 1.**

## **Overview of The Mango Industry Food Safety Training Kit**



## **Overview of The Mango Industry Food Safety Training Kit**

The Mango Industry Food Safety Training Kit (Mango-FSTK) was developed based on a food safety needs assessment of the industry and the food safety training areas outlined in the United Fresh Harmonized Good Agricultural Practices Program (Harmonized GAP) and other guidelines used by the industry. The lessons were designed to give workers in the mango industry the knowledge and help to develop the necessary skills to minimize the risk of contaminating the product with which they work.

### **Audience**

The Mango Industry Food Safety Training Kit was developed for production supervisors, quality-control personnel, field or packing managers, and/or private consultants who wish to deliver a food safety training program for a mango farm, packinghouse, or warehouse. The lessons are specifically directed toward employees who handle mangos during harvest, packing, transportation, and storage. The harvesters, field employees, and employees in the various mango packing and storage areas are the target audience of this program; however, other employees that may come in contact with mangos must also receive this food safety training.

We recommend that supervisors, managers, and company owners also participate in food safety training, since this shows employees that the company is seriously committed to following a food safety program at all levels of the organization.

The lessons inside the Mango Industry Food Safety Training Kit were specifically designed to take into account the different practices in the mango industry.

The program is available in English, Spanish, Portuguese, and, in some cases, Haitian Creole. Using this program allows each industry employee to receive the same basic food safety training, regardless of whether it is presented by supervisors of the same company, quality control personnel, external instructors, or independent consultants.



## Goals and Objectives

The overall goal of the Mango Industry Food Safety Training Kit is to assure mango food safety to keep them suitable for human consumption.

The specific objectives for the Mango Industry Food Safety Training Kit are as follows:

- Provide training materials on food safety and hygiene practices specifically designed for mango industry employees on farms and in packinghouses and importing warehouses.
- Develop food safety educational materials that take into account the specific practices in the mango industry.
- Help the mango industry to satisfy external audits food safety training requirements for field/packinghouse/warehouse employees.





## Lessons Summary

The program includes the following lessons:

### **Lesson 1. The ABCs of Mango Food Safety**

In this lesson, the instructor will describe the concept of food safety and its importance for the mango industry. The instructor also will explain what foodborne outbreaks are and its potential repercussions on the mango industry. The instructor further will review the three types of mango contaminants and discuss examples of contamination that may happen in a farm/packinghouse/warehouse.

### **Lesson 2. Personal Hygiene Practices**

The instructor will describe the concept of personal hygiene and its importance to food safety. This lesson also covers three personal hygiene areas vital for the production of safe mangos for human consumption: 1) Protective Clothing, 2) Personal Habits, and 3) Personal Health and Wounds. For each of these areas, the instructor will explain and demonstrate appropriate procedures and behaviors for lowering the risk of mango contamination.

### **Lesson 3. Hand Washing and Glove Usage**

To emphasize the importance of adequate personal hygiene, during this lesson the instructor will explain the objective of hand washing and the correct way to do it on the job. This also describes the correct way to use gloves to prevent contamination. For each of these areas, the instructor will explain and demonstrate appropriate procedures and behaviors for lowering the risk of mango contamination.

### **Lesson 4. Cross-Contamination in the Farm/Packinghouse/Warehouse**

In this lesson, the instructor will describe the concept of cross-contamination and its causes, why it may be a problem mango production, and its importance to food safety. This lesson also reviews food safety strategies to prevent cross-contamination.

The instructor will detail potential situations on the farm/packinghouse/warehouse that may lead to product contamination. These situations include animal intrusion, presence of glass, inadequate handling of packing material, and inadequate handling of water in product washing tanks, among others.

The program developed for packinghouses and importing warehouses includes a few additional slides with information about the ABCs of mango defense. In this section, the program describes different controls that can be applied to prevent the intentional contamination of mangos.



# How to Use The Mango Industry Food Safety Training Kit (Mango-FSTK)

The Mango Industry Food Safety Training Kit contains the following sections:

**Section 1.** Summary and Overview of The Mango Industry Food Safety Training Kit (Mango-FSTK)

**Section 2.** Instructor's Guide

**Section 3.** Lesson Plans

**Section 4.** Additional Materials

In addition to the binder, the kit also contains a USB with the electronic files for all sections and additional materials.

Next a brief description of each of the sections is presented.

### **Section 1. Summary of The Mango Industry Food Safety Training Kit**

This section describes the training program's objective and makes recommendations for presenting the training program. Detailed instructions on how to use the training program are also included in this section.

### **Section 2. Instructor's Guide**

The Instructor's Guide contains important information for planning and conducting an efficient training session. Instructors should familiarize themselves with this guide before conducting a training session to ensure an efficient and easy training experience. This section also contains information on monitoring and follow-up tasks once the training has been completed. It also includes additional information on monitoring, implementation, and enforcement of food safety rules at the farm/packinghouse/warehouse. Make sure you discuss these subjects with upper management at the field/packinghouse/warehouse where the training program will be given.



### Section 3. Lesson Plans

The lesson plans are the core of The Mango Industry Food Safety Training Kit (Mango-FSTK), so it is essential that instructors understand them thoroughly before starting an employee training session on the farm/packinghouse/warehouse.

The first page of each lesson plan contains a brief summary of the lesson and the learning objectives that must be covered during the training session. In some cases, these objectives are known as competencies the employee must acquire.

Within each lesson plan, you will find corresponding lesson slides for each area covered. Lesson pages contain the PowerPoint slide that will be shown to participants. Below each slide is text the instructor may use to explain the material. This area also may include information in brackets and italic letters that is intended only for the instructor. Do not read bracketed text to the training participants; the instructor should use this information to enhance the participant's training experience. The training program also includes several activities that go along with certain sections you will be covering. You will need to set up these activities in specific ways to make them useful to participants, so be sure to review the detailed instructions with each activity. Activities are also included in the PowerPoint slides. Take into account that some of these activities require additional preparation, so you'll need to do some planning ahead of time to incorporate them into the training.

### Section 4. Additional Materials

This section contains posters you can use after the training sessions to reinforce the messages discussed during class. These posters are also useful to display after the end of the training session to remind employees of the need to follow proper hygiene and food safety practices at work.

This section also includes a training session attendance sheet and a food safety quiz to evaluate whether participants have learned and understood the material. Finally, an attendance certificate is included, which can be filled out, printed, and given to each participant at the end of training.



## Example of a Lesson Plan Page



← **Copy of the PowerPoint slide**

**Why Are We Here?** ←

**Slide Title**

Today, we are here to receive food safety training for our work at the farm/ packinghouse/warehouse. As many of you know, our company is implementing or has already implemented a Good Agricultural Practices Program or a Food Safety and Quality Program, whichever the case may be. Each of us plays an important role in this program.

← **Text**

Our clients and the people who inspect our company operations require ALL employees working in the mango production, packing, and/or warehouse areas to receive food safety training.

*[The first lesson is designed for farms, packinghouses, and warehouses. The text mentions farms/packinghouses/warehouses; use the term that corresponds to your operation.]*

The instructor can use this text to explain the material contained on the slide. *[Some slides contain text in brackets and italic letters, which include instructions on how to present a certain piece of information; this information should not be read to participants.]*

26 ←

**Page Number**



## Activities

People learn by doing. The Mango Industry Food Safety Training Kit includes several activities designed to enhance the learning process. The location of the instructions for the activity within the lesson plan indicates the point during the training session at which they should be presented. Some of the activities are embedded in the slide presentations and require no preparation steps. However, a few require planning well before training sessions begin; instructions are provided in the lesson plans. Each instructions page may contain three sections:

- 1. Objective.** This describes the information to be introduced or reinforced by the activity.
- 2. Supplies.** This tells which supplies and materials will be needed for conducting the activity. You should review these at least a week or two in advance and just before starting the training session to ensure you have everything ready for the activity.
- 3. Procedure.** This section describes the process for preparing and conducting the activity.

The Mango Industry Food Safety Training Kit

**Hand Washing Activity**

The objective of this activity is to demonstrate the correct hand washing procedure.

1. Have GloGerm™ or GlitterBug® cream and an ultraviolet light ready prior to this activity.

You can order the GloGerm™ or GlitterBug® kit at:  
GloGerm™ Company  
<http://www.glogerm.com/>  
800-842-8822  
GlitterBug® Breviv Co.  
<http://www.glitterbug.com/>  
801-468-6877

2. Before starting the training session, make sure there is a hand washing station near the training location. The hand washing station must have running water and be well stocked with liquid soap, paper towels, and a trash can.
3. Take the participants to the hand washing station.
4. Ask the participants if there are any volunteers to apply the GloGerm™ or GlitterBug® cream to their hands and then apply the cream.

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This slide alerts you to the point during the training session where you need to conduct an activity and includes the instructions for planning and conducting the activity. A list of supplies also is included here.



# **Section 2.**

## **Instructor's Guide**



## Instructor's Guide

The lessons included in The Mango Industry Food Safety Training Kit were designed to help mango farms, packinghouses, and warehouses to meet food safety training goals suggested by several food safety guidelines commonly used in the industry.

Concepts in each of the lessons are conveyed and reinforced using established adult education principles for communicating food safety risks, including discussion topics, demonstrations, and hands-on activities. It is the responsibility of each farm/packinghouse/warehouse to ensure that the knowledge and skills provided in this program are implemented and followed daily. This section contains recommendations for creating the best possible learning environment for a training program. Please read it carefully before beginning the program.

### Program Delivery Format

The learning objectives, content, delivery format, discussion topics, and hands-on learning activities in this kit have been developed to provide an optimal learning environment for teaching the basics of food safety to the mango industry workers. Each lesson has been developed as a set of slides and visual aids that should take approximately 10–25 minutes to review.

Of the various ways to present the training program, the easiest and most convenient is through a PowerPoint presentation. However, since some training sites are not equipped with a computer and a projector, two other presentation options are offered: a flipchart and simple printouts. Regardless of what format you use to present the training, the training sessions should be effective as long as all the material in each lesson is covered.

### PowerPoint Slides

Presenting the slides and visual aids as Microsoft PowerPoint presentations is the most efficient way to deliver the lessons. For this method, you will need a laptop computer that is loaded with Microsoft PowerPoint or PowerPoint Presentation software and a computer projector. Since the program files are very large, you should copy them to your computer hard drive before using them.

### Printed Posters or Handouts

A low-technology option for presenting the materials is to print the slides, posters, and handouts on paper and pass them out to the participants. Each individual may then follow along as the instructor goes through the lesson.



## **The Mango Industry Food Safety Training Kit Flipchart**

The training has been developed to rely on illustrations and visual aids containing simple messages. To use the flipchart food safety training kit, set the flipchart on a table and flip through the pages.

Each page contains an illustration that corresponds to the text on the following page. Each page contains a script that the instructor can read to participants to explain the material in the illustration. After reading, flip the page and go to the next one. The instructor does not need to memorize the text; however, to make the training session more effective, the instructor should become familiar with and thoroughly understand the training content.

## **Sample Pages of The Mango Industry Food Safety Training Kit Flipchart**

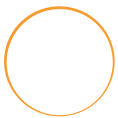




## Tips for Improving the Effectiveness of the Training Sessions

Keep in mind that the learning process is not effective when participants are bored, tired, hungry, or distracted. The amount of material that participants retain is often proportional to the amount of fun they are having. Therefore, make the training comfortable, even entertaining, while at the same time maintaining a respectful environment that conveys the impression that food safety is a serious matter.

Keeping a positive attitude about the training sessions is an important starting point for developing a food safety culture. People learn better by “doing” rather than just by “hearing.” The activities included in the lessons give participants hands-on experience that reinforces the information. Read through the lessons and prepare the easy-to-assemble activity materials ahead of time. Here are a few tips for making the most of each training session:



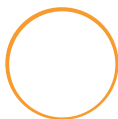
### Do Your Homework

Obtain a copy of the food safety rules and policies for the farm/packinghouse/warehouse and be sure that your message is consistent with these policies. For instance, some companies require specific types of hair restraints or the use of gloves when handling mangos or have no smoking policies, etc.



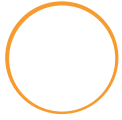
### Hand Washing Stations

The third lesson teaches hand washing skills, perhaps the most important component of the training program. Therefore, it is important to present the lesson near a hand washing station or a restroom equipped with a sink. Before starting the training, make sure the hand washing station has running water and is properly stocked with soap, disposable paper towels, and a trash container.



### Location

The food safety training lessons are designed for presentation in a conference room or at the farm/packinghouse/warehouse. If the location does not have a well-equipped conference room, be creative in locating a place to hold successful training sessions. Consider the employees' lunchroom, a warehouse, a shop, or even a common area in the company's facilities. Any of these locations could be appropriate for training.

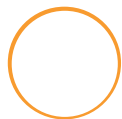


### **Scheduling**

Each lesson is designed to take about 10–25 minutes. All lessons may be presented in one sitting. If there are time restrictions or if it appears that the attention span of the participants is limited, the lessons may be presented in four sessions held on different days.

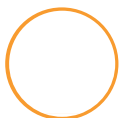
If you schedule the training session around meal times or during breaks, workers are more likely to be thinking about food. People have routines for eating at work, so, whenever possible, plan your training sessions accordingly. You should also avoid holding a training session at the end of the day when workers are tired and ready to go home.

Workers who are paid on a per-piece basis may present another challenge for scheduling training. For instance, harvesters may see training as a waste of time and may be reluctant to attend since they will not be earning income during the session. Companies that pay workers while attending food safety training sessions make an important investment that could protect them in the future. In any case, as an instructor, you must be clear about why food safety training is important to the workers and to the success of the company. Remember, keeping a positive attitude about the training sessions is an important starting point for developing a positive food safety culture.



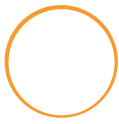
### **Preparation**

It is important for the instructor to arrive early at the training site to check that the equipment is working properly and to ensure all the materials are ready. Perhaps more importantly, it allows for interaction as the participants arrive, which helps to establish a good environment. Be respectful of others' time by starting the session on time and pacing the lesson to fit within the scheduled time.



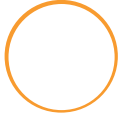
### **Class Size**

Small class sizes are recommended since some people feel intimidated in larger groups. To boost participation and create a better learning environment, limit the class size to no more than 15 workers. If you are an inexperienced instructor, you should start with even smaller groups and gradually increase the number of participants in your groups until you feel comfortable with the material.



### **Projection Screen**

If you are using PowerPoint slides, you will need a projection screen or a light-colored wall that is free of any obstructing objects that might block or distort the images. It is important for all participants to be able to see the screen.



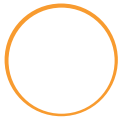
### **Seating**

Make sure each participant has a comfortable place to sit. This will encourage participants attention throughout the session. If it is not possible to have seats during training, try to keep the training session short without sacrificing any content.



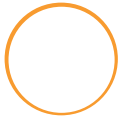
### **Food and Beverages**

Providing a simple snack and beverage or even lunch for the group can help to keep the right attitude during training sessions.



### **Lighting**

If you are going to project the slides, the light in the room should be low enough to allow participants to clearly see details of the slides or overheads. However, dim light may induce drowsiness and reduce attention.



### **Power**

It is important that electrical outlets are working and conveniently located at the selected training location. Keep in mind that you may need extension cords for a computer and a projector.



### **Noise and Distractions**

The place you choose for training should be quiet enough so that the instructor can clearly be heard and discussions can occur without distraction. Nothing is worse for maintaining a good learning environment than having the instructor yell to be heard over a loud piece of equipment or power generator. An excessively noisy place definitely is not conducive to learning. Also ask participants to turn off their cell phones.



## Documenting Food Safety Training

If a customer or consultant will audit your food safety plan, be prepared to provide evidence that your workers have received the training. A written company policy presented to an employee during an orientation or a signed statement from the worker promising to follow food safety rules is usually not sufficient evidence.

Instead, an auditor will be looking for a report or records from the trainer or consultant describing the information that was given in the training, the date and location of the training, and an attendance list. Therefore, documenting your food safety training is essential. One of the main responsibilities of the trainer is to make sure that each participant signs an attendance sheet at the beginning of the training session. This sheet should then be filed in a safe place, along with other documentation needed during an audit. Section 4 of the kit includes an example of a log to print and use to document each training session. A certificate of attendance template that can be printed and presented to each worker after finishing the program is also included.

## Evaluating Food Safety Training

Continuous self-evaluation is necessary to determine how successful you have been in training employees. In Section 4, a knowledge test is provided that you can use to evaluate the extent to which participants have learned the material. There are three ways to use the test:

1. Give the test immediately after all lessons are completed. This will give you a group average of how well the group learned as a result of training. Participants who score poorly compared with the rest of the class may require individual attention or retraining.
2. Conduct pre- and post-tests. Giving the test before training begins and then again immediately after all lessons are completed will provide a measure of how much the training session actually increased food safety knowledge. This will tell you if your efforts have been successful and will help you to identify individual participants who may need additional training.
3. Conduct follow-up testing. Retesting several weeks or months after training has been completed can tell you how well participants have remembered what they learned. Declining scores may signal that it is time to conduct another training session.



Another point to consider is testing methods for those who have reading and writing limitations. A good solution may be to administer the test to individuals in a face-to-face format by reading the questions aloud and then recording answers on a score sheet.

### **Follow-Up Training and Supervisory Enforcement of the Rules**

Merely acquiring knowledge does not always result in positive changes in behavior. This means that employees may know that regular hand washing is necessary to keep food safe, although actual increases in hand washing might not occur. In order for hand washing and other hygienic practices to become a habit, enforcement and monitoring are essential.

Management commitment is the key to success of any food safety program, and the training kit is no exception; however, it is typically difficult for managers and owners to make sure that food safety practices learned during training sessions are followed on a daily basis.

The author's research at Penn State University has shown that supervisors and middle management are critical to maintaining appropriate food safety behaviors in the work environment because they deal directly with the daily routines that occur at the farms/packinghouses/warehouses and have experience in the complicated tasks associated with enforcing rules in other areas.

Therefore, training must be followed by supervisory enforcement of food safety rules. Management support of supervisors taking on this role will contribute to the success of the food safety program. What follows are a few recommendations that supervisors and everyone in management can follow to help to ensure the success of your food safety training program:

A successful food safety training program requires that supervisors respectfully communicate the rules to workers.

Supervisors should not be hesitant to ask employees if they have washed their hands and insist that they wash them if they have not done so. If an employee is doing something wrong, describe the problem and, if possible, demonstrate the appropriate way to perform the procedure. Rule enforcement is most effective when done in a respectful manner. Instead of harsh comments or a loud voice, use comments such as "please," "thank you," "you are welcome," "I would like you to do this," or "let's all work together to do this." If regular lapses in behavior occur and disciplinary actions are required, talk to the worker in private. Never embarrass an employee in front of others, since this can unnecessarily create a tense work environment.



Consistent and fair enforcement of food safety rules is also essential. Each employee who has received the training knows how important it is to follow the rules; no excuses can be made for lapses in appropriate behaviors.

Showing favoritism to certain employees has no place within a farm/packinghouse/warehouse. If supervisors do not enforce rules fairly or show favoritism, workers will see little reason to follow the rules. This may be a problem if family or friends are involved. However, asking family and friends for their support in following the food safety rules can be helpful.

When workers are conscientiously following the rules on a daily basis, take note of it by mentioning this to them. Regular, positive reinforcement and rewards are always more effective than negative comments and disciplinary actions.



# **Section 3.**

## **Lesson Plans**



**Lesson 1.**  
**The ABCs of**  
**Mango Food Safety**





## Lesson 1. The ABCs of Mango Food Safety

In this lesson, the instructor will describe the concept of food safety and its importance for the mango industry. Additionally, the instructor will explain foodborne outbreaks and the repercussions they may have on the mango industry. The instructor will also review the three types of mango contaminants and discuss examples of contamination that may happen in a farm/packinghouse/ warehouse.

### Learning Objectives

After this lesson, participants will be able to:

- Describe a foodborne illness and list its symptoms.
- State the impact a foodborne outbreak can have on their work time, job security, and family income.
- Identify the three types of mango contamination.
- Identify the role that employees play when it comes to food safety.



## Why Are We Here?

Today, we are here to receive food safety training for our work at the farm/ packinghouse/warehouse. As many of you know, our company is implementing or has already implemented a Good Agricultural Practices Program or a Food Safety and Quality Program, whichever the case may be. Each of us plays an important role in this program.

Our clients and the people who inspect our company operations require ALL employees working in the mango production, packing, and/or warehouse areas to receive food safety training.

*[The first lesson is designed for farms, packinghouses, and warehouses. The text mentions farms/packinghouses/warehouses; use the term that corresponds to your operation.]*



## What is Food Safety?

To start this course, it is important to understand the meaning of “food safety.” We have heard these words in our job many times.

Food safety means that the food will not harm the people who eat it, and we can guarantee that the food will not make the consumer sick.

It is our job and, above all, our responsibility, to grow, pack and distribute mangos that are safe for human consumption.

In the training we will receive today, we will learn how food can become contaminated, how we can help protect mangos from contamination, and how we can help the farm/packinghouse/warehouse to pass its Good Agricultural Practices or Food Safety and Quality inspection.



## Mango and Dishes Made with Mangos

What do you think of the food in these pictures?

What food do they have in common?

These dishes look good and probably smell and taste good as well.

Do you think any of these dishes can make us sick? If so, why? [*Give participants time to answer.*]

Any food, regardless of where it was produced, packaged or prepared such as a processing plant, at home, or in a restaurant, can become contaminated and cause illness in people who eat it.

Contaminated food can taste good, smell good, and even look good—and still make you sick.

When we get sick from eating contaminated food, it is called a foodborne illness. This illness is different than the feeling you get when you eat too much—that's called indigestion.

Photo © 2014 National Mango Board and used by permission of the National Mango Board. All rights reserved.



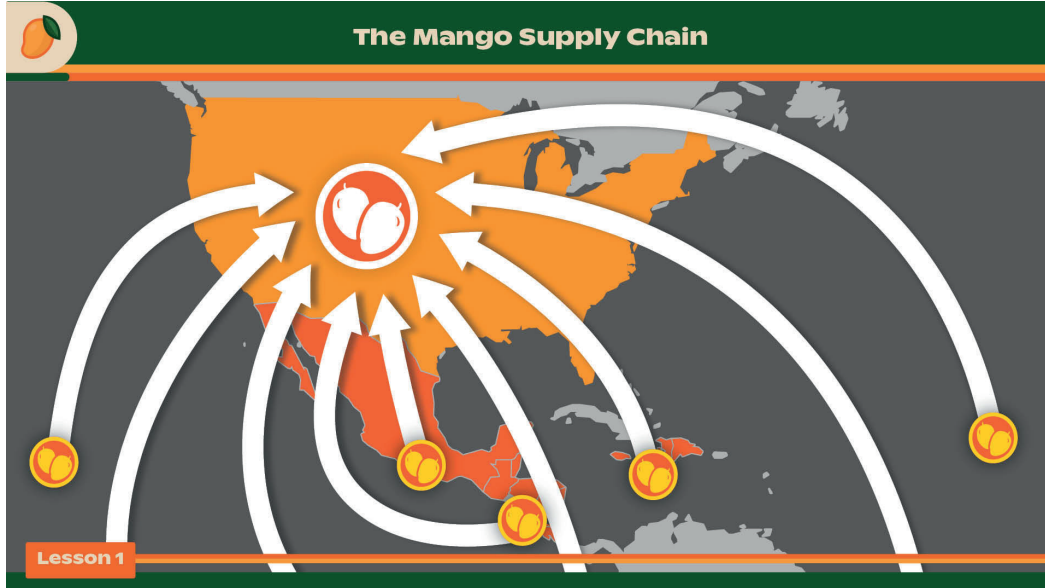
## Foodborne Illnesses

Foodborne illnesses are caused by the consumption of water or food contaminated by different types of microbes and represents a major health problem worldwide.

Symptoms of foodborne illnesses may include diarrhea, vomit, or dehydration. In some cases, these symptoms can be severe and may be deadly.

A key part of your job is to protect the mangos that you work with from contamination, so that they do not become the source of a foodborne illness.

A foodborne outbreak occurs when two or more people become sick from eating the same contaminated food.



## The Mango Supply Chain

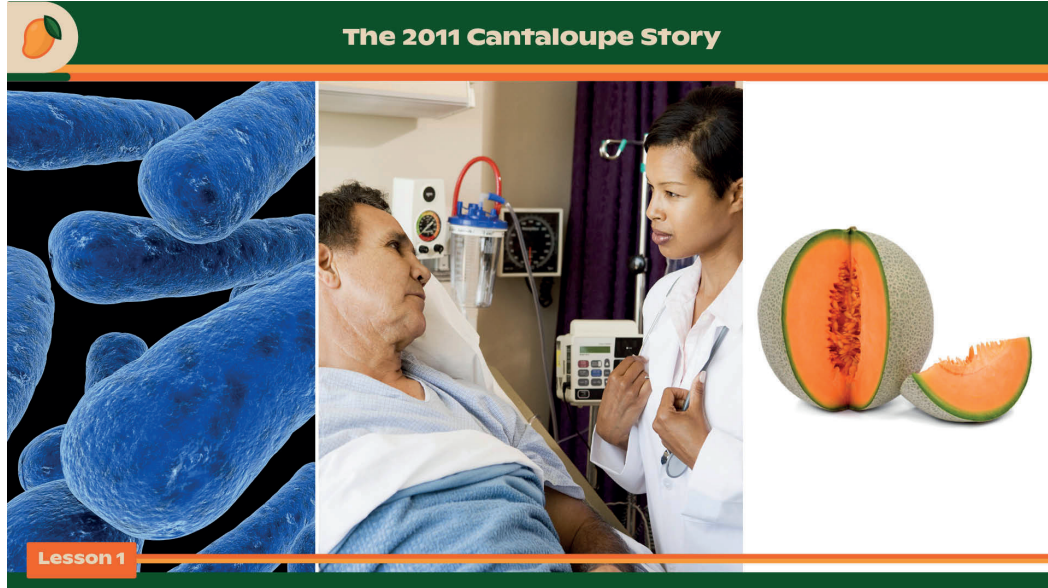
Foodborne illnesses may have serious consequences for a mango farm/ packinghouse/warehouse and its employees.

If contaminated mangos are distributed to several clients, self-service stores, packinghouses, distributors, or restaurants, illness may occur in different places and at different times.

The mangos that we grow and pack are distributed and consumed by people in several countries, including the United States, Canada, Europe and the producing country's local market.

Foodborne illnesses can have serious consequences for a food company, including its employees.

Let's talk about a real situation where people got sick and may have died because they ate contaminated food.



## The 2011 Cantaloupe Story

Foodborne illnesses are a serious issue that can have serious consequences for a mango farm/packinghouse/warehouse and its employees. Let's talk about a real situation that happened in 2011, where a great number of consumers got sick after eating contaminated fresh produce. During 2011, 33 people died and a pregnant woman had a miscarriage from eating cantaloupes contaminated with *Listeria monocytogenes*. The Centers for Disease Control and Prevention (CDC) reported a total of 147 people infected with this microbe, which caused foodborne illnesses in 28 states.

After an investigation, the Food and Drug Administration (FDA) announced that the Jensen Farms in Colorado had issued a product recall for Rocky Ford cantaloupes after they were linked to the listeriosis outbreak. These melons were the cause of the foodborne outbreak. This incident illustrates the importance of hygiene and sanitation practices at the farm/packinghouse/warehouse.

The FDA determined that the foodborne outbreak might have been caused, among other things, by the use of equipment in unsanitary or unhygienic conditions. This is an example of how small issues or simple oversights can cause things to go terribly wrong if proper procedures are not followed. Always keep in mind that simple things can mean a lot for food safety.



## What Would Happen if...? A Foodborne Outbreak Caused by Mangos

Let's think for a moment about what would happen if the news reported several people getting ill from eating contaminated mangos.

Do you think that a similar problem, a foodborne outbreak, could happen in the mango industry?

If something like this happened, what would happen with this farm/packinghouse/warehouse and your job?

If a foodborne outbreak caused by contaminated mangos occurred, people would most likely stop buying and eating them.

The market would collapse, the mango farms/packinghouses/warehouses would be forced to close, and the mango industry employees would probably lose their jobs since consumers would stop buying mangos.

So even if you don't get sick, you and your family would be directly affected if a situation like this ever happens.





## The Three Types of Contaminants

We have heard the word contamination many times. Let's discuss what it is and how we can prevent the mangos we work with from becoming contaminated. Any material or item added intentionally or accidentally during the harvest, packing, storage, or distribution process of mangos can become a contaminant and can cause harm or a foodborne illness in consumers.

Three types of contaminants could reach mangos at the farm/packinghouse/warehouse:

- Physical contaminants
- Chemical contaminants
- Biological contaminants

Food safety programs seek to reduce the risk of mango contamination.

It is the responsibility of each worker to prevent mangos from becoming contaminated during their harvest, packing, storage, and distribution and keep them from becoming the source of a foodborne illness.

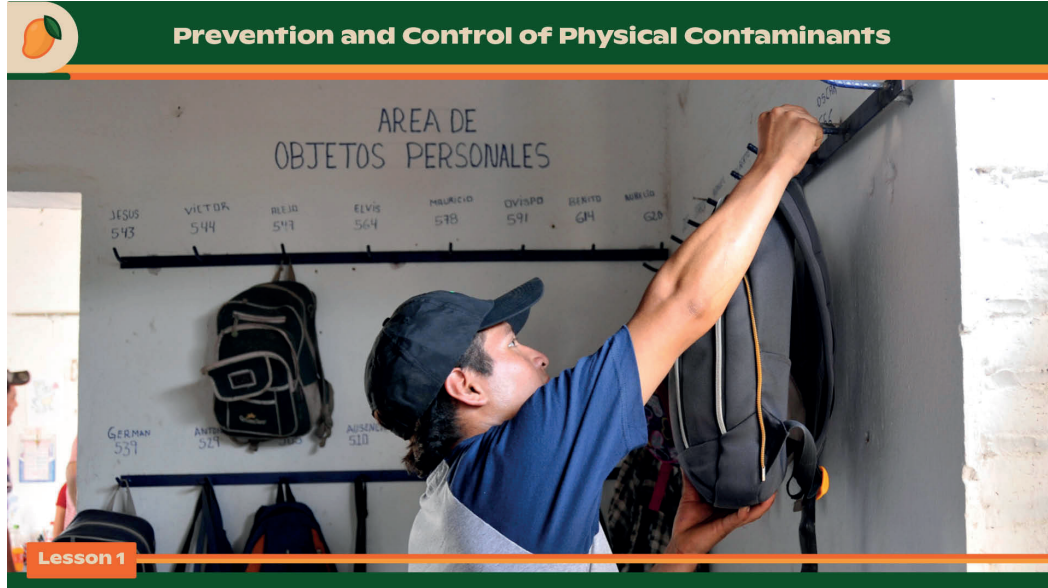


## Physical Contaminants

A physical contaminant is a hard or soft material that is incorporated to the mangos during handling, usually by accident or by an oversight of an employee. Physical contaminants can come from different places, such as office supplies used in reports or logs, glass, metal structures, wooden pallets, and plastic crates and bad practices that may occur during harvesting, packaging, or distribution. Some physical contaminants can seriously harm consumers since they may cause an obstruction in the throat, lacerations/cuts in the mouth, or tooth breakage.

Physical contaminants include:

- False nails
- Hair
- Band-Aids
- Candy wrappers
- Clips
- Staples
- Pencils and/or pens
- Pieces of bone
- Jewelry and piercings
- Screws and tools
- Pieces of glass or plastic
- Wood chips or splinters.



## Prevention and Control of Physical Contaminants

Some controls can be used in the work area to prevent physical contaminants from reaching the mangos:

- Do not use glass on the farm/packinghouse/warehouse.
- Smoke and eat only in designated areas.
- Do not wear jewelry or piercings.
- Use work equipment, such as grates, scissors, baskets, pallets, etc., properly
- Clean up tools, screws, or loose parts of machinery.
- Report deterioration in the tools or work equipment to your supervisor before a contamination incident may occur.



## Chemical contaminants

Chemical contaminants occur when the mangos come into contact with dangerous chemical compounds during their growth, harvest, packing, and/or distribution.

There are several potential sources for chemical contaminants to mangos:

- Pesticides
- Cleaning and sanitation chemical products
- Oil and lubricants
- Water sanitizers.



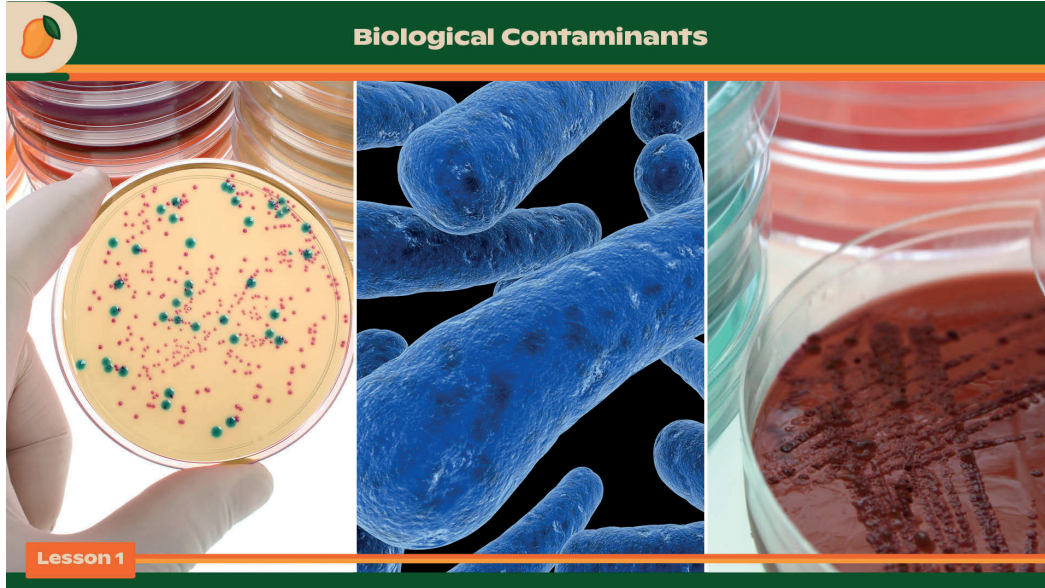
### Prevention and Control of Chemical Contaminants

## Prevention and Control of Chemical Contaminants

Some controls can be used in the work area to prevent chemical contamination from reaching the mangos. Whenever you use chemical products, remember:

- ALWAYS follow the manufacturer's instructions and ALWAYS use the dose indicated by the manufacturer or the product's label.
- Do not store or apply chemical products in inappropriate containers.
- Report leakage or spillage of equipment and machines.
- Use the appropriate handling procedures.
- Never use soaps or disinfectants in excess and always follow the supplier's instructions.
- Remember that whenever you handle chemical products, you must use protective equipment as instructed by your supervisor.
- Water used for chemical products applications must ALWAYS come from a trusted source and have an acceptable microbiological quality.

Inform your supervisor immediately if you see any chemical that is used incorrectly or if any of these products are not properly labeled or stored.



## Biological Contaminants

The third and last type of contaminant that can affect mangos are biological contaminants. This category includes microorganisms or microbes.

Microbes are living organisms so small that they cannot be seen with the naked eye; they can only be seen with a microscope. To give you a better idea of how small microbes are: if a microbe was 1 centimeter in length, then a human adult would measure about 17 kilometers (10 miles) in height.

Microbes are everywhere: in the air, water, dirt, ground, our bodies, the environment, and even the food that we eat. Not all microbes cause illness. Only a small group of microbes can cause foodborne illnesses. It is necessary to keep bad microbes from reaching the mangos.



## Prevention and Control of Biological Contaminants

Microbes that cause illness are called pathogens, but you don't have to remember that name. What you must remember is that preventing this contaminant from reaching the mangos is very important and can be accomplished by doing the following:

- Follow the company's hygiene rules.
- Wash your hands after eating, using the restroom, taking a break, before handling mangos or entering the work area, and whenever your hands have been contaminated.
- Inform the supervisor if you're sick.
- Properly wash and sanitize your work utensils.
- Maintain baskets and keep crates clean.
- Follow the instructions provided by the company's food safety manager.

Remember that food safety programs are designed to help reduce the risk of physical, chemical, and biological contamination of mangos.



## What is your Job?

Lesson 1

### What is your Job?

Your job is to handle the mangos in the safest way to prevent contamination and cause illness or injury to consumers. During this lesson, you learned:

- What foodborne illnesses are and the impact that a foodborne outbreak can have on your work, safety, and family income.
- The three types of mango contamination.
- How to avoid mango contamination by following good hygiene practices.
- Your job is to ALWAYS follow the food safety policies and procedures of your company in order to protect the mangos from contamination. Following the company's rules is a critical part of your job.
- You must not make up your own rules. If you are not sure about something, ask your supervisor.
- If you see anything that seems wrong or abnormal, notify your supervisor immediately.
- You play a key role in protecting the mangos with which you work.

This is the end of our training on the ABCs of food safety. Are there any questions? Thank you for your participation. Please sign the attendance sheet.







## **Lesson 2.**

# **Personal Hygiene Practices**



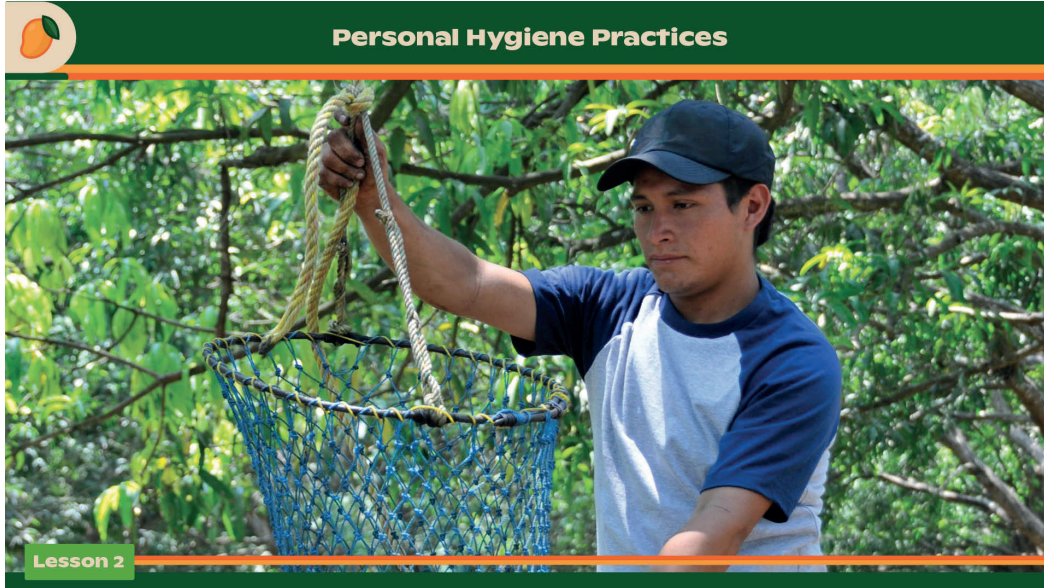
### Lesson 2. Personal Hygiene Practices

The instructor will describe the concept of personal hygiene and its importance to food safety. This lesson also covers three personal hygiene areas vital for the production of safe mangos for human consumption: 1) Protective clothing, 2) Personal habits, and 3) Personal health and wounds. For each of these areas, the instructor will explain and demonstrate appropriate procedures and behaviors for lowering the risk of mango contamination.

#### Learning Objectives

At the end of this lesson, participants will be able to:

- Explain how poor personal hygiene may affect food safety.
- Demonstrate the proper use of clothing, hair restraints, protective clothing, and other personal hygiene.
- List the areas of personal hygiene that require special care.



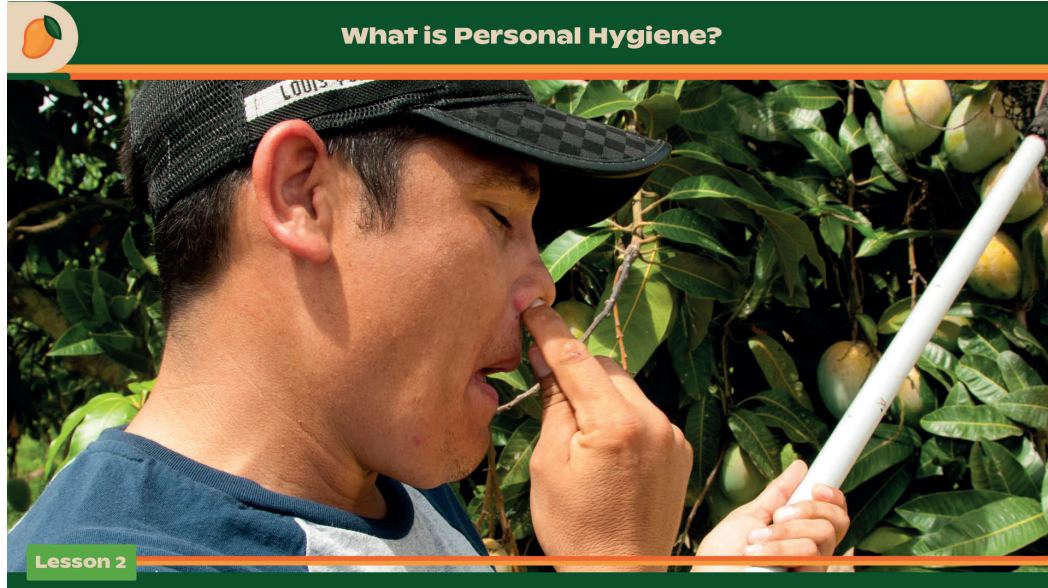
## Personal Hygiene Practices

In this section of the program, we will learn good personal hygiene habits and the personal hygiene rules and procedures that need to be followed on the farm to protect mangos from contamination.

It is important that all employees who work with mangos follow proper personal hygiene procedures.

Good personal hygiene is essential to prevent the introduction and spread of microbes in the mango production environments in which we work.

Note that the harvester shown in this photo is wearing clean clothes and a cap as a hair restraint.



What is Personal Hygiene?

### What is Personal Hygiene?

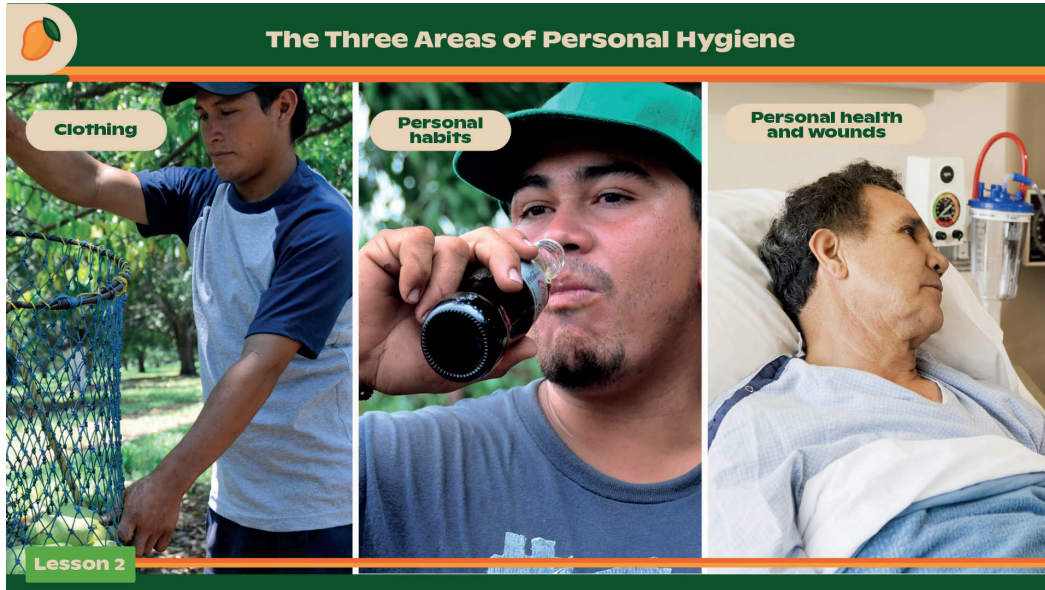
The person in this photo shows an example of bad personal hygiene practices. Bad personal hygiene habits at the workplace can affect mango food safety and cause a foodborne outbreak.

Can someone explain to me what personal hygiene is?

Personal hygiene refers to cleaning habits related to our personal hygiene such as:

- Bathing daily
- Clean hands
- Short clean nails
- Clean clothes

Personal hygiene also can include other factors such as smoking, eating, drinking, coughing, sneezing, spitting, and wearing jewelry and piercings on the job. Personal hygiene further includes the use of adequate footwear and employee health.



## The Three Areas of Personal Hygiene

As a farm employee, you must have good personal hygiene practices to reduce the risk of mango contamination.

We will divide personal hygiene into three areas:

- 1. Clothing.** This area includes clothing, hair restraints, footwear, and, in some specific cases, gloves.
- 2. Personal habits.** These are the things we do daily such as eating, drinking, smoking, and using the restroom.
- 3. Personal health and wounds.** This area includes our day-to-day health and any wounds we may have.



### Clothing: Clean Clothes

Wear clean clothes to work. You are prohibited from working at the farm in dirty, ragged, or torn clothes. Dirty clothes could house disease-causing microbes and contaminate the mangos. The harvester seen in the photograph has good personal hygiene practices, since he is wearing clean clothes and hair restraints.

DO NOT wear sleeveless shirts, shorts, open-toed shoes, or sandals.

Always wear protective clothing adequate for your specific job requirements. If you are in charge of applying chemical products, always remember to wear ALL of your protective clothing. Protecting yourself is protecting your family.



## Clothing: Hair Restraints

It is important to keep your hair clean and prevent hair from falling on mangos or utensils since that could contaminate the mangos. Moreover, consumers consider foods containing hair very unpleasant.

You need to use a hair restraint such as a hairnet, mesh cap, hat, scarf, or bandanna to prevent hair from falling into the mangos. The type of hair restraint depends on the policies of your farm. The hair restraint should always be kept clean. In the photo, you can see the harvesters using a cap, which is a specific type of hair restraint. What kinds of hair restraints are used on your farm?

Use hair restraints adequately and cover all hair and ears. Just like hair, mustaches and beards must be maintained and kept short and clean. Your farm may require you to use a beard net. Each farm has its own policy on facial hair, you also may be asked to shave daily.



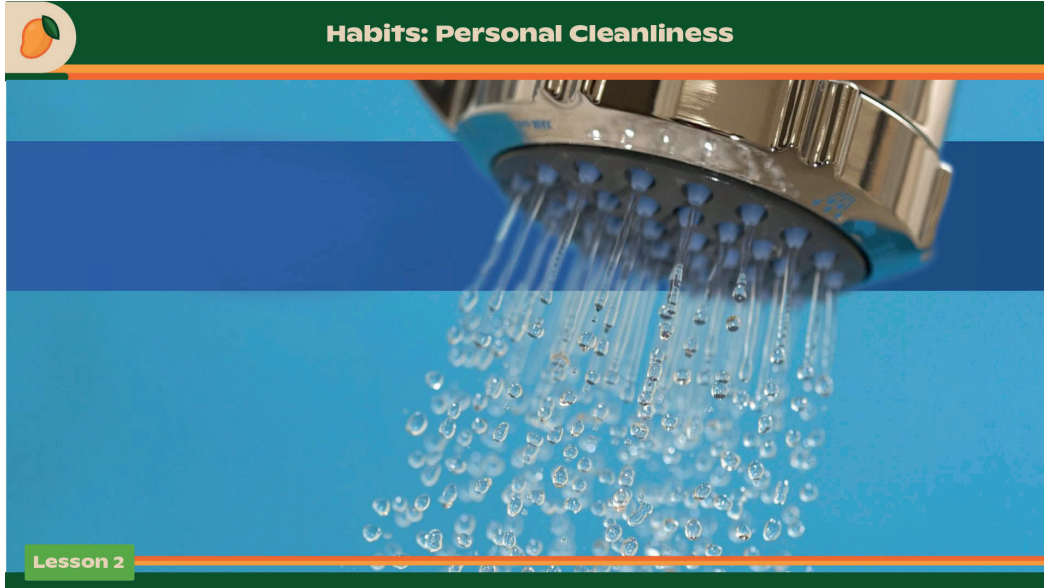


### Clothing: Footwear

You must wear clean and adequate boots, tennis shoes, or closed-toed shoes, whichever is required for your job. This is important for your safety.

You are not allowed to be barefoot nor wear open-toed shoes or sandals when working at the farm.

The employee in this photograph demonstrates one of the many different footwear options that are well suited for working on the farm.



## Habits: Personal Cleanliness

Personal habits are the things we do daily such as eating, drinking, smoking, and using the restroom. This category also includes the use of personal items such as jewelry, piercings, backpacks, and cell phones, among others.

It is important to have good personal cleanliness to take care of your health and help prevent mango contamination. Remember to bathe daily and show up to work clean. This practice is essential to protect mangos from contamination.



### Personal Habits: Eating and Drinking

Whenever we eat or drink, we can contaminate our hands and transfer our saliva from our mouths to our hands and from there to the mangos. Remember that some of us tend to use our hands to put food in our mouths and even lick our fingers as we eat. Saliva is a bodily fluid and contains millions of microbes. You must wash your hands after you eat or drink to prevent microbes from reaching the mangos.

Also, all workers have to eat and drink in the designated areas within the farm. As you can see in the pictures, these areas are far away from product and work equipment, which will help prevent mango contamination.

The designated areas can be as simple as a place under a tree away from production areas or a formal outdoor dining area. This depends on the size and activity of the farm.



## Personal Habits: Smoking

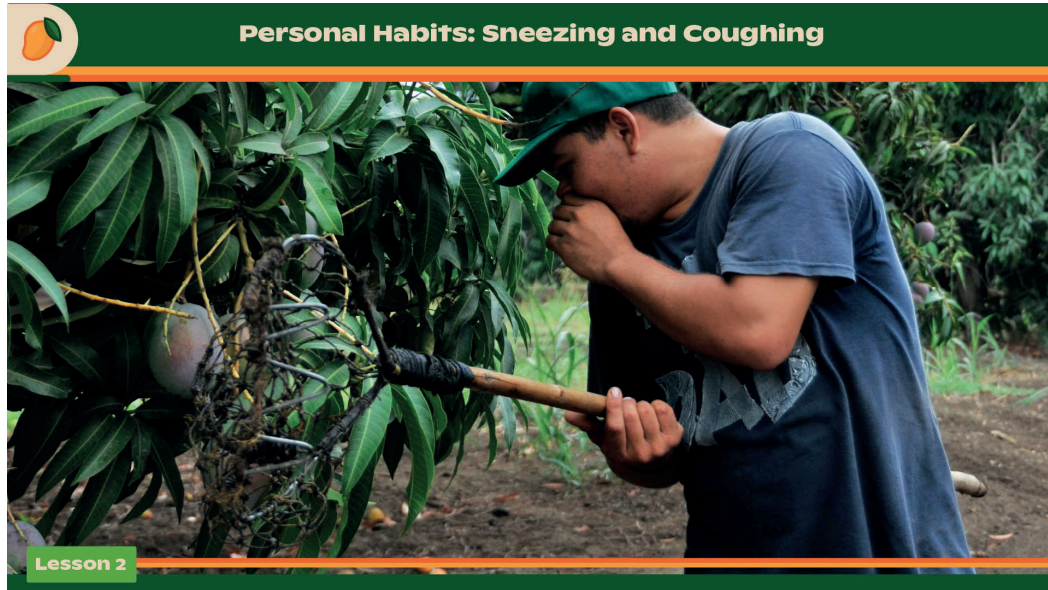
*[Instructor's note: There are several farms that do not have a designated area for smoking since they have a no smoking policy. If this is your case, only mention that it is strictly forbidden to smoke on the farm.]*

If you smoke, you can only do so in the designated smoking areas.

Cigarette butts can become a physical contaminant if they are not disposed of properly. After you are finished smoking, throw away cigarette butts in the designated containers.

Our mouths contain millions of microbes. When you smoke, these microbes can be transferred from your mouth to your hands. If you don't wash your hands after smoking or before returning to work, you can contaminate the mangos you work with.

Remember to wash your hands after smoking!



### **Personal Habits: Sneezing and Coughing**

When we cough or sneeze, mangos can become contaminated with saliva.

If you need to sneeze or cough, step away from the area where you are working and move to an area away from any product, cover your mouth, and wash your hands before going back to work. This procedure will help you to avoid contaminating the mangos.

Whenever you sneeze, you must not use your clothes as a handkerchief.



## Personal Habits: Spitting



Lesson 2

### Personal Habits: Spitting

Spitting in the work area is unacceptable because it may contaminate the mangos with microbes; saliva could fall onto the mangos and go unnoticed. Saliva is a bodily fluid that must not have contact with mangos. If you need to spit, use a handkerchief or do it far away from the product.

Throw away all mangos that have been in contact with bodily fluids.

#### Additional Learning Activity: Demonstration

Sometimes people spit in the areas where mangos are produced or packed.

*[Spit inside a glass or a bottle that contains water, coffee, or juice. Make noise while spitting. Offer the contents of the glass or bottle to the participants. Ask them to take a drink.]*

How would you feel if you had to drink from this glass or bottle?



### Personal Habits: Restrooms and Toilet Paper

Everyone who works on the farm must always use a bathroom or latrines to relieve themselves; if not, fecal matter could become a source of contamination.

You must ALWAYS use the restrooms or latrine services provided by the farm.

Some farms may have a disciplinary policy or even a zero-tolerance policy for employees who are found to be urinating or defecating outdoors.

You must also dispose of toilet paper according to the company's policy. Toilet paper must not be thrown on the floor; it should be disposed of in the toilet bowl ideally or a trash can, although this is not recommended. If soiled toilet paper is not eliminated correctly, it can become a source of contamination.



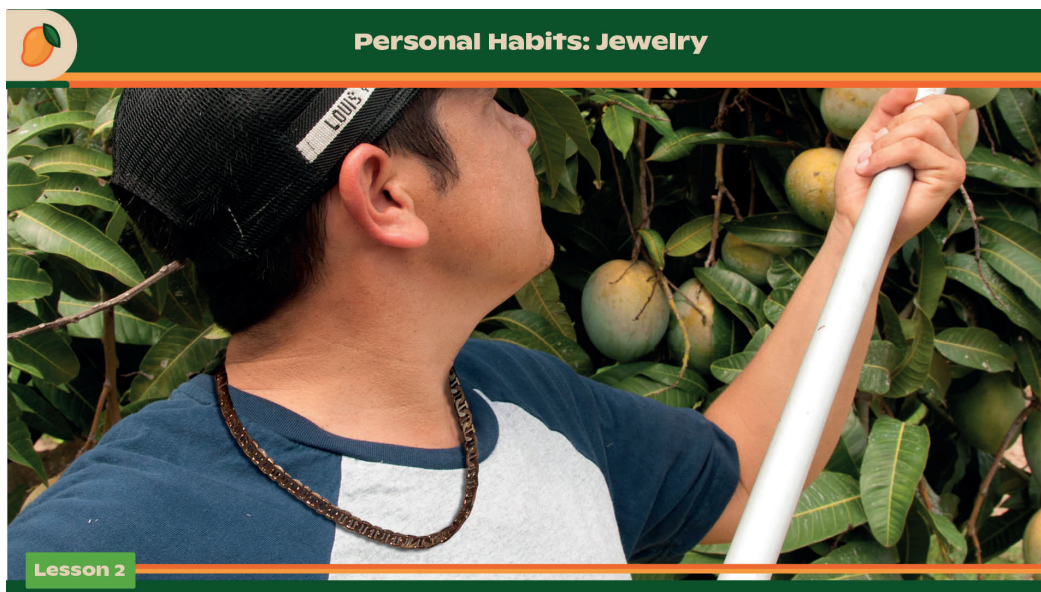
## Personal Habits: Personal Items

Do not take personal items to your work area at the farm. These could fall on the mangos and become a source of contamination. These items, aside from being a potential source of physical contamination, can be dirty and contaminate the mangos with microbes.

Personal items are not allowed on the field. Personal items include pencils and pens, backpacks, radios, CD players, earphones, and cell phones, etc.

Before beginning work, store all your personal items in the assigned area or, better yet, leave anything you won't need at home.





### Personal Habits: Jewelry

You are not allowed to wear jewelry, watches, rings, earrings, decorations, necklaces, or chains of any material within the mango production areas. Jewelry also can become a source of physical contamination.

Take off all your jewelry before starting work. Put these items in your backpack, locker, car, or, better yet, do not bring them to work. If possible, leave all your jewelry at home.

Some companies also prohibit the use of piercings when working with mangos.

#### Optional Text

*Food safety guidelines vary by farm, which means that some farms don't allow jewelry and some do: For example, some farms/packinghouses/warehouses allow workers to wear a plain wedding band with no stones, which must be covered by a glove to prevent it from becoming a source of contamination.*



## Personal Habits: Long, Polished, and Fake Nails

Fake nails, jeweled nails, and nail polish are not allowed in the workplace; these could fall into the mangos and become a source of contamination.

Always keep your nails short and clean. Long nails can harbor microbes, which may contaminate mangos as you handle them.

You may also want to refrain from wearing makeup in the workplace. Review your company's makeup policy.



### Health and Wounds



Lesson 2

## Health and Wounds

Employee health and wounds is the last area of personal hygiene.

Going to work sick can contaminate the mangos since microbes can potentially be transferred to the product.

There is history of foodborne illnesses caused by sick employees. Because of this, workers cannot work in the field if they have certain diseases.

The same applies for cuts and wounds. Employees with cuts or open wounds must follow farm-defined requirements and policies to prevent mango cross-contamination.



## Health and Wounds: Personal Health

Although appropriate personal hygiene practices can prevent the transmission of harmful microbes to mangos from employees who work with them, there are cases where such practices are not enough. Any employees with the following diseases or symptoms should NOT work with mangos:

- Vomiting
- Diarrhea
- Jaundice (yellow coloring of the skin)
- Sore throat with fever

If you have any of these symptoms, you must inform your supervisor before starting work. Depending on the type of sickness you have and the farm's policy, your supervisor may change your work activity to one that doesn't require you to handle mangos or even exclude you from work temporarily until you have recovered.



### Health and Wounds: Wounds and Blood

Open wounds, such as cuts and skin injuries, can be a source of contamination for mangos.

If you have a cut or open sore, report it to your supervisor before starting work. If you cut a hand or a finger as you work, inform your supervisor immediately. Stop the bleeding. If the bleeding cannot be stopped, and the wound appears serious, seek medical attention.

If the wound is not serious, wash your hands, cover the wound with a Band-Aid, and then, if the wound is on your hand, cover it with a glove.

Remember that any product that comes into contact with blood or any other bodily fluid must be discarded appropriately.



## Activity: Correct – Incorrect

To conclude this section of the training, we will review some examples of situations that we learned today and that could happen on a mango farm.

I'll show a slide with two pictures and ask you what is wrong in the picture on the left.

Then we will see the correct example shown in the photo on the right side of the page.

*[The purpose of this activity is to demonstrate appropriate personal hygiene practices that need to be followed in the mango industry.]*



### Clothing

What is wrong in the picture on the left?

*[Answer: The worker is wearing a sleeveless shirt. He is exposing the mangos to his armpits and sweat.]*

In the picture on the right, the harvester is wearing a clean shirt with sleeves that prevent sweat from reaching the mangos.

Would you like to eat something that has been exposed to someone else's armpits or sweat?



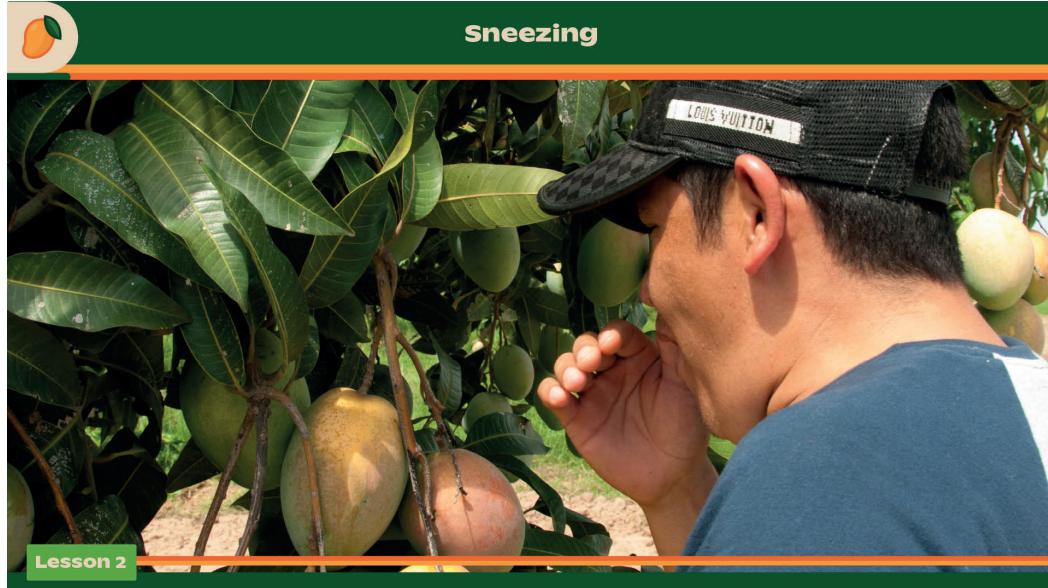
## Eating and Drinking

What is wrong in the photograph on the left?

*[Answer: The worker is eating and drinking a soda within the mango production area. Food, candy, drinks, and snacks are prohibited within the mango production area of the farm.]*

Remember that you can only eat and drink within designated areas, such as the dining room or away from the production area, as are the person in the picture on the right.





### Sneezing

What is happening in this photograph?

*[Answer: The employee is sneezing on top of the mangos, exposing them to saliva. Saliva is a bodily fluid that must not come into contact with the mangos.]*

Remember that when you cough or sneeze, you must never use your clothes as a handkerchief. You must move to an area away from mangos and cover your mouth with your hands. DON'T forget to wash your hands before returning to work.



## Personal Items: Cell Phone

What is wrong in this photograph?

*[Answer: The employee is talking on his cell phone within the mango production area.]*

Do not use your cell phone in the active mango production and harvesting areas. If you must use your phone, exit the area and remember to wash your hands before returning to work.

Supervisors are an exception to this rule, since a phone is one of the items they use regularly to perform their job duties.



## Jewelry

What is the worker doing wrong?

*[Answer: The harvester is wearing a chain around his neck as he works with mangos.]*

In the photograph on the right, we can see that the worker is no longer wearing the chain. This is important because the chain could fall into the mangos and contaminate the product.

### Optional Text

Food safety guidelines vary by farm, which means that some farms don't allow jewelry and some do. For example, some farms/packinghouses/warehouses allow workers to wear a plain wedding band with no stones, which must be covered by a glove to prevent it from becoming a source of contamination.



## Hair Restraints

What is wrong in the photograph on the left?

*[Answer: The harvester is not wearing a cap or a hair restraint.]*

In the picture on the right, we can see the correct way. Employees are wearing a hair restraint when working with mangos.

When we work with mangos, we must wear clean clothes and some sort of hair restraint, such as a hairnet, mesh cap, hat, scarf, or bandanna to prevent hair from falling into the mangos



### Restrooms and Latrines

What is wrong in the picture on the left?

*[Answer: The harvester is urinating in the field.]*

In the picture on the right, the employee is using the farm's restroom facilities.

Some farms may have a disciplinary policy or even a zero-tolerance policy for employees who are found to be urinating or defecating outdoors.

You must ALWAYS use the restrooms or latrine services provided by the farm.

This is the end of our training on personal hygiene. Do you have any questions?

Thank you for your participation. Please remember to sign the attendance sheet.



# **Lesson 3.**

## **Hand Washing and Glove Usage**



### Lesson 3. Hand Washing

To emphasize the importance of adequate personal hygiene, during this lesson, the instructor will explain the objective of hand washing and the correct way to do it on the job. This lesson also describes the correct way to use gloves to prevent contamination. For each of these areas, the instructor will explain and demonstrate appropriate procedures and behaviors for lowering the risk of mango contamination.

#### Learning Objectives

By the end of this lesson, the participants will be able to:

- Explain how our hands can contaminate mangos with microbes.
- Indicate the importance of hand washing to prevent mango contamination.
- List the different situations in which employees should wash their hands.
- Demonstrate the correct hand washing procedure.



## Hand Washing

Let's talk about the single most important practice for keeping mangos safe: hand washing. Hand washing is one of the best ways to prevent the spread of illness and infections.

During the day, our hands come into contact with objects that are not always clean, which means our hands can become contaminated with microbes. If we do not wash our hands, the dirt and microbes from those objects can easily be transferred to the mangos if we touch them without washing our hands. For this reason, you must keep your hands clean at all times.





### The Importance of Hand Washing

In this image, you can see several types of hand washing stations. Some are simpler than others, but they are all effective in the farm. The rule is simple: A good hand washing can reduce the amount of microbes present on your hands.

It doesn't matter what kind of hand washing station the farm is equipped with. What is important is that you wash your hands correctly with the procedure you will learn in this lesson.

Hand washing is like job insurance because it helps reduce the risk of mango contamination.



## When Should I Wash my Hands?

To help minimize the potential risk of mango contamination you must wash your hands BEFORE:

- Starting work.

You must also wash your hands AFTER you do any of the following activities:

- Using the bathroom. This is the most important handwashing opportunity. You must wash your hands after using the restroom!
- Taking a break or eating.
- Touching your nose or face.
- Coughing or sneezing on your hands.
- Smoking.
- Using your cell phone.



## Proper Hand Washing Procedure

There is a standard proper procedure for hand washing. All employees on the farm should follow it. Rapidly wetting your hands or washing them without soap is not enough to remove microbes or chemical products from your hands. The following are the five basic steps for thorough hand washing:

- Step 1:** Wet your hands with clean water.
- Step 2:** Apply soap.
- Step 3:** Scrub your hands and forearms for approximately 10 to 15 seconds.
- Step 4:** Rinse your hands with water to eliminate all the soap.
- Step 5:** Dry your hands using a disposable paper towel.

If there are no soap or paper towels in the hand washing station, immediately inform your supervisor, so that the matter can be taken care of.



## Step 1. Wet Your Hands with Water

Let's review in detail each of the steps for proper hand washing. First, wet your hands with clean water.



### Step 2. Apply Soap

Next, apply a good amount of soap or detergent on your hands.

Soap helps to loosen dirt and microbes stuck to the skin.



## Step 3. Scrub for 10 to 15 Seconds

Scrub your hands and forearms vigorously for 10 to 15 seconds.

Remove any dirt that is underneath your fingernails. Scrub your hands, arms, and the areas between your fingers well.

Create sufficient friction while scrubbing, since friction is probably the most important factor in eliminating bacteria and dirt from your hands.



### **Step 4. Rinse Your Hands**

Rinse your hands with clean water, making sure to remove all the soap from your hands.



## **Step 5. Dry Your Hands with a Disposable Paper Towel**

Dry your hands using a disposable paper towel or any other approved drying method such as a warm air dryer or a continuous supply of clean towels.

You must not dry your hands on your clothes, protective clothing, or work rags, which can cause you to recontaminate your hands.

Always throw away the disposable paper towel in the trash can.

These five steps will help you to ensure you wash your hands properly. If you find it difficult to remember them, check the posters placed next to the farm's hand washing stations, which demonstrate the proper procedure to wash your hands.





### Hand Sanitizer

Some farms may require the use of hand sanitizers or gel antiseptics after you have washed your hands. Review your company's policy to see if this is necessary.

Hand sanitizers are liquids and gels that reduce the microbes present on clean hands. Hand sanitizers should only be used AFTER you have washed your hands and NOT in place of hand washing.

It is prohibited to use a hand sanitizer you brought from home, and you must always keep in mind that hand sanitizers are NOT to be used in place of proper hand washing.

*[**Note:** The use of hand sanitizer is not necessarily a food safety requirement on a farm; it is optional and its use depends on each individual operation.]*



## Hand Washing Activity

The objective of this activity is to demonstrate the correct hand washing procedure.

1. Have GloGerm™ or GlitterBug® cream and an ultraviolet light ready prior to this activity.

You can order the GloGerm™ or GlitterBug® kit at:

GloGerm™ Company

<http://www.glogerm.com/>

800-842-6622

GlitterBug® Brevis Co.

<http://www.glitterbug.com/>

801-466-6677

2. Before starting the training session, make sure there is a hand washing station near the training location. The hand washing station must have running water and be well stocked with liquid soap, paper towels, and a trash can.
3. Take the participants to the hand washing station.
4. Ask the participants if there are any volunteers to apply the GloGerm™ or GlitterBug® cream to their hands and then apply the cream.



### Hand Washing Activity

5. Place your hands and the volunteer's under the UV lamp and ask the other participants to observe. To see the effect of the cream under the UV lamp, dim the light in the room.
6. Ask volunteers to only rinse their hands instead of washing them properly.
7. Wash your hands using the appropriate hand washing procedure.
8. Place your hands under the UV lamp and show the participants that your hands do not glow. Now ask the volunteers to place their hands under the UV lamp and allow the group to observe how they glow.
9. Ask the participants what they think happened and why they think their hands still glow and yours don't.

**If the cream is not available, it is important to modify this activity to show only the correct procedure at a hand washing station. The instructor must first demonstrate the procedure and then ask each of the participants to wash their hands properly before returning to work.**



# **Lesson 4.**

## **Cross-Contamination in the Farm**



### Lesson 4. Cross-Contamination in the Farm

In this lesson, the instructor will describe the concept of cross-contamination and its causes, why it may be a problem for mango production, and its importance to food safety. This lesson also reviews food safety strategies for preventing cross-contamination.

The instructor will detail situations that may happen on the farm/packinghouse/warehouse, which may lead to product contamination. These situations include animal intrusion, presence of glass, inadequate handling of packing material, and inadequate handling of water in product washing tanks, among others.

The program developed for packinghouses and importing warehouses includes a few additional slides with information about the ABCs of mango defense. In this section, the training describes different controls that can be applied to prevent the intentional contamination of mangos.

### Learning Objectives

By the end of this lesson, the participants will be able to:

- Explain what cross-contamination is and how it can be prevented on the farm/packinghouse/warehouse.
- Demonstrate the correct practices when handling mangos to avoid cross-contamination.



## Cross-Contamination

Let's remember that a contaminant is a physical, chemical, or biological agent present in food that can cause illness or injury to the consumers. Mangos are the only thing that should be present in a mango basket or box.

In this section, we will review what the concept of cross-contamination means, and we will see what actions we can take to protect mangos from cross-contamination.

Cross-contamination is the transfer of substances, objects, microbes, or other contaminants from something that is DIRTY to something that is CLEAN. Cross-contamination can become a serious problem for mangos.

There are several practices in the field that could cause the cross-contamination of mangos. Avoiding these is a critical part of our job.

*[This section includes practices that do not apply to all farms; you should show only the ones that are used or apply to your farm.]*



### Cleaning and Sanitizing of Harvesting Utensils

In the field, you should have chlorine or another sanitizing solution available and prepared to a determined concentration according to your farm procedures. The supervisor is responsible for providing the sanitizing solution and monitoring its concentration. This solution is used to keep your tools clean while you're working.

Sanitize your knife, scissors, and/or net at the beginning and end of each day.

You may need to sanitize your tools at other times during the day, such as when you return to work after breaks and/or meals, when you move from one field to another, or if any contamination occurs. You should always follow your farm's policies.

In the picture, you can see a three-step process for cleaning and sanitizing harvesting nets. The harvester cleans the net with a detergent and scrub it with a sponge; then he rinses it with water and finally immerses it in a sanitizing solution.



Food Contact Surfaces (Picking Nets and Containers)

Lesson 4

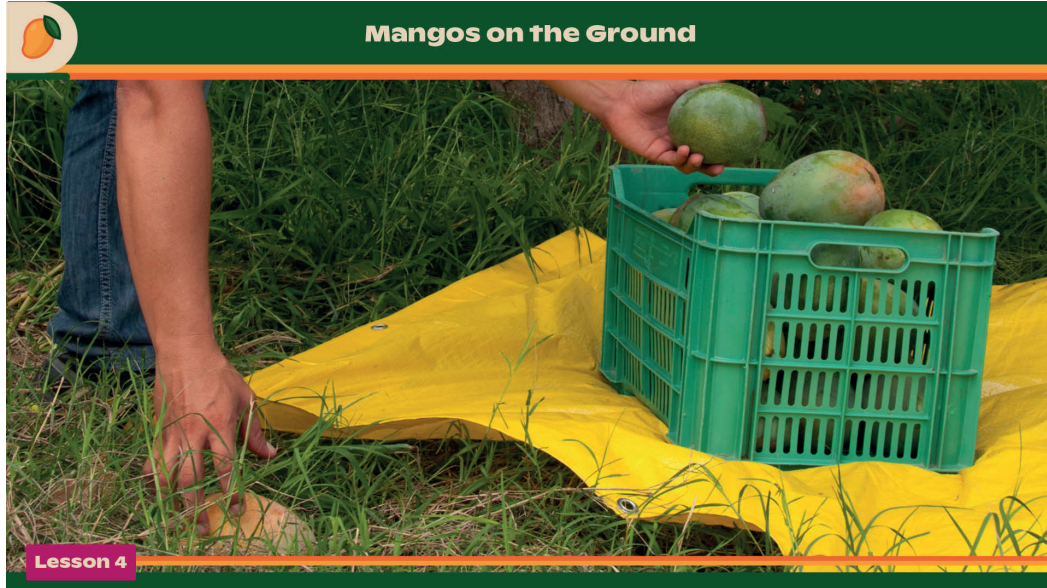
## Food Contact Surfaces (Picking Nets and Containers)

A food contact surface is a part of the equipment or a utensil with which mangos normally come into direct contact.

As part of your job, you must follow correct procedures for cleaning and sanitizing food contact surfaces to reduce the risk of cross-contamination.

Make sure that all cleaning and sanitizing procedures are effective. Document any visual, and if any, microbiological inspection of the sanitation process.





### Mangos on the Ground

The ground or soil is an important potential source of contamination where disease-causing microbes can survive. Think about yourself for a moment: would you give your family food that was on the ground?

If the mango or a basket with mangos falls to the ground while harvesting, you need to **THROW AWAY** all the product that came in contact with the ground. Always follow your supervisor's instructions.

In the pictures, the harvester is shown placing a mango that fell to the ground back into the basket. This practice is unacceptable.



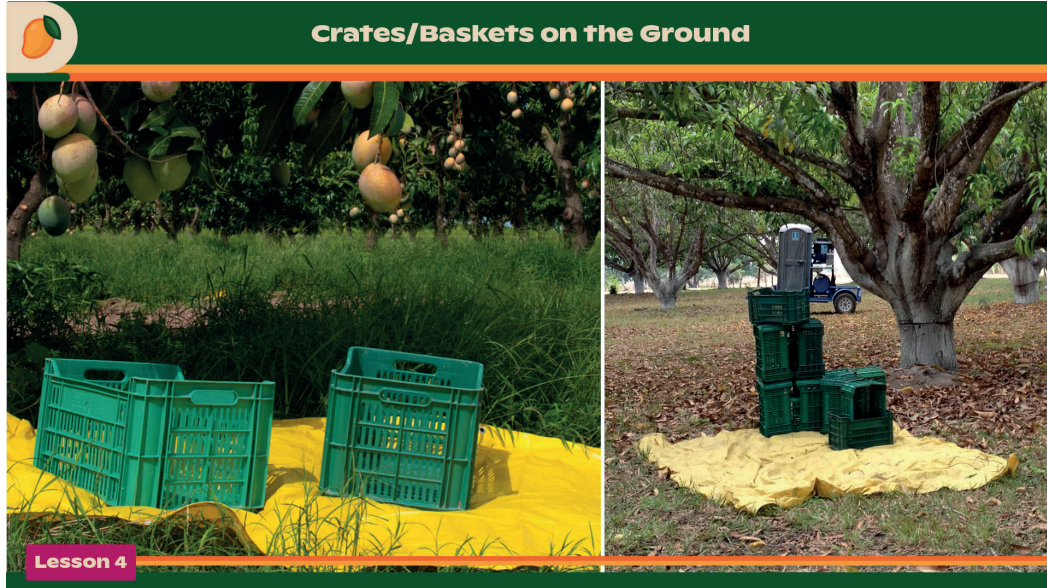
## Containers/Packaging Materials

Packaging materials, containers, plastic crates, and boxes can be another source of cross-contamination for mangos.

NEVER use baskets or boxes that look extremely dirty or broken to store or transport mangos.

You can only use baskets, crates, or boxes that are reasonably clean, undamaged, and free of dirt, diesel, oil, and/or grease. Brushes or buckets also must be free of dirt, diesel, oil, and/or grease. Contaminated reusable containers need to be properly cleaned and sanitized.

Also note that, in the picture, the baskets with mangos are placed on a wooden pallet, so they do not have contact with the ground.



### Crates/Baskets on the Ground

To prevent mangos from touching the ground and becoming contaminated, you can use a plastic blanket/tarp, a wooden pallet or a wooden block/barrier to prevent the mangos from directly touching the ground. You can also use a buffer basket.

The protection should always be placed under a pile of baskets or boxes of mangos to prevent them from having direct contact with the ground.

The rule is simple. EVERY TIME you are harvesting or working with mangos, you must use a protective surface to prevent the baskets or crates containing mangos from coming into contact with the ground.

ALWAYS place the baskets, crates, and packing materials on pallets, trucks, or trailers; never let them stand directly on the ground. If the plastic blankets/tarps are reusable, they will need to be cleaned and sanitized regularly following the procedure used by your farm.



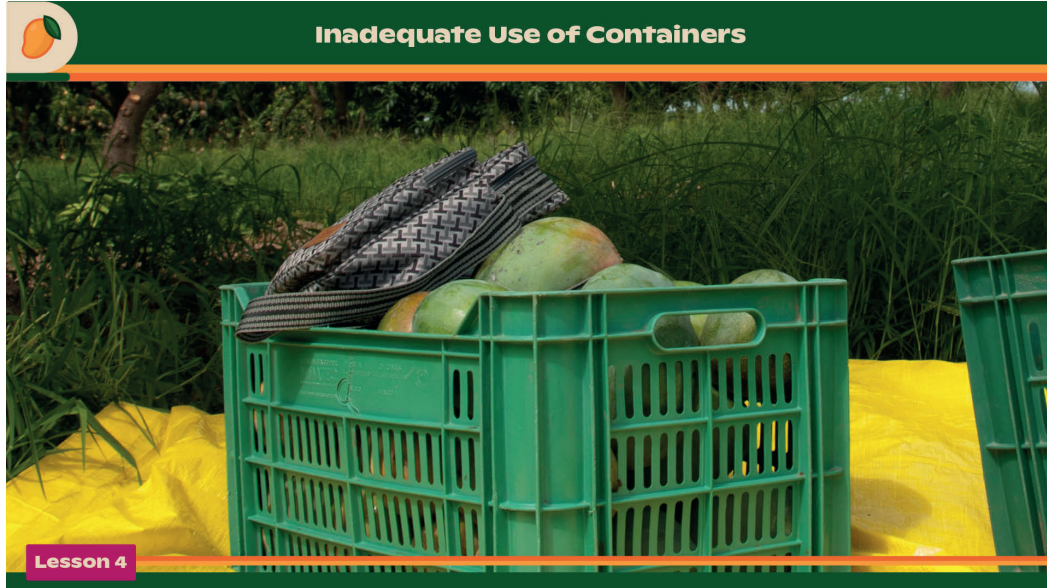
## Mangos Left on the Sun

Prolonged exposure to the sun can damage mangos that have already been harvested. You must never leave the baskets of harvested product in a place where the sun can damage them.

Place the baskets with product under the shade.

This is not a food safety issue; it is a matter of quality. Our customers have high-quality standards, and our work is to always provide the best possible product. Keeping mangos away from sunlight will help us meet our customer's requirements.

Your supervisor, as shown in the example in the photo, has a duty to remind you of this issue when this situation happens on the farm.



### Inadequate Use of Containers

Baskets, crates, or boxes should only be used to transport the harvested product. Non-food materials, such as soda cans, food, tools, nails, and clothes, etc., should not be placed in or on the mango baskets or crates.

In this photo, you can see an employee using a basket incorrectly.

The baskets or plastic crates should only be used for holding mangos.



## Animals in the Field

Both domestic and wild animals should not have access to production areas in the field. In some cases, fences or barriers should be placed to prevent domestic and wild animals from accessing the fields. If there isn't a fence, you must conduct a detailed environmental assessment of the block to be harvested to assess whether there is a potential contamination risk. The farm's supervisor or manager must document this evaluation.

ALWAYS be alert and report any evidence of any animals in the block that is going to be harvested to your supervisor.

It is strictly prohibited to keep pets or domestic animals next to the harvesting or active production areas, as this may represent a potential source of contamination.

In the pictures, you can see some examples of bad practices related to animals being in or near production areas.



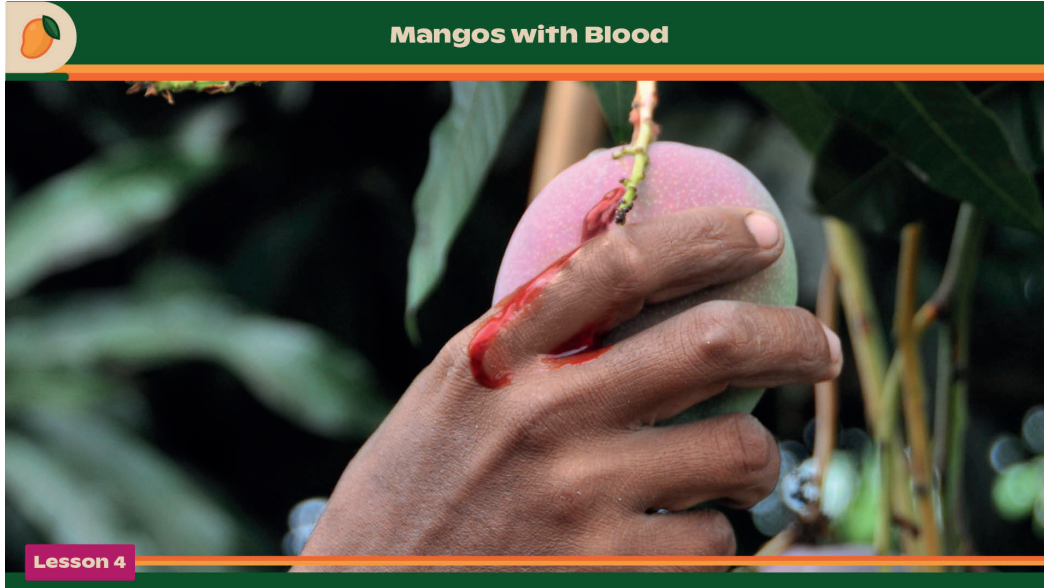
### Fecal Matter in the Field

Fecal matter is a dangerous source of contamination for mangos.

What happens if you see fecal matter in the field right in the area where you will be harvesting mangos?

If you find any evidence of fecal matter, immediately report it to your supervisor. The supervisor must conduct a food safety assessment supported by qualified personnel and document the assessment.

Do not harvest any product that has contact with fecal matter and do not put baskets or crates with mangos near fecal matter.



## Mangos with Blood

If you cut your hand while working, make sure you do not need medical attention. If the cut is not serious, wash your hands, put on a bandage, and then cover it with a glove. Tell your supervisor about the incident. However, if the cut is severe, and you cannot stop the bleeding, seek medical attention. Your supervisor will decide if you can return to work.

You and your supervisor must ensure that blood did not contaminate any of your work equipment or utensils. If blood or another bodily fluid fell on the harvesting equipment or packaging materials, they must be discarded or cleaned and sanitized following your company's policy for cleaning off blood.

If blood fell on the mangos, they should be discarded immediately. If mangos are contaminated with blood or any other bodily fluids, they must be disposed of as directed by your supervisor.





### Glass

It is prohibited to bring glassware, such as bottles, glasses, and watches to active production areas of the farm.

If you notice that glass fell on the mangos, do not just remove the piece of glass from the container; you **MUST** discard or dispose of the affected mangos and report the incident immediately to your supervisor, so that appropriate measures can be taken based on your company's glass policy.



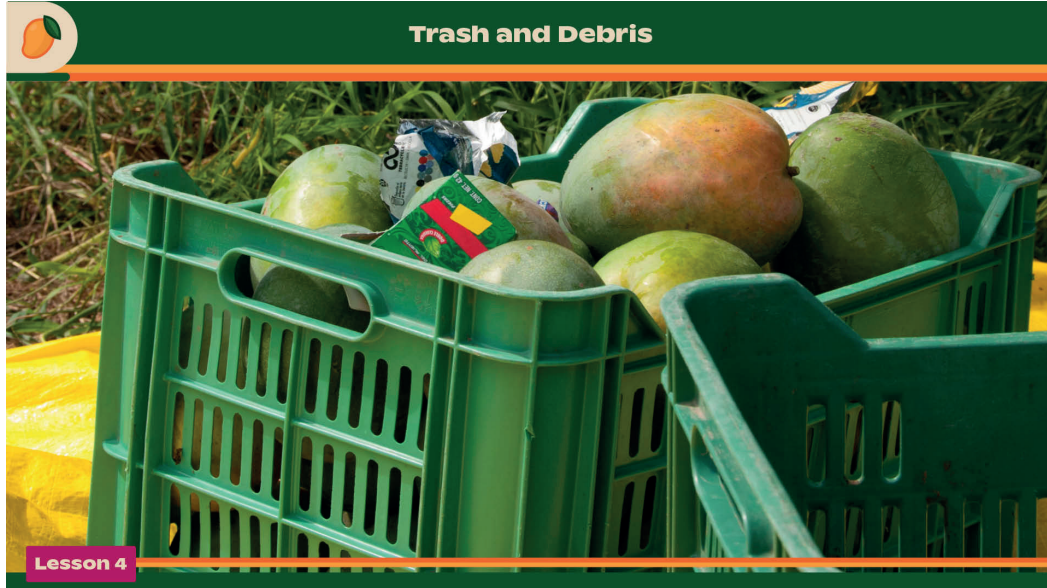
## Chemical Contaminants

Chemical contamination occurs when the mangos come into contact with improperly used chemicals.

Chemicals that can be found in the field, which could become potential chemical contaminants, include:

- Pesticides
- Cleaning chemical products
- Sanitizers
- Machine oils and lubricants

If you see any chemical product being used or stored incorrectly, report it to your supervisor. Remember to ALWAYS follow the correct procedures whenever you handle chemical products.



### Trash and Debris

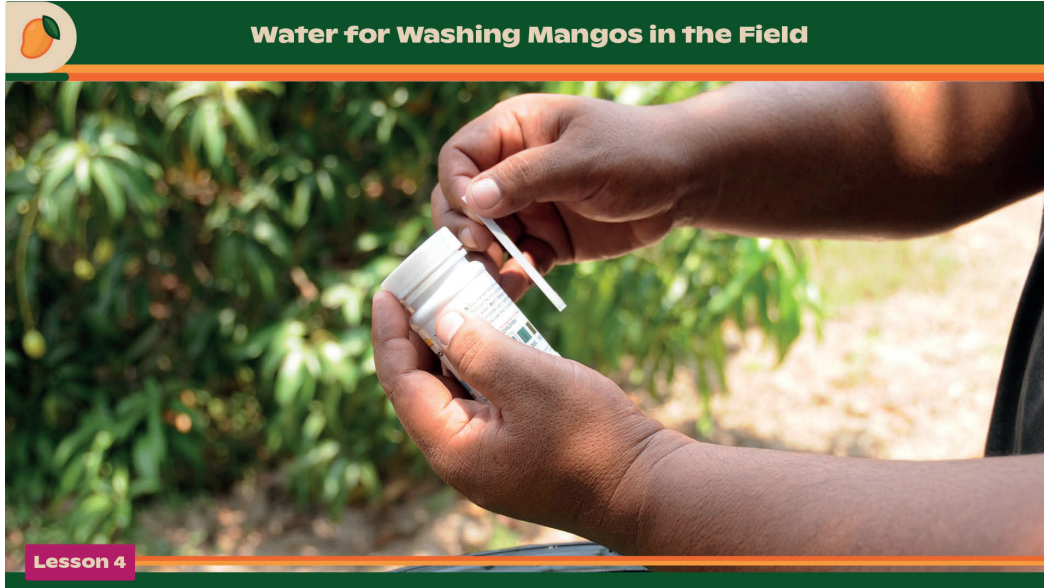
Let's talk about another area that will also help to prevent cross-contamination.

Waste and garbage are sources of contamination and, therefore, must always be placed in the designated containers. Throw away all trash in designated locations!

Assigned personnel should empty trash containers or cans daily or as often as necessary.

Eat food in designated areas only and do not leave any trash that could end up on the field and increase the risk of mango contamination. Food debris can attract pests and rodents to the field.

Remember to always wash your hands after handling waste or garbage.



## Water for Washing Mangos in the Field

There are some farms that clean and rinse mangos in the field just after harvesting. If the water is not properly managed or is contaminated, it can become a source of cross-contamination. Make sure the water you use has the proper sanitizing concentration included in your farm's policy.

In addition, if you use cloths or rags to clean the mangos, when not in use these should be kept in a chemical sanitizer solution at the concentration indicated by your supervisor. Cloths or rags should be cleaned and sanitized daily or more often.



### Visitors

The farm must have a system to record the entry and exit of visitors. This will help ensure that visitors are accounted for, which will assist in preventing intentional mango contamination or some other unwanted situation on the farm.

All visitors must abide by the farm's food safety policies and procedures.

If you see any suspicious behavior by a visitor that may cause mango contamination, report it to your supervisor.



## What Did We Learn?

To finish, we are going to review what we learned in this lesson:

- What cross-contamination is and what we can do to avoid it.
- The importance of using equipment that is clean and in good condition.
- Why baskets or plastic crates must not have any contact with the ground.
- Why the product must not have any contact with the ground.
- The importance of avoiding animals on the farm.
- How to handle wounds and cuts and what to do if mangos come in contact with blood and any other bodily fluids.

This is the end of our training in cross-contamination. Do you have any questions?

Thank you for your participation. Please remember to sign the attendance sheet.





## **Section 4.**

### **Additional Materials**





## Posters

**Do Not Forget to  
Cover your Hair**



**Mango**  
-org

 **Producing Safe  
Mangos**

**Wash your Hands**



**Mango**  
-org

 **Producing Safe  
Mangos**

It is recommended that you print out the high-resolution version of these posters available on the CD/USB or from the National Mango Board's website:

**[www.mango.org](http://www.mango.org)**



## Posters

**Todos los visitantes  
deben registrarse  
en la oficina**



**Mango**  
-org

 **Producing Safe  
Mangos**

**Hand Washing  
Procedure**



**1** Wet your hands  
with water



**2** Apply soap



**3** Scrub your hands  
and arms for  
about 15 seconds



**4** Rinse thoroughly  
with water



**5** Dry your hands  
using a clean paper  
towel

**Mango**  
-org

 **Producing Safe  
Mangos**

It is recommended that you print out the high-resolution version of these posters available on the CD/USB or from the National Mango Board's website:

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## Posters



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[www.mango.org](http://www.mango.org)



## Posters

**Wash your Hands**



**Before Starting Work**

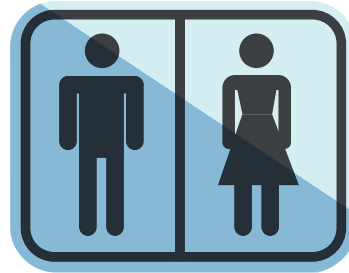


**After Taking a Break**



**After Using the Restroom**

**Wash your Hands After  
Using the Restroom**



**Mango**  
-org

 **Producing Safe  
Mangos**

**Mango**  
-org

 **Producing Safe  
Mangos**

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# Training Log

## Food Safety Training Log

<b>Date</b>	<b>Company/Farm/Packinghouse/Warehouse</b>	
<b>Training Location</b>		
<b>Topics</b>		
<input type="checkbox"/> The ABCs of Mango Food Safety <input type="checkbox"/> Personal Hygiene Practices <input type="checkbox"/> Handwashing and the Use of Gloves <input type="checkbox"/> Cross-Contamination in the Field/Packinghouse/Warehouse		
<b>Trainer/Instructor</b>		
	<b>SIGNATURE OF ATENDEES</b>	<b>EMPLOYEE NUMBER (if applicable)</b>
1		
2		
3		
4		
5		
6		
7		
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10		
11		
12		
13		
14		





## Test

### The Mango Industry Food Safety Training Kit Test

Instructions: Read each of the questions carefully and pick the best answer. There is only one correct answer for each question.

1. Is it possible to determine if a mango is contaminated just by looking at it?
  - a. Yes. The mango will have an unusual appearance, taste, and smell.
  - b. Yes. You can clearly see the microbes on the product.
  - c. No. Contaminated food can look and appear to be normal.
  - d. I don't know.
  
2. What is one of the employee's responsibilities to guarantee mango safety?
  - a. Follow the company's rules and policies.
  - b. Harvest/pack the most amount of mangos during the workday.
  - c. Hide registries from the inspectors.
  - d. I don't know.
  
3. The three types of contaminants that can affect mangos are biological, chemical, and \_\_\_\_\_ .
  - a. Cross-contamination.
  - b. Physical.
  - c. Hand washing.
  - d. I don't know.
  
4. Which of the following statements regarding hair restraints is true?
  - a. It is okay if bangs hang over our foreheads.
  - b. Short hair does not need to be covered.
  - c. All hair and ears need to be covered.
  - d. I don't know.



5. Which of the following actions will most likely increase the risk of contamination of mangos?
- a. Placing personal items in the designated area.
  - b. Forgetting to wash your hands before starting to work with mangos.
  - c. Carefully following your supervisor's instructions.
  - d. I don't know.
6. What should you do before returning to work after eating?
- a. Put on your jewelry.
  - b. Take off your hair restraint.
  - c. Wash your hands.
  - d. I don't know.
7. Which of the following practices can result in microbial contamination of mangos?
- a. Wearing clean clothes.
  - b. Handling mangos without washing your hands after using the restroom.
  - c. Using cleaning and sanitizing products incorrectly.
  - d. I don't know.
8. How long should you scrub your hands after applying soap?
- a. 10 to 15 seconds.
  - b. At least 20 seconds.
  - c. 1 minute.
  - d. I don't know.
9. When does cross-contamination occur?
- a. When a contaminant is transferred from something dirty to a mango or a surface that mangos touch.
  - b. When employees wash their hands with soap and water.
  - c. When employees eat their food in the designated areas.
  - d. I don't know.



- 10.** Why is it important to follow good personal hygiene practices when working with mangos?
- a. So employees don't become a source of cross-contamination.
  - b. So that employees feel comfortable and look good.
  - c. To prevent employee injuries.
  - d. I don't know.
- 11.** Why is it important to use the companies' supplied protective clothing such as hair restraints, aprons, and/or gloves?
- a. To protect the employees from mangos and dirt.
  - b. To protect the mangos from cross-contamination through the employee.
  - c. To keep the employees' clothes clean.
  - d. I don't know.
- 12.** Which of these practices is most likely to cause cross-contamination?
- a. An employee sneezes in his hands and immediately washes them before returning to work.
  - b. An employee takes off her protective clothing before going in to the restroom.
  - c. An employee with diarrhea continues working but makes sure to wash his hands.
  - d. I don't know.
- 13.** Which of the following statements is correct when it comes to hand washing?
- a. You can touch your hair and not wash your hands as long as your hair is clean.
  - b. It is important to use soap only when your hands are visibly dirty; otherwise, you can just use hand sanitizer.
  - c. You must scrub in between your fingers and the exposed parts of your arms.
  - d. I don't know.





- 14.** Which of the following statements is true when it comes to crates, containers, baskets, boxes, and other packing materials?
- a. Crates/baskets can be used as toolboxes.
  - b. Harvesting/storage containers must only be used to transport/store mangos.
  - c. These can be placed on the ground for short periods of time while mangos are being placed in them.
  - d. I don't know.
- 15.** Which of the following clothing is allowed when working with mangos?
- a. Closed shoes, clean pants without holes/tears, short-sleeve shirt, hair restraint.
  - b. Sandals, shorts, sleeveless shirt.
  - c. It doesn't matter as long as it is clean.
  - d. I don't know.

**Answers:** Q1: c; Q2: a; Q3: b; Q4: c; Q5: b; Q6: c; Q7: b; Q8: b; Q9: a; Q10: a; Q11: b; Q12: c; Q13: c; Q14: b; Q15: a.

If you photocopy this test, do not forget to cover the answers.



# Certificate of Attendance

## Certificate of Attendance

For participating in the Mango Industry Food Safety Training Program

The certificate of attendance indicates that the individual above finished the Mango Industry Food Safety Training Program

\_\_\_\_\_  
(Instructor's name)  
(Instructor)  
(Company name)

[Location, day, month, year]

\_\_\_\_\_  
(Instructor's name)  
(Instructor)  
(Company name)



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