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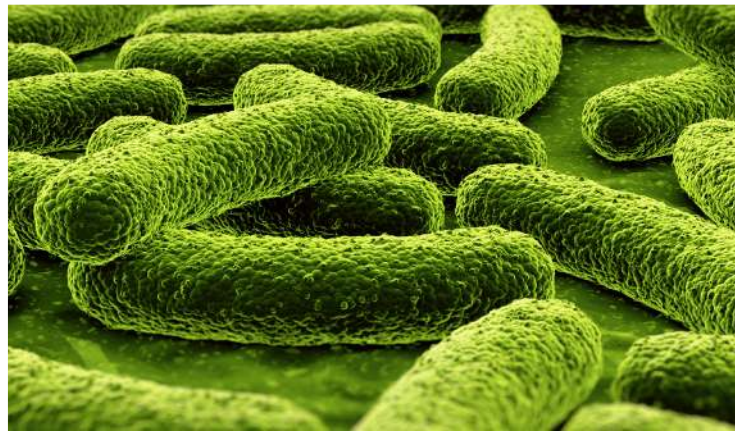
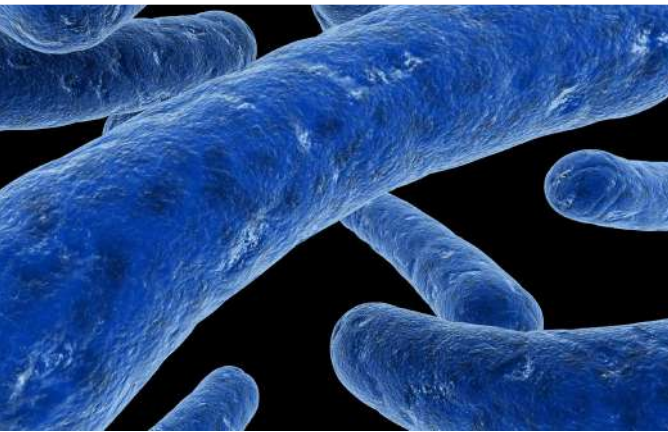
Cross-Contamination in the Packinghouse



The Mango Industry Food Safety Training Kit Packinghouse



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.

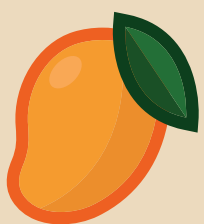
In this section, we will review the concept of crosscontamination, and we will see what actions we can take to protect mangos from cross-contamination.

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.

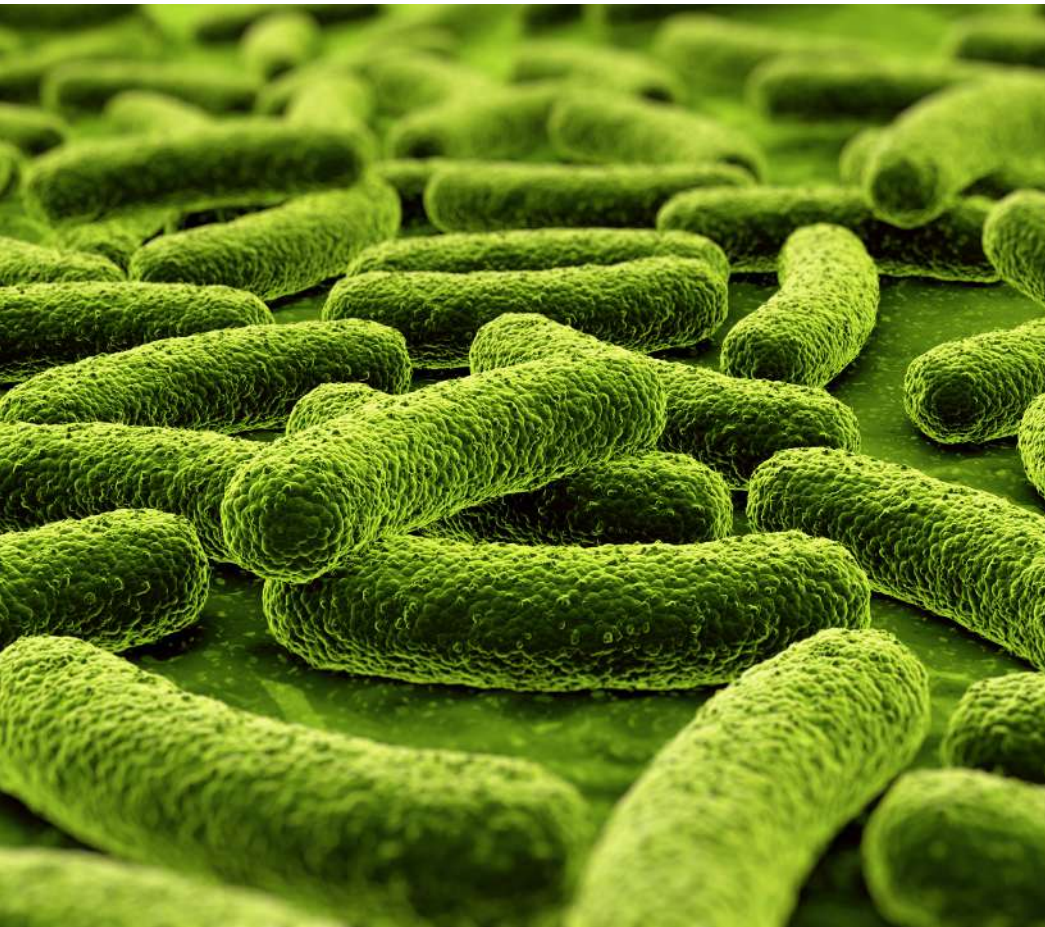
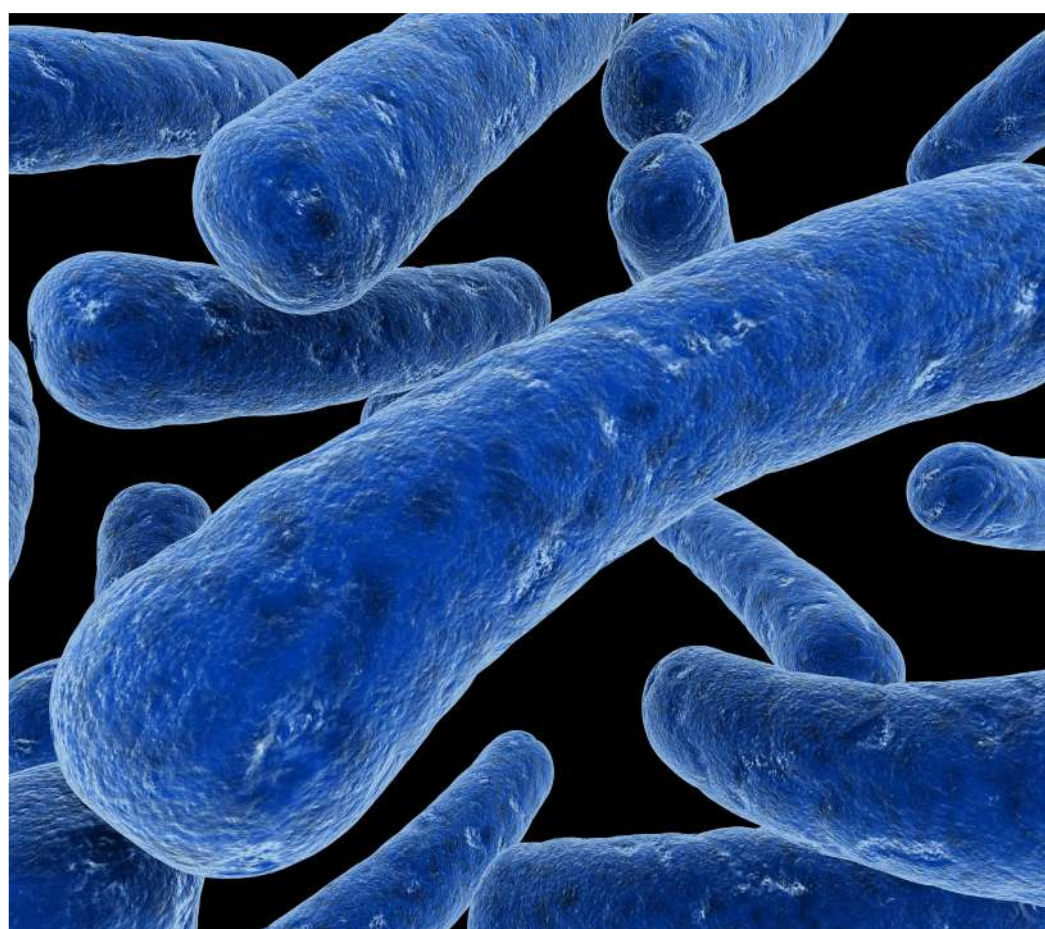
There are several practices in the packinghouse that could cause the cross-contamination of mangos. Avoiding these is a critical part of our job.

[This section includes practices that not apply to all packinghouses; you should show only the ones that are used or apply to your packinghouse.]

Notes: _____



Cross-contamination





Traffic Patterns



Just like employees, microbes move throughout the packinghouse, but they need someone to transport them. Equipment and employees are the main vehicles for microbes to move within the packinghouse.

The principle for preventing cross-contamination is to eliminate all the opportunities for a DIRTY thing to come in contact with something CLEAN.

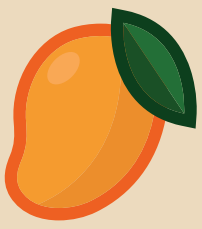
When walking through the packinghouse, it is important to stay only in your designated work area.

If you don't know in which direction you should go, ask your supervisor.

Do not take shortcuts!

Remember, you can carry microbes from a dirty area to a clean one.

Notes: _____



Traffic Patterns





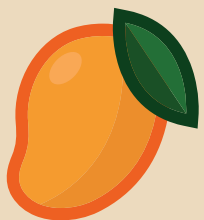
Shoe Covers



Microbes can be transported in our footwear or shoe covers. It is important that we eliminate any opportunity of DIRTY things coming into contact with CLEAN mangos.

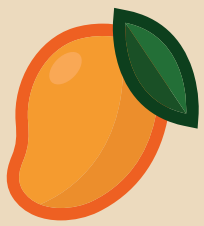
Footwear or shoe covers must not come into contact with mango-contacting surfaces (food contact surfaces). In the picture on the top, the employee in charge of pushing the mangos to the packing lines is stepping directly onto a mango-contacting surface; this practice can become a source of contamination. In the photograph at the bottom of the page, we can see that the employee does not have any contact with this surface, which reduces the risk of mango contamination.

Notes: _____



Shoe Covers





Crates/Baskets/Boxes on the Floor



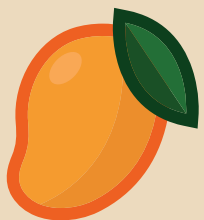
To prevent mangos from touching the floor and becoming contaminated, use a pallet to prevent the mangos from directly touching the ground. You also can use a buffer basket.

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

ALWAYS place the baskets, crates, and packing materials on pallets or tables; never let them stand directly on the floor.

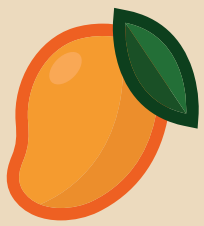
In the photo, you can see two examples of how baskets and crates should be always kept in the packinghouse.

Notes: _____

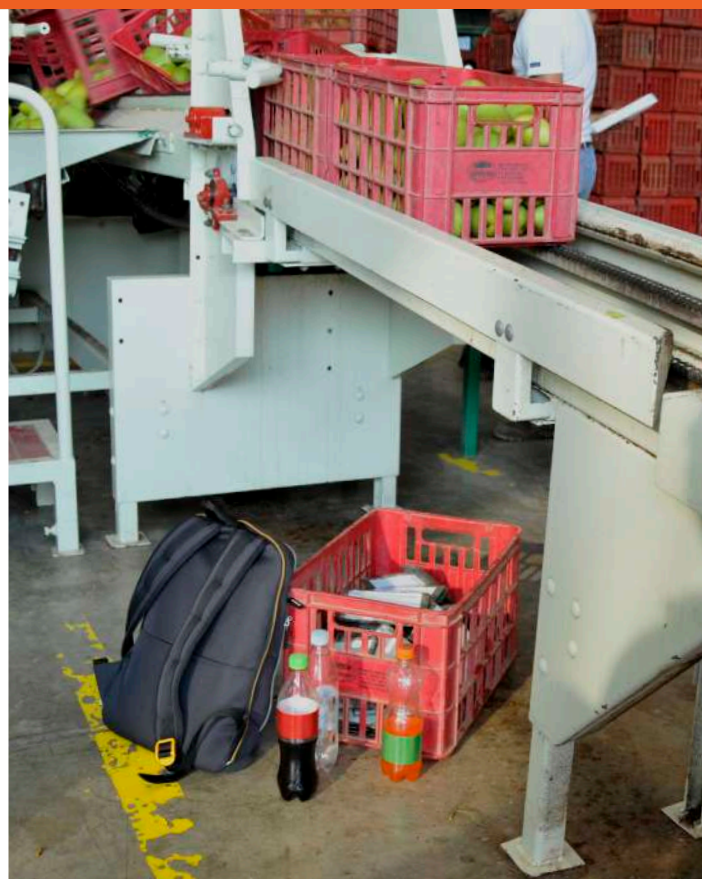


Crates/Baskets/Boxes on the Floor





Inadequate Use of Containers



If used incorrectly, packing material, such as baskets, crates, and boxes also can become a source of mango cross-contamination.

The baskets, crates, or boxes should be used only to hold mangos.

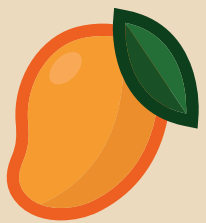
Non-food materials, such as soda cans, food, tools, nails, and clothes, etc., should not be placed in or on mango baskets or crates.

These photos show incorrect use of containers.

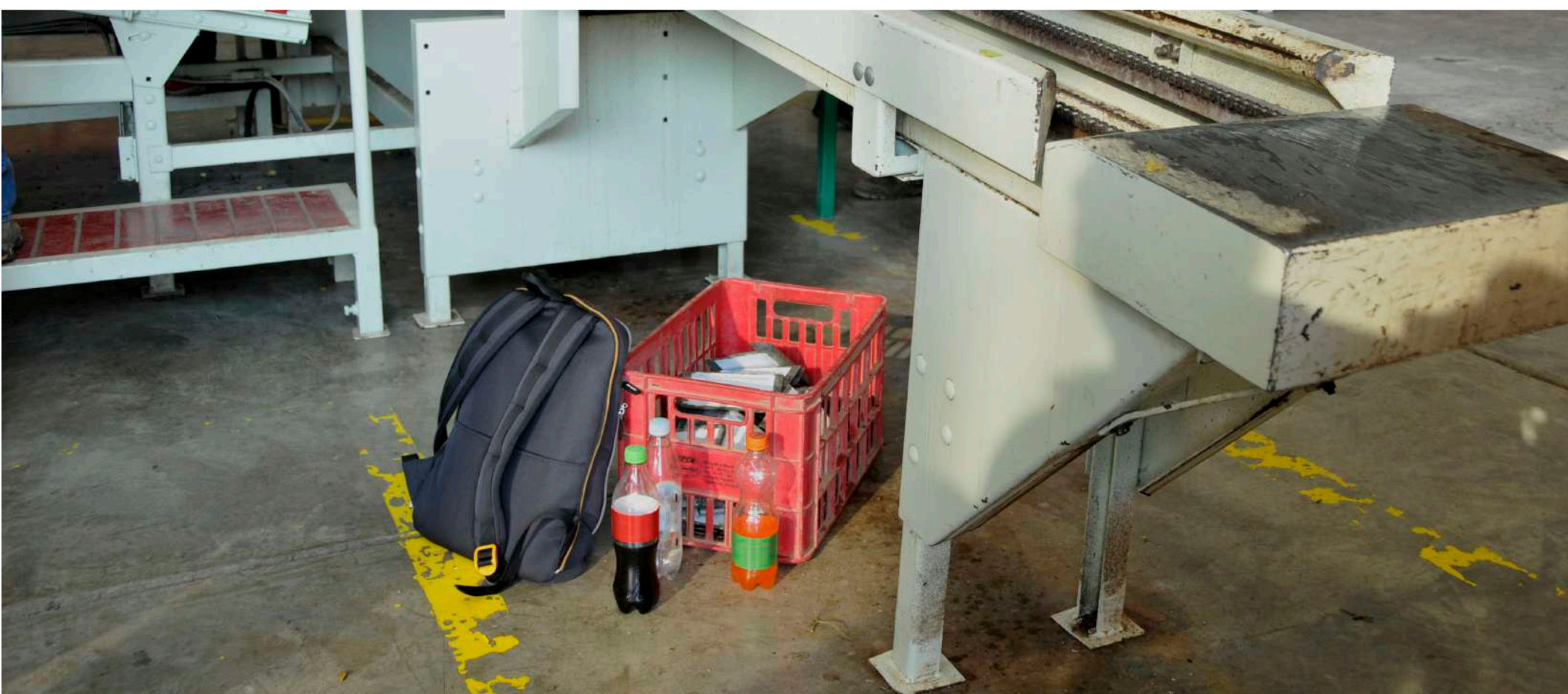
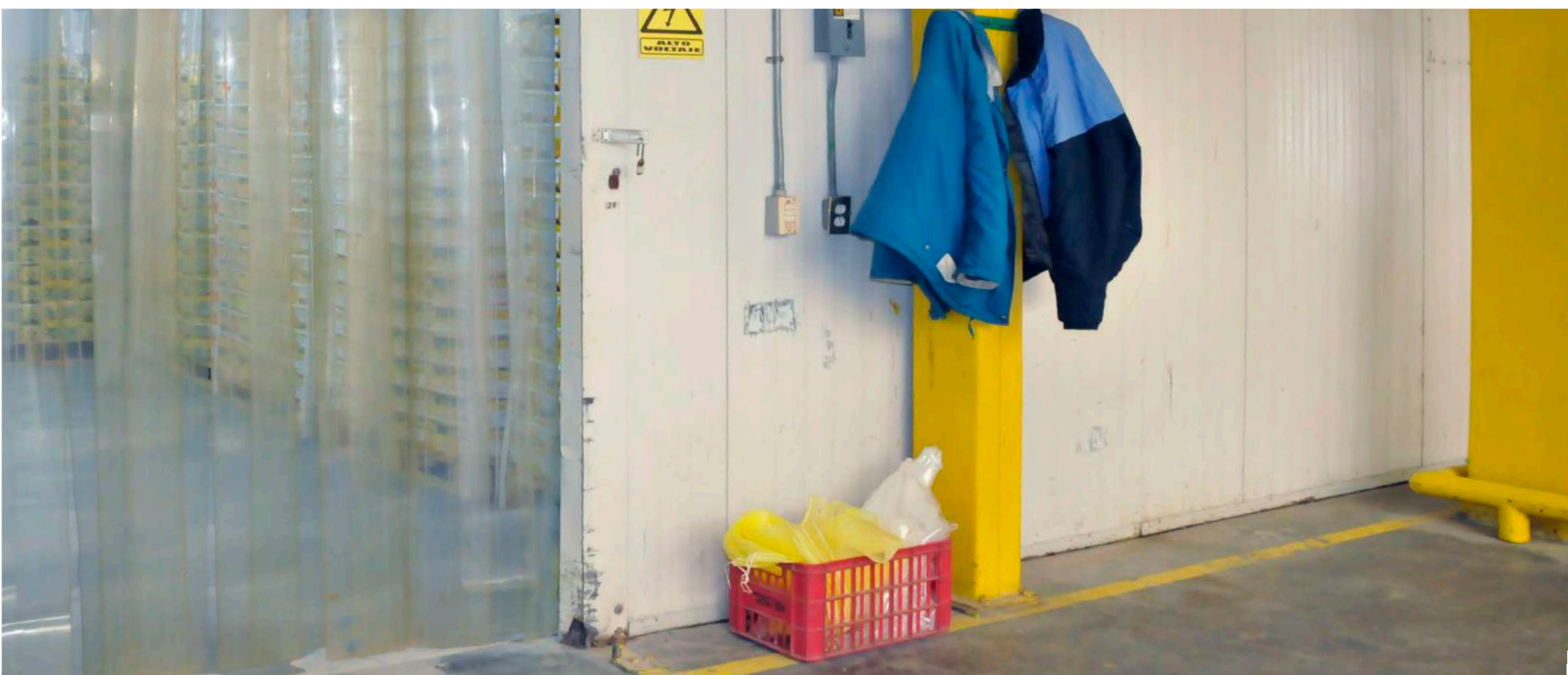
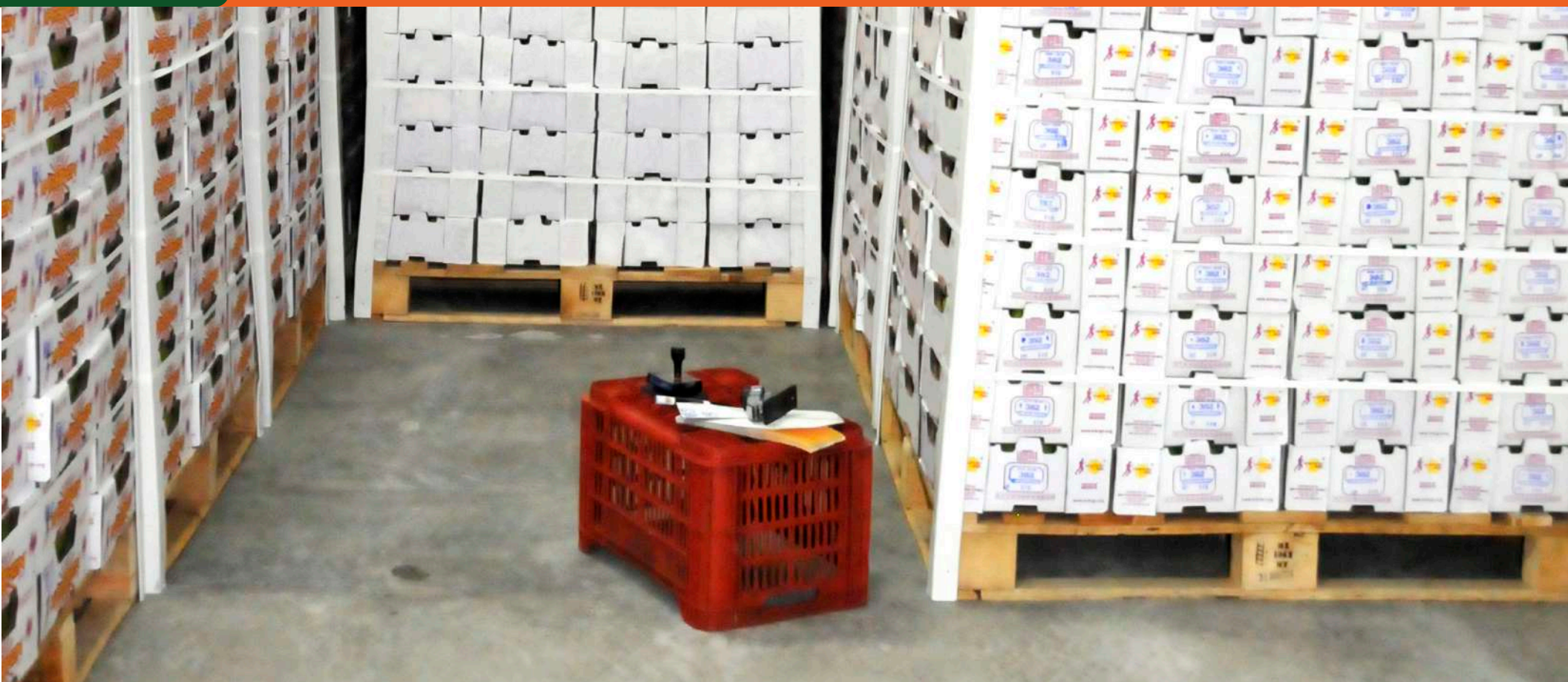
Do not use baskets or crates that look DIRTY or DAMAGED to store mangos.

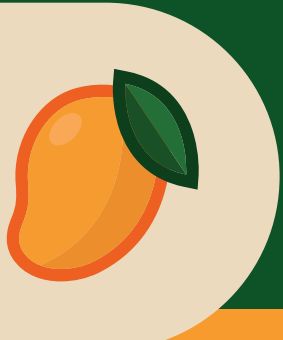
Check boxes and crates before using them. If you find anything wrong with them, inform your supervisor immediately.

Notes: _____

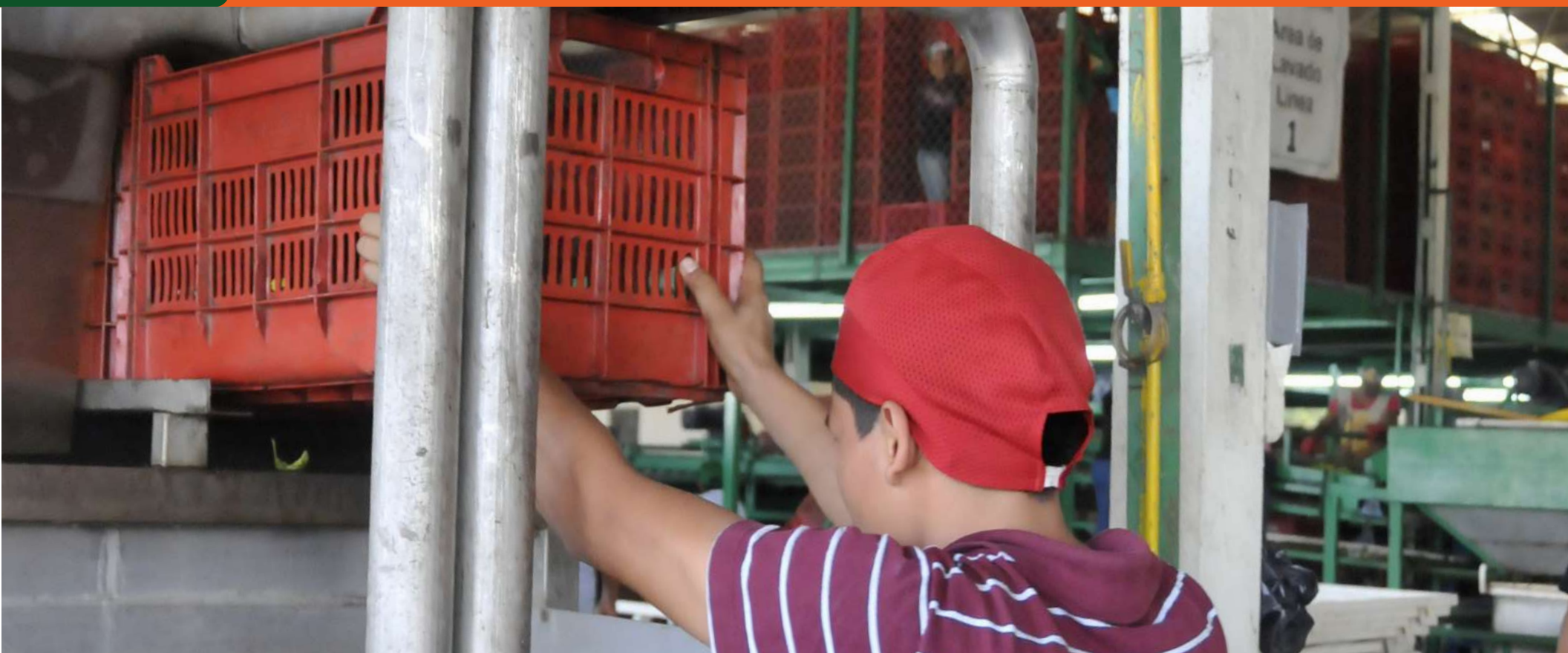


Inadequate Use of Containers





Baskets Cleaning and Sanitizing



Proper cleaning and sanitizing is key to the mango industry’s food safety efforts.

Cleaning and sanitizing help prevent cross-contamination by eliminating dirt and disease-causing microbes that could be present on mango-contacting surfaces.

Adequate sanitation also can help maintain mango shelf life by reducing the number of spoilage microbes in food contact surfaces.

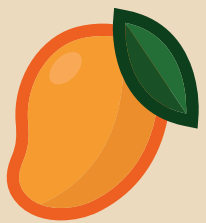
What food-contact surfaces or areas are there in your packinghouse?

[Give participants few seconds to answer.]

Some examples are packing tables, washing tanks, hydrothermic tanks, baskets, boxes and crates, conveyor belts, and any utensil used to push mangos, etc.

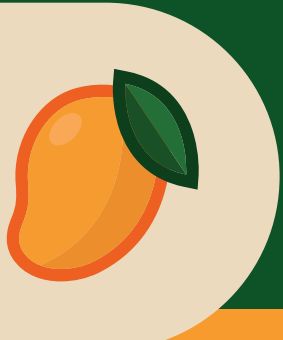
Baskets and crates must be reasonably clean. If your job includes cleaning and sanitizing activities, always follow the procedures indicated by your supervisor. If you have any questions, be sure to ask questions.

Notes: _____



Baskets Cleaning and Sanitizing





Color Coding and Chemical Products



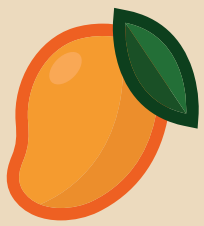
As a form of preventing cross-contamination, some packinghouses use color-coding on utensils, equipment, and clothes such as aprons and hair restraints.

Cleaning utensils and brushes used for multiple tasks can become a source of cross-contamination. To avoid this, utensils are color coded or labeled to indicate their specific use. Always follow your company's color-coding. What is your company's color code? What is shown in the illustration?

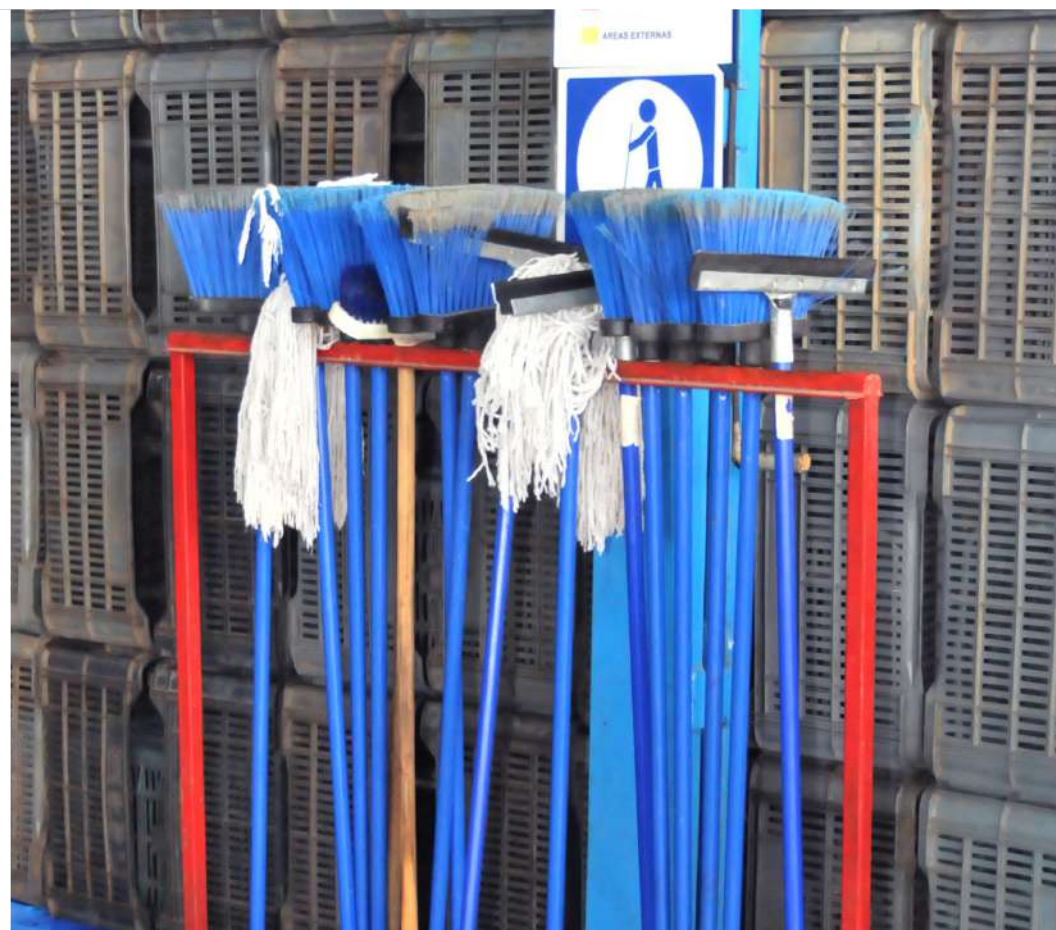
Chemical products, such as cleaning agents and sanitizers, oils, and machine lubricants, can become another source of cross-contamination and should be handled according to the supplier's recommendations. These products must be stored in a designated locked area, as shown in the photograph. If you are in charge of adding a chemical product to the wax or preparing chemical solutions, keep in mind that adding more of a certain chemical product doesn't yield better results. Always use the correct concentrations for chemical products.

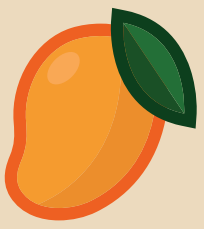
Store and use chemical products in accordance with the company's chemical management plan.

Notes: _____



Color Coding and Chemical Products





Mangos on the Floor



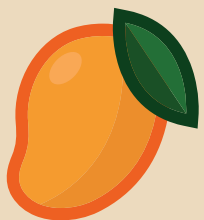
The floor is a potential source of contamination. Think about yourself for a moment: would you give your family food that was on the floor?

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

In the picture, we can see an employee picking up a mango from the floor. What we can't see is whether she returned it to the mango box or threw it away.

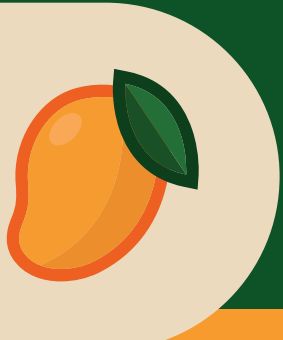
What would you do if a box mangos fell to the floor?

Notes: _____



Mangos on the Floor





Standing Water



Standing water is a condition in which puddles of water stay present for LONG PERIODS of time on the floor or equipment. This is not a desirable situation in a packinghouse.

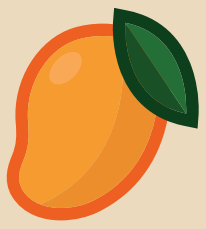
Standing water accumulated in a mango packinghouse must be removed as often as required. Standing water can harbor microbes and serve as a source of contamination to mango packing areas.

Water can spread through the packinghouse through a worker’s shoes and forklift wheels. Standing water droplets can even be accidentally sprinkled on the mangos.

Use a plastic broom or squeegee to carry standing water toward drains.

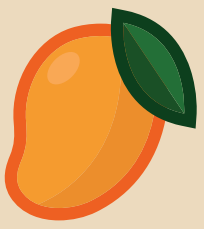
Avoid stepping on standing water or puddles.

Notes: _____



Standing Water





Drains



Drains can accumulate moisture, food particles, soils, and microorganisms.

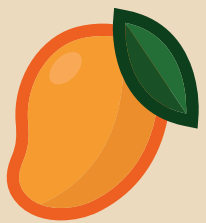
To prevent this contamination spreading from drains, they should be cleaned regularly and carefully.

Follow proper procedures for cleaning and sanitizing drains to minimize cross-contamination with other food contact surfaces. Be careful while cleaning and assign a brush for this specific task.

Drains also can be an entry point for pests. Be sure to keep drain grates or plugs in to prevent pests from entering the facility.

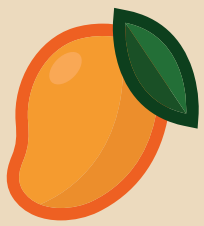
In the pictures, you can see how a packinghouse's drains should be kept, covered and with no accumulation of standing water.

Notes: _____



Drains





Coolers and Condensation



Leaky and unmaintained coolers can become a serious cross-contamination problem. Look out for and control the presence of condensation or drops of water falling from the roof or cooling units or formed on cold room curtains.

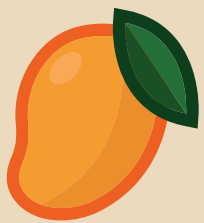
If necessary, you must move crates or boxes containing mangos or cover them with paper or plastic tarps to prevent condensation droplets from falling on them. Inform your supervisor if you see condensation droplets falling on or near mangos.

Regularly clean and sanitize cold room plastic curtains and prevent these from coming into contact with mangos.

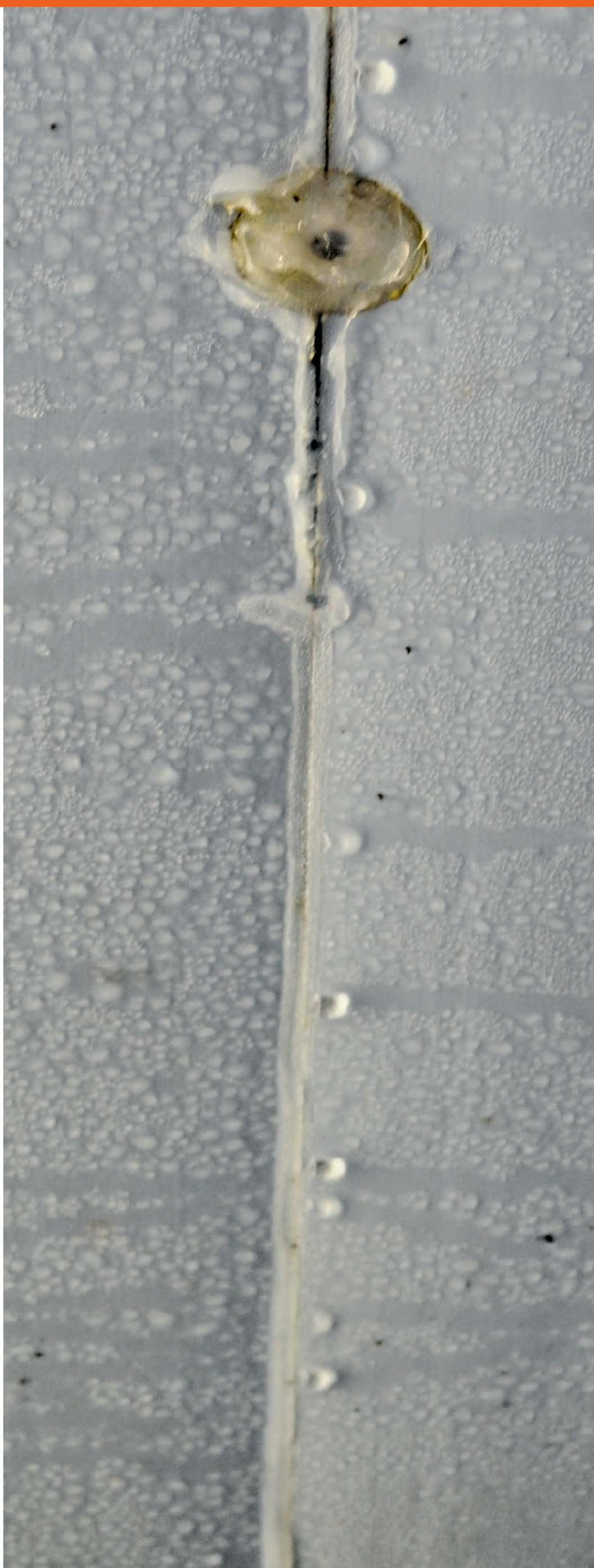
Another potential source of contamination in this area is standing water.

It is very important that you avoid standing water from forming inside the coolers; there are disease-causing microbes that like to live in cold and humid conditions.

Notes: _____

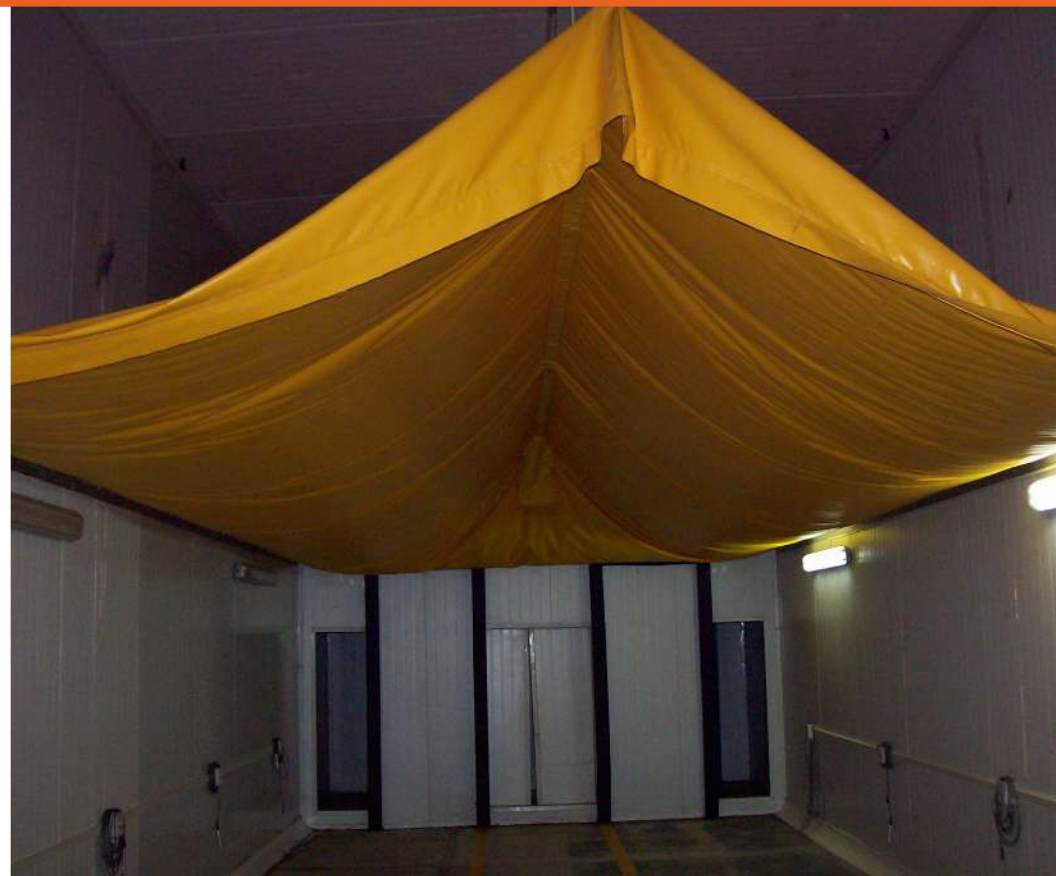
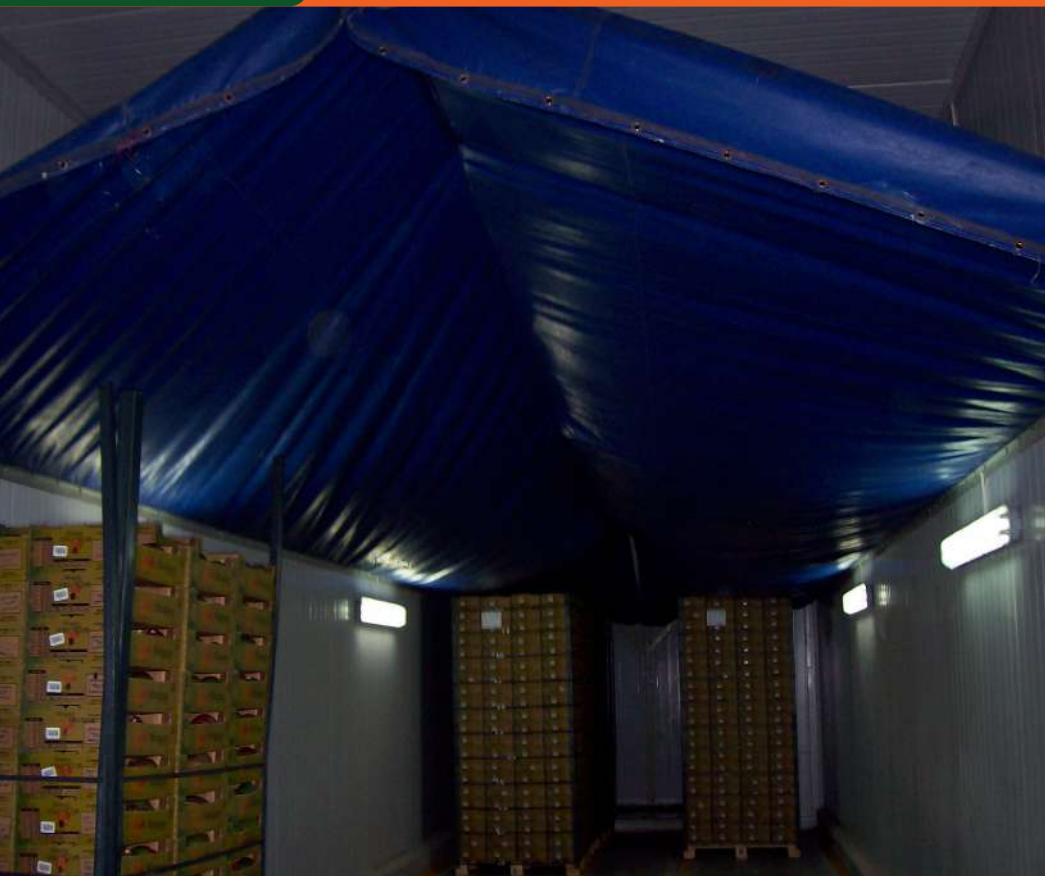


Coolers and Condensation





Forced-Air Chambers/Tunnels



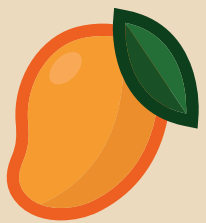
Forced-air chambers and tunnels can become a source of contamination if food contact surfaces inside them are not properly maintained and managed. Generally, mangos that have already been packed into containers are stored inside and covered by a tarp that has contact with the top-most mango boxes. This contact with the product makes the tarp a food contact surface, and, although it may pass unnoticed, it is essential to keep the tarp clean and sanitized.

To avoid cross-contamination, you must keep the tarps clean and sanitized following your packinghouse’s procedure.

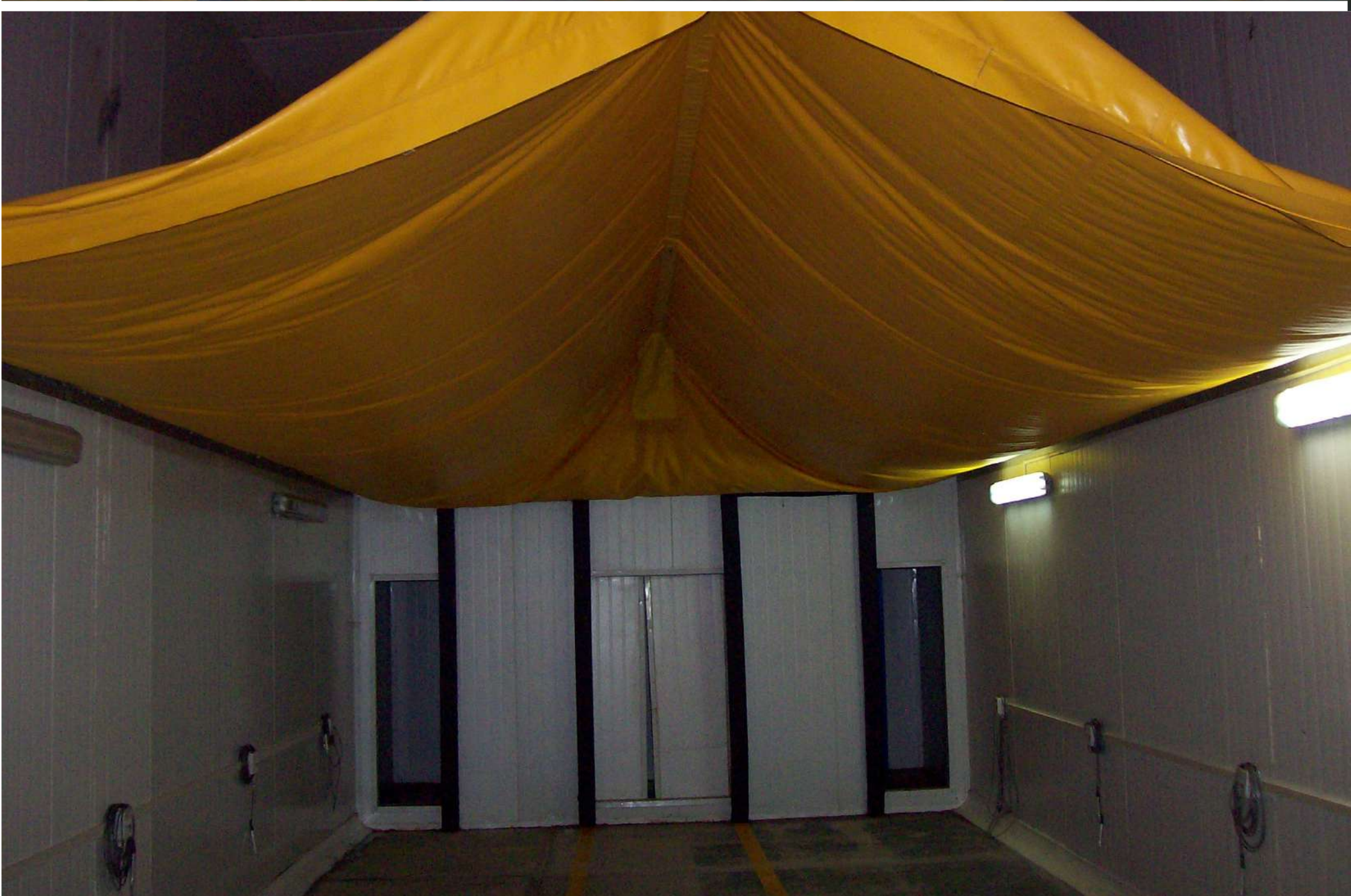
Another potential source of contamination in this area is standing water.

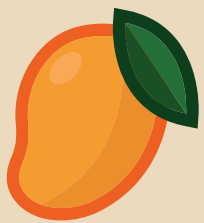
It is important that you avoid standing water accumulation inside the forced air chambers/tunnels; there are disease-causing microbes, such as Listeria, that like to live in cold and humid conditions.

Notes: _____



Forced-Air Chambers/Tunnels





Pallets



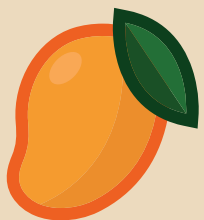
Plastic or wood pallets could become a source of contamination if not handled properly. Pallets move all around the packinghouse and can carry contaminants from one area to another. In addition, wood pallets are difficult to clean and sanitize because they are very porous. Because of this, avoid putting them in places with standing water or near open drains.

All pallets should be inspected before use. Broken pallets should be removed from the facility.

Do not tilt pallets on the walls, equipment, or mango boxes or baskets. Do not use the pallets as chairs or platforms to stand on.

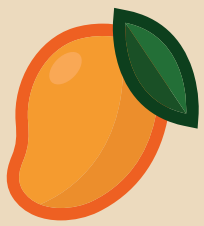
If you are handling mangos, and you need to move a pallet, wash your hands after handling the pallets and before returning to work with the mangos.

Notes: _____



Pallets





Trailers and Transportation

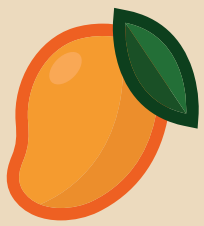


The vehicles for mango shipments must be in adequate condition. Before loading the product, inspect that the vehicles are clean, without any odor, food debris, or dirt. There should be no trace of rodents or pests in the vehicle. Also, you should check the temperature control in the trucks to ensure that the mangos are kept at the established temperatures.

You must check that vehicles used to transport mangos to and from your facility were not used for animal transportation.

Some packinghouses apply sanitizers to the back of the truck before loading it with mangos. Always follow your company's policy.

Notes: _____



Trailers and Transportation





Maintenance



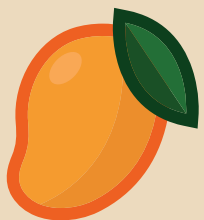
Maintenance employees are a challenge when it comes to cross-contamination. Maintenance employees must always follow good personal hygiene practices when inside the packinghouse.

Maintenance employees are responsible for keeping track of all the tools that enter any area where there is mango and for making sure that all the tools come out of the area once maintenance and repairs are finished.

All temporary repairs should be dated and recorded appropriately. Temporary repairs should become permanent repairs as soon as possible.

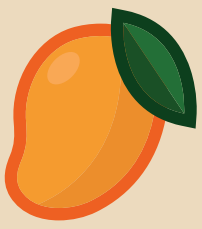
Maintenance tasks should be conducted when there isn't any exposed mango product. In the photograph, the maintenance employee is working without any mango around.

Notes: _____



Maintenance



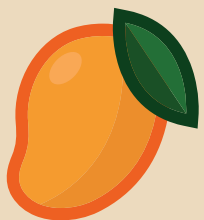


Glass



It is prohibited to bring glassware, such as bottles, glasses, and watches, to the packinghouse. Always be alert while working. If you notice that glass has fallen on the mangos, do not just remove the glass piece from the container; you **MUST** discard or dispose of the affected product and report the incident immediately to your supervisor, so that the appropriate measures can be taken based on your company's glass policy.

Notes: _____



Glass





Animals and Pests



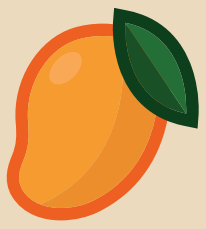
Domestic and wild animals should not have access to mango production areas in the packinghouse.

ALWAYS be alert and report any evidence of animal intrusion in any area of the packinghouse to your supervisor.

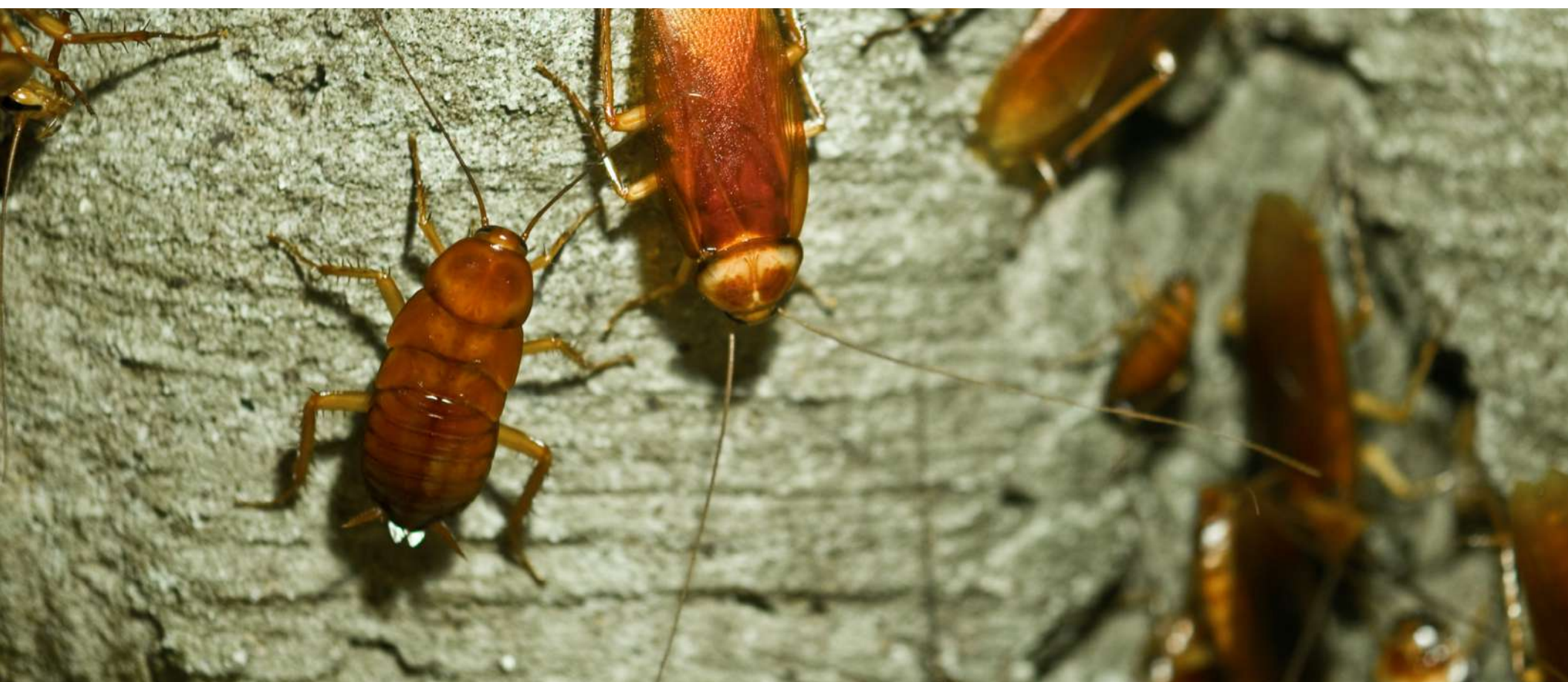
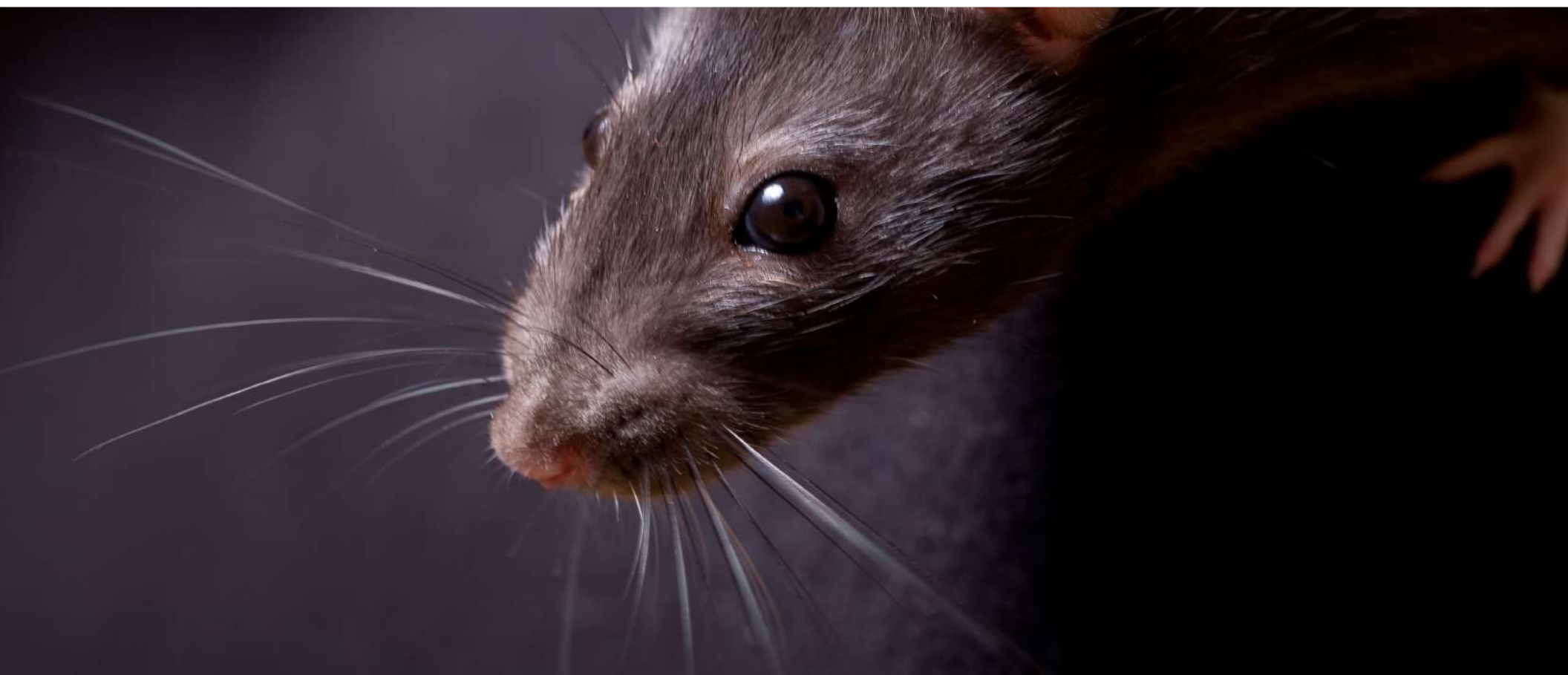
It is strictly prohibited to keep pets or domestic animals in or next to any area of the packinghouse, as this may be a potential source of contamination.

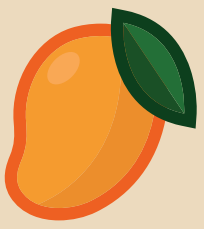
It is also important to inform your supervisor if you see any type of pest, such as cockroaches or rodents, inside the packinghouse. If these are not controlled in time, they also can become a source of mango contamination.

Notes: _____

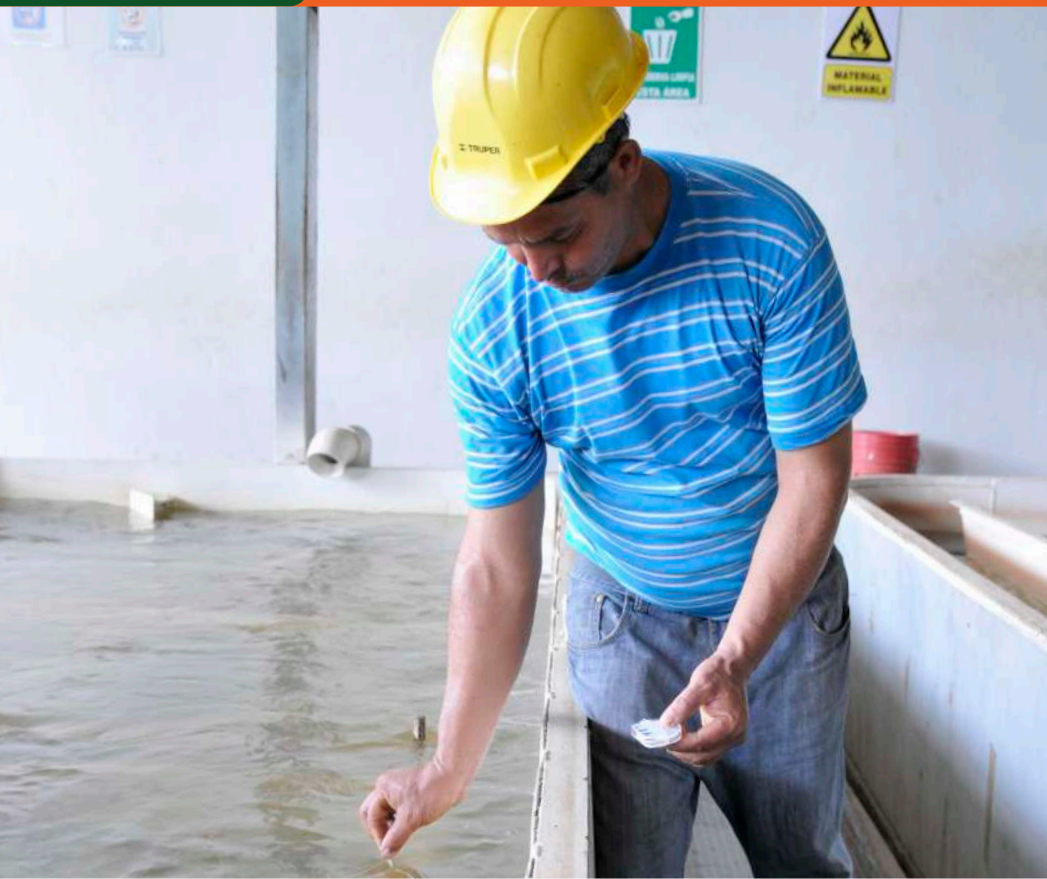


Animals and Pests





Water Tanks



Water tanks at the packinghouse are used to remove latex, dust, dirt, and leaves from the mangos. The hydrothermal tank serves to eliminate the presence of the fruit fly, and the hydrocooling tank rapidly cools the mangos so they can be packed.

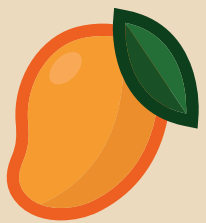
Water tanks at the packinghouse can become a source of cross-contamination if the water is not properly managed.

If the water tank becomes contaminated with disease- causing microbes, it will serve as a means to contaminate all the mangos that pass through it.

Make sure the water you use in all the tanks ALWAYS has the proper sanitizer concentration based on your packinghouse’s policy. Keep in mind that he sanitizer is used to sanitize the water in the tanks and not the mangos. This will prevent that water becomes a source of cross-contamination.

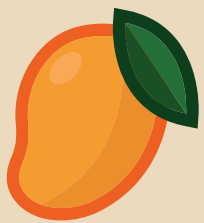
If you are in charge of monitoring the sanitizer concentration, DO NOT take shortcuts. You should always monitor it appropriately and in a timely manner. If you are unsure of what to do, contact your supervisor. Your job is one of the most important jobs in the packinghouse to prevent cross-contamination.

Notes: _____



Water Tanks





Visitors

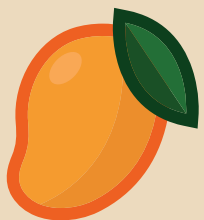


The packinghouse must have a system to record the entry and exit of visitors. This will help ensure that visitors are accounted for while at the packinghouse.

All visitors must abide by the packinghouse’s food safety policies and procedures.

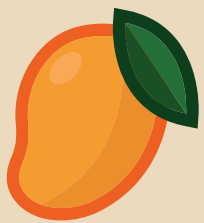
If you see any suspicious behaviors by a visitor that may cause mango contamination, report it to your supervisor immediately.

Notes: _____

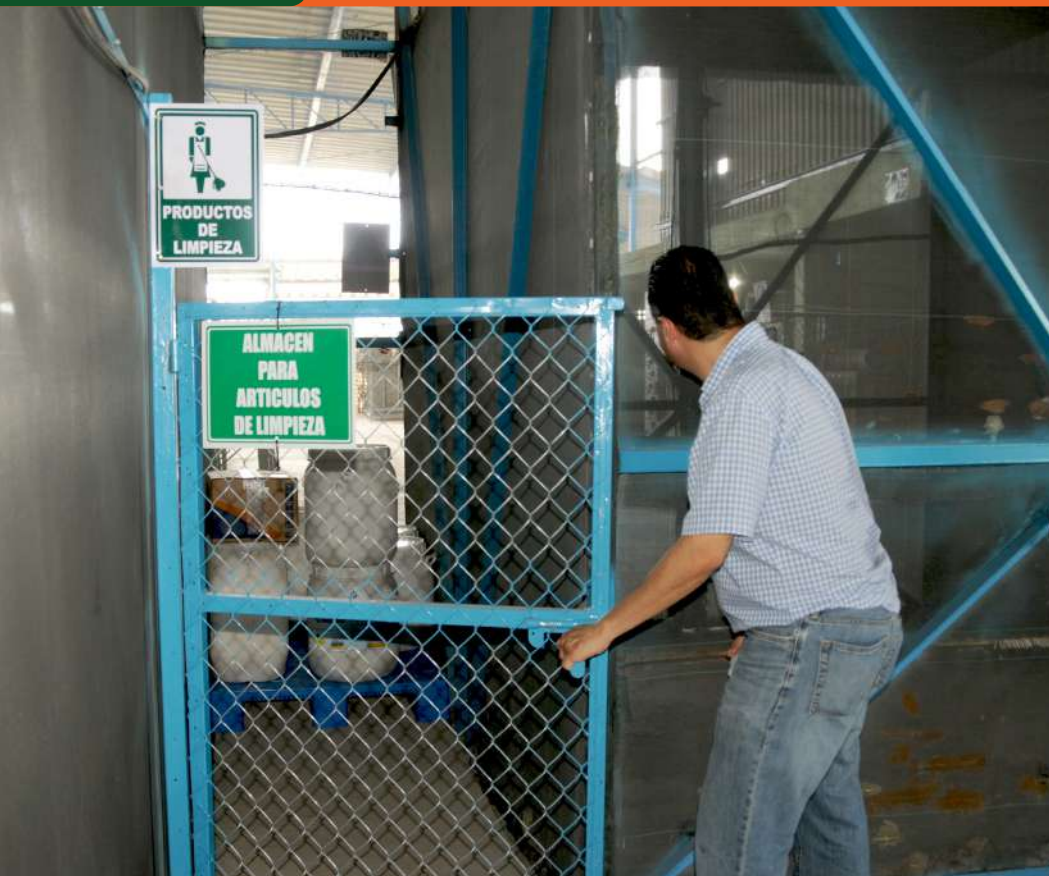


Visitors





Suspicious Behavior



All employees should be alert to any suspicious activity that may result in the intentional contamination of mangos.

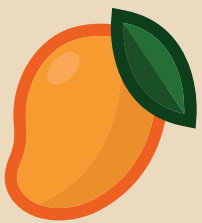
Get to know other employees. If you do not recognize someone, or the person does not have proper identification, notify your supervisor.

Identify unusual behaviors by asking yourself the following questions:

- Is an employee or a visitor in an area where he doesn't belong, such as inside a restricted area?
- Is someone hiding an object that could serve to contaminate the mangos?
- Does an employee arrive early and leave late without a justified reason?

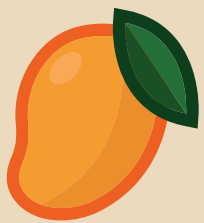
Always be alert and ready to report suspicious activity to your supervisor. If you see something say something.

Notes: _____



Suspicious Behavior





What Did We Learn?



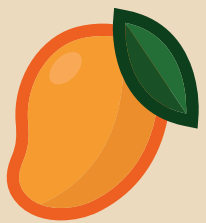
To finish this lesson, we are going to review what we learned:

- What cross-contamination is and what we can do to prevent it.
- The importance of using equipment that is clean and in good condition.
- The importance of water management on all tanks.
- Why the product must not have any contact with the ground.
- The importance of avoiding animals in the packinghouse.
- Other ways to prevent cross-contamination.

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.

Notes: _____



What Did We Learn?

