



Good Worker Health and Hygiene Practices: Training Manual for Produce Handlers¹

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Contents

Preface

1. Introduction
2. Choosing the appropriate FDA Guidelines
3. Understanding foodborne illness
4. How biological contaminants spread at the farm and in packing facilities
5. Importance of personnel health and hygiene
6. Preventing produce contamination by workers
7. Safe from the start
8. What can you provide for workers
9. Stressing personal hygiene for workers
10. Proper hand washing for employees

Appendices

References

Preface

The goal of this first Edition of *Good Worker Health and Hygiene Practices: Training Manual for Produce Handlers* is to provide owners, managers, and/or supervisors in Florida's produce industry a training tool for their workers. Drawn from many sources in the subject area including the FDA-GAPs, FDA-GMPs, FDA Model Food Code, recommendations from the American College of Occupational and Environmental Medicine, and other publications from federal government agencies, this manual is designed to be a reference to accompany the other educational materials included in the UF/IFAS Worker Health and Hygiene Training Program:

- 1) Handwashing posters:
 - Printed (11" x 18") full color handwashing poster in English

1. This document is FCS8769, one of a series of the Family Youth and Community Sciences Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Original publication date May 2005. Reviewed August 2008. Visit the EDIS Web Site at <http://edis.ifas.ufl.edu>.

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- Printed (11" x 18") full color handwashing poster in Spanish
- 2) Three videos
- Manager Guide to Worker Health and Hygiene (18:02 Minutes, English)
 - Proper Handwashing for Workers (9:42 minutes, English)
 - Proper Handwashing for Workers (10:52 minutes, Spanish)
- 3) DVDs containing the digitized version of all video materials
- 4) Check list for managers, and fact sheets

It is our intention to update and revise this manual on a regular basis to reflect changes in the field. We welcome any feedback or suggestions for improvement from the people using this training manual and training program. We thank the Florida Fruit and Vegetable Association (FFVA) for partial funding of this project. Our gratitude is extended to Dr. Douglas L. Archer who reviewed this manual.

1. Introduction, The Importance of Food Safety

It is estimated that 76 million cases of foodborne illness occur in the United States each year leading to approximately 325,000 hospitalizations and 5,000 deaths (Mead et al. 1999). While some of these foodborne illnesses can be attributed to one of more than 200 known diseases, the majority of foodborne illnesses have yet to be identified with their causative agent. Causative agents for foodborne illness include viruses, bacteria, parasites, toxins, metals, chemicals, and prions. Wide ranges of foods from both animal and plant origins (including produce) have been implicated in foodborne illness outbreaks.

Fresh produce is a crucial part of a healthy diet, but in the last three decades the number of foodborne illness outbreaks caused by foodborne pathogens associated with fresh produce consumption has increased (Sivapalasinagam, et al., 2004). According to the Centers for Disease Control and Prevention (CDC), at least 12% of foodborne outbreaks in the

US in the 1990s were linked to produce. The problem was prevalent enough that the FDA developed and released the FDA Good Agricultural Practices (GAPs) document, and the *FDA's Guide to Minimized Microbial Food Safety Hazards for Fresh Fruits and Vegetables*. In June 2004, the FDA further committed to addressing the problem by releasing an action plan to reduce produce related illness, *Produce Safety From Production to Consumption: A Proposed Action Plan to Minimize Foodborne Illness Associated with Fresh Produce Consumption*. The major goals of this action plan are to (a) prevent contamination of fresh produce; (b) improve communication with producers, preparers, and consumers about fresh produce; and (c) to facilitate and support research relevant to fresh produce.

Foodborne illness can result in litigation and regulatory actions that can bring major financial hardship to any food related business. Many produce operations and farms have gone out of business after foodborne illness outbreaks were traced back to them. The United States Department of Agriculture Economic Research Service (USDA ERS) estimated that for the six major bacterial pathogens, the costs associated with human illness were \$9.3 to \$12.9 billion annually (Busby et al. 1996). Estimated economic loss is highly variable depending on the factors used in the equation. Therefore, to protect your business and interests, one of your most important goals is to be proactive and follow workplace guidelines or rules established by regulatory agencies. These guidelines will help you provide your customers with the safest and highest quality fresh produce. Food safety must become an important part of your daily activities. This proactive approach will help your company acquire the trust of both consumers and suppliers.

Points to remember:

- Foodborne illness may cause mild to serious disease in consumers, depending on the individual. Common symptoms of foodborne illness include upset stomach, vomiting, cramps, diarrhea, or more serious symptoms that can result in death.

- Babies, children under five, the elderly, pregnant women, and people who have medical problems are more likely to contract foodborne illness, and to have more serious symptoms and a higher death rate.
- Foodborne illness results in monetary penalties and lost revenue.
- Foodborne illness could bring about negative publicity, which could ultimately result in the closing of your operation.

2. Choosing the Appropriate FDA Guidelines

Guidelines for worker health and hygiene are provided in many documents from the United States Food and Drug Administration (FDA). For farm settings or packinghouse operations, guidelines that apply can be found in both the FDA Good Agricultural Practices (GAPs), and Good Manufacturing Practices (GMPs) documents. While the FDA GAPs extensively covers farm operation, the GMPs document is more suitable for packing house operations. The GMPs (21 CFR Part 110.10 a, b) target those people in contact with food or food contact surfaces. Workers are taught to adhere to good hygienic practices to prevent food contamination.

The FDA Model Food Code provides regulatory authority governing foodservice operations. Although written for the food service industry, the FDA Food Code can provide a good guideline for preventing foodborne illness from spreading throughout your produce farm or packaging facilities. For other processing facilities (seafood, meat and poultry, and juice) the specific Hazard Analysis and Critical Control Point (HACCP) outlining mandatory rules and guidelines is available.

Please note that currently, no MANDATORY rules are ENFORCED on the produce industry; the current RULES (GAPs) are VOLUNTARY only. This document will serve as GUIDELINES not RULES for the produce industry.

Following these guidelines will help reduce the risk of being implicated in a “reckless spread” of

foodborne illness through poor personnel hygiene. The scope of this document will be relevant to personnel health and hygiene.

3. Understanding Foodborne Illness

Types of contamination

Foodborne illness is a direct result of the contamination of food such as produce, by harmful substances or disease-producing microorganisms. Contaminants are classified into three categories: biological, chemical, or physical agents. Ninety percent of foodborne illnesses come from biological contamination!

Biological Contaminants

Biological contamination, the most common of the three types of contamination, can include viruses, bacteria, parasites, and other living agents: agents that can multiply or grow in or on the human body. Some of these biological contaminants are located on the skin or in the nose, mouth, urine, or stool of people who handle food or produce.

Bacteria. Bacteria are ubiquitous in nature. Some are beneficial (e.g., those used in making fermented foods) and some can cause foodborne illnesses. Some bacteria, especially those that can make spores, can survive on produce or food contact surfaces for a long period of time. If and when the conditions are right, some of the bacteria that survive on food and produce can grow and make toxins on the food or produce.

Viruses. Viruses multiply in the living cell only. The most common foodborne viral illness is associated with Noroviruses, formerly called Norwalk and Norwalk-like virus. The more serious foodborne viral infection is caused by Hepatitis A, which is transmitted by an infected person who frequently handles food or produce that requires no further heating, such as salads or herbs (e.g., green onions), and has not washed his or her hands after using the toilet. Hepatitis A has been implicated in outbreaks related to produce.

Parasites. Harmful microscopic parasites found in many produce-related outbreaks are *Cryptosporidium* and *Cyclospora*. These parasites can also be transmitted via person-to-person contact if good personal hygiene practices are not followed. These microscopic parasites are also associated with poor water quality.

Fungi, molds, and yeast. In a practical sense, this group of biological contaminants on fresh produce causes little concern to human health, because consumers discard fresh produce showing signs of mold, fungi, or yeast. However, if fresh produce is infested or contaminated by fungi, or molds, it could lead to financial losses for the farmers and packers. Once contaminated, it is very difficult to decontaminate. Therefore, applying food safety rules will also increase the profit margin by reducing produce lost from spoilage caused by fungi, mold, or yeast.

Chemical Contaminants

Any chemicals used in your operation can potentially become chemical contaminants if they are improperly used. Keep all chemicals in a locked storage area in their original containers. If chemicals must be transferred to smaller containers or spray bottles, label each container appropriately. If used, pesticides should only be applied by a licensed pesticide applicator. Strictly following directions supplied by the manufacturers can help prevent contamination of fresh produce in your operation. Chemical contaminants include pesticides, cleaning solutions, dangerous metal products (e.g., lead, copper, paint), and any foreign chemical that comes in contact with food or produce.

Physical Contaminants

Any foreign objects that are accidentally mixed in with foods or produce become physical contaminants. Physical contaminants include glass, metal fragments (e.g., nails, screws, staples), packaging materials, fingernails, nail polish chips, hair, jewelry pieces, and any foreign objects that are mixed in with produce.

Food Infection, Food Intoxication, and Toxin Mediated Infection

Food Infection

Food infection occurs whenever a person eats produce or foods that contain enough live germs (bacteria, viruses, or parasites) that can grow inside the human body. The way to reduce infection is to reduce the possibility of produce contamination during growing, harvesting, packaging, and handling. Consumers can also cook or heat produce to a proper temperature, which can kill some of these germs making the food safe to eat. However, cooking or heating many types of fresh produce is not an option. Therefore, emphasis on prevention or minimizing contamination is very important in the fresh produce industry. The following are some infections that are traced back to biological contamination of produce.

Salmonella. Traditionally, *Salmonella* is associated with poultry, red meat, shellfish, eggs, and other high protein foods, but in recent years outbreaks caused by *Salmonella* have been linked to produce such as tomatoes, cantaloupes, and other crops. The symptoms usually appear within 12 to 36 hours after consumption and include fever, vomiting, diarrhea, and cramps. As few as 15-20 *Salmonella* cells are needed to cause illness. This number can vary depending on the age, health status of host, and strain differences among the members of the genus.

E. coli. *E. coli* is sometimes found in unpasteurized milk and raw or rare ground beef (e.g., *E. coli* O157:H7). In recent years this bacterium has also been linked to outbreaks in produce. The *E. coli* bacteria can lead to foodborne infections or toxicoinfections with various levels of severities, depending on the strain ingested and the health status of the host. Symptoms appear within 12 to 25 hours and include severe diarrhea, cramps, and dehydration.

Shigella. A multi-state outbreak of shigellosis in 1999 was traced back to the consumption of fresh parsley contaminated with *Shigella sonnei*. This species of bacterium has been implicated in many more foodborne outbreaks in recent years.

Onset symptoms can appear within 12 to 50 hours of exposure and include fever, vomiting, abdominal pain, cramps, diarrhea (with blood, pus, or mucus in stools), and tenesmus (desire to empty bowel). Depending on a person's health status, as few as 10 cells of the organism can cause illness.

Hepatitis A. The hepatitis A virus has been implicated in several outbreaks related to produce (i.e. green onions and strawberries). Hepatitis A is usually a mild illness with symptoms including fever, malaise, nausea, anorexia, and abdominal discomfort, followed in several days by jaundice (yellow skin). An infectious dose of this virus ranges from 10-100 virus particles.

Points to remember:

Once infected with any enteric pathogen, a person can continue to carry the bacteria/virus in the intestinal tracks and stool for a long period of time without showing symptoms. Therefore, fecal-oral transmissions can become a major route of infection if good personal hygiene is not practiced.

Food Intoxication

Food intoxication occurs when a person eats food containing toxins or chemicals that cause illness. The toxins may have been produced by pathogens found on the food, or may be the result of a chemical contamination. The toxin might also be a natural part of the plant or animal consumed. Although the heating process destroys bacteria and some heat-labile toxins, it *does not* destroy those toxins that are heat stable. Eating food contaminated by these remaining toxins leads to foodborne illness. Onset symptoms for foodborne intoxication appear quickly, within a few hours. The following are some food intoxications that were traced back to biological contamination of produce.

***Staphylococcus aureus* toxin.** One of the most high profile multiple outbreaks related to *S. aureus* toxin associated with produce was food poisoning caused by canned mushrooms from the Peoples Republic of China in 1989 (CDC, 1989). Staphylococcal toxin is produced by *Staphylococcus aureus*, a bacterium that is often found on the human body, mainly on wounds, cuts, burns, infections, and pimples located on the hands, in the nose, and in the throat. This toxin is heat stable (cannot be destroyed by heat). The microorganism can grow best on foods such as custards, dressings, meats, and tofu; thus it has been implicated in the outbreaks related to these foods. Symptoms appear within 2 to 4 hours after eating and include severe vomiting, diarrhea, cramps and prostration. Symptoms may last 1 to 2 days.

Toxin Mediated Infection or Toxicoinfection

Toxicoinfection occurs when a food that contains pathogens is eaten. The pathogens grow and produce toxin(s) in the intestine of the victim. Microorganisms that are capable of causing the toxin-mediated infection include all *Shigella species*, *Clostridium perfringens*, and *E. coli* O157:H7. Both *Shigella* and *E.coli* O157:H7 have been implicated in the outbreaks with fresh produce.

4. How Biological Contaminants Spread at the Farm or Packing Facilities

Bacteria, viruses, and parasites (microscopic parasites) are spread by the following means.

- sick employees
- unwashed hands or contaminated gloves
- employees with open cuts and scrapes
- employees who touch their faces and mouths with their hands
- improperly disposed hygienic items (i.e., toilet paper, paper towels)

- employees who do not wash their hands after using the restroom
- unwashed and poorly sanitized preparation surfaces, utensils, and preparation areas
- rotten produce that drips onto other produce
- unwashed surfaces or packing equipment
- soiled wiping cloths, brooms, or other cleaning items

Once items are contaminated, bacteria, viruses, and parasites can survive on the following surfaces for long periods of time:

- cooling coils and cooling ducts,
- produce,
- produce contact surfaces, and
- floors, floor drains, and equipment.

The situations provided here are only partial examples; there are many more instances where the spreading of biological agents can occur.

5. The Importance of Personnel Health and Hygiene

There is a direct correlation between poor personal hygiene and foodborne illness. For this reason, it is critical that produce handlers and other farm or packinghouse personnel understand and practice good basic hygiene habits, including proper handwashing, on a regular basis. The FDA white paper (FDA 1999) cited poor personal hygiene and improper handwashing as the third most important cause of foodborne illness. This report also cited that 93% of outbreaks related to food handlers involved sick workers. Problems associated with these outbreaks included poor personal hygiene, poor handwashing, open sores, improper glove use, and eating while on the job.

Human bodies carry a variety of microorganisms some of which are non-pathogenic (not disease causing), while others are pathogenic (disease causing). These microorganisms can be further divided into two categories: resident and transient.

Resident microorganisms are the ones that reside permanently on the different body parts of both humans and animals (i.e., skin, hair, and nasal cavities). One pathogenic resident microorganisms of high concern is *Staphylococcus aureus*. *S. aureus* levels are highest in pimples and boils. 15% to 50% of healthy individuals may be carriers of *S. aureus*, but never show symptoms. Under certain conditions, *S. aureus* can multiply at low water activity (dry conditions) and produce toxins which are heat stable.

The other group is the transient (temporary) microorganisms from sources such as feces, soil/dust, raw materials, dirty surface, etc. Pathogens from feces include, but are not limited to, *Salmonella spp*, *E. coli* O157:H7, *Cryptosporidium*, and Hepatitis A. Below is a partial list of infectious and communicable diseases that are transmitted through food.

Pathogens Often Transmitted by Food Contaminated by Infected Employees*

| | |
|----------------------------------|-------------------------------|
| 1. Hepatitis A virus | Fever, jaundice |
| 2. <i>Salmonella typhi</i> | Fever |
| 3. <i>Shigella</i> species | Diarrhea, fever, vomiting |
| 4. Noroviruses | |
| 5. <i>Staphylococcus aureus</i> | Diarrhea, vomiting |
| 6. <i>Streptococcus pyogenes</i> | Fever, sore throat with fever |

*This table is an excerpt from the FDA Food Code

Diarrhea, fever, and vomiting are also symptoms of several other pathogens occasionally transmitted by food contaminated by infected employees. Practicing good personal hygiene helps to ensure good health and to prevent the spread of illness. Management should explain to employees the many ways of keeping themselves clean. Almost any fresh produce item can become contaminated if not handled properly. By ensuring that produce handlers and other farm or packinghouse employees practice good personal hygiene, you can reduce the chance of selling contaminated produce to consumers, thereby reducing the risk of losing your business. Remember, we are all responsible for food safety!

6. Preventing Produce Contamination by Workers

Good worker health and hygiene is critical for preventing foodborne illness. The first step towards good worker health and hygiene practices is first hand knowledge of how foodborne illnesses and other infectious diseases spread. The second step is to know how to contain or limit the spread of foodborne diseases by practicing scientifically known intervention techniques such as handwashing. Lastly, one should have a healthy life style. After all, a healthy body can fight germs better than an unhealthy body, and a healthy worker is a productive worker.

Although written for health professionals and physicians, the guidelines from the American College of Occupational and Environmental Medicine (ACOE) are highly applicable for controlling infectious diseases in many settings. Maintaining good worker health and hygiene requires a sanitary facility, and workers who are healthy, practice personal cleanliness, and who refrain from personal behaviors known to spread sickness. Here are some of the simple steps that the operators or managers can take to help prevent the spread of foodborne illnesses.

How Infectious Diseases Spread

As stated above, the first step towards good worker health and hygiene practice is the first hand knowledge of how foodborne illnesses and other infectious diseases spread. It is important for managers, operators, and/or owners to convey that foodborne illness can spread through contaminated foods, oral-fecal contact, or person-to-person contact. And that good worker health and hygiene is one of the major ways to control infectious diseases.

Infection Control Techniques

Handwashing. Handwashing is one of the most effective ways to stop the cycle of infectious disease, especially those diseases spread through oral-fecal or person-to-person contact. Proper handwashing can remove dirt, soil, and some other contaminants including chemical (e.g., pesticides, cleaning solutions) and biological agents (e.g., bacteria, viruses, parasites).

Cleaning and disinfecting or sanitizing.

Cleaning is the action of removing visible soil or dirt from food or produce contact surfaces. Cleaning reduces the amount of available nutrients that can support the growth of microorganisms. Disinfecting or sanitizing actions can reduce the level of harmful microbes so that the natural immunities in the body can handle their presence.

Safe food handling and preparation. Because many foodborne illnesses are transmitted by foods, making sure that food is handled and prepared in a safe and sanitary manner can reduce the chance of people contracting foodborne illnesses. Thus reducing the chance of their spreading them to others. The most effective food safety behaviors include keeping foods at safe temperatures, using a thermometer to determine the adequate cooking of foods, avoiding cross-contamination, washing hands, and avoiding high-risk foods. These principles are referred to as the four steps: clean, separate, cook, and chill (Partnership for Food Safety Education, revised 2004).

Healthy lifestyle. Healthy lifestyles include, but are not limit to, adopting healthy behaviors such as eating nutritious foods, being physically active, and avoiding tobacco use. A healthy lifestyle can prevent or control the devastating effects of some chronic and infectious diseases.

Vaccination. Various kinds of vaccinations are also listed as tools for a healthy lifestyle for certain population groups. Hepatitis A vaccination is relevant to food handlers.

Vaccination for hepatitis A is recommended for people in higher risk groups for this disease including men who have sex with men, and illicit drug users. Food handlers are not at higher risk of contracting hepatitis A (HAV) because of their occupation. However, food or produce handlers may belong to demographic groups that have a higher incidence of Hepatitis A than the rest of the population (such as young persons and persons with lower socioeconomic status).

Experts conclude that food handlers acquire HAV infection from others within their communities, and that reducing foodborne transmission of Hepatitis A will ultimately be achieved through routine vaccination of those populations at risk (Fiore, 2004). Some county Health Departments in the US already impose mandatory hepatitis A vaccination for food handlers, but there is no mandatory Hepatitis A vaccination for produce handlers or for people working in the produce industry.

7. Safe from the Start

Management should communicate to staff and new applicants their commitment to food safety, and that employee health is a priority in preventing a foodborne illness outbreak. Without commitment from management, the program will not be successful.

Identify Employees. Identify employees who risk infecting others and contaminating food. Employees experiencing the following symptoms should be instructed to report them to a supervisor and should be restricted from working or coming into contact with food (21CFR Part 110.10a,b):

- vomiting
- diarrhea
- fever
- sore throat
- jaundice (seen by yellow eyes or skin)
- common cold symptoms

These symptoms could pose an increased risk of contaminating produce and a health risk for others.

Medical clearance. Set up a plan that requires employees who risk spreading infection receive medical clearance before they return to work. Employees diagnosed with *Salmonella typhi*, *Shigella spp.*, *E.coli* O157:H7 or Hepatitis A are restricted from performing jobs that require

contact with foods, or with food contact surfaces and packing materials [FDA Food Code].

Encourage a healthy life style. In general, healthy employees are more productive than unhealthy employees, and can help in preventing contamination during handling of produce. It is important to note that sick employees do not always show symptoms. People who have just recovered from a foodborne illness can continue to excrete microbes. These people can contaminate produce during handling or can infect other workers and surfaces they touch.

Establish a health and hygiene policy in your operation. Establish protocols for sick employees to report their illness. Train your employees and leaders to report illness as well as educating them on the consequences of not reporting. Encourage sick employees to seek treatment, give them alternative work, or ask them to take leave.

Temporary help. Set up a hiring plan that includes replacing permanent staff with qualified temporary staff whenever permanent staff are unable to get the job done.

8. What You Can Provide for Workers

Training. Training and orientation on the basic principles of health and hygiene, handwashing techniques, and recognizing foodborne illness symptoms can help workers understand their role in disease prevention.

Adequate handwashing stations. An adequate number of handwashing units should be available. They should be fully stocked and easily accessible, and no more than a five-minute walk (in the field) from where any employee is working. Instructions for proper use of the handwashing unit should be prominently posted. As a general rule, one facility is required for every 20 employees (FDA GAPs).

Toilet facilities in the field. An adequate number of toilet facilities with handwashing units should be available. One facility is required for every 20

employees (FDA GAPs). Facilities should be fully stocked, easily accessible, and no more than a five-minute walk from where any employee is working. Instructions for proper use should be prominently posted.

Employee accommodations. Provide a clean area designated for employees to eat, drink, and use tobacco. Lockers or other suitable facilities to accommodate employees personal belongings should also be provided.

Other alternative hygiene products. When disposable gloves are provided for employees, the employees must be trained to use gloves properly. Even though hand sanitizers can be used, they are by no means a replacement to proper handwashing. Should a hand sanitizer be part of an operation, it needs to be one already approved by the FDA.

9. Stressing Personal Hygiene for Workers

Good personal health and hygiene begins at home. Communicate clearly to your employees that health and cleanliness are their responsibilities (provide handouts or extension fact sheets) and they must:

- bathe daily with soap and water;
- wash their hair and brush their teeth daily;
- wear clean and adequate clothing;
- wash their hands frequently and properly; and
- if they are sick, call the workplace and follow company policy.

Make personal health and hygiene a priority for your employees at work.

While working, employees must do the following:

- Wear clean and adequate clothing. Dirty or soiled clothing is a source of contamination. Items should not be stored in pockets (21CFR Part 110.10b (1)).

- Wear hair restraints (hair net, hat, cap or head band, hair coverings, beard restraints, and clothing that covers body hair). This prevents hair from falling into produce packages or food.
- Change their apron whenever it becomes dirty. Dirty clothing or aprons can contaminate produce, produce contact surfaces, food-contact surfaces, and can support the growth of bacteria.
- Encourage employees to cover their mouths when coughing and their nose when sneezing. And wash their hands to prevent contamination.
- Workers should tell a supervisor if they are sick. The supervisor will help determine if the worker is too sick to work safely.
- Workers should tell a supervisor if they are diagnosed with Hepatitis, *Shigella*, *Salmonella*, or *E. coli*, or if they are experiencing symptoms of a foodborne illness.
- When it is possible, use sanitary gloves when handling produce.
- The employees should not wear false fingernails (artificial nails) or fingernail polish, both of which are potential physical contaminants.
- Employees must not sneeze or cough near produce. Sneezing and coughing causes droplet contamination. If an employee experiences persistent sneezing, coughing or runny nose, they must not work with produce or in produce contact areas.
- Limit wearing jewelry while working in the operation/facility. Employees must not wear jewelry on their arms or hands, except wedding bands. Jewelry harbors germs, which could contaminate produce or food. Jewelry could get caught on equipment or fall into produce or food, making it a potential physical contaminant.
- Workers should not eat food, drink liquid, chew gum, or smoke cigarettes while in the work area. Exhaled smoke contains droplet contamination.
- Sweat is another source of contamination. A disposable towel should be used.

10. Proper Handwashing for Employees

This section is directed to employees or workers. The managers, supervisors, or owners should convey proper handwashing techniques to the employees as often as they can. These instructions can be used in combination with the handwashing poster and the video for the workers.

Post a handwashing poster at every handwashing station in your operation

Proper handwashing steps:

1. Remove rings and bracelets except for plain wedding bands.
2. Use soap and warm running water.
3. Lather hands and arms up to elbows with soap, for 20 seconds (sing “Happy Birthday” twice).
4. Wash the backs of hands, wrists, between fingers, and under fingernails using a nailbrush.
5. Rinse hands and arms under running water.
6. Dry hands and arms with clean, disposable paper towels. Turn off running water with a paper towel, *not* with bare hands.
7. If your operation has a hand sanitizer policy, this is the time to use hand sanitizer. Never use hand sanitizer to replace handwashing.

Additional points to remember

- Be sure to keep fingernails trimmed and clean, because fingernails harbor germs that can contaminate food.
- Employees must always use clean, waterproof, tight-fitting bandages to fully cover cuts. For additional protection, wear disposable gloves or finger "cots."
- Unless properly bandaged, workers who have cuts with infection, burns, and other skin problems should **NOT** handle produce under *any*

circumstances. Gauze bandages are **NOT** acceptable.

- Blood and other fluids can drip from wounds contaminating produce and produce-contact surfaces (ie.,any object that touches produce, such as equipment, conveyor belts, boxes, or sinks). If this happens, produce exposed to blood **MUST** be thrown away. Produce contact surfaces must be properly sanitized.
- Gloves do not take the place of proper hand washing. Disposable gloves become dirty, just like hands, so change your gloves any time you would wash your hands; and wash your hands every time you change your gloves.
- You must wash and sanitize your hands, use gloves, use sanitary utensils, and use deli tissue or dispensing equipment when handling produce.
- Wiping your hands on your clothing, apron, or towel is **not** a substitute for handwashing...**WASH YOUR HANDS!**

Table 2. When to Wash Your Hands

| |
|--|
| <p><u>BEFORE</u></p> <ul style="list-style-type: none"> • Returning to the field or entering the packing line • Touching clean produce • Putting on new gloves • Preparing food • Consuming food • Working your shift • Cleaning equipment and preparation surface |
| <p><u>AFTER</u></p> <ul style="list-style-type: none"> • Visiting the rest room • Touching bare human body parts (ears, nose, hair, etc) • Working with soil or rotten produce • Handling garbage • Smoking or doing other activities that dirty your hands |

11. Appendices

Employees/Workers (Post-Then-Pre Evaluation)

EMPLOYEES/WORKER

(Post-then-Pre Evaluation)

1=Almost never; 2=Seldom; 3=About half time; 4=often; 5=Almost always

Circle the number that best describes your behavior

| EVALUATION: WORKER HEALTH AND HYGIENE PROPER HANDWASHING | | | | | | | | | | |
|--|-----------------|---|---|---|---|----------------|---|---|---|---|
| | BEFORE TRAINING | | | | | AFTER TRAINING | | | | |
| Set goals for changing my health and hygiene habits | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| Report sickness to employers | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| Wash hands frequently | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| Wash hands with soap and water for 20 seconds | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| Turn the water faucet off with a paper towel after finishing handwashing | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| Wash hands before using hand sanitizers | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |

Managers/Owners (Post-Then-Pre Evaluation)

MANAGERS/OWNERS

(Post-then-Pre Evaluation)

1=Almost never; 2=Seldom; 3=About half time; 4=often; 5=Almost always

Circle the number that best describes your behavior

| WORKER HEALTH AND HYGIENE TRAINING PROGRAM | | | | | | | | | | |
|---|-----------------|---|---|---|---|----------------|---|---|---|---|
| | BEFORE TRAINING | | | | | AFTER TRAINING | | | | |
| Set goals for worker health and hygiene standards for my operations | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| Create health and hygiene plans for my operation | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| Improve employee accommodations in my facility | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| Train my employees on worker health and hygiene | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| Use UF/IFAS worker health and hygiene program | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |

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