

Good Agricultural Practices: personal health and safety. [1]

1. Introduction

Ensuring the health of personnel increases productivity and aids in preventing potential microbial contamination of fruits and vegetables. An infected employee (whether or not they show symptoms of illness) can easily contaminate fresh produce with microbial pathogens. Good Hygienic Practices (GHP) should be applied, such as washing hands after sneezing, or using the restroom. Pathogens can be transmitted easily to consumers who handle or eat the contaminated produce. This applies particularly to fresh produce intended for direct consumption, such as strawberries, cherries, etc. and which do not undergo a decontamination procedure.

In this document the necessary HGP and the health of personnel involved in growing, harvesting and handling fresh produce are discussed. [1]

2. Sick employees

Employees with gastrointestinal distress or open wounds can contaminate fresh fruits and vegetables through handling. General symptoms that indicate an employee with the potential for causing biological contamination of produce are summarised in Table 1. However, even clinically healthy individuals with no symptoms of disease, can transmit microbial pathogens. The reason is that many micro-organisms can reside passively in the human body and be spread to others inadvertently.

Table 1. General symptoms of an employee with the potential for causing microbial contamination of produce include:

- Diarrhoea
 - Vomiting
 - Dizziness
 - Abdominal cramps
 - Open wounds
 - Hepatitis or jaundice (yellow colour of the skin)
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Supervisors should train workers to recognise disease symptoms and to report any appearance of symptoms. Affected workers should be assigned to activities that do not involve contact with the produce. Supervisors themselves should be trained in these

matters so that they are able to make judgements about dealing with sick employees. Workers removed from produce handling tasks because of illness should not be returned to these jobs until one of the following conditions has been satisfied. They should provide documentation from a licensed healthcare provider stating that they are free from the infectious agent that is suspected of causing their symptoms or one stating that the symptoms experienced result from a chronic, non-infectious condition.

Ideally agricultural workers should have access to a health care system. It is also important for employers to provide fruit and vegetable handlers with a training program on good food handling and hygienic practices. The possibility of contamination is directly related to the quality of the worker-training program. This training should be reinforced constantly. Demonstrations of procedures are usually more effective than simple verbal instructions. Feedback to the trainer is important to assess the effectiveness of the training. As is the case with any food safety assurance program, commitment of management to the program is essential.

3. Hygiene

Proper hygiene procedures should be established and included in hygiene and health training programs. All employees, including supervisors, temporary personnel, part-time and full-time workers should participate in this training. The level of knowledge an employee should acquire will vary with the type of operation in which the employee participates and their level of responsibility. In order to ensure that employees comprehend and implement the training, it should be given in the language of the employees. Also, trainers should consider cultural aversions and ingrained practices of the trainees, when planning and executing the training program.

Any worker with exposed wounds that can directly contaminate fresh produce should have these wounds properly disinfected and covered before participating in production and handling activities. A first-aid kit, with supplies for treating worker injuries should be readily available at the work site. The simple procedures involved in disinfecting and covering a wound should be included in employee training. Disposable gloves should be used to cover bandages, adhesive plasters and other objects that could easily fall into the product. Procedures used to treat any injuries should be documented.

When properly used, gloves are an effective way of preventing contamination and protecting the employee. However, gloves can become a means of spreading pathogens when they are not appropriately cleaned and disinfected or changed after a potential contamination incident (e.g. using the restroom or answering the phone). It should be clearly understood by workers and supervisors that the use of gloves is not a substitute for hand washing or other hygienic practices.

If gloves are used, the disposable kind (latex, plastic, etc) is better than those included for multiple use, since frequent replacement of gloves can help cleanliness and reduce the

potential for growth of micro-organisms in wet/dirty rubber gloves. Gloves should be changed at any time that bare hands should be washed. This includes after using the restroom, smoking or eating, taking a break, covering coughs or sneezes, touching skin or wounds, touching floors or other dirty surfaces, or handling agricultural chemicals or cleaning materials.

Proper records should be kept of training activities, medical conditions, and any incidents of gastrointestinal disease. In this way, the health of personnel can be properly assessed and corrective action can be taken to minimise the risk of contaminating produce. Such records will also be useful in tracing the cause of a disease outbreak.

4. Drinking water

Water for human consumption should be potable - that is, free from micro-organisms and/or chemical substances that can adversely affect the health of the person consuming it. Ensuring the availability of potable drinking water for field workers reduces the risk of water-borne diseases and consequent contamination of fresh produce. (Table 2)

Table 2. Precautions for handling drinking water in growing fields and packing areas

- Water supply systems should be in good condition and operating properly (requires constant monitoring)
 - Water storage vessels should be closed at all times
 - Individual water vessels should be cleaned and disinfected on a daily basis
 - Containers should be kept closed and out of the sun and excessive heat until required for use
 - Disposable cups should be provided and each person should use a different cup
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Contaminated drinking water may easily cause intestinal disorders in the workers and can lead to the spread of pathogenic organisms such as *Escherichia coli*, *Salmonella*, and *Shigella*. Other microbial contaminants include viruses such as Hepatitis A and Norwalk viruses and harmful protozoa such as *Giardia lamblia*, *Cryptosporidium* and *Cyclospora cayetanesis*.

To prevent contamination, it is also important that water used for hand washing is of drinking water quality.

If drinking water is stored in tanks or other vessels before consumption it is important to clean the storage vessels frequently. It also is recommended that water intended for drinking is treated before consumption. There are different systems on the market to treat drinking water just before use. Some examples are chlorine injection units, microbiological filters and ultra-violet lamps.

Frequent microbiological and physical tests should be performed on drinking water when

the water is being stored or treated on site. Records of these tests should be part of the hygiene control program and kept as evidence of the effectiveness of water treatment or suitability of storage conditions. If municipal water is used, records from the municipal authorities should be obtained and kept as evidence of the quality of the water being supplied. Simple organoleptic evaluations (colour, odour and taste) of the water should be part of the daily monitoring process. If any of the tests indicate that water quality is inadequate, the water should be replaced to reduce the chance of infection and the proper authorities should be notified of the problem.

5. Personal hygiene and sanitary facilities

The responsibility for reducing or avoiding contamination during primary production of crops falls heavily on the workers themselves. Employers can provide training and other resources to educate workers, but, in the end, the effectiveness of the program depends on the comprehension of the individual and their implementation of personal hygiene and safety practices. Therefore, management should provide workers with all necessary information about acceptable hygiene practices, ensure that it is understood and send a clear signal to the workforce about the importance of these practices.

Some basic hygiene practices that should be used by agricultural workers to minimise contamination of produce include:

- Regular bathing
- Using toilets, even in the fields. (Portable units should be provided in locations without a municipal sewage system. Units should be maintained in a good condition to encourage their use.)
- Washing hands in the correct manner and after any possible contamination
- Wearing clean clothes
- Using hair-nets
- Keeping nails clean and short

Hand washing is considered to be a basic procedure that children learn at an early age. However, individuals come from different backgrounds and may have a different concept of proper hand washing. Therefore, personnel should be well trained in these practices, no matter how basic they seem. The proper technique for washing hands is described in Table 3.

Table 3 Correct hand washing procedure

- Wet hands with warm water then vigorously apply soap, rubbing hands together for 20 seconds
- Scrub the whole surface of the hand, including the back, wrists, between fingers and under nails
- Rinse thoroughly with warm, running water
- Dry hands with paper towels

- Turn off water tap using a paper towel
- Open the exit door with a paper towel then dispose of the towel in the provided container provided

Note: When nails contain accumulated dirt, scrub them with a nail brush (the nail brush is normally used at home, since it is a personal item)

Hands should be washed after using the restroom, smoking or eating, taking a break, covering coughs or sneezes, touching skin or wounds, touching shoes, floors or other dirty surfaces, or handling agricultural chemicals or cleaning materials. Paper towels and toilet paper should be disposed of properly.

Toilets and hand-washing stations should be inspected frequently to ensure their cleanliness and the availability of soap and paper products. Keeping the installations neat and tidy should be part of the hygiene control program and should be accurately documented. Rubbish bins should be provided, and workers instructed to deposit rubbish and any unwanted food items in the appropriate bins.

It also is important that produce inspectors, buyers and other visitors follow the established hygiene and safety practices. Signs indicating proper hand washing and rubbish-disposal procedures are recommended to prevent contamination of doorknobs and other surfaces by visitors. Supervisors and the workers themselves should be asked to report any dirty sanitary facilities or other possible sources of contamination.

Toilets located in the fields should not be sited close to water sources or in places where rain can spread out contaminants or cause flooding. Any inadequate sanitary facility increases the risk of contaminating water, soil, produce and the working personnel. Maintenance and servicing of toilets should be performed away from the field to protect soil, water, and workers, in case leaks or spillages occur.

The more accessible the sanitary stations are, the greater the probability that they will be used. These facilities should be available to the on a continuous basis and not just during break periods. This practice reduces the possibility of urination or defecation in woods near the fields.

Providing sufficient toilet paper is also very important. Toilets and hand-washing stations should be cleaned and inspected regularly and periodically checked for adequate supplies. Provision should be made to dispose of hand-washing water away from the growing field to avoid contamination of produce. Containers used for water transport and storage should be periodically emptied (preferable daily), cleaned and disinfected. Bottles for potable water should be replaced regularly.

6. Summary

1. Ensuring personal hygiene and health increases productivity and aids in preventing potential biological contamination of crops, since an infected worker can transmit many biological pathogens to fruits and vegetables. An infected employee (whether or not symptoms are evident) can easily contaminate fresh produce good hygiene is not

practised. Workers with symptoms of disease should be sent home or assigned to activities that do not involve contact with produce.

2. Water for human consumption should be potable - that is, free from micro-organisms and/or chemical substances that can adversely affect the health of the consumer. Ensuring the availability of potable drinking water for field workers can reduce the risk of them developing disease and consequently contaminating fresh produce.

3. The three most commonly used water disinfectants are chlorine, ozone, and chloramines.

4. The personal hygiene of agricultural workers is an important factor in minimising contamination of fresh produce. Management should provide workers with information about acceptable hygiene practices, ensure that it is understood and send a clear signal to the workers about the importance of these practices. Some basic practices requirements include: regular bathing, use of toilets, even in the fields, washing hands and wearing clean clothes.

5. Toilets located in the fields should be properly maintained and supplied. They should not be installed close to water sources or in places where rain can spread contaminants or cause flooding. Maintenance and servicing of toilets and disposal of hand-washing water should be carried out away from the growing site in case leaks or spillages occur. Any inadequate sanitary facility increases the risk of contamination for water, soil, produce and working personnel.

[1] This document is in partly based on the document 'Improving the safety and quality of fresh fruit and vegetables' produced by the University of Maryland, USA. ©2002 University of Maryland.