

# Personal Health and Hygiene

**NECAFS**

The Northeast Center to Advance Food Safety



The Food Safety Modernization Act's Produce Safety Rule (FSMA PSR) sets mandatory standards for growing, harvesting, packing, and holding produce for human consumption.

Farms that are covered by the FSMA PSR will be held to certain standards designed to reduce the presence of foodborne illness causing organisms that can contaminate produce. This factsheet outlines the requirements for covered farms and uses the word "must" when the practice is required by the FSMA PSR.

For farms that may not be subject to the FSMA PSR, it is important to consider the implementation of these practices to ensure your produce is safe.

## Introduction

There are regular and frequent human interactions with hydroponic and aquaponic operation components. Therefore, effective training and implementation of health and hygiene standard operating procedures (SOPs) is essential to produce safety. The objective of this factsheet is to help growers consider the different ways humans interact throughout the system. Based on these interactions, growers need to understand when health and hygiene training must be provided.

### The key points covered in this factsheet include:

- Standard operating procedures (SOP) should be specific to each operation. They must describe the health and hygiene practices that apply to all personnel, and they must be based on how those personnel interact with the system.
- Visitors participating in educational workshops and trainings are common at hydroponic and aquaponic operations.
- Health and hygiene training must be provided to people who touch produce or food contact services, which may include visitors, volunteers, and other farm personnel.



Everyone who interacts with a production system contributes to the safety of growing produce.



Personnel should wash hands before and after interactions with system components, like cleaning a drum filter or handling fish.

## PRODUCE SAFETY CONSIDERATIONS ASSOCIATED WITH HEALTH AND HYGIENE



People can be a main vector of pathogens into hydroponic and aquaponic systems if they do not maintain proper health and hygiene practices (e.g., sick people working in the systems, poor handwashing, dirty clothing). In these systems, preventing the introduction of pathogens is critical because

the nutrient-rich recirculating production water is an ideal environment for pathogens to easily spread to all parts of the operation. Additionally, contaminated human hands, clothing, and personal items may also contaminate produce through direct contact.

Therefore, growers must

adopt proper health and hygiene practices—such as frequent handwashing between activities—to help reduce the spread of foodborne pathogens. Additionally, maintaining proper health and hygiene helps reduce the spread of plant and fish disease throughout a system or operation.

## WHAT ARE ADDED CONSIDERATIONS IN AQUAPONICS?

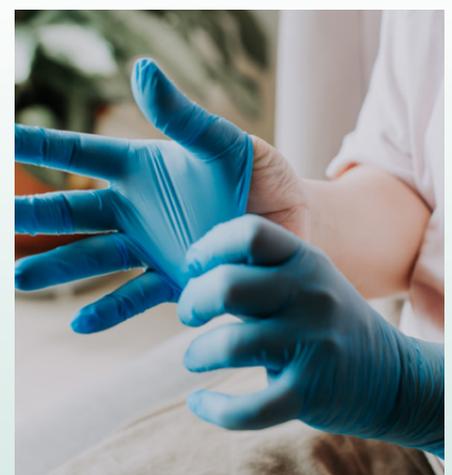


The inclusion of fish in aquaponic systems adds an additional layer of concern when it comes to the health and safety of people interacting with the fish. Though fish feces itself is not a produce safety hazard, it can serve as a habitat and transmission vector for harmful pathogens like *E. coli* or *Salmonella* if they are introduced through personnel, fish feed, wild animals, tools, or other outside sources.

Additionally, fish can carry zoonotic diseases, which can be transferred to humans and lead to illness, especially in immunocompromised people. While the risk to most personnel

is low, it can be further minimized by wearing personal protective equipment such as pierce-proof gloves. 

Therefore, to prevent the spread of pathogens throughout the system, it is important to establish a health and hygiene standard operating procedure (SOP) that applies to personnel interacting with the system. This SOP should consider routine operations such as fish harvest, sampling, system maintenance, and cleaning, as well as the potential for cross contamination between things such as hands, clothes, footwear, tools, and equipment.



Proper use of personal protective equipment can minimize the risk of transferring zoonotic diseases from fish to humans.



# Personal Health and Hygiene Training in Hydroponic and Aquaponic Operations

Depending on the size of the operation, a variety of people may interact with hydroponic and aquaponic systems each day. This may include farm personnel, service providers, volunteers, or visitors. Smaller operations may have just a few workers who move between



SEAN FOGARTY

the production, packing, and storage areas. Larger operations may have staff dedicated to a particular greenhouse or specific task (e.g., harvesting or packing).

Growers must provide health and hygiene training for all farm personnel who handle or touch produce or food contact surfaces. Records documenting the training must be kept for 2 years. Signs and clear SOPs in the native languages of personnel can be posted in production areas to serve as reminders about hygiene policies.

FSMA PSR requires personnel to wash their hands in a number of specific instances. Personnel must pay special attention to

follow recommended hand washing practices before any contact with production water or plants and after contamination of hands by production water or organic waste materials (e.g., fish feces, plant debris, or plant growth media). In other words, personnel should be properly washing their hands before and after interacting with system components. Additionally, personnel must remove or cover hand jewelry and eat only in designated areas. Hydroponic and aquaponic systems are more susceptible to the spread of disease and insects through recirculating water, therefore the handling of plants should be minimal prior to harvest.

## VISITORS TO HYDROPONIC AND AQUAPONIC OPERATIONS

When it comes to visitors and whether or not they must receive health and hygiene training, there is a very important distinction between those who touch produce or food contact surfaces and those who do not.

Many hydroponic and aquaponic operations offer an educational component by providing demonstrations, tours to visitors, classes, or workshops. In fact, a 2020 survey of aquaponic producers found that nearly half of respondents sold educational services through trainings and workshops. It is important for growers to understand that they must provide health and hygiene training to visitors when their activities include handling or touching produce or food contact surfaces. This training must include the same components as the training given to paid personnel who are performing similar activities. Records docu-

menting the training must be kept for 2 years.

If visitors' activities do NOT include handling or touching produce or food contact surfaces, then health and hygiene training is not required. However, the operation must make these visitors aware of policies and procedures to protect produce and food contact surfaces AND ensure that visitors comply with those policies and procedures. Operations must have toilet and hand-washing facilities available for visitors. A clear visitor protocol will make sure that visitors are familiar with the farm's food safety plan and minimize the introduction of outside contaminants or the spread of pathogens within the system. A visitor log can also be helpful for tracking who has entered the operation, particularly in the case of a foodborne illness outbreak.



PETER KONJOJAN

All visitors who touch covered produce or food contact surfaces must receive health and hygiene training.



## FARM PERSONNEL (OWNERS, SUPERVISORS, PAID PERSONNEL, VOLUNTEERS)

Growers must provide health and hygiene training for all farm personnel who handle or touch produce or food contact surfaces, including volunteers. It is not uncommon for hydroponic and aquaponic operations to have volunteers who have significant interactions between produce and the system over an extended period of time. One example is a volunteer who works as part of their produce share. When volunteers touch produce or food contact surfaces they must receive health and hygiene training. Records documenting the training must be kept for 2 years.

Personnel must wash hands after they become contaminated, such as after handling plant roots or styrofoam rafts.



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## WORKER SAFETY



Personnel must be trained to follow an operation's SOPs to prevent contamination of produce with bodily fluids from a sick or injured worker. Supervisors should consider the unique conditions of hydroponic and aquaponic operations and provide appropriate personal protective equipment (PPE) to protect against work-place hazards. This may include the constant noise of water and air circulation systems which can cause hearing loss and chronic stress over long

periods of exposure. Also, some chemicals may present hazards to worker health and PPE, such as ventilators and gloves, must be provided and used to protect against injury or illness.

All reusable PPE that is intended or likely to contact covered produce must be used according to the product label, cleaned routinely and sanitized when necessary, maintained, and stored in a way that prevents produce contamination. 

Personnel must wear PPE according to the product label when using certain chemicals that may be harmful to human health.



## BIOSECURITY



Hydroponic and aquaponic operations have likely implemented some biosecurity practices to control pests or plant/livestock pathogens. These practices can also be used to help meet an operation's produce safety objectives and reduce food safety risks.

To accomplish this, limit access from one production area to another as much as possible, because workers moving through multiple greenhouses can spread insects and pathogens. If the operation is large enough, consider having workers enter only certain greenhouse sections, or establishing completely separate systems and employees for different growing areas. This can help prevent any insects and pathogens from traveling between multiple areas.

In smaller operations, where workers may enter and exit

production areas more often, careful measures should be taken to prevent pests and pathogens from entering the greenhouse in the first place. Vestibules in the entryway can utilize positive airflow to blow air (and insects) out the greenhouse door as workers enter. Boot sanitation stations or foot baths containing sanitizer can reduce the spread of soil-borne microorganisms including plant, fish, and human pathogens into production areas. Sanitizer must be replaced or maintained according to the manufacturer's directions to ensure efficacy.

This co-management of practices—where one practice satisfies the goals of multiple needs—allows an operation to use biosecurity strategies, such as boot baths and positive entryway ventilation, to achieve positive results for both pest management and produce safety.

## Personal Health and Hygiene Takeaways

Health and hygiene training is required for all personnel, including visitors and volunteers who touch produce or food contact surfaces. The hands of personnel can be one of the most significant sources of human and plant pathogens that may then spread through recirculating water. Therefore, hand washing before and after activities that include contact with water is essential. In addition to training that considers personnel's interactions with the system, growers should be aware of biosecurity strategies that can help to prevent the transmission of human, plant, and fish pathogens from one area of an operation to another.



## Additional Resources

Some of the resource links provided here may be general in nature and can be adapted to hydroponic and aquaponic operations. These links do not represent an exhaustive list of content on this topic. They are intended as a starting point to guide the user toward finding additional relevant resources.

### **Biosecurity in Aquaculture, Part 1: An Overview**

<http://fisheries.tamu.edu/files/2013/09/SRAC-Publication-No.-4707-Biosecurity-in-Aquaculture-Part-1-An-Overview.pdf>

### **National Center for Farmworker Health: Aquaculture Workers factsheet**

<http://www.ncfh.org/aquaculture-workers-fact-sheet.html>

### **University of Hawaii: On-Farm Food Safety – Aquaponics**

<https://www.ctahr.hawaii.edu/oc/freepubs/pdf/fst-38.pdf>

### **University of Minnesota: UMN Aquaponic Food Safety Assessment**

<https://aquaponics.umn.edu/sites/aquaponics.umn.edu/files/files/umn-ap-food-safety-assessment.docx>

