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School Garden Food Safety Guidelines

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The following are guidelines for the safe handling of foods grown in school gardens for use in the school cafeteria. Following these guidelines will help reduce contamination from pathogens and maintain a safe environment for children, volunteers, and teachers who work in the garden. Prior to using the food items in the school cafeteria, school gardens will need to implement these guidelines and have the garden certified by the Arizona Department of Health Services (ADHS).

> **Rationale:** *School kitchens fall under the jurisdiction of the Arizona Food Code, which states that kitchen facilities may only use foods from an "approved source." The Arizona Food Code leaves this definition up to the local health authority. In this instance, the local health authority is considered the county health department. Prior to the implementation of these guidelines, county health departments considered school garden produce to be an unapproved source for use in kitchen facilities.*

These general guidelines are designed to reduce the risk of microorganisms contaminating fresh produce grown in school gardens. They also provide information about high risk areas for contamination and how to avoid or minimize such contamination. It is important to recognize that these guidelines do not guarantee the product is free from microbial contamination but verify that the school has taken proactive measures to reduce the risk of contamination by adhering to generally recognized best practices for safe food production and harvest.

Microorganisms and pathogens are a natural part of the environment and can be a problem whether you choose to use organic or conventional gardening methods. It is essential to understand how these microorganisms are typically introduced into the gardening environment and the potential means by which they can contaminate fresh produce in order for school gardens to safely provide healthy foods grown by, and for, students.

In order to implement a successful school gardening program, it is critical to involve students, teachers, school administrators, facilities staff, food service staff, and the community throughout the planning process. The school district and the ADHS will need to approve the implementation of these guidelines as an acceptable safety measure. Information about the ADHS certification procedures can be found at **http://www.azdhs.gov/phs/oeh/fses/school-garden.**

General Guidance

Every school garden must implement a written Risk Control Plan and have it approved by the Registered Sanitarian with ADHS **(Kathryn.Mathewson@azdhs.gov)** prior to utilizing garden-grown food items in the school cafeteria. The Plan should document appropriate training of student and volunteer workers in proper hygiene and harvesting as outlined below. A designated Garden Manager (Person in Charge) must document and maintain all necessary records as well as document any corrective actions.

What is the right way to wash your hands?

- Wet your hands with clean running water (warm or cold) and apply soap.
- Rub your hands together to make a lather and scrub them well; be sure to scrub the backs of your hands, between your fingers, and under your nails.
- Continue rubbing your hands for at least 20 seconds. Need a timer? Hum the "Happy Birthday" song from beginning to end twice.
- Rinse your hands well under running water.
- Dry your hands using a clean towel or air dry.

Washing hands with soap and water is the best way to reduce the number of germs on them. If soap and water are not available, use an alcohol-based hand sanitizer that contains at least 60% alcohol. Alcohol-based hand sanitizers can quickly reduce the number of germs on hands in some situations, but sanitizers do **not** eliminate all types of germs.

Centers for Disease Control and Prevention
http://www.cdc.gov/features/handwashing

Figure 1 Proper Hand Washing

Worker Health and Hygiene

All workers (students, staff and volunteers) must be trained by the Garden Manager in proper hand washing techniques and hygiene procedures. The Centers for Disease Control and Prevention recommended procedure can be seen in Figure 1. Any wounds should be properly bandaged before working in the garden.

The Garden Manager needs to tell sick workers that they must not work in the garden. Anyone who is ill should not handle food within 24 hours of vomiting or diarrhea, or before being cleared by a medical professional (e.g., the school nurse) after experiencing a combination of fever and sore throat.

It is recommended that all workers should be trained on the use of machinery including the location of controls to safely start and stop the equipment. Equipment that requires an on/off switch should only be handled by an adult, but in case of emergency, the students should know how to stop the equipment.

Since workers will be out in the sun, they should be encouraged to wear hats and apply sunscreen while gardening. The garden is an ideal way to utilize the SunWise Skin Cancer Prevention School Program, which can be found at **http://www.azdhs.gov/phs/sunwise.**

Garden Review

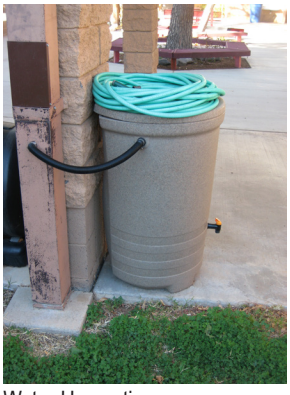
Prior to implementing the garden, it is important to consider previous land use and determine if the soil contains lead or other contaminants. The ADHS lab will conduct free lead tests on samples submitted by a school. The Garden Manager needs to document the quality of the water source for the garden, any soil amendments that will be utilized, methods implemented for pest control, and procedures to deter animals from entering the garden. Shovels, rakes, and other field equipment must be cleaned with hot, soapy water on a regular basis. If there are students with allergies at the school, keep allergenic types of foods (wheat, strawberries, melons, tree nuts, and peanuts are the most common) separate from other areas of the garden.

Land Use and Land Use History

- Document the history of the land use prior to installing the garden. The school district should have record of the prior use of the land before the school was built. It is also important to note how the land was used after the installation of the school. If the garden is placed in an area that was previously used for parking or an area where chemicals may have been applied for weed and pest control, then it is important to have the soil tested by a lab. A list of soil testing laboratories can be found at http://ag.arizona.edu/pubs/garden/az1111.pdf.
- Avoid damaging underground utilities by calling 811 (AZ Blue Stake) before you dig.
- Position the garden away from potential contamination sources such as garbage containers, school animals (rabbits, tortoises, birds, etc.), septic systems, in-ground storage tanks, and water runoff from playgrounds, roofs, walkways, and/or parking areas. Do not place the garden in a low lying, poorly drained area or an area subject to any kind of chemical application. Manage the planting area to avoid standing water and excess debris.
- Use non-toxic, non-leaching materials for raised bed gardens. Cedar, redwood, cypress, pine, and oak are acceptable woods as well as masonry and/or composite materials.
- It is important to work with the maintenance staff to ensure they use safe practices on the school grounds near the garden. These safe practices would ensure chemicals for weeds or pests are not used in the vicinity of the garden. Also, equipment such as lawn mowers, weed whips, or blowers may kick up rocks and could harm workers and should only be used when no workers are present in the garden.

Water Source

- Only use potable water for the portion of the garden in which food is grown. Municipal water tests must be acquired by the Garden Manager from the local water provider on a yearly basis. Well water must be tested for microbial contamination at least once during the growing season. Surface water must be tested three times during the growing season (first at planting, second at peak use, and third at or near harvest).



Water Harvesting

The Garden Manager needs to keep documentation of the water test results.

- If using containers to transport water, they need to be sanitized on a regular basis and only used for water. Clean the reusable containers and harvesting equipment with hot, soapy potable water. Rinse with clean water. After rinsing, sanitize with either 50-100 ppm of chlorine solution (about 1 tablespoon of chlorine solution) or 200 ppm of quaternary ammonia (or per the manufacturer's specification). Your kitchen staff should have test strips available to ensure the solution is at the proper concentration.
- At this time, we recommend that water from rainwater harvesting can only be used on non-edible plants. It is extremely difficult to keep up-to-date, accurate records of the quality of the water harvested through rainwater harvesting techniques. We recommend that this water can still be captured but used on plants not grown for food such as flowers, trees, shrubs, and grass.

Soil Amendments

- Unless using commercially produced soil in a container garden, the soil in the garden should be tested for lead; lead levels must be less than 300 ppm. The lead test is required since many gardens could be near older buildings that might have lead based paint. Areas that have been flooded in the past may have increased risk of lead contamination. You may also want to test the soil to document nutrient levels, such as available calcium, magnesium, sodium, potassium, nitrate, phosphate, salinity, and pH.


School Compost

- Mulch made from wood chips is an excellent method to preserve soil moisture or fertilizers.
- It is recommended that the garden only use commercially available compost or fertilizer. Keep a copy of purchase records from the commercial source to document the product's content.
- Hands should be washed thoroughly after handling soil or compost.
- School prepared compost must contain only plant products and can only be used on non-edible plants. The compost must maintain a temperature of 130° – 150° for three days during the decomposition process. Proper decomposition of plant products for composting involves periodically turning the pile with a shovel. This process normally takes a minimum of 1-2 months under optimal temperature and moisture conditions. The compost pile should be kept in an area separate and down slope from the garden. Do not use manure in the compost. Manure that has not been composted completely is a safety hazard.
- The Garden Manager must document the source of compost as well as record temperature levels of school prepared compost.
- Composting nuisances and risks such as the presence of pathogens, odor, vectors (small animals or insects that carry disease), fires, and litter can be prevented or minimized through proper design and operation.

Pest Control

Use organic methods to minimize or alleviate pests such as insects, weeds, animals, and fungi. These methods include traps, mechanical controls, crop selection, and non-synthetic chemicals and biological controls.

Animal Intrusion: Wild and Domestic

Animals need to be excluded from the garden area. The Garden Manager should monitor for presence of animals by looking for animal prints or feces in the garden. Fencing is the most effective method of excluding animals. Additional ideas to deter or limit animal access to the garden include utilizing scare balloons, metallic tape, CDs, or tassels. These methods provide movement and flashes from sunlight that are disturbing to vectors.

Security

To the extent that is practical, secure the perimeter of the garden with fencing. Extend the school's normal security measures in the garden, such as a sign-in sheet.

Garden Harvest

The Garden Manager should conduct a pre-harvest assessment that includes a review of hygiene requirements with the workers prior to harvest as well as making sure potable water is available to the workers. Workers should wear closed toe shoes and should check shoes prior to harvest to avoid bringing contaminants into the garden. These contaminants may include animal feces, food, gum, or phlegm. The Garden Manager needs to ensure toilets and wash facilities are clean. Adults should supervise when harvest begins. Avoid injuring the produce during harvest and handling.

Garden Sanitation

It is recommended that the Garden Manager develop a clean-up procedure in case contamination occurs. During the pre-harvest assessment, the Garden Manager should determine if there is evidence of contamination (human or animal) in the garden. The contaminated area should be isolated and labeled as "no harvest" or pull the contaminated plants immediately. Discard all plants that are contaminated. It is important to periodically remove rotten produce.

Emergency Clean-Up Procedures

A clean-up procedure needs to be developed in the event of an accidental contamination incident. Accidental contamination could include a worker getting sick or blood from a cut getting on the ground, a plant or a harvest tool. Discard all plants and soil that are contaminated.

If you step in the contaminant, clean your shoes prior to harvesting in other areas of the garden to avoid bringing contaminants into the previously non-contaminated areas.

Harvesting Containers & Equipment

- Hands should be washed before beginning to harvest the produce and again after using the restroom, touching the face, coughing, or sneezing. ADHS requires the use of single-use, non-latex, plastic gloves when harvesting produce.
- Food grade, reusable containers should only be used for harvest. The containers should not be made from wood. Rigid containers that are made from plastic or stainless steel are generally acceptable. They should be stored in a protected area during and after harvest and must be sanitized and in good condition. One-time-use harvest containers, such as paper/plastic bags and cardboard boxes, must be new and clean. Knives, scissors, and other harvesting equipment must be cleaned prior to use and must only be used in the garden for their designated purposes. Harvesting equipment should never be used for working with compost. Clean the reusable containers and harvesting equipment with hot, soapy potable water. Rinse with clean water. After rinsing, sanitize with either 50-100 ppm of chlorine solution (about 1 tablespoon of chlorine solution) or 200 ppm of quaternary ammonia (or per the manufacturer's specification). Your kitchen staff should have test strips available to ensure the solution is at the proper concentration.

Receiving by Cafeteria Staff

- The harvested produce should not be washed by the garden workers. Shake off as much dirt as possible in the garden area and deliver to the cafeteria staff in the harvest container. The cafeteria staff must verify the harvest containers are clean. Cafeteria staff must not accept the product if there are odors or evidence of contamination. Produce from the school garden needs to be kept separate from the commercial produce.
- If possible, weigh the produce so the students can document their harvest. The cafeteria staff should record who, what, when, how, and where the school garden produce was harvested and cleaned.

These guidelines were adapted from:

AZ Department of Education **(http://www.azed.gov/health-nutrition/school-gardens)**, AZ Department of Health Services **(http://www.azdhs.gov/diro/admin_rules/guidance_PHS_BEDCS.htm),** USDA's People's Garden Initiative, North Carolina State Cooperative Extension, Mountain Roots Food Project, National Farm to School Network, University of Maryland, University of Connecticut, USDA National Food Service Management Institute, Denver Urban Garden, and The Community Food Bank of Southern Arizona's Garden-to-Cafeteria Guidelines.

Technical Advice:

- Dr. Kurt Nolte, PhD, Director & Area Agent
  UA College of Agriculture and Life Sciences Cooperative Extension, Yuma County
- Stewart Jacobson, Food Safety Projects Coordinator
  Arizona Department of Agriculture

Registered Sanitarian:

- Kathryn Mathewson, School Garden Sanitarian/Health Educator
  AZ Department of Health Services, Office of Environmental Health, **azdhs.gov/phs/oeh/fses/school-garden**

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This information has been reviewed by University faculty.
cals.arizona.edu/pubs/health/az1604.pdf
Other titles from Arizona Cooperative Extension can be found at:
cals.arizona.edu/pubs

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