

Garden to Plate: Food Safety for School and Community Gardens

Fact Sheet

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Introduction

Kids and families who grow their own produce are more likely to eat the fruits (and vegetables) of their labor.

Because gardening is an effective strategy for healthier food consumption, the number of school and community gardens is increasing across the state of Kansas. However, fresh produce has also been linked to outbreaks of foodborne illness in commercial food production.

Fruits and vegetables can be contaminated any time from planting to eating. Most pathogens are killed by cooking, but they are difficult to wash off produce that will be eaten raw. To minimize contamination risks, this fact sheet outlines good practices for growing produce that school and community volunteers can take to keep their produce safe. These prevention strategies include:

- site and soil selection,
- personal hygiene,
- sanitation and tool safety,
- water and irrigation,
- compost and fertilizers,
- pest and animal management, and
- food safety in harvest and storing produce.

Site and Soil Selection

Selecting a suitable site will help reduce the risk of unforeseen problems such as flooding, animal crossings, chemicals and other contaminants in the soil, and runoff. Obtain the history of the land and ask community experts such as your K-State Research and Extension agent for help. To locate your local extension office, visit www.ksre.ksu.edu.

Know the history of the garden site to reduce risk of future problems.



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Produce should be planted away from the following hazards:

- Garbage
- Animal pens
- Manure or compost piles
- Water runoff
- Septic systems
- Wells
- Areas with high risk of flooding

For raised-bed gardens, avoid using these materials:

- Pressure-treated wood
- Used tires
- Single use plastics
- Old railroad ties

Dial 811, the national “Call Before You Dig” number, to avoid digging into any utility lines.

Personal Hygiene

Good personal hygiene is essential in preventing foodborne illness and should be constantly reinforced, especially with children.

- Always wash your hands thoroughly any time they may become contaminated, such as after using the bathroom, touching garbage, or handling animals.
- Wash hands with warm, soapy water for at least 20 seconds. Use a nailbrush to remove soil from under fingernails. Dry with a clean, paper towel.
- If water is not available at the site, gardeners should use disposable, single-use gloves when harvesting.
- No one should work in the garden while sick! Stay out of the garden if you are vomiting, have diarrhea, or a fever.
- After handling compost, or touching the compost bin, do not touch tools or produce without removing gloves and washing hands.
- Change out of dirty clothes and shoes before entering food preparation areas or kitchen.
- Cover cuts and wounds on your hands with bandages and gloves.

Sanitation and Tool Safety

Wash your hands often when using garden tools and supplies. Clean garden tools and surfaces with soap and clean water before and after each use.

Use food-grade containers when collecting, transporting, or storing garden produce.

Tool Safety Tips:

- Never lay long-handled tools on the ground. Lean against a wall or fence.
- Tools should not be held above waist level.

- Always keep an arm’s length between you and another person when using gardening tools.
- All gardening equipment should be kept in locked storage where animals and children cannot access them.

Water and Irrigation

Contaminated water will contaminate edible produce. Only use potable or drinkable water to water your garden.

If you won't drink the water, don't use it to water your edible plants.

Know your water sources:

- Potable water is clean, safe to drink, and free of pathogens. *Example:* Treated water from a municipal water supply.
- Surface water is likely to contain pathogens and is generally polluted with wastes, fertilizers, pesticides, and chemicals. *Example:* Lakes, rivers, ponds, streams and wetlands.
- Groundwater is less likely to contain pathogens and pollutants than surface water. *Example:* Water found underground in the cracks and spaces in soil, sand, and rock.
- Well water originates from rain and snowmelt that soaks through the soil. *Example:* Groundwater collected in a constructed well or holding area.
- Rainwater collection of storm water runoff from roofs. *Example:* Water collected in a rain barrel.

If the garden is already using an untreated water source, such as a river, pond, or rain barrel, be sure to have the water tested regularly, including water captured from rain barrels and cisterns.

Contaminated or untreated water may contain pathogens such as the hepatitis A virus, *Giardia*, *Shigella*, *E. coli*, *Salmonella*, *Cryptosporidium*, *Toxoplasma*, and norovirus. (For more information on food safety pathogens, visit www.cdc.gov/foodsafety/diseases/index.html)

Storage tanks and roofing construction materials can also be potential sources of contaminants in rain catchment systems. Again, be sure to test water regularly if not using treated municipal water.

For information on safe well water, visit www.kdheks.gov/envmicro/testing_of_private_wells.htm.

Irrigation:

- Trickle (or drip) irrigation that waters at the base of plants will minimize the risk of contamination. Hand watering at the base of the plant will also work when drip irrigation is impractical or cost prohibitive.
- Avoid overhead watering to reduce contamination of the plants with potential foodborne pathogens.

Compost and Fertilizers

Composting

Composting is a great way to reduce waste that goes into landfills and add needed nutrients for plants. New compost piles can be started with shredded leaves, yard trimmings, and fruit and vegetable scraps, depending on what material is available. Other materials include leaves and lawn clippings, fruits and vegetables, eggshells, coffee grounds and filters, tea and tea bags, and hay and straw. Citrus rinds, corn stalks, and nutshells may be composted but take longer to break down.

Compost: a mixture of soil and decayed organic matter that improves garden and potting soil.

Compost must reach a minimum temperature of 130°F for at least 5 days to kill pathogens such as *E. coli* and *Salmonella* before using it in the garden. Harmful pathogens may grow and live in compost piles maintained below this temperature. Compost piles that are at least 27 cubic feet generally reach this temperature. If compost piles are small, turn the pile regularly. Add coffee grounds and grass clippings (pesticide and herbicide free) to increase the temperature. Use a compost thermometer (long stem, 2 to 3 feet, found in gardening stores or online) to check the temperature of your compost pile.

Place the compost pile away from garbage and water-runoff areas. Composts should have walls, fence, or some sort of barrier to keep animals out. Meat scraps or dairy product waste are not recommended for the compost bin.

Manure may be used but must be composted to avoid contaminating the garden with *E. coli* and other pathogens. Only use manure from herbivores such as cattle or rabbits. Do not use manure from cats and dogs. If the garden accepts compost from another source but wants to maintain an organic garden, it is imperative to ask what kinds of materials are in the mixture.

If manure is used, extra steps must be taken to guarantee the safety of the finished compost:

- Do not use raw manure in your garden as it may contain *E. coli*.
- Mix the compost regularly as it is important for aeration and ensures the entire pile has reached the required temperature.
- Monitor the temperature often.
- Allow at least two cycles of maintaining 130°F for five days each to ensure that any growth of pathogens is inhibited.

Compost is ready when it is dark, moist, crumbly, and does not resemble any of the materials initially added to the pile. Most compost piles will be ready four to six months after the pile was started. Wear gloves and nose-mouth masks when handling compost.

For quick composting tips, visit www.ksre.ksu.edu/bookstore/pubs/EP6.pdf.

Fertilizers

- Before fertilizing, have the soil tested to see if nutrients and fertilizer are needed. Contact your local extension office for more information.
- Read and follow manufacturer's instructions when using and disposing of fertilizer.
- Keep fertilizers in a locked storage area.
- ONLY allow trained adults to handle fertilizers.
- If transferring fertilizer to a different container, label it with the common name of the fertilizer:
 - Never use a food container!
 - Keep original labels that specify usage, storage, cautions, etc.

Pest and Animal Management

The United States Department of Agriculture recommends not using any pesticides or herbicides in school gardens because of the potential health hazards to children. Community garden sites may also want to limit or avoid their use.

Using organic pest management methods can control damage to food crops. Control weeds, for example, by mulching, hand-pulling, or using weeding tools. For more information, contact your local extension office.

Wild animals, farm animals, and even domestic pets can bring pathogens and contaminants into your garden. Use fencing to keep them out. Otherwise, use approved repellents or sprays.

- As a rule of thumb, wash hands thoroughly before and after touching or feeding animals.
- Do NOT forget to wash your hands AFTER caring for animals and BEFORE handling garden equipment or produce.
- Create some kind of barrier so animal feces cannot contaminate garden produce (this may mean removing animals during the growing and harvesting season).
- Never harvest produce when there is evidence of animal feces or bird droppings.
- If using pesticides or fungicides, use potable water and keep sprayers clean and dry between uses.
- Avoid using pesticides or herbicides around children.

Some communities and schools are adding aquaponics or growing fish and plants together. Pond fish and fish farms are usually okay since they are contained within their own environment. Personal hygiene and cross contamination safety practices apply.



Food Safety in Harvesting and Storing Produce

- Always use common sense when it comes to food safety. The goal is to prevent contamination of produce by microbes and chemical contaminants from seed to plate.
- Wash your hands often.
- Wash food-grade harvest and storage containers with soap and water. Sanitize and let air dry between uses. Check with foodservice staff for their sanitation procedures or make up your own sanitizer using 1 tablespoon of unscented bleach to 1 gallon of water.
- Clean and sanitize sinks, counters, cutting boards, and utensils before preparing any food.
- Shake or rub off all excess garden soil or debris before bringing garden produce into the kitchen. A staging area for pre-cleaning and sorting is helpful to keep soil and food waste out of the kitchen.
- To slow mold and rotting, do not completely wash produce before storing.
- Do not rinse produce with water that is more than 10 degrees warmer or cooler than the temperature of the produce. Contaminants can be absorbed through porous tissues (e.g. stems of fruit) when large variations in temperature occur.
- Wash and sanitize cutting boards, dishes, utensils, and countertops with hot water and soap between preparation of raw meats and garden produce.
- Always use potable or drinkable water to wash produce.
- Keep raw produce separate from other foods such as meat, poultry, and seafood.
- Thoroughly rinse all produce before eating, cutting, peeling, and cooking.

- Scrub rough peels and rinds with a vegetable brush.
- Discard any bruised or damaged pieces of fruits and vegetables.
- For fruit and vegetable storage guidelines, see “Storing Fresh Fruits and Vegetables for Better Taste” — ucce.ucdavis.edu/files/datastore/234-1920.pdf
- For refrigerated produce, store in refrigeration that is between 35 to 40 degrees Fahrenheit.
- Refrigerate all cut or peeled produce in airtight containers.

Online Resources

Websites:

K-State Research and Extension Food Safety:
www.ksre.ksu.edu/foodsafety/

Kansas Community Gardens:
www.kansascommunitygardens.org/

K-State Research and Extension—Lawn and Garden:
www.ksre.ksu.edu/p.aspx?tabid=24

Topeka Common Ground: topekagardens.com/

Water Testing Information:
www.kdheks.gov/envmicro/testing_of_private_wells.htm.

Videos:

Composting: www.kansasgreenyards.org/p.aspx?tabid=37

How to Test Your Soil for Nutrients:
www.kansasgreenyards.org/p.aspx?tabid=37&itemID=36

Kansas Community Gardens, Video Series:
ksre.ksu.edu/p.aspx?tabid=24

Publications:

“Cleaning and Sanitizing the Kitchen: Using Inexpensive Household Food-Safe Products,”
edis.ifas.ufl.edu/pdffiles/FY/FY128000.pdf

“Fertilizing Gardens in Kansas”:
www.ksre.ksu.edu/bookstore/pubs/MF2320.pdf

“Food Facts, Raw Produce: Selecting and Serving it Safely”:
www.fda.gov/Food/ResourcesForYou/Consumers/ucm114299

“Kansas Garden Guide”:
www.ksre.ksu.edu/bookstore/pubs/s51.pdf

“Quick Composting”:
www.ksre.ksu.edu/bookstore/pubs/EP6.pdf

Publications from Kansas State University are available at: www.ksre.ksu.edu

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