The consumption of fresh fruit and vegetables has been recognized for generations as a component of healthy living. However, consuming fresh produce can sometimes make healthy people sick. According to the final updates from the Centers for Disease Control and Prevention, in 2006, E. coli on spinach sickened 199 people; 102 people were hospitalized and three died. The probable cause was manure and water from livestock or wild pigs walking through the field. In 2011, listeria on cantaloupe sickened 147 people, of which 33 people died. Most folks, including yours truly, have been the victim of food poisoning caused by foodborne pathogens.

In response to these outbreaks and the widespread recognized need for a modern food safety system, the Food Safety Modernization Act (FMSA) was passed into law in 2011 and after several modifications based on public input became effective on Jan. 26, 2016. This act focuses on preventing food safety problems rather than reacting once they happen.

ABOUT THE PRODUCE SAFETY RULE
Administered by the United States Food and Drug Administration (FDA), the FMSA consists of seven foundational rules. The rule applicable to the majority of fruit and vegetable producers marketing locally is the Produce Safety Rule. This rule establishes, for the first time, science-based minimum standards for the safe growing, harvesting, packing, and holding of fruits and vegetables grown for human consumption. I spoke with Justin McConaghy, Oklahoma Department of Agriculture, Food and Forestry (ODAFF) produce safety program coordinator, about how the rule affects local fruit and vegetable growers.
The key requirements applicable to market gardeners and fruit growers include:
• The use of agricultural water in production and post-harvest activities.
• The use of biological soil amendments.
• The management and/or monitoring of domestic and wild animals in crop production areas.
• Worker training in health and hygiene.
• The management of equipment, tools and buildings to avoid contamination of produce.

AGRICULTURAL WATER USE
The rule establishes two sets of criteria for microbial water quality, both of which are based on the presence of generic E. coli and can indicate the presence of fecal contamination. The rule applies to both ground and surface water sources as well as reclaimed water and public water supplies.

One set of criteria applies to water used during and after harvest. No detectable generic E. coli is allowed in water used for these activities. Examples include water used for washing hands during and after harvest, water used on food-contact surfaces, and water used in direct contact with produce (such as wash water and water used to make ice). The rule prohibits use of untreated surface water for any of these purposes.

The other set of criteria applies to production water. Production water applications include irrigation, crop sprays, frost protection and cooling water. Unlike post-harvest water, a maximum allowable level of generic E. coli is permitted in production water. This level has been established by the FDA. Each production...
water source must be tested to evaluate whether the water quality profile meets the required standards. If the water does not meet these standards, corrective actions will be required. This rule does not apply to irrigation water that does not come into direct contact with a fruit or vegetable. For example, drip-irrigated tomatoes where the irrigation water does not come into direct contact with the fruit.

ODAFF is in the process of identifying and compiling a list of accredited labs for testing agricultural water. There is no requirement to test agricultural water that is received from public water systems or supplies that meet requirements established in the rule or if the water is treated in compliance with the rule’s treatment requirements.

BIOLICAL SOIL AMENDMENTS
The rule requires that untreated biological soil amendments of animal origin, such as raw manure, must be applied in a manner that does not contact produce during application and minimizes the potential for contact with produce after application. Currently, the FDA does not object to farmers complying with the USDA’s National Organic Program standards, which call for a 120-day interval between the application of raw manure and harvest for crops in contact with the soil and 90 days for crops not in contact with the soil. The agency considers adherence to these standards a prudent step toward minimizing the likelihood of contamination. The FDA continues to conduct research to determine the time requirement needed between the applications of raw manure as a soil amendment and harvesting to minimize the risk of microbial contamination.

The use of compost as a soil amendment in fruit and vegetable production is allowable if a scientifically-valid composting method recognized in the rule is used. Examples of such composting methods include:

• **Static composting** – A process that forces air through a stationary (static) pile and maintains a minimum of 131 degrees Fahrenheit for three consecutive days followed by adequate curing.

• **Turned composting** – A process that introduces air into a pile by turning on a regular basis and maintains a minimum of 131 degrees Fahrenheit for 15 days (does not have to be consecutive), with a minimum of five turnings and followed by adequate curing.

EXEMPTIONS
Several exemptions do exist within the FMSA Produce Rule. Produce that is typically cooked (rarely consumed raw as determined by the FDA) is exempt. Examples of exempt produce commonly grown in Oklahoma include asparagus, beans consumed as seed (black, kidney, pinto, etc.), beets (roots and tops), collards, sweet corn, eggplant, okra, pecans, potatoes, pumpkin, winter squash and sweet potatoes. Also, produce that is grown for personal or on-farm use is exempt.

FARM SALES LESS THAN $25,000
Farms that have an average annual value of produce sold during the previous three-year period of $25,000 or less are also exempt.

FARM SALES MORE THAN $25,000
Farms that generate more than $25,000 in sales can qualify for an exemption if the farm meets two requirements:

1. The farm must have food sales averaging less than $500,000 per year during the previous three years.
2. The farm’s sales to qualified end-users must exceed sales to all others combined during the previous three years.

A qualified end-user is either the consumer of the food or a restaurant or retail food establishment located in the same state or Indian reservation as the farm or not more than 275 miles away.

REQUIREMENTS OF EXEMPT FARMS
A farm with the qualified exemption must still meet certain modified requirements, including disclosing the name and complete business address of the farm where the produce was grown either on the label of the produce or at the point of purchase. A farm’s qualified exemption may be withdrawn if there is an active investigation of an outbreak of foodborne illness that is directly linked to the farm.

Farms that are exempt and farms that qualify for an exemption must keep financial records to verify their exemption.
MANAGING/monitoring animals
The rule does not require farms to exclude animals, domestic or wild, from outdoor growing areas. However, farmers are required to take all measures reasonably necessary to identify and not harvest produce that is likely to be contaminated by such measures might include placing flags outlining the affected area.

Worker training
The rule requires growers to take measures to prevent contamination of produce and food-contact surfaces by ill or infected persons, use hygienic practices when handling produce or food-contact surfaces, and take measures to prevent visitors from contaminating produce or food-contact surfaces.

Farm workers who handle produce and/or food-contact surfaces, and their supervisors, must be trained on certain topics, including the importance of health and hygiene. They are also required to have a combination of training, education and experience necessary to perform their assigned responsibilities. This could include on-the-job training in combination with education or work experience related to current assigned duties.

MANAGING equipment, tools and buildings
The rule also establishes standards related to the use of equipment, tools, supplies and buildings to prevent these sources, and inadequate sanitation from contaminating produce. Procedures for the appropriate storage, maintenance and cleaning of toilets, hand-washing facilities, mechanical harvesters, picking containers, grading and sizing equipment, washing equipment, packing sheds and storage buildings, to name a few, are covered in the rule.

PRODUCE RULE COMPLIANCE DATES
The FDA has established compliance dates for activities covered by the Produce Rule based on the size of business.

Very small businesses
Very Small Businesses (those with more than $25,000 but no more than $250,000 in average annual produce sales during the previous three year period) must comply with all activities, including labeling and financial record-keeping, by Jan. 26, 2020.

Small businesses
Small Businesses (those with more than $250,000 but no more than $500,000 in average annual produce sales during the previous three year period) must comply with all activities, including labeling and financial record-keeping, by Jan. 26, 2019.

The compliance dates for certain aspects of the water quality standards, and related testing and record-keeping provisions, allow an additional two years beyond each of these compliance dates.

Training workshops
Justin McConaghy, ODAFF produce safety program coordinator, is responsible for coordinating produce safety training for growers, establishing a produce grower database and grower compliance. The first in a series of produce training workshops, conducted by certified trainers, is tentatively planned for the fall of 2017. Stay tuned for details.

Under the provisions of the FSMA Produce Safety Rule, the majority of fruit and vegetable growers in Oklahoma (and nationwide) are exempt or can reasonably qualify for an exemption. While growers may be exempt from the “letter of the law,” they should not consider themselves exempt from the “spirit of the law.” For this reason, I encourage every grower to participate in a produce training workshop. From a legal and ethical basis, it is in everyone’s best interest if safe growing and handling practices are the mode of operation on each farm.