



## **Episode Nineteen - Managing risk for agricultural production water**

Welcome to episode 19 of Food Safety Bites brought to you the University of Wisconsin Madison and funded by the USDA Food Safety Outreach Program. This is your host Harriet Behar. This episode is **managing risk for agricultural production water, including water used for irrigation**. In these podcast episodes, I will identify issues, and provide suggestions for how to reduce various fresh produce contamination risks and keep your customers safe. We will not talk in detail about what is required for a GAP audit or a FSMA inspection. If you want more information on those, please see the links on the website where you found these podcasts.

In this episode, I will continue my discussion agricultural water from the previous episode and focus on lessening the risks of using agricultural water. Testing will be discussed in a subsequent episode of food safety bites.

**Timing of applications-** If your agricultural production water is not of drinking water quality, then there are measures you can take to lessen the number of microorganisms that might contaminate your produce. It has been shown that if you apply water that might have contaminants to produce in the field and then wait a few days before harvesting, the levels of contamination will likely fall significantly due to UV, wind and other factors. Watering in the morning on a sunny and/or windy day, can help lessen the number of pathogens that stay viable on the produce originating from that water. The UV sunlight and the wind during the day can help to dry out the surface of the produce quicker which can cause some of the pathogens to desiccate and die. I will discuss using your test results later in this episode to help with the timing of your water applications.

**Evaluating risks from wells-** Wells should not be assumed to produce potable water and should be tested periodically. When a well is drilled, the surrounding area typically sinks creating a “cone of depression”. Any type of event, such as rain or flood, that causes surface waters within or even beyond that cone of depression, can push that water to the lowest spot, which is the well casing. Contaminated water can run down that well casing to the area where the water from the aquifer is being pulled up into the well and have an immediate effect of contaminating that water. Livestock should not be near well heads, nor debris, nor restroom facilities. Hydrants should not be located close to the well heads, since anything you wash, paint brushes, dirty tubs or your hands after working with animals, can be washed down into the well’s water source by running along the well casing- quite quickly. Older wells may not go very deep or their well casings may be cracked allowing contaminants to flow down into the well water.

When using a pressurized well for irrigation, use a back-flow preventer otherwise known as a vacuum breaker or check valve, between the water source and your hose or pipe. These can be found in most hardware stores in the plumbing section for under \$10. They are typically around an inch long and have a small hole that allows in air, preventing a vacuum to occur which can suck back the water from the hose into the well, when the pressure is turned off.



The location of your septic system to the well, should be known and evaluated, with a distance of at least 100 feet a good idea. If you are using a motor to pump water, do not place it on top of the well casing and make sure that any petroleum products used, for fuel or for lubrication of that motor, cannot leak down into that well, by having them a distance away along with catch pans in place under the motor and monitored periodically to verify there has not been any leaking that could contaminate the well.

**Evaluating contamination risks from surface waters-** If you are going to use surface water for agricultural production, educate yourself on where that water is coming from. If using a farm pond, is there a risk of manure in the water when there are livestock nearby or even standing in the water? Is your pump stirring up sediment from the bottom of that pond, where accumulated bacteria can get into your water?

If using water from a stream or river, are there livestock up river? Can they stand in that river? Does the river adjoin a grassy pasture or a bare feedlot? Are there 10 animals or 10,000 animals? Are they present every day or are they rotationally grazed and only there twice during the growing season? Is this waterway used by migrating birds or animals on a seasonal basis? Even if the animals are not directly adjoining these surface waters, is there is risk from livestock facilities whose land would drain into those waters after a significant rain event? All of these factors are part of evaluating the risks of E coli and other pathogens that could possibly be in the water, at what volumes and what time of year.

**Evaluating the risk from contaminated water by type of crop-** Some crops are more likely to harbor bacteria, leafy greens with lots of folds- lettuce, spinach- cantaloupe with rough surfaces. Look at growing smoother varieties if possible, especially if you are planning on overhead irrigation with surface waters.

Train your workers to handle produce gently when weeding and at harvest, especially right before or after use of non-potable water in the field. Injuries to leaves and fruits welcome the intrusion of bacteria that can then infiltrate the produce later when being submerged in post harvest handling. Think about not irrigating after recent close tractor cultivation, hoeing or vigorous hand weeding, to lessen the risk of leaf or fruit damage. If you wait numerous days after cultivation and irrigation to harvest, you should be able to identify the injured produce and not harvest it compared to harvesting on the same day as hoeing and irrigating, when the damage would be less visible.

**Monitoring-** Consider mapping out your water systems, especially if you are using more than one source. This can help you with decision making when choosing a water source for use on especially vulnerable produce, or at a time of year when the source might be at a high risk of contaminating your produce. At the beginning of the season, and periodically during the season, review the various irrigation sources and systems, to inspect that there are no areas where debris or manure could infiltrate into your water system and there has not been any damage to equipment that would allow the intrusion of bacteria, insects, or animals. Review that your system does not have areas where there is standing water for an extended period of time inside the water system, that could form biofilms.



So that's it for this episode of Food Safety Bites, the next episode is what is post-harvest handling water. This is your host Harriet Behar brought to you by the University of Wisconsin Madison, talk to you next time!