



Episode Twenty - What is post-harvest handling water

Welcome to episode 20 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 **what is post-harvest handling water**. 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.

There are basically two categories of water on a produce farm, water used to grow or produce the agricultural products, and water that is used for post-harvest uses like transporting, cooling, and cleaning produce. This is also water that is used for cleaning food contact surfaces, handwashing and making ice. There are six food safety bites episodes on water, two on agricultural production water, two on post-harvest handling water, one on testing protocols for both types of water and one on using ice and other aspects of cold-water chilling. As you can hear, water is a big issue and needs specific focus to assess risks and issues tied to each source and use.

What is post-harvest handling water- This is water used to transport produce, remove field heat, remove dirt and apply materials such as fungicides or waxes before packaging for sale. Some operations might harvest produce into water tanks out in the field, or into flumes if close enough to their packing operation. The management of this water is the final link in the chain of food safety and paying careful attention at this point in your handling is essential to both maintain the good handling practices you started in the fields and prevent unwanted contamination in this last step. Water is used to remove soil from produce and to clean it, but it also has the risk of spreading pathogens from one piece of produce to many. A glob of bird poop on a kale leaf can touch one or two other leaves in a harvest tub but can spread pathogens to a full dunk tank of 20 cases of kale leaves through the water.

Sources of water- Unlike water used for agricultural production, water used for post-harvest handling needs to be acceptable for drinking. In a different episode of food safety bites, I go into detail on testing the source water used for post-harvest handling to verify this potability each year. Non-potable water sources, such as a stream or pond, for any post-harvest use, including removing heat when just harvested out in the field, carries too many risks of contamination and should not be used, even though it might be convenient. Cisterns are considered to be surface water, since animals and debris can migrate into this water source and should not be used for post-harvest handling.

Risks associated with different types of produce- Pay attention to the type of produce you are handling, if the fruit or vegetable could be eaten raw, extra care should be taken in the post-harvest system for those types of produce, since there is a good chance that that type of produce will not be cooked and would not kill any microbes present on the produce. Potatoes are not eaten raw and would have less risk than an apple or a cucumber. The goal is to sell



produce that is free of contamination, no matter if it eaten raw or not, but extra care should be taken with produce that is riskier.

Be aware if the type of produce has lots of folds and crevices where dirt can be difficult to remove and might make it difficult to see any signs of fecal matter from wildlife. Produce with thin skins, or with hard stems that could have punctured or scraped adjoining produce in the harvest tub, should be sorted carefully in the pack area. Damaged produce has the risk of bacteria infiltrating into the produce, where it is impossible to then remove it, even if dunked in water with a sanitizer. There is a food safety bites episode on infiltration to help you identify this risk.

Risks associated with equipment and workers: Everyplace the produce touches, carries a risk of harboring bacteria. This includes workers hands, brushes, wagons, totes, tubs or buckets, table tops, screens, sinks, flumes and tanks. Mechanical washing equipment such as brush washers and barrel washers offer their own challenges from difficult areas to clean dirt and biofilms. Consider how your system prevents cross contamination at this phase of handling, since bacteria can so easily be spread in water.

Incorporate frequent handwashing, emptying dunk tanks, rinsing and re-sanitizing food contact surfaces when they become visibly dirty, as well as setting up your pack shed and coolers in such a way to isolate the dirtier produce from the finished clean produce as part of your post-harvest handling. Washing the produce using single pass water like a spray hose to remove as much of the dirt and soils as possible, then dunking it on a shallow tank with a sanitizer in it for a short amount of time, before packing is a typical method. Whenever dunking produce in water, be aware that the produce should not be more than 10 degrees warmer than the water, to prevent infiltration. Discussion on pre-chilling your produce before dunking it is in the infiltration food safety bites episode.

Consider running water with sanitizer through the single pass water used in the brush or barrel washer too. It may not seem very dirty to start, but the more produce washed, the more risk of produce contamination and accumulation of biofilms on the equipment, so a little prevention is worthwhile. When using dunk tanks or recirculating water, monitor the cloudiness or turbidity of that water and change it when it gets too dirty. I will cover the management of dunk tank water in the next episode.

Lastly, give thought to the way that wash water is disposed of, can it splash onto produce that is stacked nearby? There will be a lot of water, so be aware of any local or state regulations which address where this water will go, since much of it will have sanitizers that may or may not cause environmental harm. Sanitizers like SaniDate 5.0 are OMRI listed and approved for organic operations, and do not cause harm to the environment. For example, running the used wash water directly into a trout stream is probably not a good idea.

In another episode of food safety bites, I will go over sanitizing food contact surfaces used in postharvest washing, maintaining the correct levels of sanitizer in the water and managing your dunk tanks. Discussion of pack shed design is in another future episode.



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