



## Maintaining a Cold Chain

Implementing good food safety in the production of fruits and vegetables is an important and difficult thing to do. This food safety necessarily must go beyond just the field and extend into how the produce is stored on-farm.

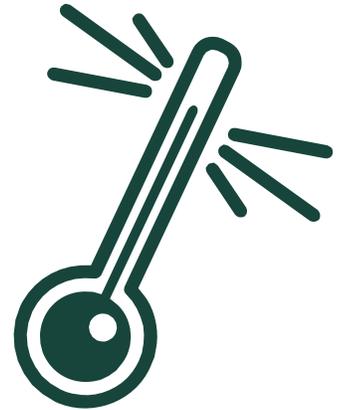
This guidance document and episode review best practices to ensure food safety compliance when using refrigeration. As with other aspects of food safety, the pertinent record keeping requirements will also be covered with respect to complying with food safety requirements.

From the time fresh produce is harvested until it is consumed, it loses nutritive value. This loss is often slowed by maintaining a cold chain, or keeping the produce held at a given temperature from the time of harvest to the time of consumption. Maintaining this cold chain is not only important from a produce quality perspective, but also from a food safety perspective.

After harvest, the speed with which field heat is removed is the first step in this process. From the standpoint of food safety, though, how field heat is removed can pose some risk. Using water as the mechanism to remove field heat, such as hydro-cooling, if done too quickly, can cause water to be drawn into fleshy produce (ie. Tomatoes, cantaloupes, etc.) and increase food safety risk. When cooling fleshy produce with water, it is recommended that the water temperature not be more than 10 degrees cooler than the base pulp temperature of the produce. This ensures that no water is drawn into plant tissues.

From the standpoint of risk in cross contamination of produce, using air to cool harvested product poses a lower risk. Forced air or vacuum cooling systems, though not suitable for all produce, can reduce risk of cross contamination.

Most foodborne illness bacteria do not grow as well in temperatures common under refrigeration. Keeping things cool helps keep any potential bacterial contaminants in check. If refrigeration is not maintained or is not working properly, this check doesn't happen and can increase the risk of foodborne illness. For this reason, it is important to make sure that refrigeration is maintained.





Routine monitoring and documentation of the temperature of refrigerated areas is the only way to make sure that the cold chain has been maintained. Try to develop a habit of checking the temperatures at certain points in the day, like at the beginning of work, lunch time and at the end of the day, or after every shift. Keeping a log of the temperature is important in order to provide proof that the cold chain has been maintained, both to your buyer as well as to any auditing agency, if it is asked for. A copy of a temperature monitoring log is included in the show notes for convenience.

An auditing agency is looking for due diligence with regards to minimizing incidence of foodborne illness, visual evidence that it is taking place and documentation that it has been taking place in the past. Assessing the risk is the first step. Implementing changes or developing monitoring protocols to reduce risk on your farm is the next step. Documenting temperatures in cold storage is the final step.