

ORCHARD FOOD SAFETY ISSUES

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No doubt most farmers, including fruit growers, are aware of some of the food safety issues that have ‘cropped’ up recently. Several food-borne, microbial disease outbreaks have been associated with fresh produce and juice (cider) products in recent years. Fruit growers must remember that they are producing a food, and with that comes a responsibility for taking steps to assure that their apples, cider, small fruit, vegetables, etc. won’t make someone—who also happens to be their valued customer!—sick from microbial contamination.

It goes without saying that many steps we already take to bring a quality crop to market also prevent food-borne illness and are just plain common sense. And there is no question eating fruits and vegetable is a healthy act. But in our day-to-day operations of producing a fruit crop we must be vigilant and take positive action to reduce the risk of food-borne illness.

Now, you may say “Why all this fuss? Nobody’s ever gotten sick eating my apples or cider!” Well, this may be partially true, but how do you know for sure no one has become sick? In fact, the vast majority of food sickness goes unreported. (Most likely a consequence of dining out!) Also, consider the fact that microbes are evolving, and one in particular, E. coli OH157, is a new, virulent, and hard-to-kill microorganism, Just a few of these bacteria can result in serious illness, particularly in weak individuals such as children and the elderly. So, “Nobody’s ever gotten sick eating my fruit!” is NOT a good excuse for ignoring food safety issues.

It’s convenient to break the subject of orchard food safety into three areas:

- *Cider*
- *Field and production*
- *Storage, packinghouse, and transportation*

Cider

Cider and fresh juice have been a ‘poster child’ for the food safety campaign, largely the result of several instances of disease resulting from contaminated cider. The Food and Drug Administration (FDA) and Centers for Disease Control and Prevention have been very active recently in regulating fresh juice and cider production to ensure its safety.

First, in 1998 a labeling rule was imposed by FDA, dictating that a warning label was to be placed on all *unpasteurized* fresh juice. At the same time, pasteurization as a way to kill microbes was promoted. Realizing the inherent limitation of labels—who really reads them?—in preventing further disease outbreaks from contaminated cider, FDA published a ‘Final Rule’ in 2001 on fresh juice production.

In a nutshell, the Final Rule mandates that processors who wholesale their cider develop and implement a HACCP (Hazard Analysis and Critical Control Points) plan. It's a phased rule, but by 2004, all cider makers who wholesale their juice must have a HACCP plan in place. Developing and implementing a HACCP plan is not trivial, so producers who only wholesale a little may balk and decide to only retail their cider. There are training programs, however, jointly sponsored by FDA and state agencies to make the HACCP process a little less intimidating.

Concerning retailing of fresh cider, apparently farm stands and growers who press cider and retail only are still required to attach a warning label if the cider is consumed off-premises, i.e., sold in plastic jugs. This has prompted many smaller, retail-only producers to purchase UV treatment equipment, which FDA has now approved as a 'kill-step,' thereby exempting their cider that has been UV treated from bearing the warning label.

An interesting aside related to UV treatment is that, according to FDA, UV-treated cider may not be called pasteurized or fresh. But it may be called UV-treated. This is from one of several FDA web sites related to the Final Rule and fresh juice processing. Be sure to check these out (see Resources at end of article) for more information if you are a cider producer and not sure exactly where you fit under the regulations.

All cider makers are also encouraged to use Good Agricultural Practices (GAPs). If you want more information on GAPs and food safety, see the Resources section at end of this article.

All this being said about cider, here is a simple test to gauge your understanding of the situation. Again, see the answers at the end of this article.

1. You make fresh cider without treating it (either pasteurization or UV-treatment) and allow customers to sample it in your store or farm stand -- *do you need to affix a warning label to the single-serve cup or container?*
2. You make cider for your own farm stand and bought a UV-treatment machine to set your mind at ease and for the safety-sake of your elderly and young customers. (Plus, although it's not recommended, you now feel more comfortable using dropped apples in you cider production.) You also have an arrangement whereby another local grower, who does not make his own cider, brings you his apples from which you press cider, bottle it, and send the juice back to the grower to sell in his own farm stand. *Does grower #1 need a HACCP plan?*

Field and production

Enough about cider. Now let's look at some food safety issues related to field production. It's a safe bet growers have not considered some of the not-so-obvious but important sources of field contamination in producing a fruit crop. Here's what to watch out for:

Site Selection -- When establishing a new orchard or berry planting, be aware of the surroundings. Right next to a dairy farm or manure pit is not a good place. Also, consider the upstream water quality and potential for wind contaminants, if they exist. NRCS (Natural Resources Conservation Service) will help you develop a farm plan that is cognizant of food safety siting issues.

Manure -- Although the use of manure in orchards is rare—and for good reason, considering its use has been implicated in several instances of food-borne illness—it still bears mentioning. Ideally, any manure used in fruit production should have been actively composted to destroy most pathogens. If not, there is technically a 120 day PHI (pre-harvest interval) for manure, and care should be made in its application to not touch edible produce. When applied, and if possible, it should be incorporated into soil right away to hasten decomposition, and therefore make contact with produce or handlers less likely. Orchards do not make good cow pastures, and every effort should be made to keep uncomposted manure out of the orchard.

Animals -- In general, it's a good bet to exclude animals from the orchard, particularly near or during harvest. This includes both wildlife and domestic animals, including pets. All have reservoirs of E. coli in their gut and feces. Let's keep them out of the orchard as much as possible. (Another good reason for erecting a deer fence.)

Irrigation -- Modern, high-density orchards and fruit plantings are typically irrigated. GAPs dictate that the source of irrigation water be clean and quality-tested on a regular basis. In general, well water is preferable to surface water from a food safety perspective. And trickle irrigation is preferable to overhead irrigation for one obvious reason—it's less likely to contact the produce. A good idea is to keep records of your irrigation practices and schedule. (More on recordkeeping later.) And, something you may not have thought of, consider your spray water source—is it potable? It should be if applying foliar nutrients or growth regulators close to harvest. It's not a bad idea to even have your spray water tested for biological contaminants.

U-Pick -- Growers running a pick-your-own (PYO) operation have a whole set of food safety issues on their plates, because of the large number of handlers, which of course are their customers, and the lack of complete control over them. (I don't need to tell this to anyone who has been in the U-pick business for any length of time—but you know the customer is always right!) Many PYO orchards and berry farms have been proactive by encouraging and providing hand-wash and toilet facilities for their customers. And most have banned family pets from the fields. If you don't already do so, it's a good idea to clean and sanitize PYO containers. (Do it at least once at the start of harvest season.) And it's not a good idea to sell produce at the farm stand that has been picked by PYO customers.

Worker hygiene -- whenever a fruit is handled, and I mean quite literally 'handled' by the human hand, the potential for contamination exists. This includes harvest labor. Pickers should be cognizant of good personal hygiene, which includes hand-washing. Thorough hand washing—for at least 20 seconds with soap —should be a policy before starting work, and after using the bathroom. Speaking of bathrooms, did you know OSHA requires one bathroom per 20 field workers within 1/4 mile or a five minute walk? Of course hand washing facilities should always be available immediately after using the bathroom.

Storage, packinghouse, and transportation

Worker hygiene in the field is a good segue into post-harvest food safety issues. Here are some things to keep in mind:

Worker hygiene -- is back again as a food safety topic. Of course, frequent hand-washing is a

must for all produce handlers in the packinghouse. Workers should be instructed on proper hand-washing procedures, and it should be monitored and enforced to be effective. Maintaining clean hand-wash and toilet facilities is a good step to making sure your workers (and yourself!) follow the hand-washing rules. Needless to say, sick workers should be sent home or reassigned to a job that does not require produce handling. *Worker hygiene is the golden rule of food safety!*

Packinghouse -- Floors should be kept clean, preferably by being washed, rinsed, and sanitized daily. Of course, no contaminated water or livestock waste should *ever* be allowed in the packinghouse. Did you consider this includes clothes or boots of workers who may have been exposed to livestock waste or similar contamination in the field? Therefore, a good rule is *no* field clothes or boots worn in the packinghouse. Finally, it's a good idea to not allow smoking, eating, or domestic animals in the packinghouse area where produce is being processed, sorted, or packed.

Wash water and packing line -- Those growers and packers who already use wash water are probably already aware of a few good practices. They include: chlorinated water should be used in the dump tank, and chlorine levels in wash water need to be monitored regularly; wash water should be changed regularly; and wash water temperature should be no more than 10 F. cooler than the fruit. (Colder water can actually force contaminants into openings in the fruit, where they are more difficult to kill and a more fertile environment for growth exists.) Packing lines should be cleaned and sanitized on a regular maintenance schedule. And remember to store packing materials in a clean room or shed away from animals.

Storage -- For several reasons, one of which relates to food safety, you don't want to exceed the cooling capacity of your cold storage. Fruit should be cooled as rapidly as possible upon harvest to maintain quality and prevent microbes (if they exist) from multiplying. Storages should be cleaned and sanitized before loading, or at least minimally at the beginning of the storage season, and of course checked for signs of animal activity regularly. Storage bins should also be cleaned and sanitized before use. In the field, ground contact should be avoided. (The practicality of this will be questioned, but the necessity from a food safety standpoint can't be debated.) Don't be too surprised to see the regulated phase-out of wood bins in the orchard in favor of plastic bins, which are far easier to clean and sanitize.

Transportation -- You go to a lot of effort to make sure the apples or whatever fruit you produce are free from microbial contamination from field, to storage, to packing. So make sure the final step, transport to markets, maintains this integrity. If using your own vehicles for trucking, it's up to you to make sure they are clean and have not been used for transporting animals, manure, pesticides, etc., prior to trucking produce. And if you use another shipper, insist that their vehicles are clean and free from debris when picking up *your* produce.

Recordkeeping/Traceback -- If ever an instance of foodborne illness be blamed on your produce, it's important to have documentation of where your fruit came from, how it was produced, and what steps were taken to prevent contamination in processing (if applicable), handling, and distributing. Good documentation of all steps from field to sale is a basic tenet of helping to maintain the cleanliness and safety of your produce, and can't be overemphasized. Good recordkeeping takes discipline, but for many reasons—including food safety—is well worth the effort.

Resources

Here are some important Internet resources to help you comply with fresh juice regulations and analyze your orchard situation with a food safety state-of-mind:

- Guide to Minimize Microbial Food Safety Hazards for Fresh Fruits and Vegetables, <http://www.cfsan.fda.gov/~dms/prodguid.html>
- New England Extension Food Safety Consortium - GAPs, <http://www.hort.uconn.edu/IPM/foodsafety/toc.htm>
- FDA's Juice HACCP, <http://www.cfsan.fda.gov/~comm/haccpjui.html>
- 2002–2003 Pennsylvania Tree Fruit Production Guide, Part VIII. Maintaining the Safety of Pennsylvania Apples and Apple Products, <http://tfpg.cas.psu.edu>
- Cornell University Good Agricultural Practices Project, Food Safety Begins on the Farm: A Grower's Guide, <http://www.gaps.cornell.edu/>
- UMass Extension Nutrition Education Program Food Safety, includes “Wash Hands” posters (in nine languages!) as PDF files, http://www.umass.edu/umext/nutrition/programs/food_safety/resources/index.html

Remember -- the key to reducing risks of foodborne illness is preventing contamination BEFORE it happens!

Answers to cider questions:

1. No, you do not need to attach a warning label to cider served as individual servings, whether purchased or as free samples, as long as it is consumed onsite. But, if the intention is for the purchaser to consume it off-premises, then the cider container (whether pints, quarts, half-gallons, gallons, etc.) should have the warning label attached.

2. Yes, the cider producer needs to have a HACCP Plan in place. This transaction is considered a wholesale sale, and therefore the regulation requires a HACCP Plan.