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Guidelines for Producing Unpasteurized Cider in Pennsylvania





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Food Safety Concerns

Within the last several years, several highly publicized incidences of foodborne illness have been linked to consumption of unpasteurized cider contaminated with *E. coli* O157:H7, *Salmonella*, or *Cryptosporidium* parasites. Small children and the elderly are most susceptible to the effects of foodborne illness. As a result, new government regulations are in place that will affect how you make cider. Whether you press small amounts to sell at your own farm stand, custom press for others, or produce large volumes for sale to retail outlets, you should follow established food safety and sanitation standards that minimize the risk for contamination.

Recently enacted federal and state regulations now require cider makers to obtain training in general food safety and sanitation, and, in some instances, to develop HACCP plans. HACCP (pronounced *Hassip*) stands for Hazard Analysis and Critical Control Point. The HACCP approach to preventing foodborne illness systematically identifies critical control points where food safety hazards must be prevented. As part of their HACCP plan, federal regulations require a process step that will achieve a 5-log (99.999 percent) reduction in harmful pathogens. Currently, the United States Food and Drug Administration (FDA) recognizes both heat and ultra-violet pasteurization as effective methods to destroy human pathogens in cider. Use the guidelines that follow to determine which government regulations apply to your operation. If you are unsure, contact the Penn State Department of Food Science or your county Cooperative Extension office.



GOVERNMENT REGULATIONS THAT WILL AFFECT YOUR CIDER OPERATION

- Under the new federal regulation, cider makers must develop a HACCP plan and pasteurize their product if they:
 - press and sell cider to other business entities (retail stores or wholesale distributors).
 - press and sell cider to other individuals who then re-sell it (custom press).
- Cider makers are exempt from the federal regulation if they:
 - sell all the cider they press directly to consumers at their own farm stand, food service operation, or farmers market location.
(Note: cider makers who do not pasteurize must label their product as such and affix a warning statement.)
- Under Pennsylvania food safety regulations, cider makers must obtain food safety training under the Food Employee Certification Act if:
 - they are residents of Pennsylvania.
 - their cider press is registered with the Pennsylvania Department of Agriculture.

Food Safety Hazards

Cider makers should consider all the possible ways that harmful microorganisms can contaminate their product. Despite all sanitation measures during processing, cider may contain harmful levels of pathogens if contaminated apples are used. Growers should, therefore, practice good agricultural practices to minimize contamination from water, soils, manure, harvesting equipment, and workers who handle apples.

Pathogenic microorganisms may also be found on the floors, in drains, and on the processing equipment. Without good sanitation practices, any of these surfaces can be a source of microbial contamination. Another potential source of contamination is workers who do not

follow good hygiene practices. A sufficient number of well-supplied and sanitary toilet and handwashing facilities is essential to minimize food safety risks.

The surest way to prevent cider from causing foodborne illness is to pasteurize it. However, many cider makers are exempt from federal regulations requiring pasteurization and thus may continue to make and sell unpasteurized cider. Cider makers who choose not to pasteurize should decide what their potential liability may be when selling unpasteurized cider and what measures they need to take to protect the public from foodborne disease.

Good Manufacturing Practices for Pennsylvania Cider Makers

The food safety guidelines provided below are taken from established food safety and sanitation standards in *Current Good Manufacturing Practice in Manufacturing, Packing, or Holding Human Food* (U.S. Code of Federal Regulations 21: Part 110) and the FDA publication *Guide to Minimize Microbial Food Safety Hazards for Fresh Fruits and Vegetables*. Cider makers can contact the Penn State Department of Food Science or their county Cooperative Extension office to obtain copies of current food safety regulations and guidelines.

1 Apple Production Guidelines



Require apple suppliers to demonstrate compliance with good agricultural practices.

Growers should document that they use production and harvesting practices that minimize the potential for microbial contamination of apples in the orchard as provided in the FDA's *Guide to Minimize Microbial Food Safety Hazards for Fresh Fruits and Vegetables*. These practices include, but are not limited to:

- Field sanitation—Provide toilet and hand-washing facilities that meet federal and state standards for quantity and accessibility.
- Livestock grazing—Do not allow livestock to graze in orchards.
- Animal fertilizers—Do not use raw manure or untreated municipal biosolids as a nutrient source for apple trees.
- Meet applicable standards for water quality and agricultural practices.
- Place fruit received into cold storage or into an enclosed area until used for processing.

Use only good quality tree-picked apples.

- Use only tree-picked apples that have not contacted the ground.
- Apples used to make cider should meet or exceed the minimum standards for “U.S. Cider” grade as specified in the “U.S. Standards for Grades of Apples for Processing,” i.e., free from decay, wormholes, and internal breakdown.
- Fruit used in the cider manufacturing should be inspected; rotten fruit removed; and damaged fruit either thoroughly trimmed or removed.

Wash apples in water containing an approved antimicrobial agent.

- Monitor sanitizer levels at appropriate intervals to ensure adequate levels are maintained at all times.
- Reused wash water should be changed regularly to prevent the buildup of chemicals.
- Rinse apples, if necessary, with potable water before grinding and pressing.

2

Water Quality



Provide all processing areas with a source of potable running water with sufficient pressure for all required washing of fruit and equipment and daily floor washing.

- All water that contacts apples or food-contact surfaces should meet or exceed Pennsylvania standards for drinking water.
- Provide running water at a suitable temperature, and under pressure as needed, in all required areas for cider processing, for the cleaning of equipment, utensils, and food-packaging materials, or for employee sanitary facilities.
- Commercial, state, or local government laboratories should test water of unknown quality. If nonmunicipal water is used, it must meet federal health standards for drinking water. In Pennsylvania, a private water source must be tested each year between August 15 and September 15 by a certified laboratory.

Maintain the plumbing system to prevent cross-connections.

- The water system in newly constructed plants should be designed and installed by a licensed plumbing contractor to meet current community building codes.
- Inspect major modifications to the plumbing system to ensure that it conforms to local building codes, including the presence of cross-connections.
- Backflow of contaminants into the potable water supply should be prevented by installing anti-siphoning devices in all hoses and storing them off the ground when not in use.

3

Grounds and Building Maintenance



Maintain grounds surrounding the cider operation to minimize product contamination.

- Roads, yards, and parking lots should be well drained and litter and waste regularly removed so that they do not become a source of contamination or become a breeding ground for pests.
- Keep grass and weeds cut short and store equipment and other materials at a sufficient distance from buildings so they do not provide sites for pests to enter.

Cider processing areas should be sized, constructed, and designed to facilitate maintenance and sanitary operations.

- Cider processing operations should be located in a separate, enclosed room or building that is clean and in good repair.
- Pressing and filling areas should be adequately screened, and doors should be equipped with self-closing devices to keep out insects, rodents, birds, and other pests.
- Sufficient space for equipment and stored materials should be available to allow for inspection and pest control and provide free movement for employees and equipment.
- Floors, walls, and ceilings should be made of materials that can be easily cleaned.
- Floors in processing and storage areas should be adequately sloped and constructed with a sufficient number of free-flowing drains to prevent standing water.
- Floors and walls in processing areas should be cleaned and sanitized each day. Clean and sanitize product receiving and storage areas frequently.
- Drip or condensate from fixtures, ducts, and pipes should be collected or diverted away from apples and food contact surfaces.

Properly dispose of pressed pomace immediately.

- Promptly dispose of pomace into covered waste containers to help control insects and rodents that may spread human pathogens.
- Keep waste areas free from spilled pomace and regularly clean waste containers so they do not attract pests.
- Do not leave pomace residue in processing areas overnight.



Provide adequate lighting in work areas.

- Lighting in processing areas, hand-washing areas, dressing and locker rooms, and toilet facilities should be adequate for efficient work practices and pest detection.
- Shield interior lights, fixtures, and skylights suspended over food to prevent pieces of glass from getting into the product.

Store hazardous chemicals in a safe and secure location.

- Label and store cleaners, sanitizers, and other hazardous chemicals away from food, food contact surfaces, or food packaging materials.
- Only authorized individuals who are trained on their safe and effective use should have access to hazardous chemicals.
- Materials Safety Data Sheets (MSDS) for every potentially hazardous chemical used should be kept on file and accessible for all employees to read.

Cold storage facilities should keep stored cider at 32–38°F.

- Cold storage units should be fitted with an indicating thermometer, temperature measuring device, or temperature recording device that shows the temperature accurately within the compartment, and should be fitted with an automatic control for regulating temperature or with an automatic alarm system to indicate a significant temperature change.
- Cold storage entry doors should be covered with plastic curtains to exclude dust and insects.

4 Equipment Sanitation



All food contact equipment must be made of food-grade materials and properly maintained.

- The design, construction, use, and general cleanliness of equipment can help reduce the risk of cross-contamination. Use only stainless steel, food-grade plastic, or wood that is safe, durable, corrosion-resistant, nonabsorbent, and easily cleaned and sanitized. Do not use copper and copper alloys in contact with apple cider.
- Poorly maintained equipment is difficult to clean. Repair or replace food contact surfaces so that they remain in proper working condition.
- As soon as possible, phase out all non-hardwood porous woods or wood in poor condition that contacts the product.

Use only clean and sanitized equipment and containers for processing and storing cider.

- Clean and sanitize food contact surfaces daily with appropriate solutions. After food contact surfaces are thoroughly cleaned, they should be sanitized with a FDA-approved sanitizer according to label directions.
- Thoroughly inspect containers before use and sanitize them if necessary.
- Previously used glass containers should be thoroughly washed, rinsed, and sanitized before use.
- Use only new closures for glass and other reusable containers.

Use only filter cloths specifically designed for cider pressing, made of durable material, and replaced frequently.

- Sanitary handling of the cloths includes hanging them over a clean line or placing them in a clean container between runs.
- At the end of each day's operation, press cloths must be washed, rinsed, dipped in a sanitizing solution, and dried by hanging on a clean line in a well-ventilated, screened area free from flies and vermin.
- Use only detergents that have been approved for use with food processing equipment.



Use press racks made only of food-grade plastic or hardwood properly coated with paraffin or food-approved coating.

- Press racks must be kept off the floor at all times. As with the press cloths, the racks must be washed, sanitized, and dried in a well-ventilated, screened-off area at the end of each day's operation.

Tubing used in the cider operation must be approved for food use, and any plastic tubing must be transparent.

- Keep tubing continuous, protected from abrasion and breakage, and with as few couplings as possible.
- Do not allow tubing to touch the floor.
- Any tubing that passes through spaces that are not readily accessible must be of one piece and easily cleaned.
- Position the tubing so that no pockets of liquid remain after rinsing.
- All tubing, clamps, couplings, and connections periodically must be disassembled, cleaned, and sanitized (tubing must be sanitized after each day's run).

Store equipment and supplies off the floor in a clean, dry, insect- and vermin-free area.

- Store equipment and containers on pallets to protect them from floor splash and condensate drip.
- To avoid contamination, store cider containers inverted with the open tops down and covered.
- Thoroughly inspect equipment and containers before use and sanitize them thoroughly as necessary.

After each day's operation, thoroughly clean and sanitize all food contact equipment.

- Use clean potable water with adequate pressure and volume to clean and sanitize food contact surfaces.
- Clean and sanitize using a standard five-step process.
 1. Dry clean—Using a brush or squeegee, manually remove food particles and soil from surfaces.
 2. Pre-rinse—Dismantle equipment to the extent possible and pre-rinse with water to remove smaller particles and wet all surfaces.
 3. Clean—Following directions on the label, apply a detergent specially formulated to



remove soils. Take care to prevent generation of aerosols that are capable of drifting onto apples or adjacent food contact surfaces.

4. Rinse—Thoroughly rinse all traces of cleaner with water moving from the top of the equipment down to the bottom.

5. Sanitize—Apply an approved food contact sanitizer. Read and follow the label directions. Do not rinse after sanitizing.

6. Air-dry—Place the equipment on racks or in a well-ventilated and screened area.

- Protect containers and food contact equipment from aerosols generated when using cleaners and sanitizers.

During the off-season, store press racks and cloths indoors so that they are protected from contamination.

- Storage areas should be protected from birds, animals, insects, and other pests.
- Before storage, thoroughly clean, sanitize, dry, and wrap all racks and cloths.
- Never store equipment, utensils, or chemical supplies not used in food processing in the cider-processing or storage areas.

5

Personal Practices to Prevent Contamination



Workers should maintain a high degree of cleanliness appropriate for a food processing operation.

- Employees should practice good personal hygiene practices such as regular bathing, hair washing, fingernail trimming, and wearing clean outer garments while on duty.
- Workers should be trained to understand the importance of proper handwashing practices and general sanitation concerns.
- Hands should be thoroughly washed with clean, warm water and soap
 - before starting work,
 - after each absence from the working area,
 - between shifts,
 - and at any other times the hands have become soiled.
- Common or shared towels should not be used.
- All jewelry, except wedding bands, should be removed.
- Hair restraints (hairnets, headbands, caps, etc.) should be worn.
- If gloves are used, they must be designed for food-handling operations. Using gloves does not exempt workers from practicing good hygiene. Whenever workers change from a food-contact or cleaning operation to a nonfood-contact operation, they should replace gloves or thoroughly wash hands before resuming food-contact operations.
- Employees should not eat, drink, chew gum, or use tobacco where apples or cider are handled, processed, or stored.
- Lunches, clothing, and personal belongings should be stored in designated areas away from production areas.

Supervisors and workers should know the signs and symptoms of infectious diseases or infected wounds.

- Employees who demonstrate the signs and symptoms of disease or infection that can be transmitted in food should be sent home or assigned to nonfood areas.
 - diarrhea
 - fever
 - vomiting
 - jaundice
 - sore throat with fever
 - exposed infected wounds or boils

6 Toilet and Handwashing Facilities



Provide employees with adequate, readily accessible, and sanitary toilet facilities.

- Toilet facilities should have self-closing doors that do not directly open into work areas.
- They should be conveniently located near the work area and supplied with toilet paper.
- Handwashing stations should be provided with
 - hot and cold running water,
 - soap,
 - disposable towels, and
 - covered trash containers.
- Toilet facilities should be cleaned and sanitized daily or as necessary to keep them sanitary.
- Signs in each lavatory should remind employees of the handwashing policy and should be in an appropriate language that is readily understood by all employees.

All wastewater must be drained properly into the sewer or a septic system separate from the toilet system.

- Plumbing should be of adequate size and design and installed and maintained to allow proper removal of wastes.
- Portable toilets should be emptied in a manner that does not cause processing and storage areas to become contaminated. Consult your local or state health department about the proper disposal facility to be used.

7

Storage and Transportation of Cider



Maintain proper temperatures to help ensure both the quality and safety of cider.

- Cider should not sit on countertops in sales areas or in unrefrigerated trucks for excessively long periods.
- Refrigerated trucks should be precooled before containers of cider are loaded, and adequate circulation of refrigerated air should be maintained.

Inspect trucks and transport containers for cleanliness, odors, and obvious dirt or debris before beginning the loading process.

- Processors should be aware of previous loads carried in a transport vehicle and consider this information when determining the use of a vehicle.
- Trucks that were recently used to transport animals or animal products should not be used unless cleaned and sanitized before loading.

8

Pest Control



Establish a pest control system.

- Cider processors should have a pest control program in place that requires regular inspections and treatment of the processing facility by a trained pesticide applicator. The program should include regular and frequent monitoring of affected and treated areas to accurately assess the program's effectiveness.
- Maintain a pest control log that includes
 - dates of inspection,
 - inspection report, and
 - steps taken to eliminate any problems.

Protect processing and storage areas from insects and rodents by baiting, trapping, or physical barriers.

- All windows, doors, and openings around the cider operation should be screened or kept closed. Plastic curtains may be installed where forklifts enter storage areas.
- When pests are a problem, tamper-resistant, labeled bait stations should be placed at both sides of each entrance to the building and around the outside perimeter of the building no more than 30-50 feet apart. Live traps, glue boards, or mechanical traps should be placed no more than 20-30 feet apart along the inside wall of growing and storage facilities. Bait stations are not allowed inside buildings.
- A map showing placement and type (mechanical trap, bait box, glue board, etc.) of all pest control devices both inside and outside buildings should be maintained.

Use pesticides under precautions and restrictions that will prevent the contamination of food or packaging materials with illegal residues.

- All applicators must be trained and licensed.
- If pesticide application takes place within the processing area, precautions must be taken to protect all raw ingredients and packaging materials.
- All food-contact surfaces must be thoroughly cleaned and sanitized between pesticide spraying and commencement of cider processing operations.



Properly label and store pesticides to protect against contamination of food, food-contact surfaces, or food packaging materials.

Keep current on the status of regulations pertaining to the pesticides you use in and around your operation. For further information on insecticides and rodenticides, contact the Pennsylvania Department of Agriculture or your county Penn State Cooperative Extension office.

9

Product Labeling and Traceback



Container labels should comply with all relevant federal and state regulations.

- A warning label must be visible on the information panel or on the principal display panel of the container's label and must read: "WARNING: This product has not been pasteurized and, therefore, may contain harmful bacteria that can cause serious illness in children, the elderly, and persons with weakened immune systems" (*21CFR Part 101 Food Labeling: Warning and Notice Statement; Labeling of Juice Products, Food and Drug Administration*).
- Containers shall be labeled to include:
 - The name of the product.
 - The name and address of the processor, or the name and address of the distributor and a code to identify the processor.
 - A declaration of the presence of a preservative, if any.
 - A declaration of the artificial flavor or color, if any.
 - A declaration of the net contents.
 - Products containing artificial flavor or artificial color shall be labeled "Artificially Flavored," "Artificially Colored," or "Artificially Colored and Flavored." (PA CODE Title 7, Part 3B, Chapter 53.7, Cider and vinegar labeling standards)

Develop a system that allows traceback of cider from processor to grower.

- Keep records that will identify the product by name, size, and lot number to allow traceback of cider from the point of consumption to the processor, packer, and grower. The ability to identify the source of a product can help to prevent food safety problems and also may be useful in identifying and eliminating a hazardous pathway.
- Keep records that include control measures taken to ensure product safety, including sanitation, standard operating procedures, and monitoring records of refrigerated storage rooms.
- Records should be legible, permanent, accurate, and signed and dated by the responsible individual.

10 Training



All employees should receive basic food safety training appropriate for their assigned responsibilities and supervisory level.

- Develop training programs that teach employees their responsibility in protecting food from microbial, chemical, and physical hazards and the importance of good personal hygiene practices.
- Practices that contribute to safe apple handling and cider production should be included as part of each employee's job orientation. Refresher training should be provided at least once per year.
- Owners, supervisors, or management should obtain more comprehensive training through extension programs, college courses, or consultants.

Food Safety Self-Assessment

Yes	No	Apple Production Guidelines
<input type="checkbox"/>	<input type="checkbox"/>	Are only tree-picked apples used to make cider?
<input type="checkbox"/>	<input type="checkbox"/>	Are apples free from decay, wormholes, and internal breakdown?
<input type="checkbox"/>	<input type="checkbox"/>	Have you received assurances that the apples you press have been grown, harvested, and transported using good agricultural practices?

Yes	No	Water Quality
<input type="checkbox"/>	<input type="checkbox"/>	Does the quality of your water meet or exceed Pennsylvania standards for drinking water?
<input type="checkbox"/>	<input type="checkbox"/>	Is the water source tested each year by a certified laboratory?
<input type="checkbox"/>	<input type="checkbox"/>	Does the plumbing system in your facility meet current community building codes?
<input type="checkbox"/>	<input type="checkbox"/>	Are hoses fitted with anti-siphoning devices and stored off the ground when not in use?

Yes	No	Grounds and Building Maintenance
<input type="checkbox"/>	<input type="checkbox"/>	Are the grounds well drained, free from litter, and with weeds and grass kept short?
<input type="checkbox"/>	<input type="checkbox"/>	Is cider produced in a separate, enclosed room or building?
<input type="checkbox"/>	<input type="checkbox"/>	Are aisles and workspaces in processing areas uncluttered so that free flow of employee and equipment traffic can occur?
<input type="checkbox"/>	<input type="checkbox"/>	Are stored materials placed far enough from walls so they do not harbor pests?
<input type="checkbox"/>	<input type="checkbox"/>	Are floors, walls, and ceilings regularly cleaned and sanitized?
<input type="checkbox"/>	<input type="checkbox"/>	Are floors free from standing water and overhead fixtures free of dripping condensate?
<input type="checkbox"/>	<input type="checkbox"/>	Are light intensities adequate and are fixtures shielded to prevent glass contamination?
<input type="checkbox"/>	<input type="checkbox"/>	Are hazardous chemicals properly labeled and stored in a secure location and only accessible to authorized employees?
<input type="checkbox"/>	<input type="checkbox"/>	Are Materials Safety Data Sheets (MSDS) for all hazardous chemicals kept on file?
<input type="checkbox"/>	<input type="checkbox"/>	Are temperatures controlled and monitored in cold storage facilities?

Yes	No	Equipment Sanitation
<input type="checkbox"/>	<input type="checkbox"/>	Is equipment designed for its intended purpose and kept in good repair?
<input type="checkbox"/>	<input type="checkbox"/>	Are food contact surfaces (grinders, press racks and cloths, tubing, tanks, etc.) cleaned and sanitized after each use and properly stored to prevent contamination?



- | | | |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | Are cleaners and food contact sanitizers appropriate for their intended use and label directions followed? |
| <input type="checkbox"/> | <input type="checkbox"/> | Is pomace promptly disposed of in covered containers and moved out of the building at the end of each day? |

Yes	No	Personal Practices to Prevent Contamination
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- | | | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | Do workers follow good hygiene practices on the job including regular handwashing? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do employees wear hair restraints in processing areas? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are employees who show signs of disease that can be transmitted by food excluded from processing areas? |

Yes	No	Toilet and Handwashing Facilities
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- | | | |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | Are toilet facilities adequate in number, kept clean, and well supplied? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are handwashing stations properly supplied at all times? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are wastes properly disposed of so they cannot become a source of contamination? |

Yes	No	Storage and Transportation of Cider
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- | | | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | Are you aware of previous loads on trucks used to carry apples? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do you inspect trucks for cleanliness before loading cider? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are refrigerated trucks precooled before loading cider? |

Yes	No	Pest Control
------------	-----------	---------------------

- | | | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | Do you regularly inspect your facility for pests? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do you maintain records that indicate the location of pest control devices and the results of pest inspections? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are pesticides applied by trained and licensed applicators? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are food contact surfaces protected when pesticides are applied? |

Yes	No	Product Labeling and Traceback
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- | | | |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | Is each container properly labeled to comply with state and federal regulations? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are records kept for each lot of cider that enables you to match the product with the date of production and the apple supplier? |

Yes	No	Training
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- | | | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | Do you provide some form of food safety training for each employee who handles apples or works in processing areas? |
|--------------------------|--------------------------|---|



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