

Pennsylvania Department of Agriculture
Bureau of Food Safety and Laboratory Services
717-787-4315
www.EatSafePA.com

CANNING OF ACID/ ACIDIFIED/ FERMENTED FOODS

Limited Food Establishment Producers may only “can” food products that reach a pH of 4.6 or less upon completion of the recipe (a combination of pH (acid level) and Available Water (a_w) may also be tested). Examples of Types of food products that might be approved for canning include:

- ✓ Naturally acidic foods (e.g. most fruits like apples, peaches, lemons, etc.),
- ✓ Fermented foods (e.g. Korean kimchi, sauerkraut, pickles, green olives, etc.) or,
- ✓ Acidified foods (e.g. salsa, chow-chow, pickled beets/ vegetables, hot sauces, and BBQ sauce).

Acidified foods are defined by the FDA as low-acid foods (e.g. vegetables) to which acid (vinegar or lemon juice) and/or acid foods (tomatoes) are added to reduce the equilibrium pH below 4.6.

Producers of Acidified Foods *must have written recipes / formulas and procedures*. You will need to provide a Process Flow for your products and have it approved by your Food Inspector prior to registration and sale of your product. If you are unsure if your product is considered an Acid, Acidified or Fermented Food, please discuss with your Food Inspector.

❖ **Initial Product testing:**

Initially, the producer shall have each unique recipe/product tested by an independent **commercial food laboratory** and test results submitted with the application for review. Producers of acidified/ fermented foods or beverages will be approved only if testing results for equilibrium pH show that their products fall within safe ranges of **pH 4.6 or below**. However, we recommend when producing acidified/fermented foods to aim for a pH level of 4.2 or below as an extra precaution.

Water Activity test (a_w) may be additionally tested to accommodate for the hurdle effect of pH and A_w interaction, if the initial resulting pH is at or above the 4.6 level.

❖ **Ongoing product testing and Record keeping:**

- *If your final equilibrium pH is 4.0 or above*, you must have a properly calibrated **pH meter** and check the pH of every batch produced. Log sheets (records) must be kept showing production date, batch number, pH and any corrective action taken if the pH was 4.6 or above.
- *If your final equilibrium pH is 4.0 or below*, you must have either a properly calibrated pH meter or **pH test strips** to verify your pH of every batch produced. Log sheets must be kept showing production date, batch number, pH and any corrective action taken if the pH was 4.6 or above.
- *If your final equilibrium pH is above 4.40*, you must have your product flow, recipe and process evaluated and approved by a Process Authority (A qualified person who has expert knowledge acquired through appropriate training and experience in the acidification and processing of acidified foods.) Click [HERE](#) for a list of some Process Authorities.

How to properly test for equilibrium pH

Equilibrium pH is the final pH in the food product after the acidic brine or ingredient acidifies and balances with the other ingredients.

For a proper pH reading, you should test the pH of the product roughly 24 hours after processing, once the containers have cooled to room temperature and stabilized. Do not take the pH of a product just before or right after canning because it will not be an accurate measure of the equilibrium pH.

- If a food is homogeneous, that is of uniform consistency (apple sauce, barbeque sauce, ketchup, etc.), then the pH of any portion may be considered to be representative of the whole.
- If the food is semi-solid (e.g. puddings, chunky salsas, and very thick sauces), these foods should be blended to a uniform paste before testing. If additional liquid is required to blend the samples, use distilled water (20 parts of distilled water/100 parts of food).
- If the food consists of a mixture of liquid/solid foods (e.g. pickled vegetables, etc.), then you need to purée this in a blender, with distilled water if necessary, into a slurry. The solid portion may differ in acidity from the covering liquid (brine). Therefore, it is necessary to test both components in order to determine the equilibrium pH. This can be done either by blending fractions of both solid and liquid portions in the same ratio as found in the original container or simply by blending the entire contents of the container to a uniform paste and then test for pH.

pH meter purchase guidance

For guidance on how to purchase a pH meter, please visit Cornell University's fact sheet on [purchasing a pH meter](#). Our general pH meter recommendations are if you are producing a food product with a pH of 4.0 or higher, it is best to purchase a pH meter with an accuracy rating of 0.01 + pH units. If producing an acidified food with a pH below 4.0, it would be best to purchase a pH meter that has an accuracy rating of 0.1 + pH units.

IMPORTANT!

All recipes must incorporate a Thermal Process (Cooking) or lethal kill step. This thermal process does not apply to Acid or Fermented Foods. It also does not apply to Acidified Foods that are at or below pH 3.3 in which case the product must be held at 77°F or higher for 48 hours prior to distribution.

❖ Other requirements for canning:

- ✓ *Anytime a recipe is altered or a new recipe is developed, the final product must be tested as described above.*
- ✓ *New lids must be used and any reused jars must be thoroughly washed and sanitized.*
- ✓ *All labeling requirements on the containers must be met.*
- ✓ ***Processors wishing to sell their products interstate (which include internet sales), or using ingredients obtained from interstate may be required to register with the US Food & Drug Administration (FDA). If you are unsure of federal regulations that apply to your situation, contact your local [FDA Small Business Representative](#).***
- ✓ ***FDA may require Acidified Food recipes to be reviewed by a Process Authority, to file processes with FDA, and to batch test all products under their jurisdiction, regardless of pH level. These requirements should be discussed with FDA, especially if you intend to sell products in interstate commerce. For more information contact FDA at 1-800-216-7331 or 301-575-0156.***

❖ Low Acid Canned Foods or Beverages

Generally, any food/beverage with a finished equilibrium pH greater than 4.6 and a water activity greater than 0.85, is considered a low-acid food. Low acid canned foods or beverages may only be processed in a commercial establishment using steam retort system. They may **NOT** be made from a limited food establishment or in any residential-style kitchen. This would include, for example, most soups, gravies, unpickled vegetables, and fruits in syrups.

For more guidance on acidified and low-acid canned foods

Please visit the FDA's [Acidified & Low-Acid Canned Foods \(LACF\)](#) website.