

Many small-scale food processors are making and selling some type of canned, shelf-stable foods, such as pickles, jams and jellies, or salsa. Such products offer a great way to add value and extend the shelf life of local produce. However, processors must ensure that these products are produced safely and in compliance with food safety regulations. Some of the most frequently asked questions regarding selling safe canned foods are listed below:

Which regulations do I need to follow for selling canned foods?

Where selling?	Regulations to follow
In Kansas	Kansas Department of Agriculture Food Safety and Lodging regulations
Outside of Kansas	FDA regulations ¹ , regulations of the state where the product is sold, and Kansas regulations
Grocery stores, distributors	Kansas Food Processor License ² . In addition, check with your buyer as their requirements may be stricter than government regulations.
Kansas Farmers Markets or other direct-to-consumer sales	More information on regulations for specific products sold direct to consumer is included in K-State Research and Extension publication MF3138 ³ .

Why are we so concerned about *Clostridium botulinum* in canned foods?

The big concern with *C. botulinum* is that it grows in the absence of oxygen, such as in canned foods. It can form heat-tolerant spores that can produce a deadly toxin of which only a few nanograms (one billionth of a gram) can cause paralysis and death. Temperatures of 250°F (above the boiling point of water, thus requiring pressure to obtain that temperature) are required to kill spores under neutral



pH conditions.

Why is the acidity of food important to its safety?

Most microorganisms, including *C. botulinum* do not grow in foods that are acidic (thus having a lower pH value). A pH of below 4.6 prevents *C. botulinum* from growing in the processed container. Most fruits⁴ have a pH in the range of 3 to 4, while tomatoes have a pH range of 4 to 5. Other vegetables, beans, meat, and fish have a pH above 5. Lemon juice and vinegar have a pH below 3, while pure water has a pH of 7.0.

How do I measure product pH?

Use pH test strips to estimate pH. These can be legally used for products with a pH below 4.0. For more accurate measurements and for products with pH above 4.0, a pH meter must be used. A good and easy-to-use pH meter⁵ can be purchased for about \$100. The pH meter must be calibrated at least weekly and the product should be at room temperature when checking the pH to ensure accuracy.

1 More information: www.fda.gov/food/guidanceregulation/guidancedocumentsregulatoryinformation/acidifiedlac/default.htm

2 More information on this license is available from: <https://agriculture.ks.gov/divisions-programs/food-safety-lodging/food-safety-licenses>

3 Available from: <http://www.bookstore.ksre.ksu.edu/pubs/MF3138.pdf>

4 List of approximate pH of some foods: <http://pods.dasnr.okstate.edu/docushare/dsweb/Get/Rendition-3801/FAPC-118web.pdf> (in appendix section of document)

5 Tips on buying a pH meter are available from [Cornell](http://www.cornell.edu).

What processing methods can I use for various types of canned food?

Method	What it does	Maximum temp	Use for:
Boiling water bath	Destroys most microorganisms of concern, including yeasts and molds*	212°F	High-acid foods – home canning and commercial applications
Hot fill	Same as above; need to use sterilized jars	190°F	High-acid foods – requires a commercial steam kettle
Pressure canning	Destroys ALL microorganisms of concern, including <i>C. bot</i> spores	250°F	Low-acid foods: home canning; Must use a commercial retort for selling low-acid foods

*Note that yeasts and molds cause product spoilage and can grow at pH below 4.6. If present, they can raise product pH to a level allowing *C. botulinum* growth.

Does someone need to check the safety of the canned foods that I sell?

Depending on the (natural and final) level of acidity of the food product, certain foods require a “scheduled process” from a process authority. A process authority is a qualified expert who has acquired training and experience in thermal processing requirements for low-acid foods or has expertise in the acidification and processing of acidified foods. You can find a list of processing authorities on the [Association for Food and Drug Officials](#) website⁶.

More details on the specific foods that require a scheduled process for direct-to-consumer sales in Kansas (including farmers markets) is available in K-State Research and Extension [publication MF3138](#). For canned foods sold out of Kansas or those sold to a grocery store or distributor, all acidified foods (such as pickles made with vinegar) and low-acid foods (such as vegetables packed in water) require a scheduled process.

What is a process review?

A recognized process reviewer will do a careful evaluation of your product formulation, processing steps, and the safety characteristics of your product to determine the product category. For acidified foods and low-acid canned foods, a processing authority will need to provide a “scheduled process” for the product that includes the product formulation, critical control points, processing steps, storage, distribution, and selling conditions that are required to keep the product safe.

Who or what is a processing authority?

This is a person or institution with FDA/KDA-recognized expert knowledge and experience in the microbiology and processing requirements for canned foods. There is

currently no commonly used, publicly known processing authority in the state of Kansas; however, the Kansas Value-Added Foods Lab⁷ works with the University of Arkansas⁸ to provide process authority service to Kansas producers. Any recognized US processing authority can be utilized.

Why should I utilize a processing authority?

It is a regulatory requirement if you are selling canned products that require a scheduled process. The processing authority can make very useful suggestions for you to improve the safety of your product, particularly if you make any changes to your process or ingredients. It also provides a documentation of safety for your customers.

How do I get a process review (and scheduled process if needed)?

First, send in a sample of the product to a process reviewer, such as the Value-Added Foods Lab at Kansas State University, for testing (pH and possibly water activity (a_w)) to determine if a scheduled process is required.

Then, if a scheduled process is required:

- » Send required information to the process authority (see the KVAFL form as an example: www.ksre.k-state.edu/kvafl/).
- » Also need to meet Kansas regulations, as well as FDA regulations if selling out of state.
- » Someone who has attended Better Process Control School must be in the facility while processing acidified or low-acid canned foods.

6 www.afdo.org/foodprocessing

7 www.ksre.k-state.edu/kvafl/

8 Information on University of Arkansas Process Authority : <https://afic.uark.edu/services/>

Where can I take Better Process Control School (BPCS)?

The University of Missouri⁹ often offers the Acidified Foods portion of BPCS, generally once every spring. The University of Nebraska-Lincoln¹⁰, the University of Arkansas¹¹, and Oklahoma State University¹² also hold BPCS, along with a number of other places¹³ in the US, including virtual options. North Carolina State University¹⁴ and the University of Tennessee¹⁵ also offer online options of BPCS.

What information do I need to submit along with a sample of my product to get a scheduled process?

The Process Authority will likely have a form to be completed. The information needed generally includes:

- » Exact formulation of product by weight;

- » Precise directions for the process, including packaging type and size to be used;
- » Intended distribution temperature: refrigerated, frozen, or shelf stable; and
- » Your name, address, phone number, email.

What do I do once my Scheduled Process is completed?

- » When processing, follow the approved process exactly as written.
 - » Must maintain records of relevant critical control points for every batch (pH, temperature, etc.).
- » Review approved process periodically to see if changes are necessary or have been made.

9 More information on the course: <https://foodscience.missouri.edu/food-science-workshops/>

10 More information: <http://fpc.unl.edu/bpcs>

11 More information: <https://afic.uark.edu/training/>

12 More information: www.fapc.biz/workshops/processcontrol

13 Complete listing: <https://consumerbrandsassociation.org/about-us/programs-initiatives/better-process-control-school/>

14 <https://foodsafety.ncsu.edu/acidified-foods-manufacturing-school/>

15 <https://foodscience.tennessee.edu/better-process-control-school-course/>

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