

Just Because It Seals, Doesn't Mean It's Safe!

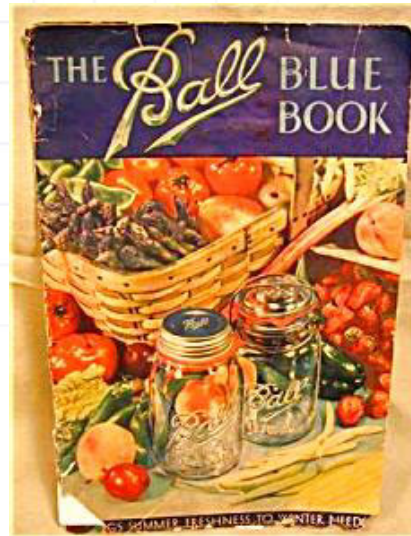


Food Safety for Fair
Exhibits and Home

Karen Blakeslee, M.S.

It is the 21st Century!

- Just because Grandma did it her way, doesn't mean it's safe today!!



- It is important to use current food preservation practices

Why Get Up to Date?

- Food preservation is a **science** and things have **changed!**
 - pH < 4.6 = high acid foods
 - pH > 4.6 = low acid foods
 - Supports growth of botulism!
 - Water activity
 - Heat penetration through the jar
 - Thickness of the food mixture
 - Size of food pieces
 - Size of jar
 - Raw pack or Hot pack
 - Altitude of residence
 - Time and temperature
 - Headspace



Creative Canning → Foodborne Illness!

- Improperly home canned vegetables are the most common cause of botulism outbreaks in the U.S.
 - Did not pressure can
 - Ignored spoilage signs
 - Improper instructions
 - Unaware of the risks



Canned peppers with botulism

CDC – Public Health Imaging Library

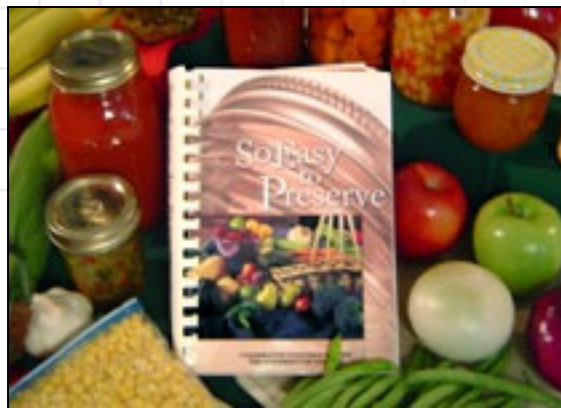
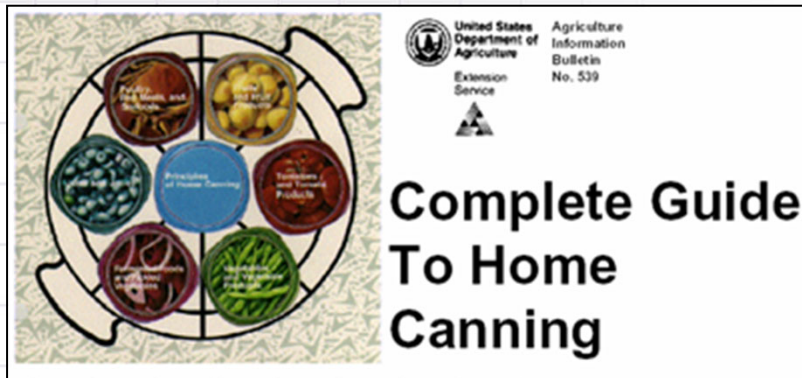
<http://www.cdc.gov/features/homecanning/>

The Basics

- Use USDA processing methods with tested recipes
- Clear, standard canning jars
- High acid foods **MUST** be water bath processed
 - Jams, jellies, fruits, pickles
- Low acid foods **MUST** be pressure canned
 - Vegetables, meats
- Tomatoes, with added acid, may be processed either way



Trusted Recipe Sources



6th edition



For instructions on how to process foods safely using boiling water bath, steam, or pressure canning methods, visit the K-State Rapid Response Center.

Here are guidelines for preserving all types of beans — snap and Italian (flat), dry, and lima.

Green and Wax Snap and Italian Beans

Quantity
An average of 14 pounds of beans are needed per 7-quart canner load or 9 pounds per canner load of 8 pints. A bushel weighs 30 pounds and yields 12 to 20 quarts. An average of 1/2 pound makes 1 pint of frozen beans.

Quality
Select filled but tender, crisp pods. Remove and discard damaged and empty pods.

Preparation
Wash beans, snap off and discard the ends, and remove strings, if appropriate. Leave whole, or cut or snap beans into 1-inch pieces. Wash and drain the prepared pieces.

Freezing
Fresh green beans contain enzymes that cause loss of color, loss of nutrients, and flavor changes when they are frozen. These enzymes must be inactivated to prevent such reactions from taking place.

Importance of blanching
Enzymes are inactivated by the blanching process. Blanching is the exposure of the vegetables to boiling water or steam for a brief period of time. The vegetables must then be rapidly cooled in ice water to stop cooking. Blanching is absolutely essential for producing top quality frozen vegetables. Blanching also helps destroy microorganisms on the surface of the vegetable.

Procedure
Freeze only up to 2 pounds of food per cubic foot of freezer capacity per day. Blanch 6 cups of raw prepared beans at a time. Place each batch in a blanching basket or colander into 1 gallon of boiling water.
Blanch small pieces 2 minutes and large pieces 3 minutes after the water returns to a boil. Cool beans quickly in several changes of ice-cold water and drain in a colander.

For hot packs: Fill the jars tightly with prepared beans, leaving 1-inch head space. Add boiling water to cover beans, leaving 1-inch head space.

For hot packs: Cover the prepared beans in a large pot with boiling water and boil 5 minutes. Fill the jars with the beans and cooking liquid, leaving 1-inch head space. Wipe the sealing surface of the jars with a clean, damp paper towel. Add lids, tighten screw bands fingertip tight, and process in a pressure canner according to the following process times.

Nutrition per 1/2 cup, drained			
Calories	22	Iron	0.8 mg
Carbohydrate	5.0 g	Sodium (without salt)	2.0 mg
Fat	0.2 g	Sodium (with salt)	268.0 mg
Dietary fiber	2.0 g		

Beans are best if consumed within a year and safe as long as the lids remain vacuum sealed. Store in a cool, dark place for best quality.

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

Ⓢ Not recommended to can homemade recipes

Packaged mixes

- For quick and easy canning
- Pickles
- Salsa
- Sauces
- Many more!



Follow instructions exactly!!!!



Boys and Girls Club Work, canning demonstration, 1920. Minnesota Historical Society Photography Collection • SA1.31 r30, 81684

- Recipes older than 1994 may be unsafe

Unsafe Recipes Sources

Just because a food is canned commercially doesn't mean it can be canned safely at home!!

- Blogs
- Pinterest
- Old recipe books
- Recipe magazines
 - May not be adequately tested
- Many others...



Unsafe Processing



Dishwasher



Oven or Microwave



Open Kettle Canning



Pressure Cooker



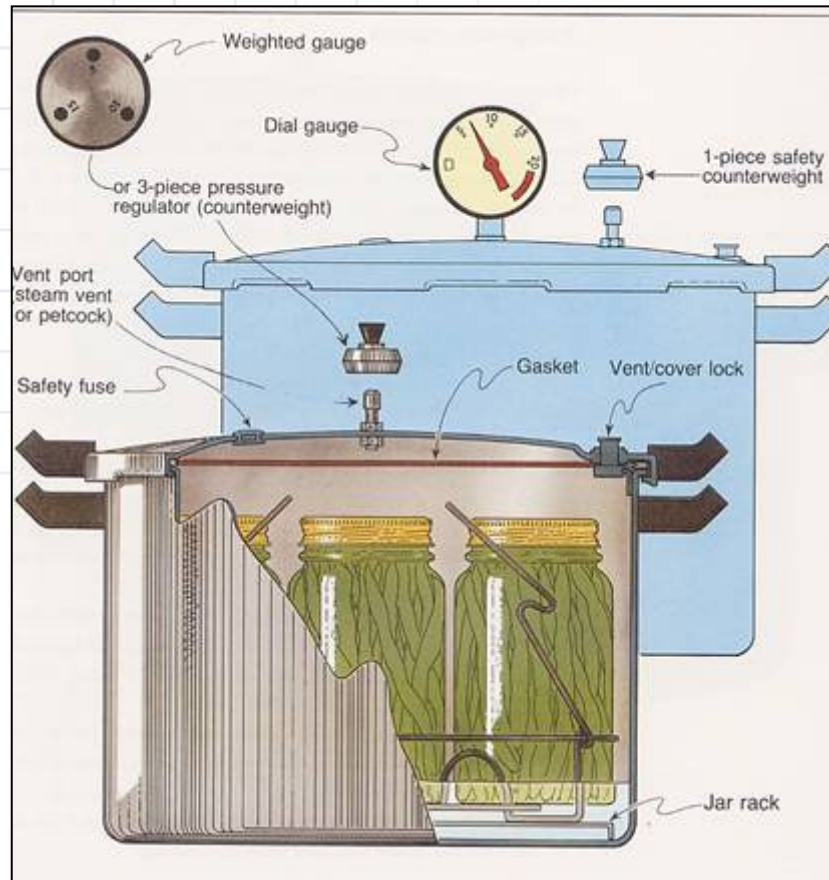
Sun Canning



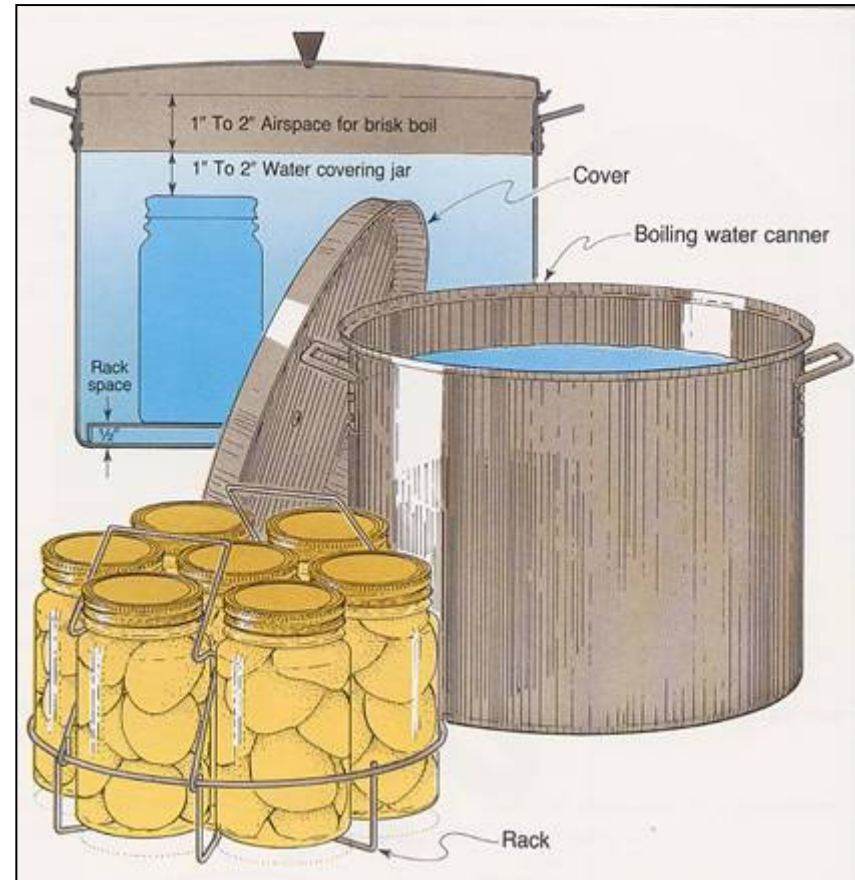
Slow Cooker

Canning Equipment

USDA Complete Guide
To Home Canning



Pressure Canner – Dial or Weighted Gauge



Water Bath Canner

Pressure Gauge Testing



- Dial pressure gauges need yearly testing
- If more than 1 pound off, replace
- Weighted gauges do not need testing
- 1 pound error in a 20-minute process causes over 10% decrease in sterilizing value
 - 2 pound error a 30% decrease

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Types of Jars

- Use regular or wide-mouth canning jars
 - 4 oz – ½ gallon sizes
 - ½ gallons for fruit juice only
 - 1 gallon not for canning!
- Clean, not damaged
- No colored jars at fairs!
- Mayonnaise jars for water-bath use only



Types of Lids

- Use two-pieced lid
- Always use new lids
- Newer lids don't need pretreating
 - Wash with soapy water, rinse

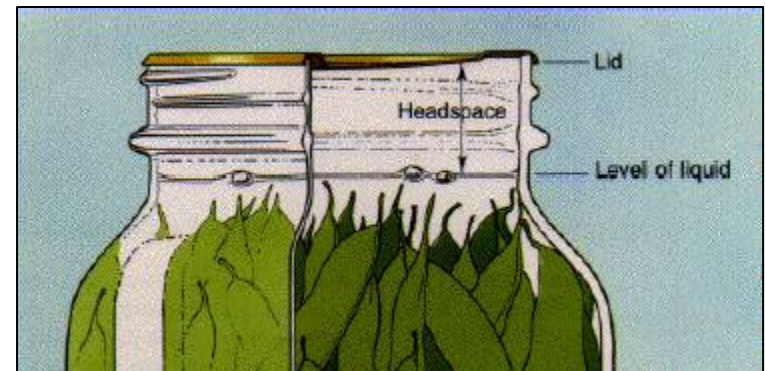


Headspace



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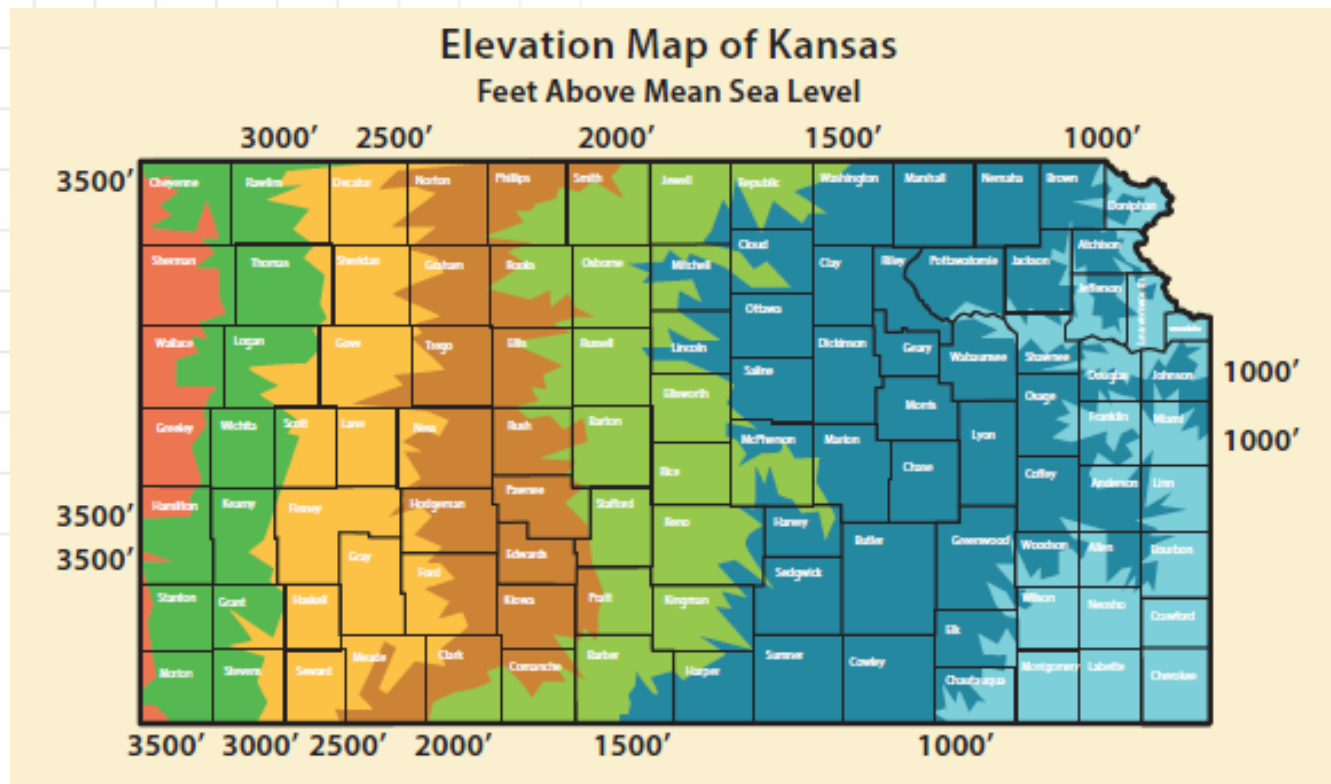
- ◎ Space in jar between bottom of lid and top of food/liquid
- ◎ Varies by type of food
- ◎ Proper headspace creates vacuum seal
- ◎ Usually:
 - 1/4" jellied fruit products
 - 1/2" fruits, tomatoes and pickles
 - 1" to 1-1/4" low acid foods



USDA Complete Guide To Home Canning

Adjusting for Altitude

This is the number one reason for disqualification!!



How to Adjust

Boiling Water Bath

↑ time

Pressure Canning

↑ pressure

Search Kansas Elevation Data at <http://geonames.usgs.gov/pls/gnispublic>

<http://www.ksre.ksu.edu/bookstore/pubs/MF3172.pdf>

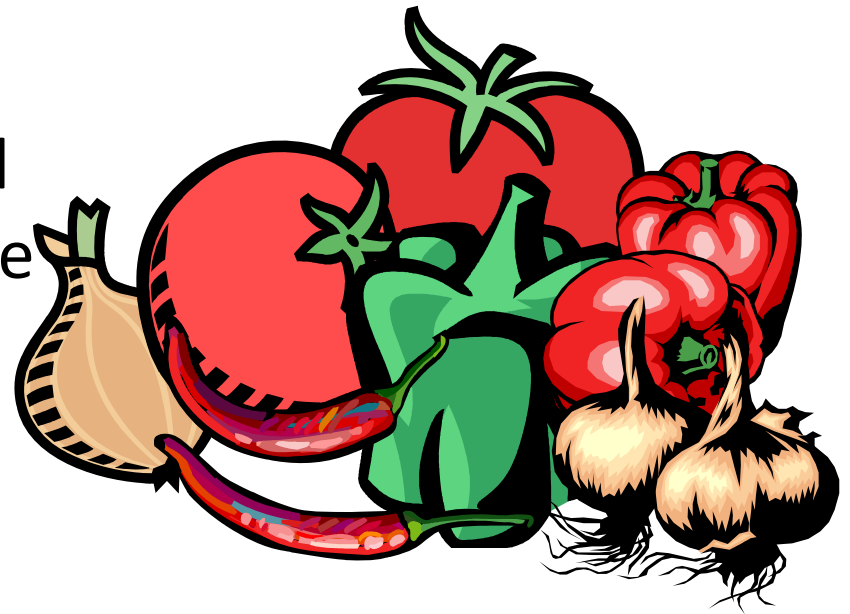
Processing Time

- Each food and preparation style has its own processing time
- Time differs with size of jar
- Too Little (Underprocessing)
 - Spoilage
- Too Much (Overprocessing)
 - Overcooked
- After removing canner lid...
 - Let jars sit in canner for minimum of 5 minutes



Sensational Salsa!

Please do not experiment with canning your own recipe that mixes low-acid vegetables together, even with “some” acid like vinegar or lime juice. If done improperly, you put yourself at risk for botulism, a potentially fatal food poisoning.



<http://nchfp.uga.edu/publications/nchfp/factsheets/salsa.html>

<http://www.ksre.ksu.edu/bookstore/pubs/MF3171.pdf>

Tomatoes Need Acid

- All Tomatoes have pH between 4 - 4.6
 - Borderline for safe boiling water canning
 - This includes all colors of tomatoes!
- For Pints
 - 1 Tablespoon bottled lemon juice
 - ¼ teaspoon citric acid
- For Quarts
 - 2 Tablespoons bottled lemon juice
 - ½ teaspoon citric acid



**Preserve It Fresh,
Preserve It Safe**

*Canning
Tomatoes
Safely*



Juice Crushed Whole/Halved

Prevent botulism! Add one of these!

Ingredient	Pint	Quart
Bottled Lemon Juice	1 Tbsp	2 Tbsp
Citric Acid	1/4 tsp	1/2 tsp
5% Vinegar	2 Tbsp	4 Tbsp

Required for pressure canning AND boiling water bath canning tomatoes!

Learn more at:
<http://www.bookstore.ksre.ksu.edu/pubs/MF1185.PDF>



More on Tomatoes

- Vinegar may be used, but....
 - 4 Tablespoons vinegar per quart or 2 Tablespoons per pint
 - Flavor may be objectionable
- Add acids directly to jar before filling
- If too acidic, add sugar to taste
 - Example: 1 tablespoon per quart



Fermenting tomatoes

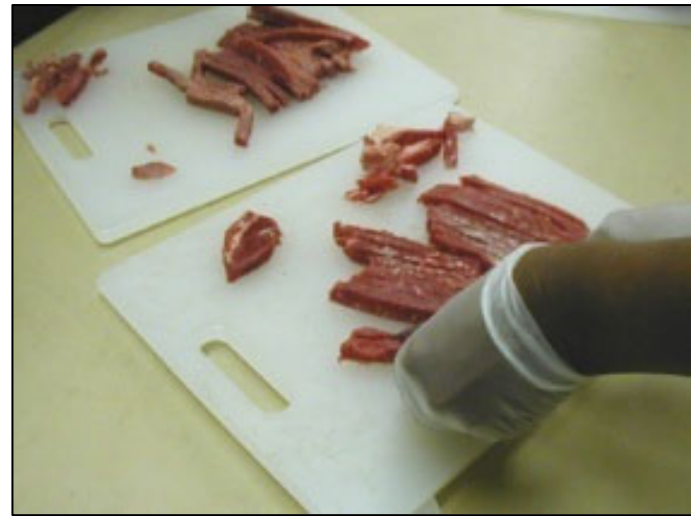
Pie Filling

- Must use Clear Jel® as thickener
 - This will not break down during processing, which would cause a runny filling
- Regular corn starch or flour will get clumpy or separate due to repeated heating.
 - Think clumpy gravy!



Safety of Jerky

- Jerky
 - Must be heated to 160°F
 - Heat in marinade prior to drying
 - Heat in 275°F oven for 10 minutes after drying
 - Strips should be ¼-inch thick or less
 - <http://nchfp.uga.edu/how/dry/jerky.html>
 - Recipe needs to reflect the heating method



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Labels for Jars

Class No. _____ Division _____
Product _____
Canning Method: Water Bath or Pressure
Process Time _____ Pressure(psi) _____
Date processed include month & year _____
Altitude of residence _____
Name _____
County/District _____

<http://www.kansas4-h.org/events-activities/fairs/kansas-state-fair/>

Scroll down to “Food Preservation”

Judging Standards

<http://www.kansas4-h.org/events-activities/fairs/kansas-state-fair/index.html>



Food Safety Recommendations for Food Preservation Exhibits

Food safety is very important for food preservation exhibits at county fairs and the Kansas State Fair. The following practices, products, methods, and materials are categorized as being either acceptable or non-acceptable for fair exhibition.

For any fair entry, **always** read the rules in the fair book for details on what and how food preservation exhibits should be entered. Paying attention to details can reduce many judging issues.

Home Canning: Ensuring Safe Canned Foods

Growth of the bacterium *Clostridium botulinum* in canned food may cause botulism — a deadly form of foodborne illness. These bacteria exist either as spores or as vegetative cells. The spores, which are comparable to plant seeds, can survive harmlessly in soil and water for many years.

When ideal conditions for growth exist, the spores produce vegetative cells that multiply rapidly and can produce a deadly toxin within 3 to 4 days of growth in an environment that consists of:

- a moist, low-acid food
- a temperature between 40°F and 120°F
- less than 2 percent oxygen

Botulinum spores are on most fresh food surfaces. Because they grow only in the absence of air, they are harmless on fresh foods.

Food Acidity and Processing Methods

Whether food should be processed in a pressure canner or boiling-water canner to control botulinum bacteria depends on the acidity of the food. Acid foods contain enough acidity to block their growth, or destroy them more rapidly when heated.

Acidity may be natural, as in most fruits, or added, as in pickled foods and tomatoes. Low-acid canned foods contain too little acidity to prevent the growth of these bacteria. The term "pH" is a measure of acidity; the lower its value, the more acid the food. The acidity level in foods can be increased by adding lemon juice, citric acid, or vinegar.

Low-acid foods have pH values higher than 4.6. They include red meats, seafood, poultry, milk, and all fresh vegetables except for most tomatoes. Most mixtures of low-acid and acid foods also have pH values above 4.6, unless their recipes include enough lemon juice, citric acid, or vinegar to make them acid foods. Acid foods have a pH of 4.6 or lower. They include fruits, pickles, sauerkraut, jams, jellies, marmalades, and fruit butters.

Although tomatoes usually are considered an acid food, some are now known to have pH values slightly above 4.6. Figs also have pH values slightly above 4.6. Therefore, if they are to be canned as acid foods, these products must be acidified to a pH of 4.6 or lower with lemon juice, vinegar, or citric acid. Properly acidified tomatoes and figs are acid foods and can be safely processed in a boiling-water canner.

Botulinum spores are difficult to destroy at boiling-water temperatures — the higher the canner temperature, the more easily they are destroyed. Therefore, all low-acid foods should be processed to temperatures of 240°F to 250°F, attainable with pressure canners operated at 10 to 15 PSIG (pounds per square inch pressure as measured by gauge).

At temperatures of 240°F to 250°F, the time needed to destroy bacterial spores in low-acid canned food ranges from 20 to 100 minutes. The exact time depends on the kind of food being

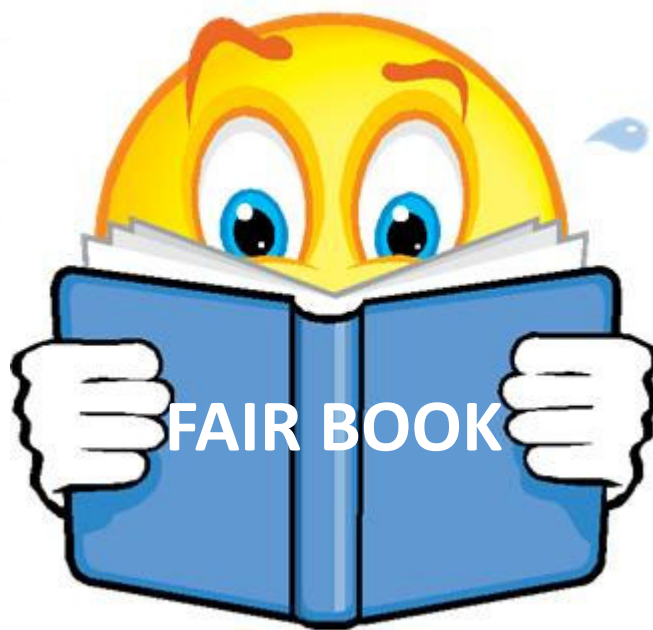
- Judging Scorecards
 - Canned Fruits and Tomatoes
 - Canned Meats
 - Canned Pickled Products
 - Canned Vegetables
 - Dried Fruits and Leathers
 - Dried Vegetables and Herbs
 - Fruit Preserves
 - Meat Jerky

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

READ

THE

RULES!



What Judges Consider

Disqualification

- Jar unsealed
- No label, missing information
- Wrong processing method
- Underprocessing
- Jerky not heated to 160°F
- Jar bigger than recipe states
- Added thickeners, rice, pasta
- Moving bubbles
- Not acidifying tomatoes
- Mashed or pureed pumpkin/winter squash
- Paraffin wax on sweet spreads
- Untested recipe source
- Contains alcohol

Lowering a Ribbon Placing

- Not following fair book rules
- No recipe
- Different color rings/ bands
- Messy jars, rusty rings
- Not enough liquid
- Improper headspace
- Wrong color (artificial color added if not in recipe)
- Food over mature
- Uneven sized food pieces
- Using colored jars
- Brands of jar/lids not the same
- Food above liquid
- Fancy pack, if not stated in recipe
- Foreign material
- Sediment in jars
- Using iodized salt

Get Educated!

4-H Foods Project Curriculum and online resources



<http://nchfp.uga.edu/putitup.html>

<http://www.rrc.ksu.edu/p.aspx?tabid=18>

10 Tips for Safe Home-Canned Foods

<http://www.ksre.ksu.edu/bookstore/pubs/MF3170.pdf>



<http://nchfp.uga.edu/>



For the Fair **AND** Home!

- This is not JUST for the Fair!!
- All foods need to be canned safely for any use!
- Be Smart!
- Be Safe!





Need a judge's training, leader's training?
Food preservation class?
Resources?

How Can I Help?

Just Because It Seals, Doesn't Mean It's Safe!



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