

HOME CANNING BY SAFE METHODS



MONTANA STATE COLLEGE
AGRICULTURAL EXTENSION SERVICE
BOZEMAN

This pamphlet has been prepared for the homemakers of Montana to give them the most accurate information available on the canning of different kinds of foods at various altitudes, so that their canned products will be SAFE for their family use.

The canning methods given here are based on the joint recommendations of a group of specialists in Montana, which included research workers and instructors in foods and nutrition, bacteriology and engineering extension specialists in home economics; commercial demonstrators; and members from the state board of health and state relief commission.

Department of Home Economics

Montana Agricultural Experiment Station

Home Canning By Safe Methods

By

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Many homemakers are approaching the summer season with extensive plans for canning and preserving foods. They have found that canning is—

ECONOMICAL—as a means of conserving excess garden, orchard, or meat products and making out-of-season foods available.

VALUABLE — from a nutritional standpoint as it permits greater variety in the family meals.

SATISFYING — since many prefer the flavor and quality of home canned foods and are proud of their achievements in canning.

Every home canner should aim to produce canned foods that are—

FREE from SPOILAGE

SAFE for USE

DESIRABLE for EATING

Preventage of Spoilage

Spoilage of home-canned foods may be prevented by following two fundamental procedures:

1. **THOROUGHLY HEATING** the food during canning by using a *temperature* sufficiently high for a period of *time* sufficiently long to *destroy* the bacteria and other organisms that cause spoilage.
2. **PROPERLY SEALING** the container so that air, which may carry bacteria, can not enter.

The bacteria in *acid foods* are more easily destroyed by heat than in foods that are not acid. Foods are therefore classified as:

1. **ACID**—such as most fruits, tomatoes, and rhubarb.
2. **NON-ACID**—such as vegetables and all meats.
3. **INTERMEDIATE**—a few fruits, such as pears, peaches, apricots, and figs.

Canning Equipment

At the beginning of the canning season, all canning supplies and equipment that will be needed should be secured and examined to see that it is in good condition.

Glass Jars

There are several types of glass jars that vary in size, shape, and method of sealing. Select jars that (1) can be easily and perfectly sealed; (2) are suitable for the product to be canned; (3) fit economically into the processing equipment; and (4) are easy to clean.

Examine the jars and covers for nicks, cracks, or uneven places that might prevent the forming of a perfect seal.

Discard all jars and covers that are defective or corroded.

Rubber Rings

Rubber rings should be purchased *new* each year from *new stock*.

In case self-seal lids are used, *new* ones must be secured each year.

Tin Cans

Tin containers are being used to some extent in home canning. Three kinds of cans may be purchased:

C-ENAMEL (dull gold enamel)—to be used for corn.

R-ENAMEL (bright gold enamel)—to be used for highly colored fruits and vegetables.

PLAIN—to be used for meats, other fruits and vegetables. (Tomatoes, if preferred).

Tin Can Sealer

The sealing of tin cans must be done with a special mechanical device—a *sealer*. This is usually made to handle three sizes of cans—No. 2 (holding about 2½ cups), No. 2½ (3½ cups) and No. 3 (4 cups).

A sealer should not only seal the can, but open it, and reflare the edge so that the can may be used more than one season.

Selection and Preparation of Foods to Be Canned

1. Select foods that are in *prime condition*.
 - a. Fruits fully ripe, but firm.
 - b. Vegetables fresh from the garden.
 - c. Meats in perfect condition.
2. Preparation of fruits.
 - a. Wash thoroughly before removing stems, skins, or pits.
 - b. Remove skins of peaches, apricots, pears, and tomatoes by *scalding* them in boiling water, *dipping* into cold water and peeling. The use of these terms is preferred to "blanching."
 - c. Remove all bruised spots.
 - d. Prevent darkening of some fruit, (apples, pears, peaches, and apricots), by dropping them into diluted salt water (1 tablespoon salt to 1 quart cold water).
3. Preparation of vegetables.
 - a. Wash thoroughly to remove all soil and grit before cutting or shelling is done.
 - b. Prepare each vegetable as for use, working *rapidly*. Two hours from garden to jar prevents much spoilage, and losses of some vitamins.
4. Preparation of meats.
 - a. Trim meat and cut off surplus fat.
 - b. Cut meat into pieces of desired size.

Methods of Home Canning

Open Kettle Method

This method is recommended as **SAFE ONLY** for
ACID FRUITS AND TOMATOES.

1. Thoroughly wash and rinse jars, then **BOIL** them in a kettle of water. Place lids, except self-sealing type, and rubber rings in boiling water with jars.
2. **COMPLETELY COOK** food to be canned.
3. Pack food into hot jars.
4. Seal jars immediately.

Methods Where Food Is Processed In Containers

1. Preparation of containers.
 - a. Thoroughly wash and rinse jars, lids, and rubber rings.
 - b. Keep jars hot to prevent breakage.
2. Precooking of foods: many foods are PRECOOKED before packing into jars—
 - a. To shrink product and make adequate packing possible.
 - b. To bring food up to high *temperatures* more quickly during processing.
 - c. To improve flavor, as in meats.
3. Packing food into containers.
 - a. HOT PACK—preferred method at present time.
 - (1) Fruits packed either RAW, or PRECOOKED and HOT, with BOILING HOT syrup added.
 - (2) Vegetables always packed PRECOOKED and HOT, with BOILING HOT liquid added.
 - (3) Meats always packed PRECOOKED and HOT. Any liquid added must be BOILING HOT.
 - b. COLD PACK
 - (1) Foods packed RAW and COLD, with COLD liquid added. Under these conditions heat penetration into jars is so slow that the cold pack is NOT RECOMMENDED.
4. Processing foods in containers.

("Processing" means heating foods in the containers to destroy bacteria).

Hot Water-Bath Processing

This method is recommended as SAFE ONLY for FRUITS and ACID VEGETABLES

- a. A wash boiler or any other vessel that has a tightly fitting cover may be used as a water-bath canner, provided it is high enough to allow the level of the water to extend above the tops of the jars. It should be equipped with a *rack* that holds the jars up from the bottom of the canner and keeps them apart.
- b. Have water in water-bath canner *boiling*.

- c. Have sufficient water to cover jars about 2 inches over the tops.
- d. Fill hot, clean jars or tin cans with food either *raw* or *precooked* and add *boiling* hot sirup or liquid to within $\frac{1}{2}$ inch of top.
- e. If contents are *boiling hot*, seal jars or cans *completely*.
- f. If contents are *not boiling hot*, *partially* seal glass jars, except when self-seal lids are used. (Tin cans must be *exhausted* by heating filled cans in water or steam bath until steaming hot to drive out air. Then *completely* seal cans at once).
- g. Arrange hot jars on rack in water-bath canner so that hot water may freely circulate under and around them.
- h. *Count time* when water begins to boil vigorously.
- i. Keep water at a rolling boil throughout the entire processing period.
- j. The temperature of the hot water-bath never reaches a point higher than the boiling point of water at the given altitude; for example, at sea level, boiling point of water is 212° F.; 5,000 feet above sea level, boiling point is 203° F.
(See table, page 19, "Boiling Points for Various Altitudes.")
- k. The temperature of the contents of the jar cannot go higher than that of the boiling water surrounding it. (See chart, page 9).
- l. Processing periods in the water-bath as recommended for sea level must be changed to meet altitude conditions according to the following rule:

For altitudes above 1000 feet the length of the processing period should be increased 20 per cent for each additional 1000 feet.

(See time table, page 14).
- m. When the processing time is up, remove jars from water-bath and immediately complete all seals that were incomplete before processing.
- n. Intermittent processing is NOT recommended.

Steamer Processing

This method is recommended as **SAFE ONLY** for
FRUITS and ACID VEGETABLES
(Water-bath processing is preferred)

- a. The only steamers that are satisfactory for canning purposes are those that supply a lively current of steam during the entire processing period.
- b. Have water under the steamer *boiling vigorously*.
- c. For filling and sealing jars, see water-bath directions d, e, f and m.
- d. Arrange jars in steamer so that live steam may circulate freely around them.
- e. *Count time* when steam begins to issue from steamer.
- f. The temperature of the steam bath will be the same as that of the water-bath. (See water-bath directions j).
- g. The temperature of the contents of the jars in the steamer rises more slowly than in the water-bath. (See chart, page 9).
- h. For processing times in steamer, see time table for hot-water bath. Water-bath recommendations corrected for altitude must be increased 10 to 15 minutes to provide for the slower heat penetration into the jars processed in the steamer.

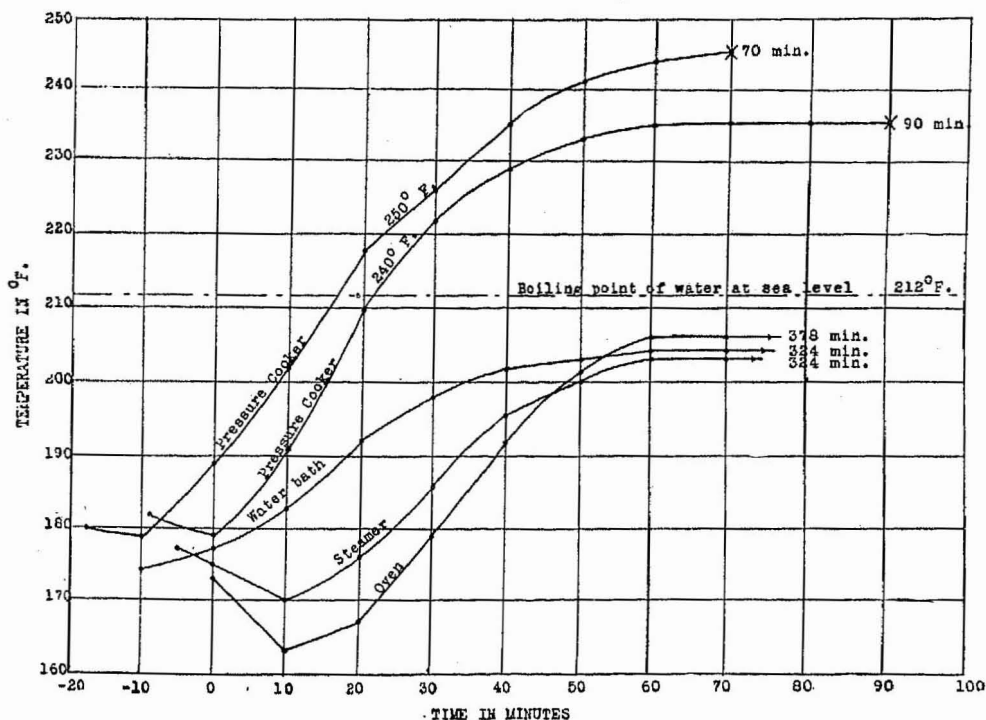
Oven Processing

This method is recommended as **SAFE ONLY** for
FRUITS and ACID VEGETABLES

- a. Preheat oven to 250° F. It is advisable to use the oven for canning only when it is equipped with an automatic heat control.
- b. Fill hot, clean GLASS jars with food, either raw or precooked, and add BOILING HOT sirup or liquid to within 1 inch of top.
- c. Partially seal all jars.

- d. Place jars on a rack in the preheated oven, leaving enough space between them to allow for free circulation of air around them.
- e. Place a tray on a lower rack to catch overflow or drippings from jars.
- f. *Count time* as soon as jars are placed in the oven.
- g. The temperature of the contents of the jar during oven processing rises to a point similar to the boiling point of water at the given altitude, but *more slowly* than in the water bath.

(See chart, page 9).



Rate of temperature change in "cream style" corn when processed in pint glass jars by various home methods at Bozeman, Montana.

O=point from which processing time was counted.

- h. The processing times recommended for the oven at sea level must be changed to meet altitude conditions as for the water-bath (1), and in addition *extended* to a period 50 per cent longer than that used for the hot water-bath.
- i When the processing time is up, remove the jars from the oven and seal.

Steam Pressure Cooker Processing

This is the ONLY SAFE method of processing
NON-ACID VEGETABLES and ALL MEATS

- a. The steam pressure cooker is recommended for canning because a temperature higher than that of boiling water is produced with the jars of food. This insures more complete destruction of bacteria.
- b. The pressure cooker should be sturdily built, with a cover that clamps down tightly, allowing no steam to escape. It must be equipped with a petcock, a safety valve and a pressure gauge.
- c. Have boiling water in the bottom of the cooker, so that the level is just below the rack that holds the jars. Be *sure* there is enough to prevent boiling dry.
- d. Fill hot clean jars with PRECOOKED food and add BOILING liquid to within $\frac{1}{2}$ inch of the top.
- e. PARTIALLY seal all GLASS jars, except when self-seal lids are used. (In using tin cans, either pack contents boiling hot or *exhaust* by heating filled cans in water or steam bath until steaming hot, to drive out air. Seal cans immediately).
- f. Place jars filled with hot food on rack in pressure cooker. If desired, put in a second layer of jars with a rack between layers. Tin cans may be arranged more compactly than glass jars.

- g. Adjust cover of pressure cooker and fasten securely to prevent leakage of steam.
- h. To begin with, leave petcock wide open so that all air may be driven out of the cooker. After a *steady stream* of steam has been flowing from the petcock for a few minutes, CLOSE it.
- i. Allow the pressure to rise until the gauge registers the pressure that will produce the *desired temperature*. The reading of the pressure gauge is affected by altitude. For this reason, it must be INCREASED 1 pound for each 2000 feet of elevation. (See time table, page 15).
- j. The temperature in a pressure cooker, when the air has been completely removed and when the gauge registers 5 pounds (corrected for altitude) is 228° F.; 10 pounds (corrected for altitude) is 240° F.; and 15 pounds (corrected for altitude) is 250° F. These temperatures are sufficiently *high* to *destroy botulinus* organisms in relatively short periods of time.
- k. *Count time* when the pressure gauge registers the desired pressure, corrected for altitude.
- l. The internal temperature of the jars being processed increases rather rapidly until it reaches a temperature similar to that of the steam outside the jars. The rate of increase depends on the density of the pack. (See chart, page 9).
- m. The processing times recommended for sea level are used, provided *all air* is forced out of the pressure cooker and the *pressure gauge* readings are corrected *for altitude*.
(See time tables, pages 14 to 17).
- n. The pressure must not be allowed to fluctuate during processing.
- o. When the processing time is up, remove the cooker from the burner and allow the pressure to be *slowly* reduced to zero, of its own accord.
- p. Open the petcock slowly.
- q. Remove jars as soon as violent bubbling ceases and *complete the seal* (except with self-seal jars).

r. Possible causes for loss of liquid from jars during pressure cooker processing.

- (1) Fluctuations in pressure.
- (2) Jar too full.
- (3) Food packed too tightly in jar.
- (4) Too tight a seal.
- (5) Too rapid reduction of pressure during cooling, causing pressure and temperature of contents of jar to be higher than that of the steam-filled space in cooker.

Storage of Canned Foods

1. Watch jars of canned food for ten days after canning to note signs of spoilage.
2. Store canned foods in a COOL, DRY, DARK storage room.
3. Dampness in storage room may cause rusting of cans and mold on jars.
4. Freezing and thawing injures the flavor and texture of canned foods.

How to Tell When Canned Foods Are Safe to Use

When a jar or can is opened there should be noted—

1. Evidence of a GOOD SEAL.
2. Presence of a VACUUM—suction of air INTO the can when it is first opened.
3. NORMAL APPEARANCE and ODOR of food product.

SPOILAGE is indicated by—

1. POOR SEAL of jar.
2. ABSENCE of VACUUM.
3. SWELLING or BULGING of tin cans.
4. MOLD on canned foods.
5. PECULIAR ODOR from canned foods.
6. ABNORMAL APPEARANCE or CONSISTENCY of canned foods.

Danger of Botulinus Poisoning

DISCARD ALL SPOILED FOODS

by burying or burning material so that poultry and animals can not get at it.

Botulinus poisoning is caused by swallowing the *toxin* produced by a growing organism called "Clostridium botulinum."

This organism occurs naturally in the soil in Montana, and food contaminated by soil may carry some of its *spores*.

The *spores* of Cl. botulinum are *very resistant* to heat when in a *non-acid* medium, such as vegetables and meats.

If botulinus spores are not destroyed by heat, they *may grow* and produce the *deadly botulinus toxin*.

The toxin produced by Cl. botulinus *may be destroyed* by *thoroughly boiling* the food for 10 to 15 minutes and *stirring* while boiling.

All home-canned non-acid vegetables and meats should be THOROUGHLY BOILED before using to *destroy* any botulinus toxin that might be present.

* * *

No home-canned non-acid vegetables and meats should be TASTED BEFORE BOILING as extremely small amounts of food containing botulinus toxin have been known to cause death.

* * *

In home-canned FRUITS of the INTERMEDIATE group (pears, peaches, apricots, figs) the appearance of MOLD or bacterial growth indicates that they may be a *possible source* of botulinus toxin. Such fruits should be DISCARDED or THOROUGHLY BOILED.

TIME TABLE FOR CANNING FRUITS AND ACID VEGETABLES IN HOT WATER-BATH AND PRESSURE COOKER

Fruits may be PACKED RAW into jars and covered with BOILING HOT sirup to within $\frac{1}{2}$ inch of top.

or

Fruits may be PACKED HOT after precooking for 3 to 8 minutes, then covered with BOILING HOT sirup to within $\frac{1}{2}$ inch of top.

Thin sirup.....1 cup sugar and 3 cups water

Medium sirup.....1 cup sugar and 2 cups water

Thick sirup.....1 cup sugar and 1 cup water

If fruit has been PACKED RAW, the glass jars should be only PARTIALLY SEALED during any method of processing. If PACKED HOT, the jars may be COMPLETELY SEALED when processed in the water-bath or steamer, but only PARTIALLY SEALED in the pressure cooker or oven.

This time table applies to pint and quart glass jars, and to No. 2 and No. 3 tin cans, when canning in the HOT WATER-BATH and PRESSURE COOKER.

When canning in STEAMER increase time given for hot water-bath by 10 or 15 minutes.

When canning in OVEN, use a time 50 per cent longer than for hot water-bath.

PRODUCT	Hot Water Bath (Preferred Method) Time in minutes for Montana altitudes							Pressure cooker at 5 lbs. or 228° F. *Change pressure for altitude (See below) Time in minutes
	Glendive Thompson Chinook	Terry Billings Missoula	Great Falls Roundup Helena	Bozeman Philipsburg Boulder	Butte Red Lodge Anaconda	Monida		
	2000	3000	4000	5000	6000	7000		
Apples ¹								
Packed raw.....	18	21	24	27	30	33	10	
Packed hot.....	6	7	8	9	10	11	5	
Apricots ¹ or ²								
Packed raw.....	24	28	32	36	40	44	10	
Packed hot.....	18	21	24	27	30	33	—	
Blackberries ²	} Packed raw or Packed hot							
Currants ²								
Gooseberries ²		24	28	32	36	40	44	10
Huckleberries ²								
Loganberries ²		6	7	8	9	10	11	—
Raspberries ²								
Cherries ² or ³								
Packed raw.....	30	35	40	45	50	55	10	
Packed hot.....	6	7	8	9	10	11	5	
Peaches ¹ or ²								
Packed raw.....	24	28	32	36	40	44	10	
Packed hot.....	18	21	24	27	30	33	—	

TIME TABLE FOR CANNING FRUITS AND ACID VEGETABLES IN HOT
WATER-BATH AND PRESSURE COOKER — (Continued)

PRODUCT	Hot Water Bath (Preferred Method) Time in minutes for Montana altitudes							Pressure cooker at 5 lbs. or 228° F. *Change pressure for altitude (See below) Time in minutes
	Glendive Thompson Chinook	Terry Billings Missoula	Great Falls Roundup Helena	Bozeman Philipsburg Boulder	Butte Red Lodge Anaconda	Monida		
	2000	3000	4000	5000	6000	7000		
Pears ²								
Packed raw.....	36	42	48	54	60	66	15	
Packed hot.....	24	28	32	36	40	44	8	
Plums ²								
Packed raw.....	24	28	32	36	40	44	10	
Packed hot.....	6	7	8	9	10	11	5	
Rhubarb ³								
Packed hot.....	6	7	8	9	10	11	5	
Strawberries ⁴								
Packed hot.....	6	7	8	9	10	11	5	
Tomatoes								
Packed raw.....	54	63	72	81	90	99	**5	
Packed hot.....	6	7	8	9	10	11	—	
Fill can with hot tomato juice								
Tomato juice								
Packed hot.....	6	7	8	9	10	11	5	
Pickled beets								
Packed hot.....	36	42	48	54	60	66	10	
Ripe pimientos								
Packed raw.....	48	56	64	72	80	88	10	
½ pint jars { no liquid added								

¹Thin sirup²Medium sirup³Thick sirup

⁴To 1 qt. berries, add 1 cup sugar. Bring slowly to boil. Let stand over night in kettle. Reheat to boiling. Pack hot into jars.

*At higher altitudes, extra pounds of pressure must be added to the pressure given to produce desired temperature:

2000	ft. above sea level	add	1	lb. pressure
3000	" " " "	"	1½	" "
4000	" " " "	"	2	" "
5000	" " " "	"	2½	" "
6000	" " " "	"	3	" "
7000	" " " "	"	3½	" "

* *At 10 lbs. pressure.

TIME TABLE FOR CANNING NON-ACID VEGETABLES IN THE PRESSURE COOKER

The only **SAFE** method of processing non-acid vegetables is in the **PRESSURE COOKER**. If a pressure cooker is not available use other methods of preservation, such as storing, drying or brining.

Vegetables should be precooked and packed into jars as **HOT** as possible.

Fill jars to within $\frac{1}{2}$ inch of top with boiling liquid, in which the vegetable has been precooked. If necessary use additional boiling water.

Add $\frac{1}{2}$ teaspoon salt to each pint jar of vegetables.

Glass jars should be only **PARTIALLY SEALED** during processing, except when self-seal lids are used.

PRODUCT	Treatment before processing	Pounds pressure* and time required for processing in pressure cooker							
		Pint		Quart		No. 2		No. 3	
		Glass jars		Glass jars		Tin cans		Tin cans	
		Lbs.*	Min.	Lbs.*	Min.	Lbs.*	Min.	Lbs.*	Min.
Asparagus	Tie in uniform bundles or cut in half-inch lengths. Precook in boiling water without a lid 3 to 5 minutes. Pack hot into containers.	10	30	10	35	10	30	10	35
Beans, Lima (green)	Cover with boiling water and precook without a lid 5 minutes. Pack hot.	10	50	10	55	10	50	10	55
Beans (string)	Cover with boiling water and precook without a lid 5 minutes. Pack hot.	10	30	10	35	10	30	10	35
Beets	Can only young tender beets. Boil or steam until skins slip off. Skin and pack hot.	10	30	10	35	10	30	10	35
Carrots	Can tender carrots and only if methods of storage are not available. Precook 10 to 15 minutes, dip into cold water, slip skins off. Pack whole or sliced.	10	30	10	35	10	30	10	35
Corn Cream-style	Cut from cob before cooking. Add half as much boiling water as corn by weight. Boil for 5 minutes and pack hot.	**15	75	—	—	**15	70	—	—
		10	95	—	—	10	90	—	—
Corn Whole-kernel	Precook ears of corn 5 minutes. Cut kernels from cobs, add half as much boiling water by weight. Bring to boil, pack hot.	10	60	10	70	10	50	10	65

TIME TABLE FOR CANNING NON-ACID VEGETABLES IN THE

PRESSURE COOKER — (Continued)

PRODUCT	Treatment before processing	Pounds pressure* and time required for processing in pressure cooker							
		Pint Glass jars		Quart Glass jars		No. 2 Tin cans		No. 3 Tin cans	
		Lbs.* Min.		Lbs.* Min.		Lbs.* Min.		Lbs.* Min.	
Greens	Steam or cook until completely wilted. Pack hot, taking care that material is not packed too solidly.								
Beet tops	is not packed too solidly.								
Chard	Cut contents of jar at right angles with a sharp knife to allow better heat penetration.								
Spinach, etc.		**15	60	—	—	**15	55	—	—
Chard stems	Treat and process like asparagus or string beans.								
Peas, green	Use young tender peas. precook in boiling water without a lid for 5 minutes. Pack hot.	10	45	10	55	10	45	10	50
Pumpkin and Squash	Cut into one-inch cubes. Add small quantity of water. Boil until heated through. Pack hot.	**15	60	**15	75	**15	60	**15	70
		10	75	10	105	10	70	10	95

*At higher altitudes, extra pounds of pressure must be added to the pressure given to produce desired temperature:

2000	ft.	above sea level	add	1	lb. pressure
3000	"	"	"	"	1½ "
4000	"	"	"	"	2 "
5000	"	"	"	"	2½ "
6000	"	"	"	"	3 "
7000	"	"	"	"	3½ "

**15 lb. pressure preferred to 10 lbs. except at highest altitudes, where corrected pressure almost reaches danger zone.

TIME TABLE FOR CANNING MEATS IN THE PRESSURE COOKER

The only **SAFE** method of processing meats is in the **PRESSURE COOKER**. If a pressure cooker is not available, plan instead to cure meats by some standard method.

Some form of **precooking** meat before processing is recommended so that less time will be required for the heat to penetrate to the center of the jars.

Pack meat **HOT** into containers and add $\frac{1}{2}$ teaspoon of salt to each pint jar.

For boiled or stewed meats; fill the jars with boiling broth to within $\frac{1}{2}$ inch of top. For steaks or roasts, cover with pan gravy (use some boiling water if necessary).

Glass jars should be only **PARTIALLY SEALED** during processing, except when self-seal lids are used.

PRODUCT	Pounds pressure* and time required for processing in pressure cooker							
	Pint Glass jars		Quart Glass jars		No. 2 Tin cans		No. 3 Tin cans	
	Lbs.*	Min.	Lbs.*	Min.	Lbs.*	Min.	Lbs.*	Min.
Beef	**15	85	15	120	15	85	15	120
Veal								
Pork								
Lamb								
Mutton								
Wild Game								
Chicken (with bone)	15	65	15	75	15	55	15	70
Chicken (boned)	15	85	15	120	15	85	15	120
Sausage, hamburger, and meat loaf	15	90	—	—	15	90	—	—
Fish	15	80	15	90	15	80	15	90
Soup (with meat, vegetables, or both)	15	65	15	80	15	65	15	80
Soup stock (without meat or vegetables)	15	45	15	50	15	40	15	45

*At higher altitudes, extra pounds of pressure must be added to the pressure given to produce desired temperature:

2000 ft. above sea level	add	1	lb. pressure
3000 " " " "	"	$1\frac{1}{2}$	" "
4000 " " " "	"	2	" "
5000 " " " "	"	$2\frac{1}{2}$	" "
6000 " " " "	"	3	" "
7000 " " " "	"	$3\frac{1}{2}$	" "

**15 lb. pressure preferred except at highest altitudes, where corrected pressure almost reaches danger zone.

BOILING POINTS OF WATER AT VARIOUS ALTITUDES

Altitude above sea level	Air pressure	Boiling point of water
Feet	Pounds per sq. in.	°F.
0	14.7	212
1000	14.2	210
2000	13.6	208
3000	13.1	206
4000	12.7	204.5
5000	12.2	203
6000	11.8	201
7000	11.4	199.5
8000	11.0	198