



METHODS OF FOOD PRESERVATION

- Freezing
- Canning
- Sweetening /acidifying
- Drying
- Pickling and Fermenting
- Salting



FRESH PRODUCE

end product only as good as what you start with

- High quality, unblemished produce
- Harvest in the morning or the evening
- Prepare quickly to avoid loss of quality, or store in cool temperatures



FRESH PRODUCE

end product only as good as what you start with

Wash produce under cool running water, scrub with a clean, sanitized vegetable brush or your hands to dislodge dirt and bacteria.



**UP-TO-DATE,
RESEARCH-
TESTED RECIPE**

➔ **National Center for Home Food Preservation**

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

➔ **University Extension websites, including**

University of Nebraska-Lincoln (food.unl.edu)

University of Wisconsin

Washington State University

Penn State University



**UP-TO-DATE,
RESEARCH-
TESTED RECIPE**

➔ **University Extension using current technology**



Canning timer and checklist APP
Oregon State University

Preserve Smart APP
Colorado State University



Needs

KITCHEN ITEMS

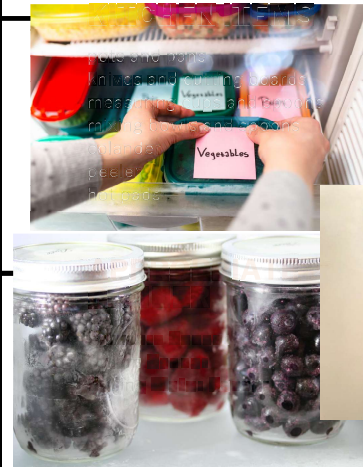
- large pots and pans
- knives and cutting boards
- measuring cups and spoons
- mixing bowls and spoons
- colander
- peeler
- hot pads



Needs

CONTAINERS

- freezer containers/bags
- mason jars with two-piece lids



headspace measurer



Needs



APPROPRIATE CANNER

Pressure Canner
Steam Canner
Boiling Water Canner



N
EXTENSION

Needs



SPECIAL FOOD PROCESSING EQUIPMENT

jar lifter
bubble remover
headspace measurer
funnel

N
EXTENSION

CANNING

Destroys microorganisms that may be present in the food by heating them to a high enough temperature.

Destroys yeasts and molds when food reaches 190°F.

Removes air from jars, leaving a vacuum seal.

Molds and some yeasts are unable to grow in a vacuum.

N
EXTENSION

CANNING METHODS

The canning method that is approved for a food depends on the type of food.

Foods are divided into two main categories:

High Acid Foods

Those that contain acid:
pH less than 4.6
Fruits, Pickles, Sauerkraut, Jams, Jellies, Marmalades, Fruit Butters, Salsas, Tomatoes (after acid is added)

212°F at sea level

Low Acid Foods

Those that have very little acid:
pH higher than 4.6
Meats (beef, lamb, pork, veal & venison), Seafood, Poultry
All Fresh Vegetables
Mixtures of acid and low acid foods

240°F at sea level

N
EXTENSION

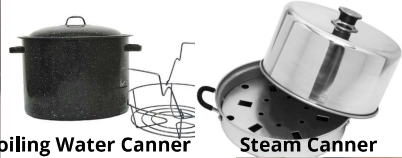
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Boiling Water Canner

Steam Canner

212°F at sea level



Pressure Canner

240°F at sea level



LOW ACID FOODS

Low acid foods must be pressure canned because of *Clostridium botulinum*

C. botulinum forms protective, heat resistant spores, like a hard seed.

Spores require higher temperatures for destruction in a reasonable period of time (240°F or above at sea level)



FAVORABLE CONDITIONS

for *Clostridium botulinum*

40-140 degrees

High Moisture

No Oxygen

Spores germinate and form toxin-producing cells



SIGNS AND SYMPTOMS

for *Clostridium botulinum*

Food can contain toxins without showing signs of spoilage. It may take between 12-72 hours for symptoms to appear.

- Digestive upset (in some cases)
- Blurred, double vision
- Difficulty swallowing, speaking and breathing
- Death



PREVENTING BOTULISM IN HOME CANNED FOODS

- Spores won't germinate in acid environments
- Spores are destroyed when a high enough temperature is reached for a specific length of time
- USDA recommends a canner temperature of at least 240°F at sea level for canning low acid foods
- Pressure canner must be used for all low acid foods



SAFE CANNING PROCEDURES



Boiling Water Canner

Naturally high acid foods (fruits, jams, jellies and pickles) may be processed in a boiling water canner.

Steam Canner

For years steam canners were not recommended but recent research has provided directions for their safe use. It can be used for high acid foods.

Pressure Canner

Low acid food (vegetables, meats, poultry and fish) must be processed in a pressure canner to kill the bacteria which causes botulism.



CANNING 101



- Food must be properly prepared and processed the correct time
- Canner must be accurate and operated correctly
- Altitude adjustments must be made
- Directions from a reputable source must be followed
- Up-to-date, research based recipes
- Beware of 'granny's method'



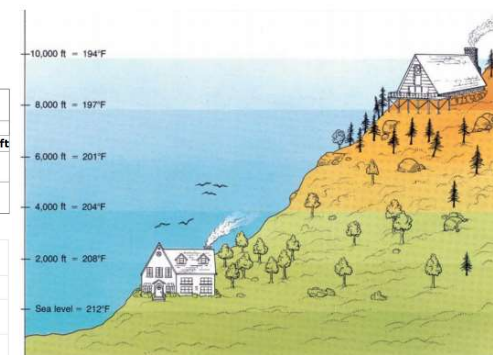
ALTITUDE

Table for Example A
Recommended process time for Peaches in a boiling-water canner.

Style of Pack	Jar Size	Process Time at Altitudes of			
		0 - 1,000 ft	1,001 - 3,000 ft	3,001 - 6,000 ft	Above 6,000 ft
Hot	Pints	20 min	25	30	35
	Quarts	25	30	35	40
	Raw	25	30	35	40
Raw	Pints	25	30	35	40
	Quarts	30	35	40	45

Table for Example B
Recommended process time for Peaches in a Dial-Gauge Pressure Canner.

Style of Pack	Jar Size	Process Time (Min)	Canner Pressure (PSI) at Altitudes of			
			0 - 2,000 ft	2,001 - 4,000 ft	4,001 - 6,000 ft	6,001 - 8,000 ft
Hot and Raw	Pints or Quarts	10	6 lb	7	8	9



Altitude changes the temperature of boiling water



ALTITUDE



ALTITUDE CHART For Boiling Water Processing		
If you are preserving at an altitude higher than 1,000 feet above sea level, adjust boiling water processing time as indicated.	Altitude Feet	Increase Processing Time
	1,001-3,000	5 minutes
	3,001-6,000	10 minutes
	6,001-8,000	15 minutes
8,001-10,000	20 minutes	

ALTITUDE CHART For Pressure Canning			
If you are preserving at an altitude higher than 1,000 feet above sea level, adjust pressure pounds as indicated.	Altitude Feet	Weighted Gauge	Dial Gauge
	0-1,000	10	11
	1,001-2,000	15	11
	2,001-4,000	15	12
	4,001-6,000	15	13
	6,001-8,000	15	14
8,001-10,000	15	15	



PROCESSING TIMES



Foods are prepared by a specific procedure

The length of time it takes to adequately heat the coldest spot in the jar is determined

Size of the jar, size of the food, consistency of the canning liquid, etc, all have an effect on how heat penetrates through the product



PROCESSING PROCEDURES



Follow directions exactly.

The following slow heat penetration:

- Adding extra sugar or fat
- Having food pieces larger than called for in directions
- Adding thickeners

Heat up and cool-down in pressure canners is counted toward heat penetration so don't quick cool the canner!



RAW PACK

For foods that lose shape when heated

Place raw food directly in jar

Boiling hot liquid poured over the food

Pack firmly, don't crush



HOT PACK

Preferred method for most foods

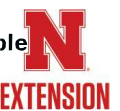
Food is cooked in liquid before packing

Cooked liquid poured over food in the jar

Fewer jars needed

Better color and flavor

Easier to pack, foods pliable



HEADSPACE

Space in the jar between the inside of the lid and the top of the food or its liquid. Check directions for the correct headspace.

- 1/4 inch jelled fruit products
- 1/2 inch fruits, tomatoes and pickles
- 1 inch to 1-1/4 inch low acid foods



SEALS/STORAGE

Wait at least 12 hours

- Listen for pop
- Lids should be curved inward and won't move when pressed
- Clear ringing sound when tapped

Remove screw band

Wash the lid and jar, to remove residue

Label and date

Store in clean, cool, dry, dark location

Use within one year of processing



FREEZING

Easy, quick, convenient
Maintains color, flavor, texture
and nutrients

Prevents the growth of microorganisms

Slows, but does not stop, enzyme action



FREEZING VEGETABLES



BLANCHING

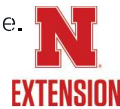


Process of immersing food in boiling water for a short period of time, then cooling it quickly to stop cooking.

Stops the enzymes that can cause undesirable changes in the food after it is frozen.

If not done properly:

produce will lose nutritive value and undergo changes in color, flavor, and texture.



BLANCHING

STEPS

- Put water in saucepan with tight lid
- Bring to a boil
- 1 gallon of water for each pound of vegetables/
2 gallons of water for each pound of greens
- Place small amount in strainer and immerse in boiling water
- Cover
- Let boil for required time, begin timing when placed in water
- Lift out of water and cool immediately
- Cool same amount of time as blanching
- Drain, pack into containers and freeze



SPECIALTY INSTRUCTIONS

Mushrooms

Treat to prevent darkening:

Steam, Cool, Drain, Pack
Pan Fry Method



Tomatoes

Does not need to be peeled

Needs to be cored



Summer Squash

Wash and grate
Pack into containers



Onions and Peppers

No blanching required



FREEZING FRUITS



PREVENT FRUIT FROM DARKENING



Ascorbic Acid (Vitamin C) Citric Acid

Use according to package
directions

Lemon Juice

3 Tablespoons per quart of water

Steam Blanch

Fill pot with 1 inch of water and
bring to a boil
Place fruit on steam rack in single
layer
Cover pot with lid and start blanch
time



Acceptable packs for fruit

DRY/TRAY

Place fruit, single layer, on a jelly
roll pan and freeze until solid
Transfer to container
Label and freeze

SUGAR

Average 1 cup sugar for 2-3 lbs
of fruit
Mix gently until dissolved
Pack loosely, leaving 1/2 inch
headspace
Label and freeze

SYRUP

Average 2/3 cup syrup for each
pint; 1-1/2 cups per quart
Prepare strength of syrup
desired
Dissolve sugar in warm water to
fully dissolve
Cool before using
Place fruit in container, pour
syrup over fruit, leaving 1/2 inch
headspace

UNSWEETENED JUICE/WATER

Place fruit in container, pour
over fruit, leaving 1/2 inch
headspace



STORING FROZEN FRUITS AND VEGETABLES

Stored at 0°F

8-12 MONTHS

date mark packages



DEHYDRATING

Removes moisture that bacteria, molds, and
enzymes need to survive.
Make those items shelf-stable.

Works on three principles:
Heat - Dry Air - Air Circulation



Do you know?

Home Food Preservation Virtual Learning Series

Wednesdays @ 6:30p.m.CST
FREE/ VIA ZOOM

Join Nebraska Extension
Learn & Ask Questions:

August 5 - Food Preservation 101 - Overview
August 19 - Boiling Water Canning/
Steam Canning/Pressure Canning
September 2 - Freezing/Dehydrating



Register At:
<https://go.unl.edu/homefoodpreservation>



Questions / Comments?

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