4-H SHOOTING SPORTS

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Wild Harvest Table Guide to Preserving Meat

Cornell University
Cooperative Extension
Department of Natural Resources

This guide is produced in partnership with Wild Harvest Table, NYS 4-H Shooting Sports, Seneca County Cornell Cooperative Extension, and Cornell University Department of Natural Resources.

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USDA United States Department of Agriculture National Institute of Food and Agriculture

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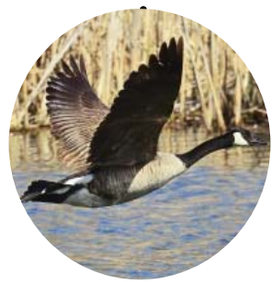
History of Meat Preservation

Drying meat is one of the oldest methods of food preservation known to humankind. What was probably an accidental discovery allowed humans to both store food for long periods of time, and provided a dense source of nutrition to take with them on journeys. Historians have found evidence of people drying meat thousands of years ago in Ancient Egypt. Dried meat was also prevalent in Native American populations. The term "jerky" comes from the South American Incan word "ch'arki" which translates to "dried meat". They would cut the meat into strips, salt it, and dry it, much like we do today, though now we can use dehydrators and ovens which can more precisely control proper drying conditions.

Photo was taken around 1910 by Edward S. Curtis.

Canning as a form of meat preservation came about when Napoleon ruled France in the early 1800s. The French Army needed ways to preserve food so they could continue fighting when fresh food was not available, and they offered a cash award to anyone who could come up with a new idea. Nicolas Appert discovered that food cooked in glass jars did not spoil unless the seals were broken, and came up with a method for sealing the jars. This invention won the prize money and was the beginning of canning food. The reason why it worked to inhibit microbe growth would not be discovered until a few decades later by the work of another Frenchman, Louis Pasteur. Around the time the French were canning with glass, in 1810 the English developed a comparable way to preserve food in tin cans. Similar to France, the British Army and Royal Navy were the primary users of "canned" meats. The first American canning factory was established in New York City in 1812. Canned food was important for feeding troops in the American Civil War and World War I. With production facilities in place, manufacturers began to develop recipes and market canned foods to home consumers. In 1909, the USDA published its first safe home food canning instructions in the Farmers Bulletin 359 and has been offering information on safe home food preservation ever since. The National Center for Home Food Preservation houses the resources from USDA on home canning and food preservation. Find out more on their website, http://nchfp.uga.edu/.

Venison (or Goose) Jerky



Jerky is really quite easy to make, yet it takes some time. Reliable, science-based recipes must be followed. If there is still deer meat in your freezer from last year, making jerky is a great way to use it because game meat should be frozen at 5°F or below for at least 20 days to kill the Trichinella parasite that causes the disease, trichinosis. Jerky is a tasty protein-packed snack to bring with you out hunting.

Ingredients

- **¼ cup soy sauce**
- **1 tablespoon Worcestershire sauce**
- **dash of pepper**
- **dash of garlic powder**
- **dash of onion powder**
- **1 teaspoon hickory smoke flavored salt (or regular salt)**

Preparing Venison or Goose to Make Jerky

1. Take about 2 pounds of meat out of the freezer, choosing a cut that will slice well, such as steaks, chops or roasts.
2. Place the meat in the refrigerator to defrost. Partially frozen meat is easier to slice. Do not defrost the meat at room temperature because this will allow bacteria to multiply and potentially cause an unsafe product.
3. Trim fat from the meat and slice the meat into slices no thicker than ¼-inch. Slice with the grain if a chewy jerky is desired and across the grain if a more brittle, tender jerky is preferred.

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Directions

1. Combine all of the marinade ingredients in a shallow glass or ceramic (not metal) pan and place meat in the pan, being sure to coat all of the pieces with the marinade.
2. Cover and refrigerate the marinating meat for 1-2 hours or overnight (the jerky will taste saltier the longer it is marinated).
3. Remove the pan from the refrigerator and place meat along with the marinade in a skillet or pan and place on the stove over medium high heat and bring to a boil. Boil the mixture for 5 minutes (this will kill any bacteria by reaching 160°F). Remove the strips of meat and place to drain on clean absorbent towels.
4. Arrange the meat strips on dehydrator trays with the meat close together but not touching. If you are dehydrating in an oven, place the meat on metal racks that are placed on cooking sheets to catch the drippings. Place the racks in a dehydrator or convection oven preheated to 140-145°F. Begin checking the meat after about 3 hours to see if it is dry. It should crack, but not break when bent.

Nutrition Facts

Serving Size
Servings Per Container 4

Amount Per Serving

Calories 380	Calories from Fat 110
	% Daily Value*
Total Fat 13g	**20%**
Saturated Fat 2g	**10%**
Trans Fat 0g	
Cholesterol 95mg	**32%**
Sodium 230mg	**10%**
Total Carbohydrate 33g	**11%**
Dietary Fiber 2g	**8%**
Sugars 4g	
Protein 35g	

Vitamin A 0% • Vitamin C 15%
Calcium 4% • Iron 45%

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

		Calories: 2,000	2,500
Total Fat	Less than	65g	80g
Saturated Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300 mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Calories per gram:
Fat 9 • Carbohydrate 4 • Protein 4

For food safety reasons all MEAT MUST BE CANNED USING A PRESSURE CANNER. Pressure canning raises the temperature above the boiling point which is necessary to kill the bacteria that causes botulism, a deadly food-borne illness.

Become familiar with these instructions before you begin your canning process.

General instructions for using a pressure canner (17 steps)

1. Place 2 to 3 inches hot water in the canner if you are canning raw packed foods. For hot packed food, the water may be gently boiling.

2. Set the jars of food on the rack in the canner so steam can flow around each jar.

3. Fasten the canner lid so that no steam escapes around the seal.

4. Make sure the vent (petcock) is open.

5. Turn burner heat to high, and watch for steam to escape in a funnel shape from the open vent.

6. Allow steam to escape for 10 minutes.

7. Close the vent, using a weight, valve or screw, depending on the type of canner. If it is a weighted gauge with varying pressures, be sure to use the correct pressure for the food.

8. For a dial gauge canner, let the pressure rise quickly to 8 pounds pressure. Adjust the burner temperature down slightly and let the pressure continue to rise to the correct pressure. (If the burner is left on high, it will be difficult to regulate the pressure once it rises.)

9. For a weighted gauge canner, let the canner heat quickly at first and when the safety lock engages adjust the burner heat down slightly until the weight begins to rock gently or “jiggle” 2 to 3 times per minute, depending on the brand of canner. Adjust the burner heat so as to have a continuous rocking or jiggling 2 to 3 times per minute. Start counting the processing time as soon as the weight rocks or jiggles.

10. Keep the pressure constant by regulating the heat. Do not lower the pressure by opening the vent or lifting the weight. Keep drafts from blowing on the canner. Fluctuating pressure is one cause of liquid loss from jars (siphoning) and for dangerous under-processing.

11. When processing time is complete, carefully remove the canner from the heat. If too heavy, simply turn off the heat. Removing the canner from an electric burner is recommended.

12. Let the pressure in the canner drop to zero. This will take 30-45 minutes in a standard heavy-walled canner and nearly an hour in larger canners. Newer thin-walled canners depressurize more quickly. Do not rush the cooling process by setting the canner in water or running cold water over it. Never lift the weight or open the vent to hasten the reduction of pressure. Proper depressurization is important for the safety of the food.

13. When canner is depressurized, open the vent or remove the weight. Older canners are depressurized when the gauge on a dial gauge canner registers zero, or when a gentler nudge to the weight on a weighted gauge canner does not produce steam. Newer canners are equipped with a safety lock. These canners are depressurized when the safety lock releases. Sometimes safety locks located in the handle of the canner will stick. If a nudge to a canner weight indicates it is depressurized then run a knife blade between the handles to release the lock.

14. Wait 10 minutes, unfasten the lid and remove it carefully. Lift the lid with the underside away from you so that the steam coming out of the canner does not burn your face. Do not leave the canner unopened to completely cool. The food may spoil, and it may be very difficult to open the canner hours after it has cooled.

15. Use a jar lifter to carefully remove the jars as soon as the processing time and depressurization time is over. Place the hot jars right side up

on a rack, dry towel, wood board, or layers of newspaper to prevent the jars from breaking from contact with a cold surface. Any water on the top of jars will evaporate, so do not tilt the jars to pour water off as this can break the seal. Leave at least 1-inch of space between jars. Keep hot jars out of cold drafts.

16. Do not tighten rings. Jar lids should not be re-tightened after processing. As jars cool, the contents in the jars contract, pulling the self-sealing lid firmly against the jar to form a high vacuum. Most two-piece lids will seal with a “pop” sound while they’re cooling.

17. Allow jars to cool, untouched, for 12 to 24 hours.

Finishing the Canning Process

1. Testing for seal - When jars are completely cool to the touch (about 12 hours), test each jar for a seal. Jars with flat, metal lids are sealed if:
   - Lid has popped down in center.
   - Lid does not move when pressed down with a finger.
   - Tapping the center of the lid with a spoon makes a clear ringing sound. A dull thudding sound may indicate a weak seal or that food is touching the underside of the lid. To determine which, hold the jar up and look at it.
2. If a jar is not sealed, refrigerate and use it within 2 or 3 days. Other options are to freeze the contents (in a freezer container) or to reprocess the food within 24 hours of the initial processing.
3. To reprocess, start by removing the lid. Check headspace of food and liquid. Check the jar rim for damage. If no chips or nicks are on the sealing rim, the lid may not have been put on tightly enough or the lid may not have been prepared properly. Clean the sealing surface of the jar or replace the jar if damaged. Use a new lid and process for the full raw-pack time. After reprocessing, the food will be safe, however the quality will be diminished.

Storage of Jars

1. Remove, wash, dry and store metal screw bands in a dry place to retard rusting. Wash jars and label each jar with contents, date processed and lot number if more than one canner load was processed on the date. Writing the date and content directly on the lid with a permanent marker works well and insures you won't mistakenly use the lid again next year (the metal rings can be reused, but the lids should only be used once for canning). For best quality, store between 50°F and 70°F in a dry place to prevent the lids from rusting and possibly breaking the seal.
2. Before opening each jar, look for bulging lids, leaks and any unusual appearance of the food. After opening, check for off-odor, mold, foam or spurting liquid. Never taste questionable foods. Caution: To prevent the risk of botulism, low-acid and tomato foods not canned according to 1994 or more recent USDA-endorsed recommendations should be boiled even if you detect no signs of spoilage. At altitudes below 1,000 feet, boil foods for 10 minutes before tasting or eating. Add an additional minute of boiling time for each additional 1,000 feet elevation.
3. All low-acid foods canned according to the approved recommendations may be eaten without boiling, when you are sure of all the following:
   - Food was processed in a pressure canner.
   - The pressure canner gauge was accurate.
   - Up-to-date researched process times and pressures were used for the size of jar, style of pack, and kind of food being canned.
   - An approved recipe was used with no changes made in ingredients or proportions of ingredients.
   - The time and pressure recommended for processing the food at the canning location's altitude were followed.
   - Jar lid is firmly sealed and concave.
   - Nothing has leaked from the jar.
   - No liquid spurts out when jar is opened.
   - No unnatural or "off" odors can be detected.
   - Meat that is not fully submerged in liquid may discolor, but it is still safe to eat.

References: USDA's Complete Guide to Home Canning, 2006. So Easy to Preserve, 5th Edition, Cooperative Extension Service, The University of Georgia, 2006. National Center for Home Food Preservation website: http://www.uga.edu/nchfp/. Compiled by Judy Price & Katherine Humphries , Cornell Cooperative Extension.

Canning Meat Strips, Cubes or Chunks

(Bear, Beef, Veal, Lamb, Pork or Venison)

1. Choose high quality, chilled meat. Remove excess fat.
2. Strong-flavored wild meats should be soaked for 1 hour in a brine made from 1 tablespoon salt per quart of water. Rinse meat.
3. Cut into 1-inch wide strips, cubes or chunks.

Hot Pack Preparation

1. Pre-cook meat to the rare stage by roasting, stewing or browning in a small amount of fat.
2. If desired put ½ teaspoon salt in pint jars, 1 teaspoon in quart jars.
3. Pack meat loosely into hot jars, leaving 1-inch headspace.
4. Fill jar to 1 inch from the top with boiling meat juices, broth, water or tomato juice (especially for wild game).
5. Remove air bubbles. Add more liquid if necessary.
6. Wipe jar rim. Place prepared lid on jar and hold in place with ring.

Raw Pack Preparation

1. If desired put ½ teaspoon salt in pint jars, 1 teaspoon in quart jars.
2. Pack raw meat into hot jars, leaving 1-inch headspace.
3. Do not add liquid.
4. Wipe jar rim. Place prepared lid on jar and adjust jar ring.

Process in a Dial Gauge Pressure Canner at 11 pounds pressure OR in a Weighted Gauge Pressure Canner at 10 pounds pressure

Pints	**75 minutes**
Quarts	**90 minutes**

Altitude Adjustment

Dial Gauge Pressure Canner

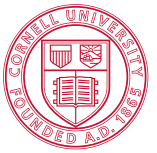
Altitude	Pounds of Pressure
0 to 2,000 feet	11
2,001 to 4,000 feet	12
4,001 to 6,000 feet	13
6,001 to 8,000 feet	14
8,001 to 10,000 feet	15

Weighted Gauge Pressure Canner

Altitude	Pounds of Pressure
1 to 1,000 feet	10
Above 2,000 feet	15

Adapted from So Easy to Preserve, 5th Edition, Cooperative Extension University of Georgia.

For more information and recipes, go to:



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