

Wild Side of the Menu

No. 3 Preservation of Game Meats

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Pat Beck, Nutrition Specialist

Martin Marchello, Professor of Animal and Range Sciences Department

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Wild game provides wholesome, nourishing food, but should be preserved carefully to retain quality. Like domestic meat, wild meat is perishable, so care is needed to maintain its quality. Freezing meat is the most accepted way to maintain top quality.

Other methods for preserving game meats include curing and smoking, drying, corning, canning and sausage making.

To insure good quality in frozen meat:

1. Freeze meat while it is fresh and in top condition.
2. Select proper freezer wrapping materials.
3. Wrap tightly; pressing out as much air as possible.
4. Freeze and store at 0 degrees Fahrenheit or lower.
5. Avoid long storage periods.

Most wild game will keep up to one year frozen without loss of quality.

In most states hunting laws require that all wild game be used before the next hunting season. Check regulations for amount of game you can keep and length of time that you can keep it.

Curing and smoking game

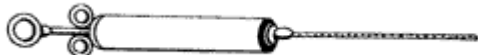
One purpose in curing meat is to make a high quality meat product for future use. Only properly butchered and thoroughly cooled meats should be used.

Fresh meats can be home-cured by two methods: dry cure or pickle cure (often called sweet pickle cure). Traditionally, dry-cured meats were not injected with sweet pickle. However, when temperature control is difficult or impossible, injecting pickle helps to insure a quality safe product.

The purpose of injecting or pumping is to distribute pickle ingredients throughout the interior of the meat so that curing begins on the inside and cures outward at the same time that curing begins on the outside and works inward. This protects the meat against spoilage and provides a more even curing.

Pumping is usually done with a stitch pump*, an instrument with a hollow needle and holes in the needles through which brine can come out when the needle is inserted in the meat (Figure 1).

Figure 1

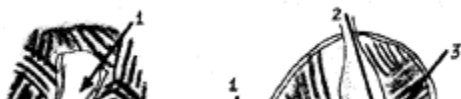


*Can be ordered from Morton Salt Co., 110 N. Walker Drive, Chicago, IL 60606.

Stitch pumping

Pickle recipes usually are given on packages of commercial cure. Dip pump first in boiling water. Then, to keep the pump sanitary while pumping meat, don't touch the needle with hands or lay it down. When not in use, put pump needle end down in container that holds the pickle.

To use, draw pump full of pickle and insert needle all the way into the meat. Push with slow even pressure. As pickle is forced into meat, draw the pump toward you to distribute pickle as evenly as possible. Always fill pump full of pickle to prevent air pockets.



Meat will bulge a little and a small amount of pickle will run out of the meat when the pump is withdrawn. To stop the pickle from running out

after the needle is withdrawn, pinch the needle holes together with thumb and forefinger for a few seconds.

Use three or four pumpfuls of pickle for legs and shoulders that weigh 10 to 15 pounds, and five or six pumpfuls for those that weigh 15 to 25 pounds.

The diagrams of the shoulder and leg (Figures 2 and 3) show the bone structure. The lines show how and where the needle of the pump should be inserted for making the five different pumping strokes for large legs and shoulders. For smaller legs and shoulders fewer injections are needed.

Dry curing game

After pumping, apply dry cure using the recipe below or a commercial product.* Rub well over all the meat especially around the bones, hock and the knee joint.

* Freeze-Em-Pickle; Made by B. Heller and Company; "Morton Tender Quick Cure" or other products are appropriate. Each product has its own recipes. References include "A Complete Guide to Home Curing of Meat," by Morton Salt Co.

Dry Cure (For 100 pounds of meat)

6 pounds salt
3 pounds sugar
3 ounces sodium nitrate or 1 ounce sodium nitrite**

Rub dry cure mix over entire leg surface:

1/3 of mix on first day
1/3 of mix on seventh day
1/3 of mix on fourteenth day

Place on flat surface, uncovered, at 38 F for 2 days per pound of leg, or approximately 4 to 6 weeks. Curing action stops when temperature inside the meat gets below 34 F.

When the meat is cured, let the smaller legs soak for 30 to 40 minutes and larger ones 60 minutes in lukewarm water. Then work and scrub with stiff brush to remove grease and salt. Meat is now ready to smoke.

**Sodium nitrate and sodium nitrite (USP Grade) can be obtained at a drug store. Salt Peter (potassium nitrate) may be used instead.

Using sweet pickle cure

Put pumped leg in a container such as a crock, barrel, sealed wooden box or a stainless steel container, or in a USDA approved plastic container that is approved for food products, such as containers used in the restaurant trade. Do not use other metal containers. Add water to cover the meat. Remove the meat and add enough salt to the water so an egg will float, measuring as you add. If you do not have a specific pickle cure recipe, add sugar to equal 1/2 the amount of salt used. Add commercial cure to pickle according to package directions.

Put leg into pickle. Let stand at 38 F for 3 days per pound of meat (45 days for 15 pounds meat). If temperature becomes warm and brine becomes ropy, remove meat. Wash the meat. Boil and skim pickle or make a new one. The new pickle should be as strong as the original. If space is a limiting factor, it might be advantageous to bone out the wild game. This procedure is described in Circular HE-125, "Wild Side of the Menu No. 2., Field to Freezer." Keep the pieces of meat as large as possible and then use one of the procedures described above for curing. Smoke after curing is complete.

Smoking

Smoke leg until golden brown at 110 F to 125 F. Then raise smokehouse temperature to 170 F until the internal temperature of the meat reaches a minimum of 137 F. Usually the internal temperature is brought up to 141 F. A meat thermometer will make it easy to check temperature. Hardwood such as hickory, maple, chokecherry, oak, or apple is best for smoking. Never use a soft wood such as pine because the resin tars will produce off-flavors.

Smokehouses can be as simple as a tarp covering or as sophisticated as a commercial unit. An old refrigerator makes a useful smokehouse. Plans for more elaborate smokehouses are available at North Dakota State University Extension Agricultural Engineering Department, North Dakota State University Station, Fargo, North Dakota 58105.

Drying or "jerkying"

Drying or "jerkying" meat is an art that has been known since the dawn of civilization. There are many recipes which can be tried, but before you begin check the **jerky maker's check list** and then adapt these

directions to your own circumstances.

A jerky maker's check list

1. Use fresh lean meat that is free of fat and connective tissue.
2. Slice the meat across the grain.
3. Add the correct amount of seasoning. If you do not have a scale, use approximate equivalent measures for the jerky recipes as follows:

Salt 10.5 ounces = 1 cup
 (298 grams)
 8.0 ounces = 3/4 cup
 (227 grams)
 3.0 ounces = 4½ level tablespoons
 (85 grams)

Sugar 5.0 ounces = 2/3 cup
 (141 grams)
 3.5 ounces = 1/2 cup
 (100 grams)
 1.0 ounce = 2 level tablespoons
 (28 grams)

Ground spices 0.5 ounce = 6 level teaspoons
 (14.3 grams)
 0.08 ounce = 1 level teaspoon
 (2.4 grams)

Saltpeter

(Potassium 0.3 ounce = 2 level teaspoons
 Nitrate) (8.5 grams)

4. Cure the meat the correct length of time at 38 F. Salted meat should be placed in wooden, stainless steel or stone containers.
5. Keep the drying or smoking temperature in the smokehouse or oven at 120 F (use a thermometer).
6. If an oven is used, line the sides and bottom with aluminum foil to catch the drippings. Open the door to the first or second stop, or prop open to allow moisture to escape and to lower the oven temperature. A fan will speed air circulation and the drying process.
7. Use hardwood for smoking. (Do not use pine, fir or conifers because they cause off-flavors.)
8. Remove the jerky from the smokehouse or oven before it gets too hard for your taste. Five pounds of fresh meat should weigh approximately 2 pounds after drying or smoking.
9. Store jerky in clean, airtight containers or plastic bags, or wrap it in freezer paper and freeze it. Check often during the first month to be sure jerky is dry enough to keep well. Although jerky will last almost indefinitely at any temperature, its quality deteriorates after a few months.
10. Seasonings and smoking or drying times can be changed to suit individual tastes.

Large pieces of meat which are pickle cured make excellent jerky when sliced and dried or smoked. Corned meat pickles are preferred because spices are included in the cure.

Deer jerky

Debone hind leg, splitting into individual muscles; top, bottom and tip. Pump with brine* (2 pounds commercial saltcure mixture/gallon of water).

Place in crock or USDA approved plastic container. Do not use plastic containers such as garbage cans, plastic bags or supermarket ice cream buckets. Cover completely with brine and weight meat down to keep it submerged.

Store in cooler (38 F) for 10 days.

Every 2 days change the position of the meat and weight it down again.

After 10 days remove from brine and smoke 5 hours at 150 F.

Hang to dry at room temperature (about 2 weeks). Cut off to use as needed.

*Can use ordinary syringe. Inject into several areas.

Venison jerky

100 pounds of meat (coarse grind — 75 pounds; fine grind — 25 pounds)

2 pounds (3 cups) salt

3 ounces (3/4 cup) cardamom

2 ounces (3/4 cup) marjoram

*3 ounces commercial cure (6%) — determined by container weight

5 ounces monosodium glutamate (MSG) — determined by container weight (optional)

**3 ounces (3/4 cup) cayenne pepper

**7 ounces (1-3/4 cups) black pepper

1/2 cup liquid smoke

1/2 cup water

1 tablespoon garlic powder

Mix ground meat, salt, cardamom, marjoram, garlic powder, cure, MSG and peppers together until very tacky. Press into loaf pans lined with foil or cellophane wrap. Let stand 30 minutes at room temperature. Put into cooler until firm or slightly frozen to make slicing easier. Slice into strips 1/6 inch thick, 1 inch wide. Combine liquid smoke and water. Spray on both sides of strips.

Place in oven at 170 F for drying. Dry 2 hours to produce a chewy jerky or 3 hours for a hard, dry product.

*Cure is optional, as it is used to develop a pink color and as a preservative.

**Jerky is quite spicy. If you like less spice, cut amount of black pepper and cayenne used.

Oven method jerky

3 pounds venison
1/2 teaspoon liquid smoke in 2 tablespoons water
Salt and pepper to taste

Slice the meat 1/4 inch thick. Remove all fat. Lay the meat out in a single layer on a clean counter surface. Dab each piece with a brush dipped in the water and liquid smoke. Salt generously. Sprinkle with pepper if desired. Place the strips layer on layer in a large bowl or crock. Place a plate and weight on the top of meat. Let stand overnight or at least 6 hours. Remove meat strips from bowl and dry.

Remove oven racks. Stretch meat strips across the racks. Allow the edges to touch but not overlap. Do not cover the entire rack. Allow room for air circulation in the oven. Arrange the racks so the top rack is no closer than 4 inches from the top source of heat and the bottom rack no closer than 4 inches from the bottom of the oven. Set the oven temperature at 150 F and let the meat dry for about 11 hours. Check the meat early in the drying process. If there is excessive drip, catch it on aluminum foil on a rack near the bottom of the oven. Lower the temperature till the oven feels warm but does not cook the meat. Cool and store in an airtight container.

Note: Frozen meat may be "jerked." Thaw meat and proceed according to one of the recipes given.

Corning game

You can corn venison, antelope, moose, bear or beef with the same corning method. It makes all of these meats plain good eating. People who will not eat wild meats may like them corned, as corning takes out the musky wild flavor and tenderizes the toughest wild meats.

To make 6 gallons of corning liquid:

3 pounds (6-3/4 cup) salt
10 ounces (1-3/8 cup) sugar
2 ounces sodium nitrate
1/2 ounce sodium nitrite
3 level teaspoons black pepper
3 level teaspoons ground cloves
6 bay leaves
12 level teaspoons mixed pickling spice

For onion flavor, add one medium sized onion, minced. For garlic flavor, add 4 garlic cloves, minced. Put the ingredients into a pickle crock or glass jar and add enough water to make a total of 6 gallons, including the

ingredients

The container should be covered. A good piece of round is wonderful corned, but less desirable cuts of meat like the brisket can be corned.

The ideal temperature for corning meat is about 38 F. During the fall or spring months this is not too difficult to obtain. In the winter an unheated part of the basement can be used for corning meat. During the summer months it is hard to find a place around 38 F. Higher temperatures need not affect the end result of the corning process at all, if, for every 15 degrees of temperature above 38 F you add one-third more salt. At 83 F add 3 pounds more salt, making a total of 6 pounds of salt.

Place meat into the liquid. Put a heavy plate on meat; weight plate. if necessary, to keep meat below pickle brine.

Leave the meat in corning liquid for 15 days. On the fifth and tenth days, stir the liquid well, remove the meat and put it back so the bottom piece is on top. After the fifteenth day remove the meat. Use what you want immediately and store the balance in a cool place refrigerated at 38 F.

The meat at this stage has a grayish pink color. When cooked, corned meat changes to the characteristic pink color associated with a cured product.

Cooking corned meat

Place the corned meat in a pan with a cover. Add cold water to cover meat. Bring to a boil and remove the scum from the water. Reduce the heat and simmer for about 5 hours or until tender. Season to taste and serve as the main meat dish.

Canning game

Only good quality, properly cleaned and cooled game should be canned.* To insure safety of canned meats, all jars or cans must be processed in the pressure canner to get a sufficiently high temperature for a long enough time to kill all bacteria that causes spoilage or food poisoning.

Large game animals are canned like beef and small game animals and birds like poultry. Either type of meats can be raw packed or hot packed.

*Contact your NDSU Extension Office in your county for complete directions.

Small Game Animals and Birds

Procedure: Choose freshly killed and dressed, healthy animals or birds. Dressed meat should be soaked 1 hour in water containing 1 tablespoon of salt per quart and then rinsed. Remove excess fat. Cut meat into suitable sizes for canning. Can with or without bone.

Hot pack – Boil, steam, or bake meat until about two-thirds done. Add 1 teaspoon salt per quart, if desired. Fill jars with pieces and hot broth, leaving 1-1/4 inch headspace.

Raw pack – Add 1 teaspoon salt per quart, if desired. Fill jars loosely with raw meat pieces, leaving 1-1/4 inch headspace. Do not add liquid.

Adjust lids and process as in table below using appropriate schedule.

Large Game Animals

(STRIPS, CUBES, OR CHUNKS)

Procedure: Choose quality chilled meat. Remove excess fat. Soak strong-flavored wild meats for 1 hour in brine water containing 1 tablespoon of salt per quart. Rinse. Remove large bones.

Hot pack – Precook meat until rare by roasting, stewing, or browning in a small amount of fat. Add 2 tablespoons of salt per quart, if desired. Fill jars with pieces, and add boiling broth, meat drippings, water, or tomato juice, leaving 1-inch headspace.

Raw pack – Add 2 teaspoons of salt per quart, if desired. Fill jars with raw meat pieces, leaving 1-inch headspace. Do not add liquid. Adjust lids and process as in Table 1 using without bone schedule.

Table 1. Canning Time Table for Game

Pack	Jar Size	Time Min.	Pounds Pressure			
			Dial Gauge		Weighted Gauge	
			*0-2000 ft.	2001-4000 ft.	0-1000 ft.	Above 1000ft.
Without bone Hot or Raw	pts.	75	11	12	10	15
	qts.	90	11	12	10	15
With bone Hot or Raw	pts.	65	11	12	10	15
	qts.	75	11	12	10	15

*Local Altitude

Making sausages

The lean trimmings from wild game make an excellent meat for sausage production. Try one of your favorite recipes and substitute wild game and fowl trimmings for the beef portions.

Venison summer sausage

15 pounds venison
10 pounds pork trimmings
(5 pounds lean, 5 pounds fat)
7 ounce (2/3 cup) salt
1 ounce (2 tablespoons) commercial cure
1 ounce (2 tablespoons) mustard seed
3 ounces (1/2 cup) pepper
3 ounces (1/2 cup) sugar
1/2 ounce (3 tablespoons) marjoram

Mix salt and cure with coarsely ground venison and pork trimmings. Pack in shallow pan and place in cooler for 3 to 5 days. Then add rest of ingredients and mix well.

Cure is optional. It is used to develop a pink color and as a preservative

Sausage is quite spicy. If you like less spice cut down proportions of spices. Smoke sausage as described below.

Smoked sausage

Stuff prepared sausage into 3-inch diameter fibrous casings and smoke at 140 F for 1 hour; 160 F one hour; and 180 F until internal temperature reaches 152 F (insert a meat thermometer in the thickest part of the sausage). Remove from smokehouse and spray with hot water for 15 to 30 seconds. Follow with cold spray or place in ice water until internal temperature is reduced to 100 F. Let dry 1 to 2 hours. Place in cooler.

Wild game polish sausage

25 pounds 50/50 pork trimmings

20 pounds wild game (lean meat)
1 quart water
14 ounces (1-1/3 cups) salt
2 ounces (4 tablespoons) cure
1/2 ounce (6 teaspoons) marjoram
1-1/2 ounces (3 tablespoons) mustard seed
3 cloves garlic
2 ounces (1/4 cup) pepper

Mix all ingredients together and grind the product through a coarse plate and follow this with a fine grind. Stuff in hog casing and smoke at 120 F for one hour, 150 F for one more hour, then at 170 F for two hours or until internal temperature of 141 F is reached. Follow same procedure as described for summer sausage (above).

Quick sausage

2 pounds hamburger or deerburger mix
1/2 teaspoon pepper
1/8 teaspoon garlic powder
1/4 teaspoon onion powder
2 tablespoons curing salt
1 tablespoon liquid smoke
1 cup water
1 tablespoon mustard seed (optional)

Pack mixture in a water glass to within 1/2 inch of the top. Use large glass container or enough glass tumblers. Cover and freeze overnight. Run warm water on glass to release. Plastic containers will not crack and are safer, but may pick up flavors from the sausage. Wrap in cellophane wrap. Tie ends. Simmer 1 hour in water. Slice thin.

Note: Hamburger or pork sausage can be mixed with ground venison.

More information and recipes on sausage making are available in Circular He-176. "Sausage Production in the Home – An Art."

Freezing fish

Special care should be taken with fish because it tends to dry out more quickly than other meats. Glazing with ice or freezing in water are good methods of freezing fish.

For ice glazing, place cleaned, eviscerated fresh fish in a tray in freezer. When frozen, dip in near freezing

ice water. Place fish again in freezer to harden the glaze. Repeat dipping fish until about 1/8 inch of ice coating has been formed. Overwrap with film, freezer paper or foil.

To freeze in water, fill freezer container (milk cartons can be used) with water. Add whole fish or fish fillets. Completely cover fish with water, then seal and freeze. Whole dressed fish probably freezes best this way.

The author has had good results in freezing fish for long periods of time by wrapping dressed fresh fish in plastic wrap and then wrapping again in aluminum foil.

Pickling fish

While the term "pickled fish" sometimes is used to include fish cured in brine, it should be applied only to those products in which vinegar is used. Only a few types of fish are preserved commercially by pickling, but almost any species may be prepared for home use.

Fish preserved with vinegar-spice cure must be fresh and of the best quality. The flavor, texture, color and keeping quality are affected by the water, salt, sugar, vinegar, herbs and other miscellaneous ingredients.

Use drinking **water** or water approved under all sanitary codes. "Hard" waters are unsuitable, especially those with a high iron, calcium or magnesium content. The minerals interfere with the curing process and can cause rancidity and off flavors.

Use a high-grade white distilled **vinegar** of 4 to 6 percent acidity (40 to 60 grain). Acidity is usually listed on the label. Do not use vinegars of unknown acidity. Ciders and other fruit vinegars may give the fish an off-flavor and color.

A high grade, pure granulated dairy or canning **salt** is required. The salt must be as free as possible from magnesium compounds, as these impurities give a bitter flavor to the cured product and may cause discoloration of the fish. Noniodized salt is best for pickling.

Table (cane or beet) **sugar** is recommended.

Spices should be fresh and of a high grade of purity. Best results are secured by buying fresh, whole spices, and making up the mixture, by recipe at the time it is to be used. Prepared commercial mixtures are convenient and time-saving if you can obtain the desired amount.

Soak fresh fish in a weak brine of 1 cup salt to 1 gallon cold water for 1 hour.

Drain and pack fish in a glass, heavy food grade plastic or enamel container with a strong brine (2-1/2 pounds salt to 1 gallon water) for 12 hours. Keep at refrigerator temperatures between 40 and 45 F.

Pickled fish (Recipe is spicy)

10 pounds fish
1 ounce whole allspice
1 ounce mustard seed
2 ounces regular mixed pickling spice
1/2 pound onion, sliced
1/2 ounce bay leaves
1-1/2 quarts distilled (white) vinegar
2-1/2 pints water
1 ounce white pepper
1 ounce hot ground or dried peppers (optional and to taste)

Rinse the fish in fresh water. Combine the ingredients listed above in a large pan or kettle. Bring to a boil and add fish. Simmer for 10 minutes, or until fish is easily pierced with a fork. Remove fish from the liquid and place in a single layer on a flat pan and refrigerate for rapid cooling to prevent spoilage. Pack cold fish in a clean glass jar, adding a few spices, a bay leaf, freshly sliced onions and, if desired, a slice of lemon.

Strain the vinegar solution, bring to a boil, and pour into jars until the fish are covered. Adjust lids. This product must be stored in the refrigerator at 40 to 45 F and should be used within 4 to 6 weeks. For a less spicy product, use less white pepper and hot or ground pepper.

Pickled smelt

2 pounds cleaned smelt
3 cups water
1 teaspoon salt
1/4 teaspoon white pepper
2 bay leaves
1 cup onion, sliced
1 cup white vinegar

Cook fish in water, salt, pepper and bay leaves and onion in a covered pan for 12 minutes. Drain and measure fish stock. There should be 2 cups. Add the vinegar and bring to a boil. Cook 5 minutes and cool in refrigerator at 40 to 45 F. Pour over fish, let stand in refrigerator for several hours. Serves 4 to 6.

Norwegian pickled herring

3 salted herring
3/4 cup vinegar
1-1/4 cups water

3 tablespoons sugar
 1/3 teaspoon white pepper
 A few whole peppers
 1 red onion

Clean and cut herring into fillets. Soak in plenty of water 12 to 15 hours. Skin and remove all bones. Dissolve the sugar in water, add vinegar, pepper and onion thinly sliced. Add herring and let stand in cold place a few hours before serving.

Canning Fish

Although freezing is the easiest way to preserve fish, canning does offer some advantages. The only safe way to process fish is in a pressure canner. Fish that has been frozen can be safely canned. Thaw fish in a refrigerator and can promptly. Follow recommended canning procedures carefully.

Table 2. Canning Time Table for Fish, except Tuna

		Pounds Pressure				
		Dial Gauge			Weighted Gauge	
Pack	Jar Size	Time Min.	*0-2000 ft.	2001-4000 ft.	0-1000 ft.	Above 1000ft.
Raw	1/2 pt. or pt.	100	11	12	10	15

*Local Altitude

Fish may be canned with its bones. They add to the flavor and nutritive value of the product. However, it is recommended only pint or smaller containers be used.

Recipes for canning fish follow. Only properly cleaned, dressed and cooled fish should be canned.

Clean and cut fish into pieces about 1 inch shorter than height of jars. Soak fish for 1 hour in cold water containing 1 cup salt to 1 gallon water. Place clean plate on fish to keep under brine. Do not reuse salt water. Drain fish for ten minutes, then pack into jars, skin side next to glass. Alternate heads and tail ends if small fish are used. Leave 1 inch headspace. Do not add liquids or oil. Process according to the table.

"Mock" Salmon

Allow 2-1/4 to 3 pounds of whole fish for each pint of canned fish. Clean and prepare fish. Remove heads, fins and tail. Remove skin, if desired. If the fish is slimy, a solution of 1

tablespoon vinegar to 2 quarts water helps remove the slime. The color of some fish can be improved by soaking the fish in cold water containing 1/2 cup salt to 1 gallon water for 30 minutes. Do not reuse salt water. Rinse fish in clean water. Cut fish into jar-sized lengths. Make sauce.

Sauce

1 cup catsup
1 cup vinegar
1/2 cup water
3 tablespoons salt
1/4 cup minced onion
2 bay leaves, crumbled

Combine and heat the above ingredients. This makes enough sauce for about 8 pints. Pack fish into jars to within 1 inch of the top. Cover with sauce leaving 1 inch headspace. Remove air bubbles, wipe jar rims, place prepared lids on jars and tighten the screw bands. Proceed according to canning time table.

Quick Pink Salmon

To each pint of fish add:

1 tablespoon vinegar
1/4 teaspoon salt
2 tablespoons tomato juice

Leave 1 inch headspace. Adjust lids. Process according to Table 2.

Note: Glass-like crystals of magnesium ammonium phosphate sometimes form in canned salmon. There is no way for the home canner to prevent these crystals from forming, but they usually dissolve when heated and are safe to eat.

For further information request the following from your NDSU County Extension Office or write the Distribution Center, Agriculture Communication, Morrill Hall, Box 5655, Fargo, North Dakota 58105:

HE124 Wild Side of the Menu No. 1 – Care and Cookery
HE125 Wild Side of the Menu No. 2 – Field to Freezer
HE176 Sausage Production in the Home – An Art
HE403 Food Freezing Guide

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