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Processing Meat in the Home

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The consumer who wishes to process meat products in the home should be familiar with both federal (Food Safety and Quality Service of the USDA) and state (Minnesota Department of Agriculture) meat processing rules and regulations. Consumers often process meat products and later wish to sell portions of their production. This cannot be done. A person must know the rules and regulations on home meat processing to know if he or she is in violation of federal, state, or municipal laws. Other federal and state laws were established to ensure production of clean and wholesome meat products from licensed plants for consumers. Consumers of home-prepared products should be familiar with all rules and regulations regarding sale of meat and meat products. For detailed information, contact the Minnesota Department of Agriculture, Food, Meat and Poultry Inspection Division, 90 W. Plato Blvd., St. Paul, MN 55107, Phone 612 296-2627; or USDA, Food Safety and Inspection Service, P.O. Box 554, So. St. Paul, MN 55075, Phone 612 290-3371.

MATERIALS NEEDED

Persons who wish to process meat products in the home should have the following materials: (1) clean, wholesome meat; (2) necessary spices and curing ingredients; (3) easily cleanable processing equipment that is housed or contained in clean and sanitary surroundings; (4) scales to weigh meat to the nearest pound, spices to the nearest 10th of an ounce and curing ingredients to the nearest 10th of a gram; (5) proper packaging materials including casings if required; (6) adequate refrigeration facilities for perishable products; and (7) knowledge of the factors affecting meat spoilage, including the nature and control of pathogenic organisms (see 3 under "For More Information" at the end of this fact sheet).

Persons who do not have the above items should not process meat in the home. Instead, they should buy the desired finished product at a retail store or USDA-inspected meat processing facility.

Check the yellow pages in your phone book for commercial sources of equipment, curing ingredients and spices (key words include Butcher's Equipment and Supplies).

SPECIFIC FORMULATIONS

It is impossible to describe all the meat product formulations consumed in the home. The following procedures are for some of the most common home-processed meat items.

Fresh pork sausage. The following is a common seasoning formulation for 10 pounds of fresh pork sausage:

- 3 oz salt
- 1/4 to 1/2 oz sage
- 1/4 to 1/2 oz black pepper
- 0.1 oz red pepper
- 0.3 oz white pepper
- 0.1 oz ground cloves or 0.1 oz nutmeg
- 0.6 to 1.2 oz corn sugar (if the sausage is to be used fresh). Corn sugar is a dextrose made from corn starch.

Grind the unseasoned pork trimmings through a 1/2-inch plate (coarse grind). Thoroughly mix the seasoning, spread it over the coarsely ground product, mix and regrind through a 1/8-inch plate. Add 1/2 cup of cold water to each 4 lbs of ground, seasoned sausage and knead until it becomes sticky and dough-like enough to yield a product that will slice and fry without crumbling. Package and refrigerate (or freeze) immediately.

Scrapple. Cook pork (head, meat, feet, heart and tongue, or other pork trimmings, if desired, including liver) in water in a covered container until the soft tissue separates readily from the bone. Separate tissue from bone and grind with a fine grinder. Return the ground meat to the strained soup container and boil. Cereal is then added. A common cereal mixture is seven parts cornmeal and three parts of either buckwheat, white, or rye flour. Approximately 4 lbs of ground meat combined with 3 lbs of soup (liquid) plus 1 lb of cereal is sometimes used. Gradually moisten the cereal with a cool liquid (water or the cooled soup) to prevent lumping. Add this premoistened cereal to the ground meat-soup mixture slowly then boil for 30 minutes. Prior to finishing boiling, add seasoning. A suggested seasoning combination for 8 lbs of finished scrapple would include 3 oz salt, 1/4 oz black pepper, 1/4 oz sweetened marjoram, 1/4 oz nutmeg, 1/4 oz sage or thyme, and 2-1/2 oz onions. Some prefer to add a pinch of mace and a pinch of red pepper also. After the seasoning is mixed thoroughly and the onions cooked, pour the scrapple into pans (not bowls) and refrigerate 30-32 degrees F immediately.

Summer Sausage. Farmer-style summer sausage is a tasty processed meat item often prepared in winter for summer consumption. A popular formula follows:

- 4.0 lbs lean beef
- 6.0 lbs lean pork trimmings
- 0.8 oz sugar
- 0.6 oz pepper (black or white)
- 0.2 oz sage or 0.1 oz ground mustard
- 4.0 oz salt
- 0.7 gram sodium nitrite measured very carefully and dissolved in 1/4 cup water

NOTE: It is very important that the level of nitrite not be exceeded since excessive human consumption of nitrite can be lethal. In fact, the use of commercial salt-sodium nitrite mixtures is strongly encouraged because of the problem of measuring accurately such a small quantity of nitrite. Some drug stores also are sources of sodium nitrite and may assist you in weighing out appropriate amounts for the recipe. There are commercial sources of salt containing sodium nitrate and sodium nitrite for home curing of meat. One popular source contains 0.5 percent sodium nitrate and 0.5 percent sodium nitrite. If you use this commercial source of salt and nitrite, use 5 1/2 level tablespoons per 10 lbs of meat. However, before using check carefully to make sure the product contains 0.5 percent sodium nitrate and 0.5 percent sodium nitrite. If the salt-nitrate and nitrite mixture you are using contains more or less nitrate and nitrite, adjust the amount included in this formula accordingly and accurately!

Mix the beef and pork and grind through a 1/4-inch plate. Add the seasoning and curing ingredients and mix thoroughly with a mixer or carefully by hand. Grind again through a 3/16-inch plate. Place the product on trays and refrigerate at 36°F for 12 to 48 hours to cure. After the cured red color has developed, stuff into hog casing or a commercial collagen casing. The product should be smoked to 110°F so that a rich, dark color develops. Continue to heat the product until 142°F internal temperature of the sausage is reached. The temperature must exceed 137°F in the internal portion of the sausage to destroy any *Trichinella spiralis* (trichinosis) that may be present in the pork. The internal color will then be the typical cured pink color. Store the product several weeks in a drying area not exceeding 45°F. A semi-moist atmosphere (75-80 percent relative humidity) will help prevent hardening or uneven drying in the sausage.

The finished product should have a tang when eaten. This is produced by certain acid-producing bacteria (normally present in the sausage). The acid tang insures satisfactory removal of moisture from the sausage during drying, thus preventing spoilage by other types of bacteria. To ensure the presence of the desirable acid-producing bacteria, old-time recipes include mixing each batch with a pound or so from a previous batch that has been successfully stored without spoilage. The uncooked pound to be used in mixing should be kept under refrigeration.

Summer sausage need not be smoked. However, for those desiring a smoked flavor but lacking the necessary and safe smoking equipment, liquid smoke is available commercially.

Bratwurst. A common formula for 10 lbs. of bratwurst sausage follows:

3.0 lbs boneless light veal (or can be replaced entirely by pork or lean beef) and 7.0 lbs lean pork trimmings. The pork should be approximately 70 percent lean.
3-1/2 oz salt
0.4 to 0.6 oz fine ground white pepper
0.05 oz ground mace
0.05 oz ground celery seed

Grind veal and pork through 1/8-inch plate, add seasonings, and mix well. Stuff into casings (preferably 30-36 mm in diameter) and link. Product then may be stored in the refrigerator for a few days or frozen for periods up to one to two months. In some cases, it may be desirable to cook the bratwurst and then refrigerate. This is accomplished by heating in water until the internal temperature of the bratwurst reaches 150°F. Cooking the bratwurst prior to freezing is not recommended because of subsequent reduced shelf life.

Other Sausages. There are literally hundreds of different types of sausages, many of which have several recipes per individual sausage. The reader is urged to obtain the publications listed at the end of this fact sheet for additional and detailed sausage recipes.

Curing and Smoking Hams and Bacon. There are numerous ways to cure and smoke hams and bacon. Salt may be used alone, with sugar, or with sugar and nitrite. The last method, sometimes referred to as "sugar cure," uses dry ingredients, liquid ingredients, and combinations of both.

The dry sugar cure is safest if you have no refrigerated curing room or equipment for brine curing. Make up the curing ingredients as follows:

8 lbs salt
3 lbs cane sugar
3 oz sodium nitrate
1/2 oz sodium nitrite (or a total of 4 oz nitrate if no nitrite available). Remember, excess nitrite is toxic.

Use 1 oz of cure per 1 lb of pork (for heavy hams weighing more than 20 lbs, use 1 1/2 oz cure per 1 lb of ham). Hams should be rubbed three separate times at three to five day intervals. Bacon should have one thorough rubbing with a light sprinkling over the flesh side after rubbing. Picnics and butts should have two rubbings at three to five day intervals. Place the rubbed meats in boxes, on shelves, on wooden tables to cure but not in tight boxes or barrels where they rest in their own brine. Do not use cardboard or galvanized containers. The length of curing should approximate seven days per inch of thickness. For example, if the ham weighs approximately 12 to 15 lbs and is approximately 5 inches thick through the thickest part, this ham should be cured 7 x 5 = 35 days. If a bacon is 2 inches thick, it should be cured for 7 x 2 = 14 days. It is advisable to rub some of the curing salt into the aitch bone joint and hock-end of ham to guard against bone sour. It is all right to leave the product in cure longer than the recommended time since the saltiness does not increase. Dry curing should be done in a cool place to reduce the risk of spoilage.

Since bacon has only a one to two month freezer life because of its salt content, it may be advisable to cure one slab of bacon at a time. The uncured belly can be frozen until curing.

There are several formulas for the "sweet pickle cure" for home processing of ham, bacon, and shoulder. The reader is urged to obtain the publication, "The Meat We Eat," listed at the end of this fact sheet to obtain detailed instructions on sweet pickle curing.

Corning. Boneless brisket, plate, chuck, of beef usually are used for corning. For each 10 lbs of meat dissolve in 0.4 gals of water, 0.8 lbs of salt, 0.3 lbs of sugar, 0.4 oz of baking soda, 0.3 oz of sodium nitrate, and .025 oz of sodium nitrite (5 1/2 tbsp of a curing salt containing 0.5 percent sodium nitrate and 0.5 percent sodium nitrite may be used as replacement for the salt, sodium nitrate, and sodium nitrite if you are unable to obtain pure sodium nitrate and pure sodium nitrite). A good color can be secured by using 0.4 oz of cream of tartar instead of the sodium nitrate. Garlic and pickling spices (cloves, peppercorns, bay leaves, and thyme) may be added in varying amounts if more flavor is desired.

Place the meat in a stone crock or wooden tub (do not use metal containers that will corrode). Put the chilled curing ingredients in the container in sufficient quantities to cover the meat. If using garlic and pickling spices, add them, stir, and weight the meat with a board upon which a nonmetal weight can be placed. If the cut meats are not more than 3 inches thick in the thickest part, they will cure in approximately 12 to 14 days.

Dried Beef. Top round, bottom round, and sirloin tip (knuckles) are commonly used to prepare dried beef. Dried beef is similar to corned beef except (1) dried beef is made from the muscles of the round, whereas corned beef usually is made from the brisket; (2) the dried beef curing mixture contains an extra 1/10 lb sugar but not the baking soda, garlic, cloves, etc.; and (3) dried beef, unlike corned beef, is hung to dry for 24 hours and then given a light or heavy smoke in the smokehouse.

Dried beef may be prepared using a straight dry cure using the same salt, sugar, sodium nitrate, and sodium nitrite combination described in the corned beef section. When dry curing dried beef, apply 1 to 1 1/2 oz of the dry cure to each pound of meat. Approximately two rubbings at three to five day intervals are necessary. Check the curing vessel daily and if self-formed brine accumulates in the curing vessel, remove this excess brine because pieces resting in this brine will become salty.

Jerky. Top round steak sliced 3/8-inch thick is suitable for beef jerky. Discard any fat surrounding the muscle and cut the lean into thin strips 1 inch wide or less. Prepare a pickle cure of 2 lbs salt and 10 cups of nearly boiling water. Dip each strip into this hot, sweet pickle cure until the strips are nearly white. Black or white pepper may be added to the solution or generously sprinkled on the slices after dipping. Other seasonings used occasionally include oregano, marjoram, basil, and thyme. Place the strips on wire oven shelves and place in an oven at 225°F or higher. Leave the oven door partially open so that the moisture from the lean can escape and thus dry the product. When the product has been dried (approximately 65 percent moisture loss), remove from oven and store in a cool, dry place that is free of insects, rodents, and dust.

Venison Jerky. Cut lean strips of venison and place in granite canner, stone crock, or plastic bucket. Cover with brine solution made from:

2 quarts water
1 cup salt
1/2 cup sugar
4 tablespoons black pepper
Garlic salt

Place a weight on the meat so the liquid covers the surface and allow it to stand at least 12 hours. Drain well and place on trays. Transfer to smoke house and smoke from 5 to 15 days, depending on the thickness of the pieces being dried. Use any nonresinous wood, such as maple, hickory, or apple. When completely dry, store the meat in airtight containers. Follow specific directions if a commercial smoker is used.

Freezing. Meat products that have salt added to them during processing are not particularly suitable for freezing. Salt accelerates the development of rancidity and thus decreases freezer life. With a freezer set at 0°F, intact ham and bacon can be frozen for two months whereas sliced bacon and most sausages have a freezer life of one month. When the freezer is set at -15°F, freezer life is doubled.

FOR MORE INFORMATION

1. "The Meat We Eat," by J. R. Romans, K. W. Jones, W. C. Costello, C. W, Carlson, and P. T. Ziegler. 1984. 12th Edition. ISBN 0-8134-244-5. May be available from your local public library or can be obtained by sending $25 to The Interstate Printers and Publishers, Inc., 19-27 North Jackson St., Danville, IL 61832-0594. This publication contains a voluminous amount of information on slaughter, cutting, curing, and sausage manufacture.
2. "A Complete Guide to Home Curing," Anon. 1975. Published by the Morton Salt Company and available from Cumberland General Store, Route 3, Crossville, TN 38555. Send $3.45 and ask for item number 9225.
3. "Going Wild," by Urban Gaida and Martin Marchello. 1987. Published by Watab Marketing, Inc., 832 First Street North, Sartell, MN 56377.
