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Preservation of Meats and Poultry in Frozen-Food Lockers  
Michigan State University Extension Service  
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# Preservation of Meats and Poultry Products in Frozen-Food Lockers

By Leonard H. Blakeslee, J. A. Davidson and Ruth M. Griswold

MICHIGAN STATE COLLEGE :: EXTENSION SERVICE  
EAST LANSING

## FREEZING MEAT

Preservation of fresh meats, poultry and game by freezing has increased rapidly in the past two years. The use of freezer locker plants throughout the year offers an opportunity to have a variety of fresh meat available at all times. The post-war development of home freezer units will result in a much greater expansion in the preservation of all foods by frozen storage. Good results are being obtained by this method of preservation, especially when rural and urban patrons of freezer lockers produce their own good-quality animals to slaughter for frozen storage. Systematic planning and preparation are necessary for an economical supply and tempting variety of meats.

The following suggestions for use in the preparation and handling of meats in frozen storage are based on established trade practices and recent experimental work conducted at the Michigan and other agricultural experiment stations.

### SELECTION AND SLAUGHTERING OF ANIMALS

Young, well-finished, healthy animals provide the best quality meat for storage. Ideal age and weights of the different classes of live animals with range in dressed weights and percentage of retail cuts expected are as follows:

	Age	Weight	Dressed Weight	Retail Cuts as Percent Dressed Weights*
Cattle	1-2 years	600-1000 lb.	300-600 lb.	75-85%
Veal	4-8 weeks	150-200 lb.	80-120 lb.	80-90%**
Hogs	6-8 months	180-250 lb.	135-200 lb.	80-90%**
Lamb	5-6 months	80-100 lb.	36-50 lb.	80-90%**

\*Percentage will be smaller if some bones are removed.

\*\*Including the fat pork used for lard.

Animals may be slaughtered\* on the farm if suitable equipment and a clean place are provided. Temperatures ranging from 34° to 40° F. are desirable for quick and thorough cooling after slaughter. This is very important in the case of heavy animals to prevent souring around the bone.

During the summer and hot weather, carcasses should be taken to the cooler immediately after slaughter. In the spring or fall, carcasses may be allowed to cool overnight, then transferred to a cooler. If slaughtered during the winter, the carcass should never be permitted to freeze before it is taken to the locker plant. Such freezing may prevent proper chilling of the meat around the bone, and makes the texture of the meat less desirable. Many locker plants provide slaughtering service at nominal prices with convenient coolers for properly chilling any class of animals.

\*Full information on handling of animal previous to slaughter and how to stun, bleed, scald, skin, split and perform other slaughtering operations can be obtained by writing to Bulletin Office, Michigan State College, Extension Bulletin E-151, "The Home Meat Supply".



Fig. 1. Packaging in preparation for freezing chicken.

weight, date frozen, name and locker number. The use of different colored papers for wrapping, such as brown for pork, white for beef is recommended.

Freezing should be done immediately after wrapping. Good results are obtained when meats are frozen quickly after wrapping, at 10° to 15° below zero F. Storage temperatures should be maintained at 0° F. for satisfactory results. Constant storage temperatures are recommended because fluctuation in temperature results in lower quality meats. Since all fat tends to become rancid in storage, long periods of storage are not recommended. At 0° F., pork can be kept for four to five months; beef, veal, lamb and poultry can be kept for six to twelve months. A constant turn-over of a variety of meats in frozen storage is economically desirable.

## FREEZING POULTRY

Only poultry of high quality should be used because storage does not improve the quality. Use healthy and well-finished birds. Proper killing and bleeding are essential in obtaining the best possible appearance. Dry-pick or "slack scald" (125° to 130° F.—bird immersed 20 to 60 seconds) the birds to remove the feathers. Remove pin feathers and singe to remove hair-like feathers (fil plumbe). Care should be exercised in removing feathers so that skin remains intact. Cool, if possible, overnight at 32° to 34° F. If chilling room is not available, clean immediately and rinse in water at room

## CLEANLINESS ESSENTIAL IN HANDLING MEATS

Strict cleanliness should be observed in all operations involved. *Freezing does not sterilize meat* and, therefore, the meat is only so clean as are the method and utensils employed in slaughtering, cutting, wrapping and otherwise handling. Freezing may kill some bacteria and molds, but tends only to inactivate most bacteria, molds and enzymes normally present on and in meat. Low storage temperatures tend only to slow up or inhibit the action of these organisms. It is, therefore, important to be as clean as possible by sterilizing knives and keeping slaughtering, cutting and storage quarters absolutely clean.

### AGING AND CUTTING THE CARCASS

After chilling the carcass 48 hours at 34° to 40° F., pork and veal should be cut and placed in frozen storage to preserve the natural freshness. Fat beef and lamb or mutton carcasses improve in tenderness by aging from 7 to 10 days. If beef is aged longer than 10 days, all molly or otherwise undesirable external lean and rancid or excess fat should be trimmed before freezing because bad odors taint even the frozen meat.

The charts on the other side of this bulletin illustrate the standard method of cutting beef, pork, and lamb. Definite instructions should be given the butcher concerning the cuts of meat, the weight of roasts and thickness of steaks desired. Ground beef, veal, lamb or pork sausage should be packed firmly to exclude air, then wrapped securely. Sausage and other ground meat may be seasoned before freezing, but should not be salted as salted meat develops a rancid flavor more rapidly than unsalted meat.

### WRAPPING AND STORAGE

Meat must be wrapped well to keep it from drying out during storage. Each package should contain enough meat for one meal. If two pieces of waxed locker paper are put between layers of steaks, chops and similar cuts of meat before they are wrapped together, they may be separated without thawing. The paper in which meat is wrapped for freezing should prevent the loss of moisture and protect the meat from absorbing undesirable flavors and odors. The paper should not crack or become brittle at low temperatures, absorb blood, water or grease, or impart flavor to the meat. Moisture-vapor-proof cellophane used inside a piece of heavier waxed locker paper is very satisfactory. One or more layers of 40-pound paper, waxed on one or both sides, is a satisfactory wrapper. If the paper is waxed on one side, the waxed surface should be placed next to the meat. Other satisfactory papers are now available and new types are being developed. Ordinary brown wrapping paper is not suitable for locker use.

Methods of wrapping vary with individuals, but in all cases enough paper should be used to permit sufficient overlapping of edges and creasing of all folds thereby making the package as air-tight as possible. Close, secure wrapping sometimes called a drug-store wrap helps to exclude air, and makes the package neat and small, thus occupying less space. The neatly-wrapped package should then be made secure with wire staples, gummed tape, wrapping cord or other substantial material.

Identification on each package should include such information as description of meat (rib roast, sirloin steak),

is available, remove immediately and rinse in water at room temperature to remove blood, and wash in ice water.

Under most conditions of storage for home use the halving of the bird, or cutting up in pieces for frying or fricassee is more desirable since less space is required for storage. This simplifies the drawing procedure. Remove the head and neck, oil sac and shanks. Cut from the neck to the rear along the backbone. Remove entrails. The backbone may be removed by cutting along each side if desired. Broilers may be halved by cutting along the keel. Chicken for frying or for fricassee should be disjointed after final washing. Pack giblets in a carton or moisture-vapor-proof paper and freeze separately or place in the container with the pieces of chicken. When packing halves of chicken, one-half is placed skin-down on the table. Two pieces of water-proof paper are placed on the half and the other half placed on top. The paper aids in separating the frozen halves. Wrap and freeze as for other meats.

### FREEZING GAME AND FISH

Freezing is a very satisfactory method of preserving game and fish. Consult your conservation official or your local locker operator for regulations regarding legal periods of storage for game.

The same general methods of preparation for freezing are recommended as for other meats and poultry. Game should be carefully wrapped to prevent dehydration and, also, the tainting of other things in storage.

Fish that is to be frozen should be cooled thoroughly on ice or by some convenient method as soon as possible after catching. Scale, eviscerate, wash and cut just as for cooking. If desired, the cleaned whole fish, fish steaks or fillets may be immersed not longer than 30 seconds in a 10% salt solution, prepared by dissolving 1 pound of salt in 4½ quarts of water. Wrap in packages of suitable size with moisture-vapor-proof paper or pack in a suitable box lined with moisture-vapor-proof paper. Freeze according to directions already given. Fat or oily fish may become rancid, like pork, if kept frozen too long. Time of storage should therefore be less than 4 months. Fish should not be thawed before cooking.

### FREEZING EGGS AND DAIRY PRODUCTS

To freeze whole eggs, break fresh, clean eggs into a bowl and add 1 tablespoon corn sirup or honey, or 1 teaspoon salt, to each 2 cups of liquid eggs. Mix thoroughly, breaking all yolks, but do not whip in air. Package in small moisture-vapor-proof containers. If desired, the whites and yolks may be separated before freezing. Package the whites without mixing or adding anything. To the yolks, add 1 tablespoon corn sirup or honey, or 1 teaspoon salt, to each 2 cups yolks. Beat well with an egg beater, but avoid much foaming, and package. Freeze eggs promptly after packaging, and use as soon as thawed. One tablespoon yolk equals 1 egg yolk, and 1½ tablespoons white equals 1 egg white. One cup holds about 5 eggs.

Butter may be frozen successfully if the cream from which it is made is pasteurized immediately after separation, and if the butter is wrapped in a moisture-vapor-proof package. The home freezing of milk, cream, home-made ice cream, or any kind of cheese including cottage cheese, seems unnecessary because of the rather constant supply. Cream must receive special treatment before it may be frozen successfully.

milk is too bulky for freezing, cheeses often become crumbly after freezing and thawing; and ice cream that is to be held in frozen storage requires a stabilizing agent.

## THAWING AND COOKING FROZEN MEAT

Frozen meats and poultry may be thawed in a refrigerator or at room temperature before cooking. If held in the food compartment of a refrigerator without removing the wrapping, little juice is lost from meat during thawing. A piece of meat weighing 1 to 2 pounds will thaw in a refrigerator in 5 to 12 hours, while a 4-pound roast requires from 24 to 36 hours. Frozen meat held at room temperature requires about two hours per pound of meat for thawing. This time may be reduced about one-half if an electric fan blows on the meat. Unwrapped meat and poultry should not be thawed in water. After thawing, meat should be cooked promptly, since thawed meat spoils more rapidly than fresh meat. Cooking methods are the same for thawed as for fresh meats.

Thin pieces of meat such as chops, steaks and cutlets are often cooked without thawing. Cooking should be slow enough so that the meat cooks evenly. It is difficult to cook large pieces of meat, including roasting chickens, properly if cooking is started while the meat is completely frozen, as the outside of the meat may be well browned while the inside is underdone. Hence, it is better to thaw larger pieces of meat at least partially before cooking. If roasting is started while the meat is still frozen, about 20 minutes *more* per pound should be allowed than for thawed meat, and the oven temperature should be low.

A meat thermometer is a useful guide in cooking fresh, thawed or frozen meat. A hole is made in the meat with a skewer and the thermometer is inserted in such a way that the bulb is in the center of the meat. If roasting is started before the meat has thawed completely, it is easier to insert the thermometer after the meat has been in the oven about an hour. Beef is rare when the thermometer registers 140° F., medium at 160° F and well done at 170° F. Lamb is roasted to an internal temperature of 180° F., fresh pork to 185° F., while veal and smoked pork are roasted to 170° F.



# BEEF CHART

## Retail Cuts



Ground Beef Heel of Round  
—Roast or Braise— Braise or Simmer—



Hind Shank  
Soup or Simmer



Rolled Flank Flank Stew  
Braise Stew



Flank Steak Flank Steak Fillets  
Braise



Plate Boiling Beef Rolled Plate Short Ribs  
—Simmer or Braise—



Beef Brisket Corned Beef  
Simmer



Knuckle Soup Bone Cross Cut Fore Shank  
—Soup or Braise—



English Cut



Arm Pot Roast  
Braise



Arm Steak



Rolled Neck



Boneless Neck  
Braise or Stew

## Wholesale Cuts



## Retail Cuts



Round Steak Top Round Bottom Round (Swiss Steak)  
Braise



Rolled Rump Rump Roast  
Braise or Roast



Sirloin Steak Pin Bone Sirloin Steak  
Braise or Panbroil



Porterhouse Steak T Bone Steak Club Steak  
Braise or Panbroil



Standing Rib Roast Rolled Rib Roast Rib Steak  
Roast Braise



Blade Steak Blade Pot Roast

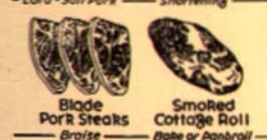
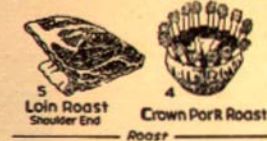


Triangle Pot-Roast Boneless Chuck Pot-Roast Shoulder Fillet  
Braise

Meat Cuts and How to Cook Them

# PORK CHART

## Retail Cuts



## Wholesale Cuts



Bacon Square  
Seasoning - Panbroil

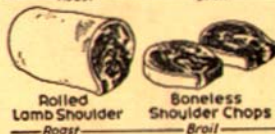
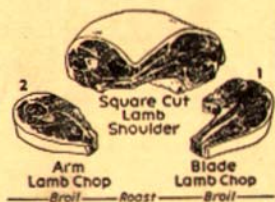
## Retail Cuts



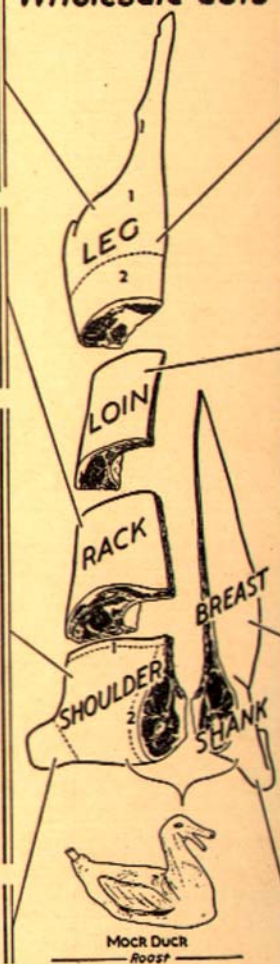


# LAMB CHART

## Retail Cuts



## Wholesale Cuts



## Retail Cuts

