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

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

MICHIGAN STATE COLLEGE :: EXTENSION DIVISION
EAST LANSING

General Directions

The preservation by freezing of fresh meats, poultry and game has increased rapidly in the past two years. The use of freezer locker plants throughout the entire year is a modern application of the age-old method of preserving the fine and nutritious qualities found in freshly-slaughtered meats. 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

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	Per Cent Retail Cuts*
Cattle	1-2 yrs.	600-1000 lb.	300-600 lb.	75-85%
Veal	4-8 wks.	150-200 lb.	80-120 lb.	80-90
Hogs	6-8 mos.	180-250 lb.	135-200 lb.	80-90**
Lambs ...	5-6 mos.	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 36° F. are desirable for quick and thorough cooling after slaughter. This is very important with 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 over night, then transferred to a cooler. If slaughtered during the winter, the carcass should be protected from freezing, to insure proper chilling. 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 Room, Michigan State College, for Extension Bulletin E-151, "The Home Meat Supply."



Fig. 1. Packaging in preparation for freezing chicken.

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 fric-see should be disjointed after final washing.

POULTRY WRAPPING AND LABELING

The giblets (gizzard, liver, heart, and neck) and pieces may be packed in a carton or wrapped in moisture-vapor-proof paper and then placed in a carton if desirable. 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 in moisture-vapor-proof paper before freezing.

Labeling and dating are important. Freezing should be started as soon as packaging is finished. Freezing should be done in similar manner as for other packaged meats. Storage at constant temperature (0° F.) is desirable.

MEAT WRAPPING, IDENTIFICATION AND STORAGE

For frozen storage, meat should be wrapped in meal-size packages and in suitable form for cooking when taken from storage. Definite instructions should be

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. With proper sanitary precautions there is no danger of food poisoning developing from frozen meat of healthy animals. Prolonged keeping of thawed meat, even at low temperatures, is not recommended.

AGING AND CUTTING THE CARCASS

After chilling the carcass 48 hours at the indicated temperature, pork and veal should be cut and placed in storage to preserve the natural freshness. Fat beef and lamb or mutton carcasses seem to improve in tenderness by aging from 7 to 10 days. All fat tends to become rancid when aged. If it is desirable to age beef longer than 10 days, all moldy or otherwise undesirable external lean and rancid or excess fat should be trimmed before freezing because bad odors taint even the frozen meat.

Ground beef, veal, lamb or pork sausage should be firmly packed to exclude air then securely wrapped with the waxed side of the paper against the meat. Sausage should not be seasoned because it may develop a rancid flavor much sooner than unseasoned sausage.

The accompanying charts illustrate the standard method of cutting beef, pork, and lamb.

PREPARATION AND PRESERVATION OF POULTRY

The general considerations pertaining to other meats are applicable to poultry. Only poultry of high quality should be used because storage does not improve the quality. Use healthy and well-finished birds.

KILLING AND PICKING POULTRY

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 (filii plumes). 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, draw immediately and rinse in water at room temperature to remove blood, and wash in ice water.

DRESSING

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

given the butcher as to weight of meats and thickness of steaks desired. Steaks, chops, and similar cuts of meat when wrapped together should be carefully separated with two pieces of a good quality of waxed paper to permit separation without thawing if desirable. Recommended cellophane or 40-pound paper waxed on one side is in common use for wrapping. The waxed paper should be used with the waxed surface next to the meat and the unwaxed surface out which makes identification more convenient. Other wrappers which will prevent dehydration or moisture loss of the meat and protect it from absorbing outside flavors and odors are suitable. It is also important that the paper does not crack or become brittle at low temperatures, absorb blood, water, oil or grease, or impart flavor to the meat enclosed.

In a test of representative wrapping materials at the Michigan Agricultural Experiment Station on pork stored four months at 5° F. the following moisture losses were recorded:

Wrapping Material	% Moisture Loss in 4 Months' Storage
*300 M. A. T. Cellophane.....	0.00%
*40-pound wrapping paper..... (waxed inside only)	0.94%
50-pound brown wrapping paper	4.74%

Methods of wrapping vary with individuals, but in all cases enough paper should be used to permit sufficient over-lapping of edges and creasing of all folds thereby making the package as air-tight as possible. Close, secure wrapping helps to exclude air, 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 material as description of meat, (rib roast, sirloin steak) weight, date frozen, name and locker number. The use of different colored paper for wrapping, such as brown for pork, white for beef, is recommended.

Freezing should be done immediately after wrapping to prevent the meat juices from soaking the wrapper. Good results are obtained when meats are quick-frozen 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. All fat tends to become rancid in storage, therefore, long periods of storage are not recommended. At the above-mentioned storage temperature, 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.

*Recommended wrapping materials.

FROZEN PRESERVATION OF GAME AND FISH

This method of storage is recommended for game and fish since there is less wastage than by any other method of fresh preservation. 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, also tainting of other items, in storage.

Fish that are to be frozen should be thoroughly cooled on ice or by some convenient method as soon as possible after catching. Scale, eviscerate, wash and cut, just as one would do before cooking. Immerse the cleaned whole fish, fish steaks or fillets 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 above-mentioned directions. Fat or oily fish may become rancid, like pork, if kept frozen too long. Time of storage should therefore be similar to pork.

THAWING AND COOKING FROZEN MEAT

All meat should be cooked soon after it is thoroughly thawed since thawed meat spoils more rapidly than fresh meat. Proper use of home refrigerators and the freezing compartment makes possible storage of a week's supply of meat. Slow thawing of meat at refrigerator temperature is recommended because there is less drip or loss of juice. Small pieces of meat less than 2 pounds in weight require as much as 10 hours to thaw completely while a 4-pound roast requires up to 36 hours, and larger pieces correspondingly longer.

If home refrigeration is not available, pieces of meat can be kept frozen for several hours by wrapping in several thicknesses of paper or placing in a well insulated container.

Meat may be thawed before cooking, or cooking may be started while the meat is still frozen. For thawing, meat should be placed on a rack in a pan, and held at room temperature or in a refrigerator until thawed, after which it should be cooked immediately. Meat should never be immersed in water for thawing. If cooking is to be started while the meat is frozen, a low cooking temperature should be used, and sufficient time should be allowed for both thawing and cooking. Approximately 20 minutes **more** per pound is required to roast meat, which is still frozen, than for thawed meat. However, in order to avoid confusion for persons accustomed to cooking fresh meats, it is recommended that all meats, especially poultry, be thawed thoroughly before cooking. The same cooking methods can then be used for the various types of thawed meats as for fresh meats and poultry as the cooking times per pound are approximately the same. Special care should be taken always to cook pork until it is well done.

BEEF CHART

Retail Cuts



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



Hind Shank — Soup or Simmer



Rolled Flank — Braise — Flank Stew — Stew



Flank Steak — Braise — Flank Steak Fillets



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



Beef Brisket — Simmer — Corned Beef



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



English Cut

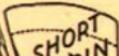
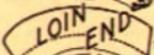


Arm Pot Roast — Braise



Arm Steak

Wholesale Cuts



Retail Cuts



Round Steak — Braise — Top Round — Bottom Round (Swiss Steak)



Rolled Rump — Braise or Roast — Rump Roast



Sirloin Steak — Broil or Panbroil — Pin Bone Sirloin Steak



Porterhouse Steak — Broil or Panbroil — T Bone Steak — Club Steak



Standing Rib Roast — Roast — Rolled Rib Roast — Rib Steak — Broil



Blade Steak — Blade Pot Roast



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



Rolled Neck — Braise or Stew



Boneless Neck

Meat Cuts and How to Cook Them

PORK CHART

Retail Cuts

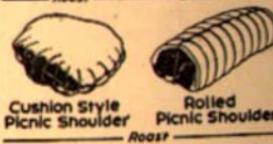


Wholesale Cuts



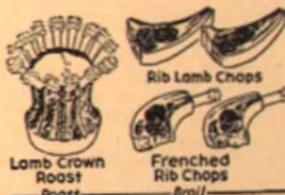
Bacon Square — Seasoning - Panbroil —

Retail Cuts

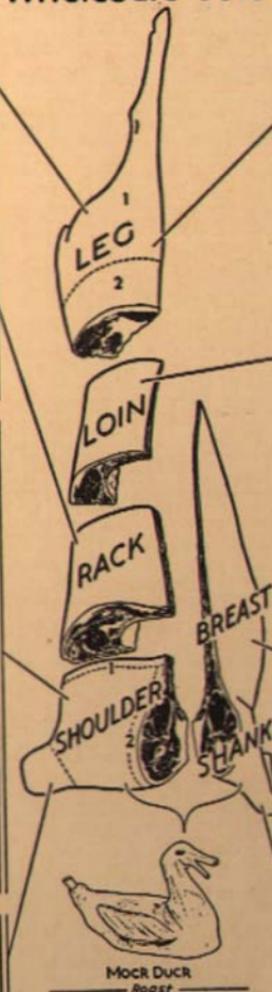


LAMB CHART

Retail Cuts



Wholesale Cuts



Retail Cuts

