

Home Freezing Meat And Poultry

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Freezing Meat

MEAT is one of the most universally-liked foods. Research has proved that meat provides many of the food nutrients essential to good health. Because it is such an outstanding food, meat occupies an important place in the family food budget.

The use of zero storage has increased the variety and quality of meat served in many homes, and has helped to hold down family food costs. To obtain a quality product, however, the locker patron or home freezer owner must be extra careful in the handling and processing of meat to be stored at 0° F.

Selection

Careful selection of healthy, good quality animals of adequate finish is the first step to successful preservation by freezing. Regardless of whether the animals are slaughtered at a community center or at home, there are two important precautions that must be taken to insure good keeping quality: (1) proper sanitation, and (2) immediate thorough chilling of the carcass below 40° F. Pork and veal are ready to be cut and packaged after a 30-hour chill. Beef and lamb, however, should be aged to obtain a more highly flavored and tender meat.

Rapid Chilling

In order to minimize the danger of off-odors and flavors in meat, the carcass should be chilled thoroughly for 24 to 36 hours after slaughtering. Improper chilling or delayed chilling are often the cause of much meat spoilage. Rapid chilling retards the activity of both bacteria and enzymes. A chilled carcass will cut more easily and yield more attractive cuts.

Aging or Ripening

Quality beef and lamb are improved by aging and should be allowed to age at a chill room temperature of 33° to 38° F. for 7 to 14 days. The length of the aging period will depend upon the amount of fat covering. Low-grade beef should not be ripened more than 5 to 6 days. Prime and choice beef can be aged 10 to 14 days, or longer if desired.

Aging increases the tenderness and develops the flavor. When beef is aged too long, however, the outside fat cover becomes discolored and rancid, and requires excessive trimming. Beef that has been aged for long periods will not keep as long at 0° F. as fresh beef. The following table gives the recommended periods of aging:

Beef—Choice grade	14 days
Good and Commercial	7 days
Lamb—Choice and good	7 days
Pork	1 to 2 days
Veal	2 to 3 days
Poultry	1 day

Cutting and Boning

Meat that is being processed for 0° F. storage should be cut and packaged to suit the size of the family. Research has indicated that bone adds neither flavor nor tenderness to the finished product. Remove as much of the bone as possible to conserve valuable storage space and to facilitate packaging.

Partial boning of the meat cuts will save 25 to 30 percent on storage space. In addition, there is less dehydration and rancidity development in the boned cuts because of tighter packaging. When bone is not removed, the wrapper is often punctured or air pockets are left because of the irregularity of the cut.

In the case of rib roasts, pork chops, and steaks, trim off the back bone or any sharp rib bones. Bone out the less desirable cuts such as brisket, plate, flank, and shank, and either cube for stewing or grind. Boned cuts can be sliced and served easily. The bones that are removed can be used for making soup stock and the soup stock frozen. Locker space also can be saved by trimming off excess fat before wrapping.



Boneless cuts of meat require less storage space and can be easily sliced.

Wrapping Materials

Many kinds of wrapping materials are available. Just any wrapping material, however, is not suitable for preserving foods in zero storage. It is poor economy to use inferior wrapping materials for freezing meats.

Foils, synthetic films, and laminated wrappers are among the best packaging materials available. The cost of these wrappers is little more than that of the inferior packaging materials. The better wrapping materials should be used to prevent drying out or freezer burn, and to preserve the natural color, flavor, and nutritive value of the meat. The only foil recommended for freezing at the present time is aluminum. The aluminum foil on household rolls is too thin and is not recommended for freezing. Use only the .0015 gauge to package food for freezing. There are many laminated papers on the market and most of them give adequate protection.

A satisfactory wrapping material should meet the following requirements:

1. Moisture-vapor-proof
2. Odorless and flavorless
3. Grease-proof
4. Attractive
5. Clean and sanitary
6. Prevent loss of moisture
7. Prevent oxidation

A good packaging material is of little value unless it is properly applied. The one important step in wrapping meat is to mold the wrapper against the meat to exclude air pockets. A wrapper that is held close to the meat gives the most adequate protection.

Laminates

These wrappers are constructed of two sheets of material cemented to one another. The inner sheet is moisture-vapor-proof and protects the meat while the outer sheet provides mechanical protection. Such wrappers are easy to apply and will protect the meat for the recommended storage period.

Films

Many different kinds of films are available for packaging, the most common being cellophane. Use only the type recommended for freezing. A good substitute for cellophane is Pliofilm 80 FM-1. The newer polyethylene film is also a good substitute for cellophane. It has greater strength and elasticity, but is not as transparent as cellophane.

Wax Paper

Other wrapping materials are made of Kraft paper to which a coat of wax has been added. Wax impregnated or coated papers will give protection to the meat for three to four months.

Wrap chops or steaks in a flat rectangular package so they can be separated easily while still frozen. When several cuts are placed together



Tear off the amount of wrapper needed for each individual cut. Place the meat near the center of the paper.



Bring the two ends together and crease to insure a tight fit.



Fold the ends together until the wrapper is drawn up tight against the meat.



Fold the ends in tight to eliminate air pockets. Creasing each fold assures a better seal.



Fold the opposite end and bring both triangular ends together on the under side of the package.

Place cellophane or locker paper between steaks or chops so they will come apart easily when you take them out of storage. Place the waxed or glazed side of the wrapper toward the meat.



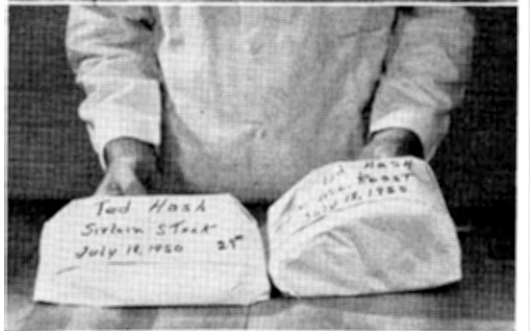
Fold the edges of the wrapper together and crease to make a seal. The folded edge will draw the paper against the meat.



Fold the end of the wrapper together to form a triangle. Crease each fold to assure a good seal and force out air. Turn the free end under and tape or tie.



Fold the opposite end and tape or tie in place. Mark each package clearly.



in one package, they should be separated with a small piece of cellophane or a piece of wrapping material to facilitate their removal without complete thawing of the entire package.

Ground meats should be wrapped into a pan-shaped loaf. Wrap tightly to force air out of the package. Ground or sliced meats do not keep as long in zero storage as roasts, so it is important that they be wrapped thoroughly. Ground meat that is made into patties before freezing will be convenient for the cook, but the storage period will be reduced because meat packaged this way will have many air pockets.

Properly packaged meat should be quick frozen at 0° F. or lower. Avoid slow freezing for it causes loss of meat juices when the meat is thawed and lowers the quality of the meat. It is not advisable to freeze more than 5 per cent of the capacity of the home storage unit at one time. For example, a 12 cu. ft. home storage unit that has a capacity of 450 pounds will furnish freezing space for 15 to 20 pounds of meat at one time.

A large quantity of warm meat, placed in a home cabinet for freezing, will cause the cabinet temperature to rise above normal. Freezing will be too slow to insure high quality. Furthermore, a large quantity of warm meat will raise the temperature of the stored food, endangering its quality. Meat that is frozen in the home-type cabinet should be placed in contact with the freezing walls. Packages should not be piled on top of each other during freezing, unless each package touches a side wall of the freezer. Take large amounts of meat to be frozen to a central freezing plant.

Meat should be stored at 0° F. or lower. Temperatures above 0° F. as well as fluctuating temperatures cause considerable loss of moisture and food nutrients.

Meat that is preserved by freezing should be marked plainly with the owner's name, kind of meat, weight, and the date of freezing.

Ground meat should be packaged in a loaf to assure maximum contact between the meat and the wrapper.



Length of Storage

Meat should not be stored too long. The following are the maximum recommended storage periods for properly wrapped meats:

Beef and Veal	9 to 12 months
Lamb	9 to 12 months
Chicken and Turkey	9 to 12 months
Venison	9 to 12 months
Fresh Pork	6 to 9 months
Rabbit	6 to 9 months
Squirrel	6 to 9 months
Sausage (Seasoned)	4 to 6 months
Ground Meat	4 to 6 months
Cured Ham and Bacon	6 to 9 months
Cured Ham & Bacon (Sliced)	3 to 4 months

Freezing Poultry

BIRDS should be starved overnight or about 12 hours before killing. Provide plenty of water to help empty the intestines. Holding birds off feed is important from both the standpoint of appearance and keeping quality in zero storage. Birds that have empty crops when killed can be drawn more easily.

Killing is usually done by the ax and chopping block method or by cutting the head off with a knife. This method should be avoided, however, because the struggling of the birds causes bruises and poor bleeding. A better method of slaughtering is the sticking method. Hang the bird head down by placing the feet in a wire shackle or a loop of cord. Grasp the head firmly and insert a small sticking knife into the mouth cutting the arteries at the junction of the head and neck. Push the knife back into the lower part of the brain and twist. A blood cup hung on the beak or a trough will catch the blood.

Newer methods of killing are also being used, although they require special equipment, such as the use of an electrically charged knife or stunning device. These methods of slaughtering are most satisfactory because they allow thorough bleeding and prevent broken wings.

Picking

There are four generally recognized methods of picking poultry—dry picking, scald picking, sub-scald picking, and wax picking.

Sub-scald is generally practiced because dry picking usually requires more time and skill. For sub-scalding, the bird is immersed in water at 140° F. for approximately 30 seconds. Picking is usually done by hand or by the use of a picking machine. When more speed is desired a higher scalding temperature should be used. Hard scalding, however, removes the bloom and gives a less pleasing appearance.

Chilling

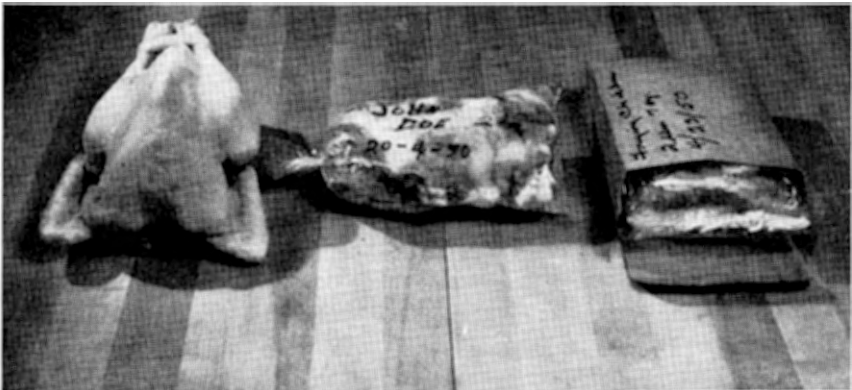
The dressed carcass should be drawn before cooling in order to minimize the danger of off-odors and flavors in the meat. The carcass should be chilled immediately after drawing. Chilling can be accomplished by placing the warm carcass in a commercial chill room, or in a refrigerator if only a few are being dressed. The chilling temperature should be 36° to 38° F., and it will take approximately 10 to 12 hours to chill the carcass completely.

When the dressed carcass is allowed to remain in a cooler for a longer period, the skin becomes dry giving the carcass a dark, unattractive appearance. If adequate refrigeration or cooling space is not available, the carcasses can be chilled by using ice or ice water. Poultry meat allowed to remain in ice water overnight, however, will lose color and food nutrients because of the loss of meat juices.

Preparation for Packaging

Poultry meat should be packaged and frozen in quantities to fit the needs of the family. Cut-up-chicken takes less freezer space than whole carcasses and can be wrapped in a space-saving package. Broilers and fryers can be left whole or cut in half for freezing. A carcass that has been disjointed and packaged into family-size servings requires one-third less storage space than a whole carcass. You may want to freeze only the choice meaty parts and use the bony fresh wings and ribs. A chicken that is cut up before packaging allows maximum contact between the wrapper and meat, thus permitting a longer storage period.

Roasters that are to be stored in the freezer should first be drawn, then packaged whole. In many cases, it may be desirable to freeze halves or even quarters of large birds to fit family needs. Turkeys are generally



Three methods of packaging chicken for freezing. Note the absence of air pockets where the whole carcass has been coated with a wax compound. An irregular shaped package requires more storage space.

frozen whole. A large turkey, however, can be cut in half or quartered in order to avoid having to use the entire carcass at one time. A young turkey can be cut up much the same as suggested for a broiler.

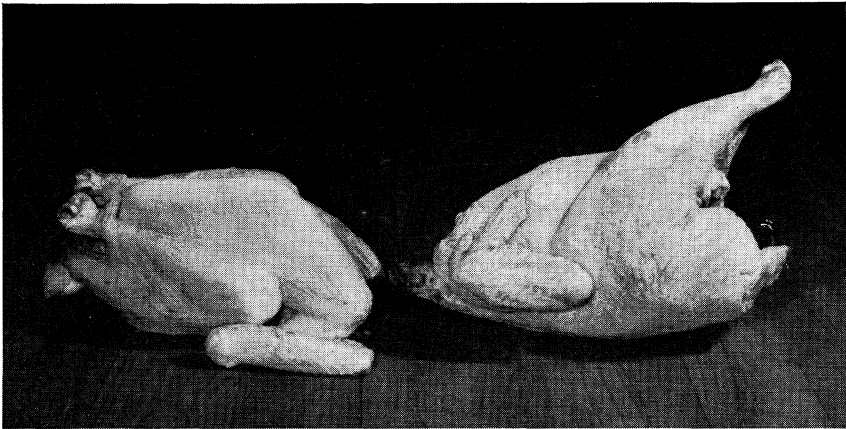
Cooked turkey that has been left over from a large Thanksgiving or Christmas dinner can be wrapped and placed in the freezer for later use. For home storage remove the wings from the carcass and package separately. This will allow the remainder of the carcass to be wrapped more compactly.

Packaging

Poultry meat is very susceptible to freezer burn, or drying out, when held in zero storage. So it must be well protected. Freezer burn is the name applied to the whitened areas surrounding the follicles left by the removal of the feathers and is the result of moisture loss. Freezer burn begins to show up in these areas first because of the exposed tender areas of the skin. When excessive drying out occurs, the whitened areas spread out over large parts of the carcass causing an unsightly appearance. Moderate to slight freezer burn may occur even on well-packaged carcasses. A small amount of freezer burn, however, does not impair the flavor to any great extent and will disappear during cooking. Off-flavors frequently accompany excessive freezer burn.

Preventing rancidity in frozen poultry is another important function of good wrapping material. Poultry fat is oily and becomes rancid easily in the presence of oxygen. A wrapper that will cling close to the carcass and eliminate air pockets is best.

Many types of containers and wrapping materials are available for the processing of poultry for zero storage. Only certain wrappers, however, are suitable for whole birds. Always use a wrapper that is moisture-vapor-proof.



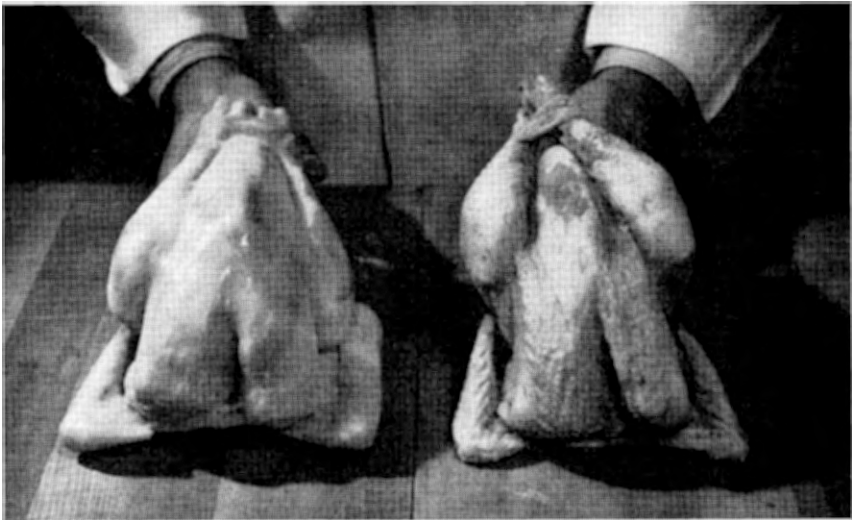
The chicken on the right shows the effects of poor packaging. Note the large areas of freezer burn (the whitish-looking areas). The chicken on the left has been properly prepared for freezing.

The care with which the wrapping material is applied to the carcass is perhaps more important than the selection of a wrapper. A poorly applied wrapper will not afford adequate protection for the meat. Observation indicates that maximum contact between the wrapper and meat provides the greatest retention of quality over a long storage period.

When wrapping a whole carcass, truss the legs and wings close to the body to make packaging easier. The giblets and neck should be wrapped separately and placed under the wings. Do not put the giblets inside the body cavity, because complete thawing of the carcass will be necessary before the giblets can be removed for the preparation of the stuffing. Also, the giblets do not store as well as the fleshy part of the carcass and often cause a flavor change.

Glazing

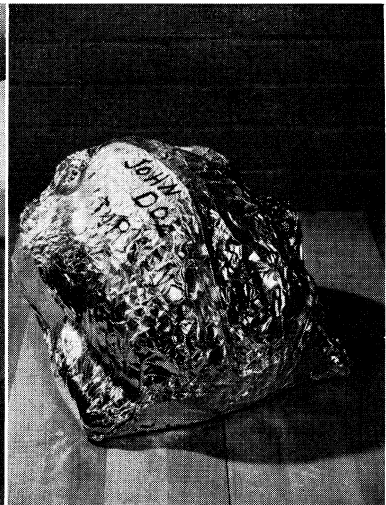
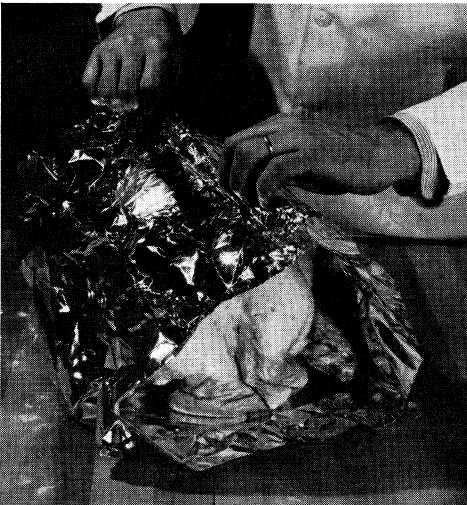
Glazing poultry and fish is a common method of packaging, but this protection is inadequate for long storage periods. First, freeze the carcass unwrapped, and then dip in water that is near-freezing. Let the ice film freeze and dip again. Two or three dippings in cold water will form a tight protective coating on the carcass. This ice coat will afford adequate protection for a period of two to three months. Glazed poultry should be checked from time to time and the ice renewed when necessary. If the glazed carcass is overwrapped with a piece of butcher paper it can be left in storage for a longer period. The outside wrapper protects the ice from being chipped off and slows down evaporation.



The bird on the left has been coated with a wax compound that will provide good protection during storage. Dipping should be done after the carcass has been frozen.



Select only enough wrapper to adequately cover the bird. Giblets should be packaged separately and placed in the pocket made by the wings and thigh. Truss the wings and legs to make wrapping easier.



Fold the opposite edges of the wrapper together over the bird and crease and fold to make a seal. Crease the ends toward the center, then mold the ends close to the bird to form a tight seal. The bird, ready for storage, is on the right.

A more permanent method of coating a whole turkey or roasting hen is with a new synthetic wax compound. This wax compound works well for home packaging. To wax coat a fowl, first quick-freeze it without a wrapper. After freezing dip it into the wax compound which has been preheated to 150° F. One dipping of about 3 to 4 seconds will leave approximately 1/8 inch coating of wax on the carcass. Plug the vent cavity of the carcass with a wad of clean locker paper to prevent the compound from coating the inside. Inside coating is not necessary and tends to increase the cost of wrapping.

When the coated chicken or turkey is removed from the storage unit it should be allowed to thaw. It takes only partial thawing for the wax to become a loose shell around the bird. Cut the compound with a knife and it will peel off easily.

Cooking Frozen Meats

FROM the standpoint of economy it is best to thaw frozen meat before cooking. If thawed in the refrigerator the roast may have some influence in maintaining the cold temperature. This reduces the amount of electricity used. A frozen 5-pound rolled rib roast will require approximately 5 2/3 hours roasting time at 300°-350° F. The same cut thawed will require only 2-3 hours cooking time. Small cuts, such as chops and steaks if cut 1 1/2 inches thick or thicker are quite satisfactorily broiled or pan fried without thawing. Some authorities report a juicier broiled steak is obtained when it is cooked while frozen.

Allow 8-12 hours per pound for a roast to thaw in the refrigerator. The size, shape of cut, and thickness of the roast will influence the time of thawing. At room temperature (70°-75° F.) allow 2 hours per pound for thawing a roast. Bone in the meat decreases the thawing time of the meat. Leave the meat in the packaging material when thawing to keep out air and to catch the drip. It is best to thaw in the refrigerator or at room temperature, never under water.

METHODS OF COOKING FROZEN MEAT

Broiling

Tender cuts of beef and lamb can be broiled in a gas or electric broiler or in a heavy pan on top of the stove. Meat for broiling should be cut thick; steaks from 1 to 2 inches and lamb chops at least 3/4 inch thick. Pre-heat broiler pan and lightly rub with fat. Place the pan under the broiler in such a way that a 2-inch-thick steak or chop is 4 to 5 inches from the source of heat; place 1-inch-thick meat 3 inches from the source of heat.

Salt and turn the meat when half the approximate broiling time is up. When second side is browned, salt and remove meat to a hot platter.

To pan broil pre-heat a heavy frying pan and rub lightly with fat. Place meat in the hot pan. Do not add fat or water. Brown both sides at high heat. Then reduce the temperature and continue cooking until as done as desired. Pour off any fat that accumulates.



These loin lamb chops are perfect for broiling. Tender cuts of beef and lamb can be broiled with great success.

Oven Roasting

Good grade beef roasts and all pork and lamb roast cuts are suitable for oven roasting. Meat should be at least 5 inches thick to prevent excess moisture loss.

Place meat, fat side up, on a rack in a shallow pan. Rub with salt and pepper. Pour any juices from thawing over it. If available, place a meat thermometer so the bulb is centered in the thickest muscle of the meat. Be sure that it does not touch bone or fat. *Do not* add water or cover the pan. Check the temperature table for roasting. There is no need to sear the meat before roasting or to baste while roasting when this method is used. Most thermometers give the readings for the various kinds of meat and degree of doneness. If a thermometer is not used follow the table on page 19 for approximate roasting time.

Internal temperature of meat at stages of doneness:

Beef, raw	140° F.
medium	160° F.
well-done	170° F.
Lamb, medium	175° F.
well-done	180° F.
Veal or pork, well done	185° F.

Pot-Roasting or Braising

(For less tender cuts of beef and lamb, pork and veal chops.)

Season meat and rub with flour. Brown it on all sides in a heavy pan. Add a small amount of water or vegetable juices. Cover pan tightly and cook over low heat. Add more water when needed. Keep the water just simmering.

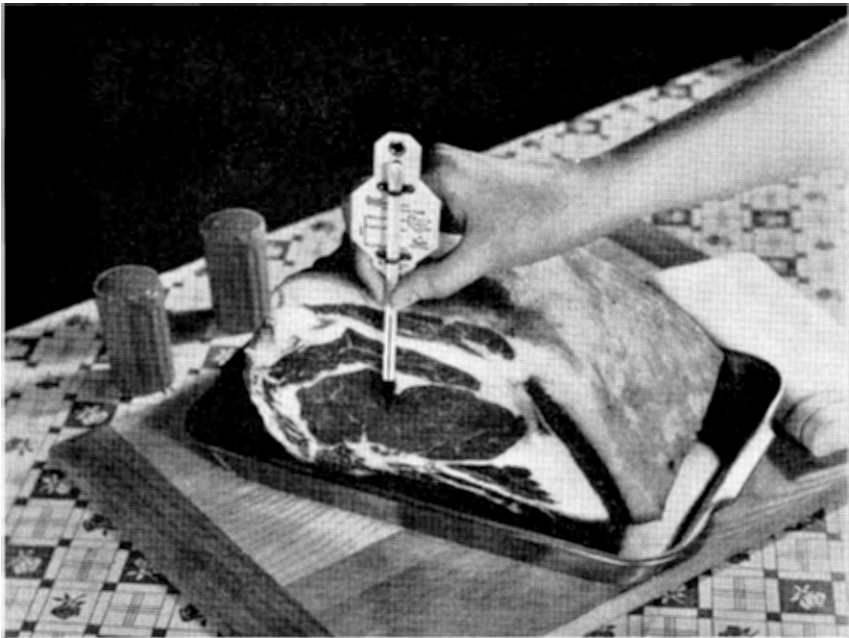
Stewing

(For least tender cuts of meat.)

Cut meat into cubes. Brown after dredging in flour. Barely cover it with water and let it *simmer* in a heavy, tightly-covered pan until tender. Add vegetables just long enough before serving to insure them being done, not over cooked.

Cooking Frozen Chicken

Thaw frozen chicken over-night in the refrigerator or 5-6 hours at room temperatures. Frying chicken will thaw more quickly if pieces can be separated.



Insert thermometer so that the bulb is in the center of the largest muscle and not touching any bone or fat.



A space-saving rolled rib roast, thawed, and ready for oven roasting.

Frying Chicken

1. For each pound of chicken, blend $\frac{1}{4}$ cup flour, $\frac{3}{4}$ teaspoon salt, and $\frac{1}{8}$ teaspoon pepper in a paper bag. Shake chicken, 2 or 3 pieces at a time, in a bag to coat evenly. Save leftover flour for gravy.
2. Heat $\frac{1}{2}$ inch of cooking fat in a skillet until a drop of water just sizzles.
3. Start browning meaty pieces first, slipping less meaty pieces in between as chicken browns.
4. Turn as necessary with kitchen tongs or two spoons to brown and cook evenly.
5. When chicken is uniformly browned (15 to 20 minutes), reduce heat, cover tightly, and cook slowly until tender (20 to 40 minutes), depending on size and thickness of pieces. The heart, gizzard, and neck which have been precooked for 25 minutes—and the liver may be floured and browned with chicken the last 15 minutes.

6. If the pan cannot be covered tightly, add 1 to 2 tablespoons water.
7. Uncover last 5 to 10 minutes to re crisp skin.
8. Test for doneness: The chicken is done when meat on the thickest part of the drumstick cuts easily and there is no pink color visible.
9. Lift chicken to a warm platter. Prepare gravy in pan drippings.

Roasting hens will require 8-12 hours to thaw in the refrigerator, depending on size and whether or not they have been stuffed before freezing.

Roasting Chicken or Other Fowl

1. Place fowl, breast down, on a rack that is at least $\frac{1}{2}$ inch high in a shallow open pan.
2. Cover top of fowl with fat-moistened thin cloth. Do not wrap bird in cloth.
3. Roast at 325°-350° F.
4. Do not SEAR. DO NOT ADD WATER. DO NOT COVER.
5. If cloth dries during cooking, moisten cloth with fat from bottom of pan.
6. Turn fowl breast up when about $\frac{3}{4}$ done. Roast until tender.
7. Test for doneness: Move legs by grasping end of the bone. The drumstick-thigh joint breaks or moves easily. Or, drumstick meat is very soft when pressed between fingers. Do not pierce meat with fork.

Stuffing

Fowl may be stuffed before freezing or when completely thawed.

1. Rub cavity of bird with $\frac{1}{2}$ to 1 teaspoon salt.
2. Stuff body and wishbone cavity lightly.
3. Close by placing skewers across the body opening and lacing shut with cord.
4. Tie drumsticks together, then tie securely to tail.
5. Fasten neck skin to back with skewer. Shape wings "akimbo" style; bring tips onto back.
6. Brush skin with melted fat. Poultry seasoning may be sprinkled over surface.

Time Table for Roasting Chicken

Dressed Weight	Ready-to-Cook Weight	Oven Temperature	Approximate Roasting Time
2 to 3½ lbs.	1½ to 2½ lbs.	350°F.	1¼ to 2 hours
3½ to 4½ lbs.	2½ to 3½ lbs.	350°F.	2 to 3 hours
4½ to 6 lbs.	3½ to 4¾ lbs.	325°F.	3 to 3½ hours
6 lbs. and up	4¾ lbs. and up	325°F.	3½ to 4 hours

TIME TABLE FOR ROASTING MEATS

Cut	Method of Cooking	Degree of doneness	Thawed before cooking	Started to cook in frozen state
			Approximate time (minutes per pound)	Approximate time (minutes per pound)
Standing-rib roast	Roasting at 300°F.	Rare	18	43
		Medium	22	47
		Well-done	30	55
Rolled-rib roast	Roasting at 300°F.	Rare	28	53
		Medium	32	56
		Well-done	40	65
Pork-loin roast Center cut	Roasting at 350°F.	Well-done	30 to 35	50 to 55
			50 to 55	70 to 75
Rib or shoulder ends				
Leg of lamb	Roasting at 300°F.	Well-done	30 to 35	40 to 45
Beef rump	Braising	Well-done	30 to 35	50
Porterhouse steak				
1 inch thick	Broiling	Rare	8 to 10	21 to 33
1½ inches thick		to	10 to 15	23 to 38
2 inches thick		Medium	20 to 30	33 to 43
Beef patties				
1 inch thick	Pan-broiling	Medium	10 to 12	16 to 18
Sausage patties	Pan-broiling	Well-done	15 to 25	22 to 28

This table is merely a guide. The length of cooking depends on the proportion of fat and bone present, the shape, weight, and temperature of the meat, as well as on the temperature of cooking. Using a meat thermometer is the best method to determine doneness. The meat roasting thermometer takes the guess work from roasting. It soon pays for itself in terms of fuel and meat saved from over-cooking.

COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS

**COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS, WEST VIRGINIA UNIVERSITY
AND THE UNITED STATES DEPARTMENT OF AGRICULTURE, COOPERATING**

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