

**COOPERATIVE EXTENSION WORK
IN
AGRICULTURE AND HOME ECONOMICS
STATE OF OKLAHOMA**

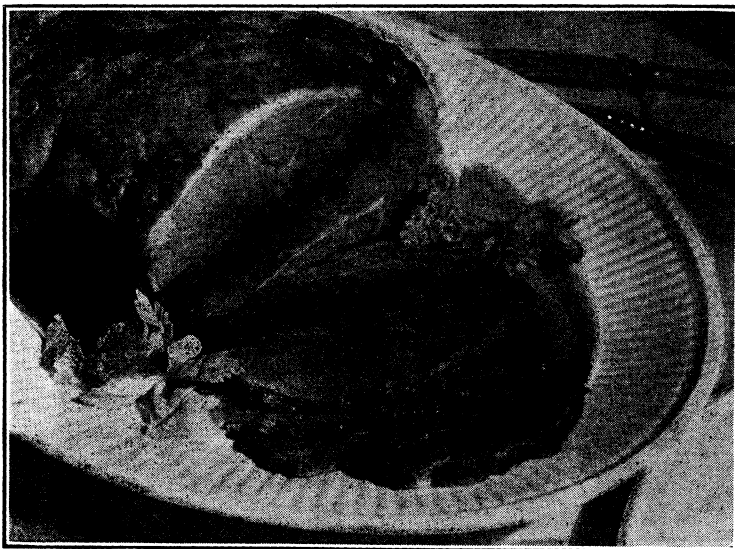
D. P. TRENT, Director

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Meat and Its Preparation



(Courtesy U. S. Bureau Home Economics)

By
MARTHA McPHEETERS
Food-Nutrition Specialist

MEAT AND ITS PREPARATION

Meat, when used in moderation, is a very valuable food. The term "meat" as used in this circular includes all flesh foods.

Place of Meat in the Diet

All meats are enough alike in composition and require the same fundamental principles of cookery, so may be spoken of as a single food material.

Meats in general are about 20 per cent protein, 1 per cent mineral and very little, or no carbohydrates. The remainder is fat and water which varies with the species and condition of the animal. The average water content is about 70 per cent. In addition to these elements they contain vitamins.

Some of Vitamins A, B, and G are present in muscle tissues, but such glandular organs as liver, kidneys and heart are much better sources of these vitamins. Muscle tissue contains little or no Vitamin D. Most animal fats contain some of Vitamin A and many fish oils are a good source of it. Fish oils are also an outstanding source of Vitamin D. The cooking of meat renders it a negligible source of Vitamin C.

The proteins of meat are complete proteins and well adapted to body building. Meat is also a good source of iron and phosphorus.

One serving of meat (about four or five ounces) a day is considered a moderate use of meat. An average serving of lean meat furnishes approximately one-third of the daily protein. The other two-thirds should be secured from milk, cheese, eggs, legumes and cereals.

All meats are quite completely digested, regardless of how they are cooked. The length of time that meat remains in the stomach depends largely upon the fat content.

Factors Influencing Palatability

Meat is a food that may be very palatable or very displeasing both to the eye and taste. Some of the factors which have much to do with its palatability are:

1. **Tenderness.** The tenderness of uncoked meat depends upon the kind and amount of connective tissue which it contains, the distribution of fat, its texture and degree of ripeness. The kind and amount of connective tissue varies with the age, activity, sex and species of the animal. For example, pork has less connective tissue than beef. Fish have very little connective tissue. Capons and steers are more tender than roosters and older males.

2. **Fat.** Meat that is well marbled (marked) with fat is more tender than it would be if the fat were absent. It indicates good conditioning of animal for meat purposes.

3. **Texture.** Texture has to do with the fineness or coarseness of the bundles of muscle fibers and the distribution of fat. Young females have finer textured flesh than older animals and males.

4. **Degree of Ripeness.** Meat undergoes several changes after it is killed. It is first soft and flabby, then becomes firm and rigid. This stage of rigidity is called rigor mortis. In a few days the meat again becomes soft and more tender. Meat will be found to be more tender for eating at this stage of change than while in a state of rigor.

5. **Flavor.** The flavor of meat is due to its extractive and its fat. Species, age, exercise and ripeness are also factors in influencing the quantity of its extractives.

The flesh of birds is high in extractives and the flesh of pork and mutton are low in extractives. The flavor of pork and mutton is found largely in their fat. Beef is high in extractives and the fat is also high in flavor. The flesh of older animals is more highly flavored than that of younger animals. Likewise, the flavor of the highly exercised muscles and animals is greater than of those receiving less exercise. As meat ripens, the extractives increase, giving more pronounced flavor.

6. **Color.** Again age, species and exercise have much to do with color. The method of killing many times effect color, due to improper bleeding. Old meat is darker in color than young meat. The greater the exercise, the darker red is the meat. Beef is darker than pork.

The color of the fat may vary from white to deep yellow. Feeding and age have much to do with the color of fat.

7. **Cooking.** The cooking of meat has much to do with its palatability.

Principles of Cookery

Meat is classified as a protein food. The muscle fiber proteins are coagulated by heat. This coagulation starts at as low a temperature as 126°F. A temperature of 158°F. to 167°F. will toughen the coagulated protein. These temperatures indicate that meats should be cooked at a low temperature. A temperature of 176°F. to 180°F. which we often speak of as simmering temperature is considered the best temperature for the cooking of all meats and all cuts. The lower the temperature, the longer the cooking period. There are three stages of doneness:

	Degrees F.	Degrees C.
Rare	130-150	54-65
Medium	150-160	66-71
Well Done	180	82

The degree of doneness to which meat is cooked is a matter of personal preference. Pork, however, is the one meat that should be cooked to the done stage in order to make a safe food should it contain trichina. Some other meats such as chicken, veal and mutton are usually preferred well done by most people.

Recent research tells us that roasts containing bone or metal scewers require less time for cooking due to the fact that they are conductors of heat. Also, roasts containing much fat require a longer cooking period because fat is a poor conductor of heat.

Furthermore, that the only value in searing is that it improves the outside appearance and outside flavor and develops aroma, and that it may firm the meat somewhat for slicing. Other than this it seems to have no value and is believed by some to increase losses in cooking. The searing should be done quickly and at a high temperature for good results.

The time at which salting is done does not seem to make as much difference as we once thought it did. Neither does it seem to make much difference whether meat is basted during the cooking period or whether it is cooked covered or uncovered.

Tender cuts may be cooked without the addition of moisture or fat. Broiling and roasting are best suited for the tender cuts.

The tougher cuts, used in roasts and stews, cook more readily and are more palatable with the addition of water and possibly some fat.

Classification of Cuts

(Tender Cuts)

Steaks
Sirloin
Porterhouse
Tenderloin
Club
Rib (short cut)

Roasts
Rib
Loin

(Less Tender Cuts)

Steaks
Chuck
Shoulder
Flank
Round
Rump

Roasts
Chuck ribs
Cross Arm
Clod
Round
Rump

Stews
Neck
Plate and brisket
Flank
Shank
Heel of Round

The subject matter content of the above paragraphs are in accord with a resume of the subject by Marion DeYoe Sweetman, Prof. of Home Economics, University of Maine, and the Bureau of Home Economics, U. S. Department of Agriculture.

Broiled Steak

Select one of the tender steaks from 1½ to 2 inches thick. Trim the steak of excess fat and wipe it off with a damp cloth. A steak may be broiled by direct heat or it may be pan-broiled in a skillet. To broil by direct heat, grease the rounds of a rack, lay the steak on it, and place over live coals, or under an electric grill, or the flame of a gas oven.

If a gas oven is used, have the steak 2 or 3 inches below the flame. Best results are usually obtained by leaving the door open. Sear on one side and then turn, being careful not to pierce the brown crust. When both sides are seared, reduce the heat, and turn the steak occasionally until cooked to the desired stage.

To pan-broil a steak, sear it on both sides in a lightly greased, sizzling hot skillet, then reduce the temperature and cook to the desired stage, turning the meat to insure even cooking. Do not add water and do not cover. From time to time pour off accumulated fat so that the steak will not fry. A thick steak after searing may be successfully finished in a hot oven (450°F.). Slip a rack under the steak in the skillet, and the meat will cook evenly without being turned. This is a convenient arrangement, for full attention may then be given to other last-minute preparations for the meal.

Place the steak when done on a hot platter and season with salt, pepper, and melted butter. Garnish with parsley and serve at once.

No definite time can be given for cooking a steak because of varying thickness, degree of heat applied, and personal preference. A steak 1½ to 2 inches thick will probably require 20 to 25 minutes to cook medium rare under the flame of a gas oven.

These same principles of broiling and pan broiling may be applied to all broiled meats.

Rib Roast of Beef

Select a two or three rib standing roast. Wipe it off with a damp cloth, rub with salt, pepper, and flour. Place the roast fat side up in an open pan without water. As the fat melts and cooks out it will baste the meat. Make

a small incision. ~~Through~~ through the fat covering and insert a meat thermometer so that the bulb reaches the center of the roast. (See title-page.) Place the meat in a hot oven (500°F.). Sear the meat for 20 to 30 minutes until lightly browned, then reduce the oven temperature to about 300°F. and continue the cooking until the thermometer in the meat reads about 140°F. for a rare roast, 160°F. for a medium roast, or 180°F. for a well-done roast. A rib roast will probably require 16 minutes to the pound to be rare, 22 minutes to the pound to be medium, and about 30 minutes to the pound to be well done. Higher oven temperature than 300°F. will shorten the time of cooking, but it will increase the shrinkage of the roast, and both meat and drippings may become too brown. Reducing the oven temperature to 250°F. will decrease the shrinkage markedly and will cook the meat uniformly, but longer time will be required.

When a rib roast will not stand upright, lay it on a rack in an open pan without water, and insert the meat thermometer directly into the center of the lean meat, not through the fat covering as in the standing roast. Baste occasionally during cooking to prevent drying out.

Serve the roast on a hot platter, surrounded by browned potatoes or by squares of Yorkshire pudding. Apply the same principle of cookery to all roasts—pork, turkey, chicken, etc.

Yorkshire Pudding

Beat together thoroughly until smooth 1 cup milk, 2 eggs, $\frac{1}{2}$ cup flour, and $\frac{1}{2}$ teaspoon salt. Pour the batter into the hot roasting pan containing about $\frac{1}{4}$ cup of the beef drippings. Bake for 15 to 20 minutes in a moderately hot oven (400°F.). Cut in squares and serve at once with the roast.



(Courtesy U. S. Bureau Home Economics)

Pot Roast of Beef

Cuts of beef suitable for pot roasting are chuck ribs, cross arm, clod, round, and rump. Select a piece from 4 to 6 pounds in weight. Wipe with a damp cloth. Rub the meat with salt, pepper, and flour. Brown the meat on all sides in a heavy kettle, using about 3 tablespoons of beef fat. Slip a low rack under the meat, add one-half cup of water, cover tightly, and simmer until tender. The time required for cooking can not be definitely stated, but it will probably be about three hours. Turn the roast occasionally. When the meat is done, remove from the kettle, skim off the excess fat from the liquid, and measure the remainder. For each cup of gravy desired, measure 2 tablespoons of fat and return to the kettle, add 1½ to 2 tablespoons of flour and stir until well blended and slightly browned. Then add 1 cup of the meat stock or of cold water and stir until smooth. Season the gravy with salt, pepper, and chopped parsley. Serve the pot roast on a hot platter with buttered carrots and stuffed onions.

If desired, any of the following vegetables may be cooked in the pot with the roast: Carrots, celery, onions, potatoes, tomatoes, and turnips. Add the vegetables during the last hour of cooking the meat if they are to be served whole or in quarters.



STUFFED FLANK STEAK AND BROWNED POTATOES

(Courtesy U. S. Bureau Home Economics)

Stuffed Flank Steak

Flank steak	1 onion, minced
1½ cups stale bread crumbs	½ cup chopped celery
1 teaspoon salt	2 tablespoons butter or beef
½ teaspoon pepper	drippings

Wipe the meat with a damp cloth. For the stuffing, brown the celery and the onion lightly in the fat and combine with the other ingredients. Spread the stuffing over the steak. Beginning at one side of the steak, roll it up like a jelly roll, and tie securely in several places with clean string. (When carved in slices, the meat will be cut across the grain, if rolled from the side, not the end.) Sear in a small quantity of fat in a heavy skillet or

a baking pan on top of the stove, and turn the meat frequently until browned on all sides. Slip a rack under the meat in the pan, cover closely, and cook in a moderate oven (350°F.) for 1½ hours, or until tender. When the meat is done, remove from the pan and prepare gravy as follows: Drain off the fat. For each cup of gravy desired, measure 2 tablespoons of fat and return to the pan, add 1½ to 2 tablespoons of flour and stir until well blended and slightly browned. Then add 1 cup of cold water or milk and stir until smooth. Season with salt and pepper. Serve the stuffed steak with browned potatoes.

Swiss Steak

3 pounds lean beef about 2½ inches thick	1½ teaspoons salt
3 tablespoons melted suet	½ teaspoon pepper
½ cup flour	2½ cups hot tomato juice and pulp or hot water

Sift the flour, salt, and pepper together and beat thoroughly into the steak with a meat pounder. The beating makes the meat more tender, and the flour absorbs the juice. Cut the steak into individual portions, if desired.

Sear the meat in the hot fat in a heavy skillet or kettle. Cover with the tomato juice and pulp or the water, adding more if necessary. Place a lid on the cooking utensil and simmer for two hours, or until the meat is so tender it can be cut with a fork. Turn the pieces occasionally during the cooking. If the gravy becomes too thick add more liquid from time to time. There should be plenty of rich gravy to serve over the meat. Onions may be browned and cooked with the meat if desired. Serve piping hot.

Brown Stew

Brown stew is made in the same general way as Swiss steak or pot roast. For stew cut the meat into inch cubes and roll in flour. Brown well in hot fat, add water or tomatoes, cover, and simmer until tender. Onions, carrots, turnips, and potatoes may be added if desired.



WRAP HAMBURG STEAK WITH BACON, THEN BROIL
(Courtesy U. S. Bureau Home Economics)

Broiled Hamburg Steak on Onion Rings

2 cups ground lean raw beef	1 tablespoon chopped parsley
¼ cup ground suet	3 tablespoons butter
1 cup soft fine bread crumbs	2 teaspoons onion juice
7 strips bacon	½ teaspoon salt
7 slices Spanish onion	½ teaspoon pepper
½-inch thick	1 tablespoon water

Lay the slices of onion in a buttered shallow baking dish. Pour over them 2 tablespoons of melted butter, sprinkle with salt and pepper, add the water, cover closely, and bake in a moderate oven (350°F.) for 30 minutes, or until tender. In the meantime, cook the chopped parsley in 1 tablespoon of butter and combine with the beef, suet, crumbs, and seasonings. Knead until thoroughly mixed. Mold into seven flat cakes and wrap each with a slice of bacon. (See illustration.) Place each cake on an onion slice in the baking dish, and broil under direct heat for five minutes on each side. Baste occasionally with the drippings. Serve at once from the baking dish.

If it is not convenient to broil the meat cakes by direct heat, pan-broil them in a hot skillet, and serve on the onion slices.

Roast Fresh Pork

Prepare and cook as you did the beef roast, being sure to cook well done.

Candied Sweet Potatoes

Candied sweet potatoes are good with roast pork.

Boil six medium-sized sweet potatoes until they are fairly tender, but not done. Allow the potatoes to cool, skin them, and cut them lengthwise in halves. Arrange the pieces in one layer, in buttered baking dishes or a large shallow pan, and do not pack them close together. Boil 1 cup of corn sirup or maple sirup, one-half cup of brown sugar, 3 tablespoons of butter, and one-fourth teaspoon salt until slightly thickened. Pour the sirup over the sweet potatoes. Bake in a moderately hot oven (375°F. to 400°F.) 45 minutes to 1 hour. Turn the pieces carefully while cooking and brown them on all sides. Serve the candied sweet potatoes with roast pork.

Panned Pork Chops

Wipe pork chops with a damp cloth. Sprinkle them with salt and pepper and dust them lightly with flour. Place the chops in a heavy hot skillet with the fat edge down, so as to brown the fat and at the same time grease the skillet. Turn the chops and brown them lightly on both sides. Pour off the fat that has cooked out, cover the skillet closely, and continue to cook at very moderate heat until the meat is tender. Turn the chops occasionally to cook them uniformly. Chops of ordinary thickness (about one-half inch) will require about 20 minutes to cook after they have been lightly browned.

Pork chops shrink considerably while cooking, and it is better to have them cut fairly thick. Three-quarters to 1 inch is not too much. Chops of this thickness will require longer cooking than thin chops, but they will be more juicy when done.

Stuffed Rib Chops With Apples

6 rib pork chops, 1½ inches thick	¼ teaspoon salt
1 cup fine dry bread crumbs	½ teaspoon savory seasoning
¼ cup chopped celery	Dash of pepper
1 tablespoon butter	½ teaspoon celery seed
1 tablespoon minced onion	3 tart red apples
1 tablespoon chopped parsley	

For the stuffing cook the celery, onion, and parsley in the butter for a few minutes, add the bread crumbs and seasonings, and stir until well mixed. Wipe the chops with a damp cloth. Cut a pocket in each chop. Sprinkle the chops with salt and pepper and rub lightly with flour. Sear the chops in a heavy, hot skillet, turning the fat edges down at first and then browning both sides. Then fill each chop with stuffing and skewer the edges together with toothpicks. Lay the stuffed chops on a rack in a baking dish or pan with cover. On the top of each place, cut sides down, one-half of an apple which has been cored but not pared. Cover closely and bake in a moderate oven (350°F. to 375°F.) for about 45 minutes, or until the meat is tender. Lift the chops and apples together from the baking dish onto a hot platter and remove the toothpick skewers. Garnish with parsley and serve at once.

Sausage and Hominy

Mold flat sausage cakes one-half inch thick. Cook the sausage cakes brown and crisp on both sides in a heavy uncovered skillet. Remove the cakes, drain and keep warm in the oven.

Pile cooked hominy in the center of a meat platter. Arrange the sausage around the mold of hominy. Pour some of the brown sausage gravy over the hominy.

Cooking Cured Pork

Cured pork, as well as fresh pork, should be thoroughly cooked at a slow to moderate temperature. This principle of cookery should be applied whether the meat is to be fried, broiled, roasted or steamed.

Baked Ham

Wash and scrape the ham thoroughly and soak it overnight in a large pan with cold water to cover. In the morning wipe the ham dry. Make a small incision through the rind with a sharp knife or a steel skewer, cut short gashes around it with scissors, and insert a roast-meat thermometer through the opening so that its bulb reaches the center of the fleshiest portion of the ham. Place the ham, rind side up, on a rack in an open pan. Do not add water and do not cover. Bake the ham in a slow oven, (260°F.) until the thermometer in the meat registers 170°F. Between 25 and 30 minutes per pound will probably be required to bake a whole ham. For half hams, proportionately more time is necessary. Shank ends usually require from 40 to 45 minutes per pound, and butts from 45 to 55 minutes per pound to bake when the oven temperature is 260°F. When the ham is done remove the rind.

Make a paste of 2 cups of brown sugar and 3 cups of fine soft bread crumbs, 1 teaspoon of prepared mustard, and cider or vinegar enough to moisten the mixture. Spread the paste over the fat covering of the baked ham and stick long-stemmed cloves into the surface. Bake the coated ham for 10 minutes in a hot oven (500°F.).

Fried Ham

Trim the rind and the lean edge off a slice of ham. If the slice is thin, cut it into individual portions before cooking. Grease a moderately hot skillet with some of the fat, add the ham, and cook slowly, turning frequently. Allow about 10 minutes for thinly sliced ham, and 15 to 20 minutes for a slice one-half to three-fourths inch thick. To make gravy, add a small quantity of water to the pan drippings and pour over the ham.

Using Canned Meats

Heating the meat to some extent in the can makes it more easily removed from the can. However, it may be removed cold if preferred.

Steak

Remove steak from the container, being careful to not break the pieces. Brown for a few minutes in hot fat in a skillet. Then place in the oven uncovered to finish heating through. Serve hot.

Roasts

Remove roast meat from the container and place in the oven for reheating and slight browning.

Stews

Most stew meat is canned without vegetables, so the vegetables may be added when the meat is reheated for serving. Sliced potatoes, carrots and onion and tomatoes make a good combination for this purpose. Cook until vegetables are done.

Using the Canned Ground Meat (Baked Hash)

To two cups of the canned ground meat, use at least one or more cups of cooked vegetables. Brown some onion in hot fat and add to the meat. Then add left over mashed potatoes (or other potatoes) left over peas or carrots and some tomatoes. Mix and season to taste with salt and pepper. Add enough broth to make a moist hash mixture. Turn into a buttered baking pan and bake in moderate oven for 30 minutes.

Croquettes

2 cups ground lean cooked beef	Tabasco sauce, as desired
1 cup mashed potato	Salt
3 tablespoons gravy or stock	Pepper
1 tablespoon onion juice	Dry grated sifted bread crumbs
1 tablespoon chopped parsley	1 egg beaten up with 1 table- spoon water
1 tablespoon butter	Fat for deep frying

Cook the parsley in the butter, and mix with the meat, potato, gravy, and other seasonings thoroughly. Mold into croquette shapes. Dip into the egg mixture, roll in the bread crumbs, and let stand an hour or longer to dry the coating. Heat the fat in a deep vessel to 350°F. or until a cube of bread browns in 40 seconds. Place two or three croquettes at a time in a frying basket and lower slowly into the hot fat for two minutes or until they are a golden brown. Remove the croquettes and drain on a sheet of paper. Serve hot with parsley garnish and tomato sauce.

To make softer croquettes, omit the mashed potato, and either increase the quantity of gravy to three-fourths cup, or use three-fourths cup of white sauce. To prepare gravy or white sauce thick enough to act as a binder for a croquette mixture, blend 3 tablespoons flour with 1 tablespoon butter, add three-fourths cup meat stock or milk, and cook in a double boiler, stirring until smooth. Mix the gravy or sauce with the meat and seasonings.

Tomato Sauce

½ to 1 T. butter	1 C. tomatoes (put through sieve)
2 T. flour	½ t. salt

Mix the butter with flour. Add the tomato juice and cook slowly until the mixture is thick and smooth.

Sandwiches

No. 1.

Mix the cold ground meat with salad dressing. Add extra pepper and salt if needed.

No. 2

To this same mixture add chopped hard cooked eggs or chopped parsley, celery or pickle.

