

MN 2000 EB 379e2
1976 Bent

Extension Bulletin 379
Revised 1976

Richard J. Epley



CONSUMER
QUESTIONS
ABOUT
MEAT

Agricultural Extension Service
University of Minnesota

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The author expresses his thanks to C. E. Allen, professor, Department of Animal Science, and Mrs. Sharon Gilsrud, former Blue Earth County Extension Home Economist, for reviewing the manuscript and making helpful suggestions.

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INSPECTION

QUESTION:

ANSWER:

1. Who inspects meat in the state of Minnesota?
The U.S. Department of Agriculture, Animal and Plant Health Inspection Service, inspects live animals and their carcasses to make sure that (1) the animals are healthy and (2) their carcasses and edible organs are a wholesome source of meat. This inspection occurs in all plants that buy animals from one person or firm and sell meat to another. USDA inspection also takes place in plants that process meat and ship this meat across state lines. The Minnesota Department of Agriculture inspects at retail stores to make sure that the stores comply with certain rules and regulations relating to processing, storage, handling, labeling, advertising, and sale of certain meat products. Some municipalities also inspect at the retail and restaurant levels for sanitation, temperature control, etc.
2. Are all animals and carcasses described in question 1 USDA-inspected?
Yes. Each carcass and all edible organs are thoroughly examined by qualified inspectors to insure that the products are wholesome sources of food.
3. Are all animals and carcasses analyzed for every possible contaminate, such as antibiotics, heavy metals, etc.?
No. The USDA does this on a sampling basis, and if an occurrence of this problem is found, further extensive examinations of carcasses and organs for the specific contaminant are conducted.
4. Are the approximately 2,000 retail stores in Minnesota under continuous day-by-day inspection?
No. The retail stores are spot checked. They are also inspected because of consumer complaints. These consumer complaints may vary from such things as overly fat hamburger to canned hams stored on shelves when the labeling states refrigeration is required.
5. Who pays inspection costs?
The taxpayer.
6. Is inspection mandatory?
Yes, unless you or your firm are exempt. Exempt persons or firms are those who slaughter animals and use the meat only for consumption by members of their households and non-paying guests. Also exempt from USDA inspection are certain retail establishments which buy federally inspected meat and process that meat in their own shops. Although these latter operations are exempt from USDA inspection, they are subject to inspection by the State of Minnesota, Department of Agriculture.
7. Who can be contacted about meat inspection questions?
USDA—Dr. Walter Wirszczuk, USDA Animal Plant and Health Inspection Service, 316 Robert Street, Room 608, St. Paul, Minnesota 55101. Phone (612) 725-7808.
STATE—Ben Steffen, Chief of Field Inspection, Minnesota Department of Agriculture, State Office Building, St. Paul, Minnesota 55155. Phone (612) 296-2627.

GRADING (carcasses and wholesale cuts)

1. Is grading mandatory?
No. Grading is strictly voluntary and up to the individual packer. He can have carcasses graded by the USDA, Meat Grading Branch, or he can establish his own "house grades."
2. Who pays for grading?
The participating packer or processor who requests the grading must pay the USDA an hourly rate to cover the cost of grading.
3. Which species are graded most frequently?
Lamb and beef are graded the most frequently, whereas pork is seldom graded by USDA Meat Graders.
4. What are the USDA grades of beef and what do they mean?
QUALITY GRADES (qualitative from highest to lowest grade)
Prime (highest)
Choice
Good
Standard
Commercial
Utility
Cutter
Canner (lowest)

The quality grades for beef predict the relative palatability of beef with respect to flavor, juiciness, tenderness, and overall eating satisfaction. The higher the grade, generally the more desirable the eating quality.

YIELD GRADES (quantitative from highest to lowest yield)

- Yield Grade 1 (meaty)
- Yield Grade 2
- Yield Grade 3
- Yield Grade 4
- Yield Grade 5 (fattest)

The yield grades predict the amount of meat that one can normally obtain from a beef carcass. A yield grade 1 will yield 82 percent of its carcass weight (hanging weight) in semi-boneless retail cuts. A yield grade 3 beef carcass will yield 73 percent whereas a yield grade 5 will yield 63 percent.

5. How are these grades determined?

Quality—The USDA Meat Graders objectively evaluate the beef carcass for maturity and marbling. The standards are complex and have specific requirements of maturity and marbling for each grade. Essentially the maturity classification breaks carcasses into groups of either young cattle or old cattle. Carcasses that are young are graded either Prime, Choice, Good, or Standard. Carcasses that are in the old maturity classification are graded Commercial, Utility, Cutter, or Canner. Once the maturity of a beef carcass is established, there are certain marbling requirements for each grade. For example, USDA Prime requires a slightly abundant amount of marbling, USDA Choice requires a small amount of marbling, and USDA Good requires traces of marbling. The degrees of marbling, from highest to lowest, that are recognized in the specifications are Abundant, Moderately Abundant, Slightly Abundant, Moderate, Modest, Small, Slight, Traces, Practically Devoid, and Devoid. Remember that as the marbling (and consequently usually the quality grade) increases, the percentage of protein decreases.

Yield Grades—The yield grades are determined by the USDA Meat Graders by considering four factors: (1) hot carcass weight, (2) fat thickness over the ribeye, (3) the amount of kidney, pelvic, and heart fat, and (4) the size of the ribeye area.

6. Which quality grade is the most popular?

USDA Choice, because it is a compromise between the more desirable flavor of Prime and the higher nutritional value (protein content) of the lean portion of Good.

HOW MUCH MEAT?

1. What carcass yield (dressing percent) can I expect from a live animal?

Beef—60-63 percent; Pork—68-75 percent; Lamb—48-54 percent.

The dressing percent is the hot carcass weight divided by the live weight. The hot carcass will shrink about 2 percent in the cooler because of dehydration during the chilling process.

2. How much meat will I get from the carcass?

Beef—60-85 percent, depending on the levels of fatness and muscling.

Pork—40-80 percent, depending on the levels of fatness and muscling.

Lamb—78-92 percent, depending on the levels of fatness and muscling.

The above figures are based on a semiboneless method of cutting, half of the cuts have the bone in and half of the cuts have the bone out. It's further based on a standard trimming procedure, which may vary from plant to plant.

3. How will I know how much meat I will get from a side of beef?

Ask for the approximate yield grade of that side of beef and use that information to calculate the percent retail yield as shown in answer 4 of the grading section. For further information on this matter, write Bulletin Room, 3 Coffey Hall, University of Minnesota, St. Paul, Minnesota 55108 or contact your local Extension office. Ask for Animal Science Fact Sheet No. 18, "Buying a Side of Beef" and Animal Science Fact Sheet No. 29, "Buying Forequarters and Hindquarters of Beef." For help in getting a rough estimate of yields of retail cuts from a side of beef, ask your local Extension office for Extension Folder No. 289, "Cost Estimate of Beef By The Side."

TRICHINOSIS

1. What is trichinosis?

Trichinosis is a disease that is caused by consuming improperly cooked pork which is infected with the live organism Trichinella spiralis.

2. Can trichinosis be fatal?

Yes. However, the average mortality rate for individuals developing clinical symptoms is about 5 percent because of successful medical treatment with the drug Thiabendazole.

3. Is all pork infected with trichinosis? No. Recent figures show that only about 1 of 11,000 pork carcasses is infected with the live *Trichinella spiralis* organism. This is because the incidence of feeding garbage, especially uncooked garbage, to pigs is minimal and has decreased significantly in the past few years.
4. If the organism is present, how is the organism destroyed so that the pork is safe to eat? *Trichinella spiralis* is destroyed in pork products by cooking the pork product to an internal temperature of 137° F. All consumers are urged to use a meat thermometer to make sure that all pork is cooked to an internal temperature of 137° F. The actual recommended internal temperature of cooked fresh pork is 170° F., because pork cooked to 137° F. just doesn't taste as good as it can. This method of destroying the live *Trichinella spiralis* is monitored by the USDA. One other method of destroying *Trichinella spiralis* is freezing for certain lengths of time as follows:

Temperature °F.	Days of frozen storage	
	Products not thicker than 6 inches	Products 6 to 27 inches in thickness
5	20	30
-10	10	20
-20	6	12

For more information about trichinosis, obtain Animal Science Fact Sheet No. 23, "Trichinosis" from your local Extension office.

PROCESSING

1. What are water-added hams? Water-added hams are hams that have gained water during the curing process. All hams are injected with a curing brine or solution containing the necessary ingredients so that a cured meat product will result. During the subsequent smoking and heating process, most hams lose all of this added water. However, some hams retain a portion of this added water because of either mistakes (too much brine was pumped into the ham) or the nature of the fresh product, that is, the product was dark, firm, and dry type in the fresh state. Hams that gain 1 to 10 percent added water in the curing and smoking process must be labeled "water added" or "moist."
2. Should I buy a water-added ham? It depends on flavor preferences and the price. Let's assume that a water-added noncanned ham is selling at a certain price per pound. Figure that this ham could contain up to 10 percent water. Take the weight of that ham, say 15 pounds, times 10 percent. This tells you that the ham contains 1.5 pounds of water. Subtract this 1.5 pounds from 15 pounds; the result is 13.5 pounds of "regular" ham. Then take 13.5 pounds of "regular" ham and divide it into the total price that the 15-pound ham is selling for. This gives you your new price per pound on a "regular ham basis." Compare this price per pound with the price per pound of a regular ham. If it is less, you would be ahead buying the water-added ham; but if it is more, you would be ahead buying the regular ham. Some consumers prefer water-added hams because of their greater juiciness. For more information on ham, obtain Animal Science Fact Sheet No. 27, "Consumer Tips For Buying and Serving Ham" from your local Extension office.
3. Are tenderizers safe? Yes. However, some people occasionally respond adversely to large intakes of the monosodium glutamate (MSG) in some tenderizers. MSG is used as a flavor enhancer. If you are sensitive to MSG contained in some tenderizers, use other methods of tenderizing meats such as acid marinades. Do not use any tenderizer in excess. Follow directions on the package.
4. What about the use of soy products in ground beef? Certain soy products are added to ground beef to lower the cost per pound. Currently the retail regulations require that such products not have "Burger" in the name and also contain a list of ingredients on the label. Unless fortified or otherwise processed, soy products are usually lower in B vitamins, certain minerals (available iron and phosphorous), and the amino acid methionine and higher in sodium than the meat product that the soy product is mixed with. More research is needed in this area. For more information, obtain Food Science and Nutrition Fact Sheet No. 18, "Soy Proteins in Your Food" from your local Extension office.
5. What ingredients are added to meat and are they safe? Ingredients or additives added to meat must be identified on the label. The ingredients must be listed in order of the amount of weight. The ingredient present in the largest quantity is listed first, followed by the second most plentiful ingredient, etc. The safety of meat ingredients is determined by the Food and Drug Administration of the Federal Government. The extent of the use of ingredients (including labeling) is monitored by the various meat inspection agencies.
6. What about nitrates and nitrites used in curing? Are they safe? Yes. The use of nitrates and nitrites is approved by the Food and Drug Administration and is monitored by the USDA. For more information, obtain Animal Science Fact Sheet No. 28, "Nitrite in Meat" from your local Extension office.

7. How long should beef be aged? Days of aging is strictly a personal preference. For more information, obtain Animal Science Fact Sheet No. 20, "Aging Beef" from your local Extension office.
8. What about processing meat in the home? It is legal if you do not sell the meat to someone. For more information, obtain Animal Science Fact Sheet No. 26, "Processing Meat in the Home" from your local Extension office.

SELECTION

1. How can I adequately identify the names of meat products? Effective December 4, 1973, Minnesota state rules and regulations require that prepackaged meat sold at retail must contain on the price-weight label the following information: (1) specie, (2) wholesale cut, and (3) "recommended" retail cut name. The recommended retail cut names do not include the so-called fanciful names, such as "Penthouse," "Family," "Bronco," "Spencer," etc. For more information, obtain Extension Bulletin 393, "Names of Retail Meat Cuts" from your local Extension office.
2. Can fanciful names still be used? Yes. Fanciful names may appear on any part of the package except the price-weight label. Therefore, always check the price-weight label first.
3. How can I tell how much beef is in "Beef with Gravy" as compared to "Gravy with Beef," etc.? Write to U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Washington, D.C. 20250, and ask for the publication entitled "Standards for Meat and Poultry Products—A Consumer Reference List."
4. What color is the most desirable in fresh beef? A bright, cherry red color is most desirable and usually will give you optimum eating satisfaction and little shrinkage. Occasionally, you will find very dark colored beef. This beef is from an animal that had been stressed before slaughter. The juiciness of this beef may be better than normal. This product will shrink less during storage, processing, and cooking. This dark colored beef is not to be confused with beef from an old animal (commercial grade) or beef that has been in the retail case too long. For more information on dark cutting beef, write to Bulletin Room, 3 Coffey Hall, University of Minnesota, St. Paul, Minnesota 55108, or contact your local Extension office. Ask for Animal Science Fact Sheet No. 17, "Dark Cutting Beef."
5. How can I tell when ground beef is not fresh? This is complicated, because many color changes occur in ground beef during storage. In general, look for a bright, cherry red color. For more information, write for Animal Science Fact Sheet No. 19, "Fresh Meat Color Changes," at the above address, or contact your local Extension office.
6. Are all meat products code dated according to "freshness?" No. Code dating is not currently required by law. If you want to know how long a product has been processed or displayed, ask your retail meat man about that specific product.
7. What color is the most desirable in fresh pork? A bright grayish-pink to darker color is most desirable. Excessively pale, soft, and watery pork is more apt to lose juices during storing and cooking.
8. What level of marbling is the most desirable? Marbling contributes to flavor and somewhat to juiciness. The higher the amount of marbling, the more flavorful and juicy the particular meat product will be. However, there is a point beyond which excessive amounts of marbling do not contribute any more flavor or juiciness but result only in a tallowy or oily feeling in the mouth while chewing. Additionally, one should avoid buying beef, pork, or lamb with no marbling because it is more apt to dry out during the cooking process and will lack flavor and juiciness. It may, however, contain less calories. Select cuts of beef, pork, and lamb with small to moderate amounts of marbling for best taste.

PRICING

1. Why are meat items priced differently? Cuts of meat are priced differently because they have different flavor and tenderness characteristics and varying consumer demands. For example, filet mignon is never tough if cooked properly, but cuts from the chuck or round occasionally lack tenderness. Also, certain cuts require more processing—cutting and trimming, curing, etc.—and this extra cost must be added on to the price. Pricing differential is also caused by the demand for specific cuts. Some cuts are more expensive because the local demand is great. Also, there are only so many rib steaks, club steaks, T-bones, etc. per carcass. The retailer prices each cut at the price at which it will sell.
2. How can I get the most meat for my dollar? Figure cost per serving.

$$\text{Cost per serving} = \frac{\text{Price per pound as purchased}}{\text{Number of servings per pound}}$$

Use the following guide:

<u>Type of cut</u>	=	<u>Servings per pound</u>
Boneless		3
Semi-boneless		2
Very bony		1
Example—Cut A, boneless, \$1.80 per pound		
Cost per serving = $\frac{\$1.80}{3}$ = \$0.60 per serving		
Cut B, bony, \$1.20 per pound		
$\frac{\$1.20}{1}$ = \$1.20 per serving		

For more information, obtain Animal Science Fact Sheet No. 24, "Buying Meat By Cost Per Serving" from your local Extension office.

3. How should I price hamburger, ground beef, and similar items?

First, you must understand the difference between hamburger, ground beef, lean ground beef, and extra lean ground beef. **Hamburger:** Hamburger is chopped fresh and/or frozen beef with or without added beef fat as such and/or seasoning. It does not contain more than 30 percent fat. Water is not added. It does not contain binders, extenders, hearts, beef cheeks, tongue, tongue meat, or other by-products. When beef cheek meat (trimmed beef cheeks) is used in the preparation of hamburger, the amount of cheek meat is limited to 25 percent and its presence is declared on the label in the ingredient statement, if any, or otherwise near the product name.

Ground beef, regular ground beef, or chopped beef: Ground beef, regular ground beef, or chopped beef consists of ground or chopped fresh and/or frozen beef with or without seasoning and without the addition of beef fat as such. It does not contain more than 30 percent fat. Water is not added. It does not contain binders, extenders, hearts, beef cheeks, tongue, tongue meat, or other by-products. When beef cheek meat (trimmed beef cheeks) is used in the preparation of chopped or ground beef, the amount of cheek meat is limited to 25 percent and its presence is declared on the label in the ingredient statement, if any, or otherwise near the product name.

Lean ground beef, lean regular ground beef, or lean chopped beef; Lean ground beef, lean regular ground beef, or lean chopped beef meets the requirements of ground beef but does not contain more than 22 percent fat.

Extra lean ground beef, extra lean regular ground beef, or extra lean chopped beef: Extra lean ground beef, extra lean regular ground beef, or extra lean chopped beef meets the requirements of ground beef but does not contain more than 15 percent fat.

Summary:	Maximum fat %	Fat can be added	Water can be added
Hamburger	30	yes	no
Ground beef	30	no	no
Lean ground beef	22	no	no
Extra lean ground beef	15	no	no

To price the different categories of ground beef, calculate how much fat and protein you are buying:

Hamburger and ground beef	30 percent fat, 17 percent protein
Lean ground beef	22 percent fat, 19 percent protein
Extra lean ground beef	15 percent fat, 21 percent protein

You must recognize, however, that as the percent fat decreases, flavor and juiciness also decrease.

4. Does marbling influence price?

In beef and lamb, marbling influences price to the extent that marbling influences grade (higher grades have more marbling and higher grades, Prime and Choice, are usually higher priced than the Good grade). Marbling has little effect on the price of fresh pork.

STORAGE

1. How should I store fresh meat?

At 30-32° F. in your refrigerator. Meat stored at this lower temperature will have a longer shelf life than meat stored at 40-45° F. This is because the growth of microorganisms, which are always present in some quantity on all meat, occurs more rapidly at higher temperatures than at lower temperatures. Growth of microorganisms is responsible for discoloration and subsequent spoilage of meat products. Do not be afraid to store meat at 30-32° F.,

because meat freezes at 28.6° F., not 32° F. To set your refrigerator at 32° F., place a paper cup half full of water in the part you will store meat. When a partial ice formation is observed, the temperature is 32° F. For more information, write the Bulletin Room at the University of Minnesota or contact your local Extension office and ask for Extension Folder 278, "Storing Meat in Your Refrigerator."

2. Should I rewrap fresh meat before putting it into the refrigerator?

Not necessarily. Rewrapping only introduces the possibility of further microbial contamination from your hands, cutting table, and various utensils. The clear packaging material that fresh meat is packaged in is permeable to oxygen so that it maintains its bright bloom, but is impermeable to moisture from the inside out so that the meat will retain all its moisture.

3. How long will meat stay fresh in the refrigerator?

This depends on the temperature (as described in answer 1) and upon the sanitary conditions of the retailer that you purchased the meat from. Normally, by storing meat at 30-32° F. you can expect a refrigerator life of 5-7 days. However, so many factors influence refrigerator life, especially temperature of the refrigerator, that guidelines are often inaccurate. Additionally, in the case of fresh beef, the amount of aging that a carcass has undergone at the packing plant or the retail store before cutting strongly influences refrigerator life of fresh beef (especially ground beef), making guidelines almost worthless. You should consume the product before it turns to a brownish-red color or develops off odors.

4. Should hams be stored in the refrigerator?

Definitely yes!! Only hams that are specifically labeled "Does not require refrigeration" should remain at room temperature. Otherwise, all canned hams and definitely all uncanned hams must be refrigerated at all times. If canned hams that require refrigeration are not refrigerated, it is possible that botulism could result.

5. How should meat be frozen in the home?

Use a high quality freezer wrap to freeze meat in the home. Remove the store wrap, wrap the meat tightly with the freezer wrap and place in the freezer. Be careful not to overload your freezer. For more information, obtain Extension Bulletin No. 244, "Freezing Foods for Home Use" from your local county Extension office.

6. How long can meat products be frozen?

As a general rule, cured pork items, except sliced bacon, can be stored 1 to 2 months; fresh pork items, 3 to 6 months; and fresh beef and lamb, 6 to 12 months.

7. What variables influence the shelf life of frozen meat?

The freshness of the product before freezing, the packaging material (should be water and oxygen impermeable), the tightness of the packaging, and the temperature of the freezer (should be 0°F or lower) all influence how long meat products can be frozen and still maintain optimum taste. Specific storage times for certain meat items are almost meaningless unless the above factors are known.

THAWING

1. How should frozen meat be thawed?

Frozen meat should be thawed in the refrigerator because you do not want to risk leaving a frozen product on the counter top too long because excessive microbial growth might occur. It will take longer to thaw the product in the refrigerator, especially if one sets it at 32° F. (where it should be), but it is much safer to thaw in the refrigerator. If time does not allow you to thaw properly, try cooking the frozen meat. People often are confused and worried about cooking frozen meat, but there is nothing wrong with this procedure and you will avoid keeping the product at room temperature for excessive periods of time. Cooking in the frozen state will require about 20 percent more cooking time. Unless you are very careful, it is not recommended that frozen steaks be broiled because they may burn on the outside before they are cooked properly internally. If you must thaw meat at room temperature, leave the wrapper on to minimize moisture loss. Cook within 3 hours after placing the product at room temperature!

2. Are thawing and refreezing all right?

Meat that is thawed properly in a refrigerator set at 30-32° F. can be refrozen. Each time meat is frozen and thawed, it loses some juices. However, nothing is wrong with refreezing meat thawed in this manner. If the meat is held at room temperature for several hours or is off-color, never refreeze.

COOKING

1. What happens when meat is cooked?

Muscle protein toughens and connective tissue softens. Therefore, cook cuts with low amounts of connective tissue by using dry heat and cooking rapidly. The objective is to cook the meat cuts that are low in connective tissue to the lowest degree of doneness that appeals to you so that toughening of the muscle proteins and water loss will be minimal. For cuts with high amounts of connective tissue, use low heat and a moist cooking method, so that the large amount of stronger connective tissue of these cuts is converted to gelatin, and thus becomes more tender. The result is a more tender product than the same product cooked with dry heat.

2. What is the most common mistake in cooking meat? The most common mistake in cooking meat is that meat is cooked for too long at too high a temperature. This can be prevented, especially in roasts, by using a meat thermometer and avoiding oven temperatures above 325° F. Buy a good meat thermometer, not a cheap one!
3. What is the proper way to use a meat thermometer? Insert the thermometer into the thickest part of the cut making sure that the tip of the thermometer does not touch deposits of fat or bone.
4. What temperature should meat be cooked to?
- Beef: Rare 135-140° F.
 Medium 150° F.
 Well 160° F.
- Pork: Fresh 170-175° F.
 Cured 150° F.
- Lamb: Medium- 170-175° F.
 well
5. How can I prevent steaks and chops from buckling and curling on the grill? Cut the edge of the fat and connective tissue on the outside of the muscle two or three places before cooking. Do not cut into the muscle.

EATING CHARACTERISTICS

1. What influences flavor? Marbling influences general flavor; as marbling levels increase, the flavor increases. As the animal becomes older, the flavor also increases in intensity. Genetics also influence flavor. What the animal eats, especially the pig, can influence flavor. Also, degree of doneness and method of cooking influence flavor. Broiled or fried pork will be browner than pork cooked with moist heat at a low temperature. This latter procedure often results in pork with a "piggy flavor."
2. What influences tenderness? Tenderness is influenced by the age of the animal; the older animal is less tender. Additionally, muscles vary in their tenderness. Muscles that are used strictly for supportive functions in the animal tend to be more tender than muscles that are used for locomotive and supportive functions. Locomotive muscles, such as those in the forelegs, will be less tender because of the composition, amount, and nature of the connective tissue. Also, the genetics of the animal influence tenderness. Aging beef for 7 days or more increases tenderness. As already mentioned, method of cooking also influences tenderness. Perhaps the factor most important to meat tenderness is final internal meat temperature; meat is more tender at lower temperatures. What the animal is fed has very little influence on tenderness!
3. What influences juiciness? The state of the fresh product before cooking influences juiciness. For example, dark, firm, and dry beef, pork, or lamb will be expected to retain more juices during cooking than a pale, soft, and watery product. More important, juiciness is influenced by the final internal temperature of the meat product. Meat is more juicy at lower meat temperatures and when high oven temperatures (above 325° F.) are avoided.
4. What is "sex odor"? "Sex odor" is a strong onion-like or perspiratory-like odor given off from cooked pork products that have been derived from sexually mature males, late castrated males, or cryptorchids. If you have observed "sex odor" ("boar odor") in a fresh or cured pork product during cooking, return that product to your retailer immediately and tell him of the problem.
5. What causes a fishy odor in pork? Pigs that have been fed unusually large amounts of fish or fish meal. Additionally, a fishy odor can be absorbed in meat that has been stored in, around, or on fish.

NUTRITIONAL VALUE

1. What is the composition of the muscle portion (excluding trimmable fat and bone of uncooked meat?

	<u>Average percentage</u>
Moisture	70
Protein	20
Fat	8
Vitamins, minerals, and carbohydrates	2

2. How does this composition change?

Marbling influences the composition considerably:

Item	Heavily marbled	Practically devoid of marbling
	percent	
Moisture	68	73
Protein	18	21
Fat	12	4
Minerals, vitamins, and carbohydrates	<u>2</u>	<u>2</u>
	100	100

Cuts low in fat (marbling) include shank, flank steak, and round (beef), foreshank and and ham (pork), and foreshank and leg (lamb).

3. Do some species contain more polyunsaturated fatty acids than others?

Yes. Although beef, pork, and lamb all contain both saturated and polyunsaturated fat, there are differences because of species, location of the fat deposit (internal fat vs. subcutaneous fat), composition of diet, etc. In general, ranking by species from low to high polyunsaturated fatty acid content would be as follows:

- Lamb
- Beef
- Pork

For detailed information, obtain Agriculture Handbook No. 8 from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

4. What is the relationship between nutritional value and taste of meat products?

Inverse. As the amount of fat decreases and protein increases, usually the flavor also decreases. This is why Choice grade beef is preferred by most consumers. Prime usually has optimum flavor but has a lower nutritional value caused by a higher fat content and lower protein content. Good grade beef has optimum nutritional value but isn't as tasty. Therefore, Choice is between the higher flavor of Prime and the higher nutritional value of Good.

5. Are certain meat products high in salt?

Cured meat products contain salt, some more than others. If you are on a low-salt diet, contact the dietitian at your local hospital or write directly to the processor of the meat item in question.

STORING COOKED MEAT PRODUCTS

1. How should cooked meat products be stored?

Immediately after using, store cooked meat products in the refrigerator. After cooling, wrap the meat product in a freezer wrap or other impermeable material to prevent air from coming into contact with the meat. This is necessary to minimize oxidative rancidity which leads to a warmed-over flavor. Beef and pork, when reheated, almost always have a "left-over" flavor. The reason for this and preventative measures are not well understood.

**CONSULT THE COUNTY AGRICULTURAL
EXTENSION SERVICE OFFICE NEAREST YOU**

AITKIN (218) 927-2188
Courthouse
Aitkin 56431

ANOKA (612) 755-1281
550 Bunker Lake Blvd.
Anoka 55303

BECKER (218) 847-7195, 6298
Box 663, 818 Washington Avenue
Detroit Lakes 56501

BELTRAMI (218) 751-5564
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Ortonville 56278

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BROWN (507) 794-7993
City Hall 794-7994
Sleepy Eye 56085

CARLTON (218) 384-4281
Courthouse
Carlton 55718

CARVER (612) 442-4496
233 South Olive
Waconia 55387

CASS (218) 547-1312
Box W, Reeds Building
Walker 56484

CHIPPEWA (612) 269-6521
Courthouse
Montevideo 56265

CHISAGO (612) 674-4417
Box 278
North Branch 55056

CLAY (218) 233-2781 Ext. 308, 309
Courthouse
Moorhead 56560

CLEARWATER (218) 694-6151
Courthouse
Bagley 56621

COOK (218) 387-2015
Courthouse
Grand Marais 55604

COTTONWOOD (507) 831-4022
R.R. 2, Box 123
Windom 56101

CROW WING (218) 829-1497
Courthouse
Brainerd 56401

DAKOTA (612) 463-3302
315-4th Street
Farmington 55024

DODGE (507) 374-6435
Main Street
Dodge Center 55927

DOUGLAS (612) 763-6077
Courthouse
Alexandria 56308

FARIBAUT (507) 526-2138
County Office Bldg, 412 North Nicollet
Blue Earth 56013

FILLMORE (507) 765-3896
Masonic Building
Preston 55965

FREEBORN (507) 373-1475
200 Post Office Building
Albert Lea 56007

GOODHUE (612) 388-6701
Courthouse
Red Wing 55066

GRANT (218) 685-4820
Courthouse
Elbow Lake 56531

HENNEPIN (612) 473-4285
Suite 107, 250 North Central
Wayzata 55391

HOUSTON (507) 724-3929
310 West Main Street
Caledonia 55921

HUBBARD (218) 732-3391
Courthouse
Park Rapids 56470

ISANTI (612) 689-1810
Post Office Building
Cambridge 55008

ITASCA (218) 326-9466
Courthouse
Grand Rapids 55744

JACKSON (507) 662-5293
Main Street
Lakefield 56150

KANABEC (612) 679-3010
Courthouse
Mora 55051

KANDIYOHI (612) 235-1485
Courthouse
Willmar 56201

KITTSOON (218) 843-5361
Courthouse
Hallock 56728

KOOCHICHING (218) 283-2534
Courthouse
International Falls 56649

LAC QUI PARLE (612) 598-3325
Courthouse
Madison 56256

LAKE (218) 834-4395
Courthouse
Two Harbors 55616

LAKE OF THE WOODS (218) 634-1511
Federal Building
Baudette 56623

LE SUEUR (612) 357-2211
Courthouse
LeCenter 56057

LINCOLN (507) 694-1470
Courthouse
Ivanhoe 56142

LYON (507) 532-5230
Box 587 Courthouse
Marshall 56258

MAHNOMEN (218) 935-2554
Across from Courthouse
Mahnomen 56557

MARSHALL (218) 742-6491
Courthouse
Warren 56762

MARTIN (507) 235-3341
2423 Albion Avenue S.
Fairmont 56031

MCLEOD (612) 864-5551
Courthouse
Glencoe 55336

MEEKER (612) 693-2801, 2
Courthouse
Litchfield 55355

MILLE LACS (612) 983-6280
County Office Building
Milaca 56353

MORRISON (612) 632-3634
Old Courthouse
Little Falls 56345

MOWER (507) 437-6616
Courthouse 437-6617
Austin 55912

MURRAY (507) 836-8551
Murray County Courts Building
Slayton 56172

NICOLLET (507) 931-3240, 3241
P.O. Box 240
St. Peter 56082

NOBLES (507) 376-6171
Courthouse
Worthington 56187

NORMAN (218) 784-2111
Courthouse
Ada 56510

OLMSTED (507) 385-8250
717 3rd Avenue S.E.
Rochester 55901

EAST OTTER TAIL (218) 346-5750
Town Hall
Perham 56573

WEST OTTER TAIL (218) 739-2271 Ext. 42
Courthouse
Fergus Falls 56537

PENNINGTON (218) 681-2116
Courthouse
Thief River Falls 56701

PINE (612) 384-6156
Cassidy Building
Hinckley 55037

PIPESTONE (507) 825-3120
Post Office Building
Pipestone 56164

EAST POLK (218) 563-2465
City Hall
McIntosh 56556

WEST POLK (218) 281-1751
Post Office Building
Crookston 56716

POPE (612) 634-3091
Courthouse
Glenwood 56334

RAMSEY (612) 777-1327
2020 White Bear Avenue
St. Paul 55109

RED LAKE (218) 253-2897
Courthouse
Red Lake Falls 56750

REDWOOD (507) 637-8323
Courthouse
Redwood Falls 56283

RENVILLE (612) 523-2522
Courthouse
Olivia 56277

RICE (507) 334-4319
Courthouse
Faribault 55021

ROCK (507) 283-2648
110 N. Oakley
Luverne 56156

ROSEAU (218) 463-1052
208 Courthouse
Roseau 56751

NORTHERN ST. LOUIS -HIBBING OFFICE
Courthouse (218) 263-6602
Hibbing 55746

NORTHERN ST. LOUIS-VIRGINIA OFFICE
Courthouse (218) 741-5151
Virginia 55792

SOUTH ST. LOUIS (218) 726-7512, 7513
2215 East 5th Street, Room 111
Duluth 55812

SCOTT (612) 492-2370
123 1st Street East
Jordan 55352

SHERBURNE (612) 441-1341
Courthouse—326 Lowell
Elk River 55330

SIBLEY (612) 237-2344, 2298
Courthouse
Gaylord 55334

STEARNS (612) 252-2132
Federal Building
St. Cloud 56301

STEELE (507) 451-8040 Ext. 70
County Administrative Annex
Owatonna 55060

STEVENS (612) 589-2382
Courthouse
Morris 56267

SWIFT (612) 842-4761
Courthouse
Benson 56215

TODD (612) 732-2724
Courthouse Annex
Long Prairie 56347

TRAVERSE (612) 563-4515
Courthouse
Wheaton 56296

WABASHA (612) 565-4509
Courthouse
Wabasha 55981

WADENA (218) 631-2332
Courthouse
Wadena 56482

WASECA (507) 835-3610
122 3rd Ave. N.W., Box 70
Waseca 56093

WASHINGTON (612) 439-3220
6081 Oxboro Ave. N. Ext. 230
Stillwater 55082

WATONWAN (507) 375-3941
Courthouse
St. James 56081

WILKIN (218) 643-5481
Courthouse
Breckenridge 56520

WINONA (507) 454-5101
First Level, Courthouse
Winona 55987

WRIGHT (612) 682-1383
Courthouse
Buffalo 56313

YELLOW MEDICINE (612) 669-4825
1104-10th Avenue
Clarkfield 56223