



Improving Communications with Your Beef Processor



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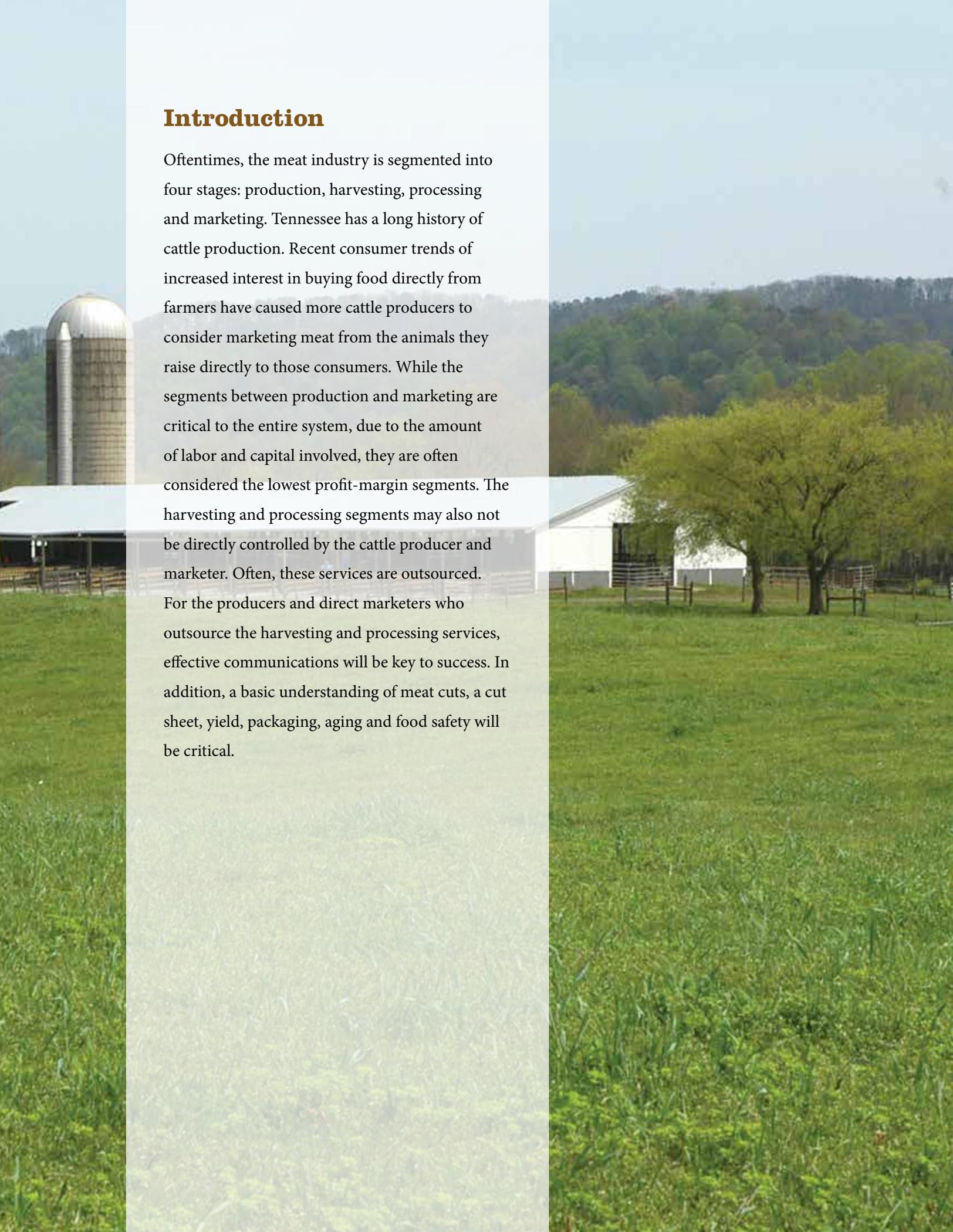


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Introduction

Oftentimes, the meat industry is segmented into four stages: production, harvesting, processing and marketing. Tennessee has a long history of cattle production. Recent consumer trends of increased interest in buying food directly from farmers have caused more cattle producers to consider marketing meat from the animals they raise directly to those consumers. While the segments between production and marketing are critical to the entire system, due to the amount of labor and capital involved, they are often considered the lowest profit-margin segments. The harvesting and processing segments may also not be directly controlled by the cattle producer and marketer. Often, these services are outsourced. For the producers and direct marketers who outsource the harvesting and processing services, effective communications will be key to success. In addition, a basic understanding of meat cuts, a cut sheet, yield, packaging, aging and food safety will be critical.



Why Use a Processor?

Recent consumer interest in purchasing locally raised beef has increased the interest from local cattle producers to fill such demand. As a result, more and more cattle producers are finishing animals for local harvest and processing. Some are working with federally inspected facilities to prepare meat cuts for sale directly to consumers, while others are marketing live animals to local customers for their own custom harvest and processing.

In these situations, the harvesting and processing phases are extremely important to the overall local meat supply-and-demand scenario. As the number of cattle finished for local processing increases, the stress on local harvesting and processing facilities also increases. To address these increases in processing opportunities, some facilities have extended their hours of operation and have begun to improve the efficiencies of throughput. However, the increased number of animals for local harvesting and processing has caused some delays for cattle producers with animals to deliver.

In frustration, some cattle producers who are trying to secure harvesting and processing services to complete their value-added marketing chain have exclaimed, "I'll just start my own harvesting and processing business on the farm!" After the construction, equipment and labor costs are weighed with basic business operation, regulatory and management issues, very few new harvesting and processing operations actually start up.

When people are searching for a business to perform animal harvesting and meat processing services, it is usually for two common reasons. First, cattle producers look for a federally inspected facility to prepare meat that can be sold directly to consumers. Second, owners of live animals look for custom-exempt facilities to harvest their animals and process the meat for their own consumption.

In the first case, where meat will be prepared for legal sale, a few key things are needed and expected from the harvesting and processing services. These include:

- Properly inspected and credentialed operation/facility (including the USDA inspection legend on packaged meat products).
- Experienced humane harvesting practices.
- Safety and sanitation practices as prescribed by USDA Hazard Analysis and Critical Control Points (HACCP) plan.

- Ample supply of proper meat handling and cutting equipment.
- Well-trained labor.
- Proper packaging equipment, materials and labeling capabilities.

When a facility is credentialed/approved by USDA, producers expect that the operation will conduct harvesting of the animal according to federal humane slaughter protocols. Because these standards are federally mandated and subject to change, some producers would rather contract with a harvesting/processing facility that is familiar with and up-to-date on humane harvesting requirements.

There is also an expectation that harvesting and processing operations are using prescribed safety and sanitation practices to ensure safe food products. The expectation of safe meat cutting and handling practices is often related to the expectation that existing processors have good equipment (knives and saws) and labor trained in up-to-date cutting practices — practices aimed toward efficient processing.

Custom-exempt — Not for sale

Custom-exempt operations only harvest and process for the owner of the animal. Custom-exempt operations may provide custom services for livestock owners as well as hunters of wild game. Because these facilities provide a custom service for the owner of the animal, the meat is the legal property of the person who owns the animal. Therefore, meat from a custom-exempt facility is prepared for the exclusive use of the animal owner and can only be served to the non-paying family, guest and employees of the owner of the animal. Meat from a custom-exempt facility cannot be sold and all packages should be labeled "Not For Sale." Custom-exempt operations are exempt from continuous, animal-by-animal inspection; however, they must still be permitted by the Tennessee Department of Agriculture and are occasionally inspected for sanitation procedures, packaging, handling and humane slaughter. Custom-exempt operations must register with the U.S. Department of Agriculture and are subject to federal humane slaughter requirements and provisions, but the animals themselves are not inspected for disease.

Beef producers also contract with an existing meat processor because they expect that the operation can obtain proper packaging materials and provide proper labeling. Finally, when a federally inspected facility is sought because a producer wishes to sell meat products, there is an expectation and need to have the USDA inspection legend appear on each meat package.

In the second case, where live animals will be sold for custom-exempt harvesting and processing, a few key things are needed and expected from the harvesting and processing services. These key communication items are addressed in the following section of this publication. While primary needs and expectations of the beef owner may vary, cattle producers who sell live animals often have direct communication with the custom processor and may have opportunities to facilitate and improve the communications between the processor and the animal owner.

Communication Is Key

Individuals using an animal harvesting and meat processing facility are encouraged to communicate with the facility management prior to animal delivery. Prior communication is suggested whether a federally inspected or a custom-exempt facility is being used. Advance communications and discussions may include the following:

Delivery

Owners should never show up at the facility without making an appointment. Both the date and time of day for live-animal delivery should be determined. The amount of lead time that an operation needs depends on a number of factors. These include the time of year and whether or not the operation is also involved in deer processing. The number of animals that will be delivered at one time is also important. That is, if a cattle producer is bringing six animals in a single load during an otherwise busy season, the processor needs more lead time than for a single animal delivered in a slow season. When discussing delivery of the live animal, beef owners are encouraged to find out exactly where the animal is to be unloaded and who to see upon arrival for unloading. Also vital: whether or not any paperwork needs to be completed prior to unloading.



When live animals are delivered to a custom-exempt harvesting and processing facility by the beef producer (seller), the name, or names, of the owner(s) of the live animal should be the individual(s) who purchased the live animal. That is, the person delivering the animal should not be recorded as the owner of the animal.

Cutting/Processing

Try to have all cutting instructions available at time of animal delivery. Use the cut sheet provided by the processing facility or make sure the operators are familiar with the cut sheet that you have developed (refer to “Basics of Meat Cutting” section later in this publication for additional information on carcass cutting styles). This facilitates the process of getting the animal through the system and minimizes potential delays and errors.

Packaging and Labeling

If the plant offers packaging options, the preferred type of packaging should be clearly identified on the cut sheet (see “Packing Options” section later in this publication for additional information on packaging). This step is particularly important when there are charges for different packing styles. Also, if the processing facility is using custom labels, make sure that arrangements are finalized as to who provides/prints the custom labels and safe handling labels.

Payment and Pickup

It is very important to discuss the charges and payment prior to bringing the animal to the processing facility. What is included in the standard charge? What are additional charges? Some operations require full

or partial payment upon delivery of the live animal, while others only require full payment when the meat is picked up. Also, some operations may take multiple forms of payment, while some may not take credit cards or may not accept personal checks. The timing and types of payment should be discussed to minimize misunderstandings. For the custom-exempt services, payment should be made directly by the owner of the animal, and it is suggested that a clear transaction between the processing operation and the owner be documented.

Special Instructions

When an animal seller/owner desires more than the standard processing procedures, be sure that the processor understands the requests. For example, do you want a shorter or longer aging period than the standard? What is the facility's policy for separating beef for multiple owners (when one animal is owned by more than one person in shares)? Do you want a special trim level, i.e., 1/8 inch or no external fat? What happens to the byproducts?

One of the best ways to ensure good communications with the processor regarding meat cuts is to use a cut sheet. However, it is important to understand that each processor is different, and a single, standard cut sheet may not be applicable.

A cut sheet is basically a form that is used to describe how the carcass will be cut into retail cuts. Often, processors will have their own cut sheet that shows how they routinely cut up a carcass into retail cuts. Some cut sheets will have a standard list of cutting options with various "yes," "no," or "select one," "select two" scenarios. The cut sheet can be used to indicate the preferred cuts. For example, the chuck may be cut into roasts, steaks, stew meat or ground. In addition to identifying various cuts, the cut sheet can specify steak thickness, ground beef/stew meat packaging size, or ground beef percent fat. The processor may offer additional processing options, such as ground beef patties, packaging choices, soup bones and variety meats (organs).

If you develop your own cut sheet, here are a few items/sections you should consider including:

- a) Customer contact information.
- b) Animal description.
- c) Cutting instructions for each animal.
- d) Primal cut.

Are "lot numbers" and/or "code dating" required?

While lot numbers and/or code dates are not required by state or federal law, they are often a significant part of an operation's recall plan system. They are highly suggested and very effective for recall, trace back and inventory management.

- e) Ground beef/stew options (bulk vs. patty, weight).
- f) Packaging options (type, steak thickness, steaks/package).

An example of a generic cut sheet is shown in the Appendix .

Basics of Meat Cutting

There are several terms that are used in the animal harvesting and beef processing industry at the meat cutting phase. Live weight, carcass weight and the dressing percentage are among these terms. Also important are the industry-accepted primal and retail meat cuts.

The live weight of an animal refers to its total weight on the day of harvest. Some operations will weigh the animal upon arrival and unloading at the facility, while others will weigh the animal moments prior to harvesting. Either of these total body weights is often referred to as the live weight or harvest weight. Depending on a number of factors, such as age, breed and sex of the animal, typical harvest weights range from 900 to 1,200 pounds.

The carcass weight is the weight remaining after all dressing procedures are completed. Dressing procedures include removal of the blood, hide, head, intestinal tract and internal organs. The carcass weight will be the weight of the entire carcass before any further processing and meat cutting are done. Often, the carcass weight will be further defined as the hot-carcass weight or a cold (chilled) carcass weight. This differentiation is made because the weight of a carcass will decrease as water in

Dressing percent calculation

Dressing percentage for a 1,200-pound live animal with a 750-pound carcass has a 62 percent dressing percentage: $(750\text{-pound carcass} / 1,200\text{-pound live weight}) \times 100 = 62\text{ percent}$.

the carcass evaporates as it cools. The hot carcass weight is the weight obtained immediately after harvest and prior to entering a cooler. The cold (chilled) carcass weight is measured after postmortem chill. There is often a 2 to 2.5 percent (or more) difference in hot and cold carcass weight. Meat processors may also refer to the “hanging weight” of an animal. This measurement is essentially the carcass weight and may be expressed as the hot or cold carcass weight.

The dressing percentage of an animal is the portion (percentage) of the live weight that remains in the carcass. Dressing percentage is sometimes referred to as the “yield.” Dressing percentage is calculated by dividing the hot carcass weight by the live animal weight. The dressing percentage will vary from one animal to another. For example, a 1,200-pound live animal with a 750-pound carcass weight would have a dressing percentage of 62.5 percent, while a 1,200-pound animal with a 686-pound carcass would have a dressing percentage of 57.2 percent. These calculations are summarized in Table 1.

Table 1. Example Dressing Percentage for Two Animals with Different Hot Carcass Weights

	Animal 1	Animal 2
Live Animal Weight	1,200 pounds	1,200 pounds
Carcass Weight	750 pounds	686 pounds
Dressing Percentage	62.5 percent	57.2 percent

Dressing percentages can vary widely from one animal to another due to differences in the intestinal contents (gut fill), carcass fatness and the muscle-to-bone ratio. Water and gut fill will increase the live weight and thus decrease the dressing percentage; animal fatness increases the carcass weight and will increase the dressing percentage. The whole animal carcass will be cut into halves, and then each half will be separated into the hind and front

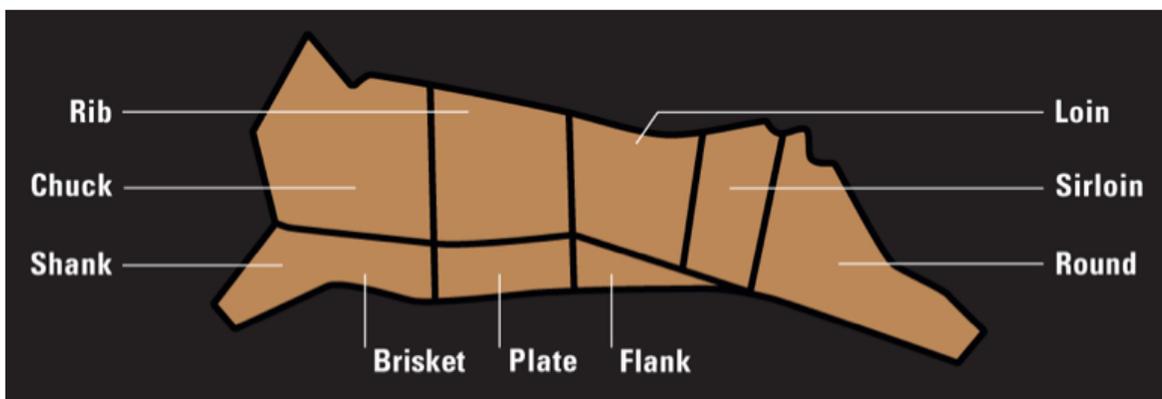
quarters. Each quarter is then separated into primal (or wholesale) cuts. This process is referred to as “breaking down the carcass.” Beef primal cuts in the front quarter are the rib, chuck, shank, brisket and plate; the hind quarter is composed of the flank, round, sirloin and short loin (see Figure 1). The round, loin, ribs and chuck are the major beef primals and are referred to as the thick cuts. The other primals are referred to as the thin cuts.

Primal cuts will be further processed into sub-primals or into retail cuts. The basic concept of cutting beef retail cuts is to separate tender meat from less tender meat, to separate thick muscles from thin muscles and to separate fatter from leaner portions.

While there are some standard and generally accepted meat-cutting practices and styles, other cutting practices are specific to an individual processor. Similarly, some processors are willing to process and cut according to specific requests of the animal owner, while others may provide very limited cutting options. Some processors

have a standard cut sheet from which they do not vary. During early communications with the processor, it is good practice to openly discuss how much, if any, flexibility is available in cutting. Will the processor cut to preferences? Does the beef owner have the option for boneless vs. bone-in cuts, steak thickness, or regular vs. extra-lean ground beef?

Figure 1. The nine primal (wholesale) cuts of a half beef carcass.

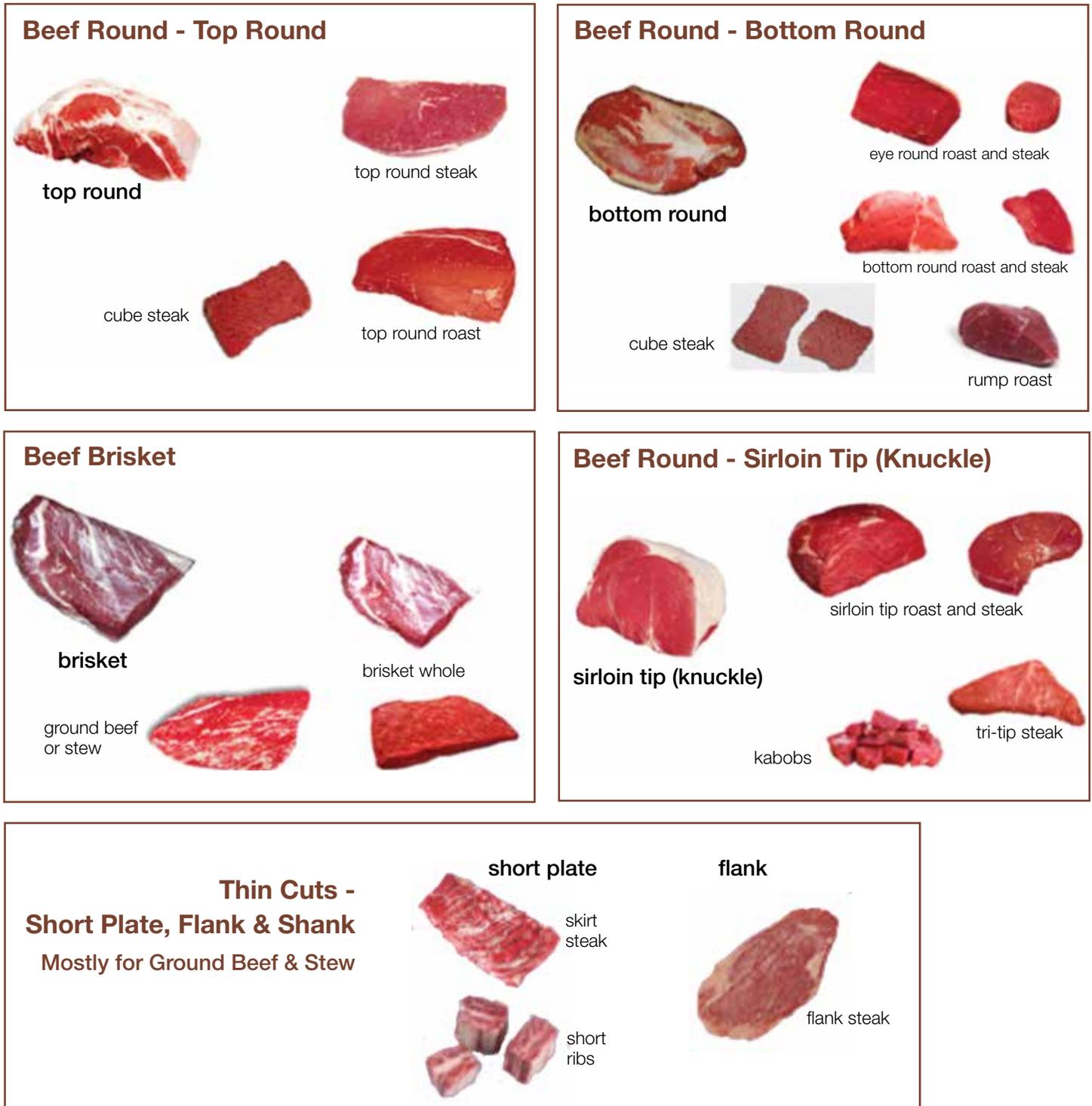


If working with a custom-exempt operation, it is helpful to determine whether or not there are any limitations on cutting wholes, halves and quarters for multiple (share) owners. Beef producers should become familiar with beef retail cuts regardless of their direct marketing route. Figure 2 shows a variety of retail cut suggestions for each primal cut. A variety of other resources are available to assist in the understanding of meat cuts. The National Cattleman's Beef Association has marketing materials

available (store.beef.org). A booklet titled "Guide to Identifying Meat Cuts" is available from Internet sources.

The Uniform Retail Meat Identity Standards also is available online (www.beefretail.org/CMDocs/BeefRetail/URMIS/introduction.pdf). This resource is a comprehensive collection of various retail cuts that can be derived from primal and sub-primal cuts.

Figure 2. Retail meat cut suggestions for each primal cut. Source: AggieMeat, aggiemeat.tamu.edu.



Carcass Yield — How Much Meat Will I Get?

Many times, animal owners expect to get 1,200 pounds of meat from a 1,200-pound live animal, and they are surprised when they receive much less. Several variables influence the amount and cuts of take-home or saleable meat. These include:

- Carcass fat — A fatter carcass tends to yield less meat products.
- Muscling — Heavier-muscled cattle tend to yield more retail cut weight.
- Trim level — Most consumers prefer about 1/4-inch external fat. Closer trim provides less yield.
- Bone-in vs. boneless cutting — Less retail cut weight is available with boneless cuts. More cuts put into ground beef will lower the yield (i.e., short ribs boned out and added to ground beef).
- Leanness of ground beef — The leaner the ground beef, the less take-home or saleable meat.
- Trimming loss — Bruises, abscesses and trimming due to aging lowers the amount of saleable/take-home meat.

In the University of Kentucky publication “How Much Meat to Expect from a Carcass” (ASC-179), www2.ca.uky.edu/agc/pubs/asc/asc179/asc179.pdf, the information in Table 2 is used to summarize the effect that some of these variables have on carcass yield. Obviously, boneless retail cuts weigh less than the similar bone-in cuts, which substantially lowers the cutting percentage. Within a cutting style, the amount of fat has the greatest effect on the cut yield. The fatter the carcass or the more fat that is removed (either by trimmer cuts or leaner ground beef), the less the packaged product yields.

Table 2. Average Amount of Meat from a 1,200-Pound Live Beef Animal

Cuts	Trim (Inches)	Ground Beef		Approx. amt. of freezer meat (lb.)
		Lean (%)	Fat (%)	
Boneless steaks and roasts	1/8	90	10	425
Bone-in steaks and roasts	1/4	80	20	500
Mixture of bone-in and boneless steaks and roasts	1/8	80	20	490
Boneless steaks and roasts from very fat animal	1/8	90	10	348
Boneless steaks and roasts from Holstein (dairy animal)*	1/8	90	10	396

*A Holstein steer was used in the example to show how a light-muscled animal will affect the amount of take-home product. Source: South Dakota State University. Note: Estimations may vary by 25 pounds or more.

How much space is needed to store meat?

It takes about 1 cubic foot of storage space for 35 to 40 pounds of meat and about 2.25 cubic feet per 50 pounds. For the 1,200 pound animal yielding 490 pounds of take-home or saleable meat, approximately 10 to 14 cubic feet of storage space will be needed.

In general, a 1,200-pound live animal that yields a 750-pound carcass may only yield 490 pounds of boneless and trimmed beef. It is not uncommon for a 750-pound carcass to contain 150 pounds of fat and 110 pounds of bone. It is important to understand that not all of the meat is in steaks either. For example, boneless and trimmed beef totaling 490 pounds may result in the following cuts of take-home or saleable meat:

- 185 pounds — Ground beef
- 90 pounds — Chuck roasts and steaks
- 85 pounds — Round roasts and steak
- 80 pounds — Rib and loin steaks
- 50 pounds — Other cuts (brisket, flank, short ribs, skirt steaks)

This example breakdown of a boneless and trimmed carcass into ground beef, roasts, steaks and other cuts is only an example. Actual weights of different cuts vary greatly.

Other products from the animal harvesting process are the byproducts, sometimes termed co-products. These byproducts of processing are often categorized as edible and nonedible byproducts. Edible byproducts include the edible organs such as tongue, liver, heart, oxtail and

sweetbreads (pancreas or thymus gland) (Figure 3). Nonedible byproducts are items such as the hide, blood, bones, inedible organs and fat. It may be understood that it is the processor's responsibility to dispose of the inedible byproducts. This would mean that the byproducts belong to the processor, who is free to sell the products if a market exists. Processors may have a lower processing fee if they have a strong market for byproducts. For example, if you wanted to tan the hide from a steer, you may need to negotiate a price for retaining this byproduct. On the other hand, if a processor has no outlet for the byproducts, there may be a disposal fee. Because the methods for handling byproducts can vary greatly, it is important to discuss the handling and packaging of byproducts when discussing all processing options.

Packaging Options

The purpose of packaging is to protect the meat product. The preferred packaging depends upon whether the meat will be kept fresh or will be frozen. The most common meat packaging materials include:

- Clear films.
- Tray with film over wrap.
- Paper (butcher paper).
- Paper with wax lining.
- Vacuum packaging.

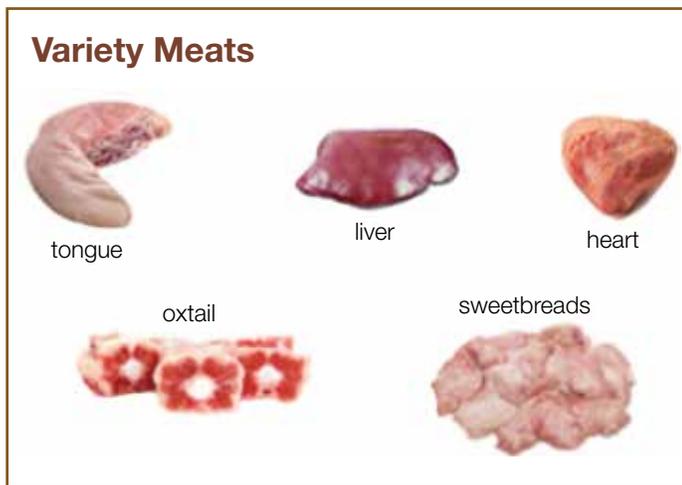


Figure 3. Edible byproducts from beef cattle. Source: AggieMeat, aggiemeat.tamu.edu.

How long can meat be kept?

Frozen beef steaks and roasts can typically maintain quality for nine to 12 months, while frozen ground beef tends to last three to four months. Frozen meat will last longer in colder and constant temperatures (0 F or colder). Prolonged storage of frozen meat tends to be a greater meat-quality problem than meat safety concern.

Fresh or frozen?

Most processing operations prepare products as frozen because of the extended storage time with frozen meat. However, if you wish to market fresh beef products, then you need to be aware of the limited storage life and make provisions for the unsold products.

For fresh meat, clear films and tray with film overwrap are typically used. The film should be oxygen-permeable, but not moisture-transmissible so the beef will keep the fresh, red color. Vacuum packaging is a very good option due to the increased storage life of the meat. The reduced oxygen levels in the vacuum package keep meat safe and flavorful but do result in a darker, purple-red lean color.

For frozen meat, butcher wrap paper is often used. Some papers have a wax coating that helps prevent moisture loss. Vacuum-packaged frozen meat will have a longer storage time but typically a higher cost. Vacuum packaging films can get brittle in frozen temperatures and tear easily. Regardless of packaging material, tears in the packaging result in meat dehydration that is commonly called freezer burn. This greatly reduces the appearance and palatability of the meat.

Some processors may have separate ground beef packaging options, too. In addition to the above, they may make patties or offer ground beef in a plastic tube called a chub.

Aging

Aging is the amount of time from live animal harvest until the carcass is broken down and packaged into retail cuts. It is typically the number of days that the carcass hangs in the cooler to age. Dry aging refers to the process of a carcass hanging in a cooler (dry environment) after harvesting. Wet-aging refers to the process of vacuum packing wholesale beef cuts after harvesting and aging in the package (moist environment). Dry aging is more common in smaller processing facilities, while wet aging tends to be more prevalent in larger processing operations.

The aging process has tenderizing and flavor effects on the meat. Most carcasses are aged seven to 14 days. Most of the tenderizing effect is accomplished by 10-14 days. Aging can enhance the “beefy” flavor of the meat.

However, prolonged aging can reduce yield due to surface dehydrations and can develop off flavors, especially in the ground beef.

Aging time depends on the owner’s marketing objectives, cattle type (i.e., fatness, age) and the availability of space in the processing facility. Carcasses with little or no fat covering, such as some grass-fed animals, should not be aged longer than seven days due to potential surface dehydration and “cold shortening” (resulting in a less tender meat). Although quite variable, older animals (greater than 24 months) can be less tender. Most meat-processing operations are accustomed to aging meat for seven to 10 days. Extended aging times can take up space at the processor and increase costs.

Focus on Food Safety

Food safety is everyone’s responsibility. Food safety should be a high priority for cattle producers, the processor and the consumer. Food safety practices should never be compromised. All beef producers should be certified through a Beef Quality Assurance program. Federally inspected facilities are required to develop and implement a variety of handling, cleaning and sanitizing practices that focus on preventing pathogens. Regardless of whether the processor is federally inspected or custom exempt, proper sanitation should be a daily chore both outside and inside the facility.

Appendix

Example Generic Cut Sheet for Beef				
Owner of Animal: _____				
Contact Information		Animal Description		
Name:		Deliver Date:		
Address:		Ear Tag:		
		Description:		
Phone:		Receiving: Whole Half		
General Instructions				
Hang Time:		days		
Fat Trim Thickness:		1/4 in. 1/8 in. No Fat		
Ground Beef:		lbs/package		Patties
Stew:		lbs/package		
Other:				
Cutting Instructions				
Chuck	Yes/No	Approx. Wt.	Steaks/Package	Special Cutting
Chuck Arm/Blade Roasts				
Chuck Arm/Blade Steaks				
Short Ribs				
Rib	Yes/No	Approx. Wt.	Steaks/Package	Special Cutting
Rib Roast				
Rib Steak				
or Rib Eye Steak				
Loin	Yes/No	Approx. Wt.	Steaks/Package	Special Cutting
T-Bone/Porterhouse Steaks.				
or Tenderloin				
Top Loin				
Sirloin	Yes/No	Approx. Wt.	Steaks/Package	Special Cutting
Sirloin Steaks				
Sirloin Roasts				
Round	Yes/No	Approx. Wt.	Steaks/Package	Special Cutting
Bottom Round Roast				
Bottom Round Steak				
Eye of Round Roast				
Eye of Round Steak				
Rump Roast				
Sirloin Tip Roast				
Sirloin Tip Steak				
Top Round Roast				
Top Round Steak				
Cube Steak				
Kabobs				

Shank	Yes/No	Plate/Flank	Yes/No	Special Cutting
Cross Cuts		Short Ribs		
Ground		Skirt Steak		
Stew		Flank Steak		
Brisket	Yes/No	Ground		
Whole		Stew		
Half				
Ground				
Stew				
Byproduct Meats	Yes/No	Special Cutting/Packaging		
Liver				
Heart				
Kidneys				
Tongue				
Oxtail				
Bones				
Suet				

Summary

The harvesting and processing segments of the meat industry are extremely critical for cattle producers who want to sell meat directly to a local customer. Many times, these services are performed by private business entities for the cattle producer and meat marketer. A basic understanding of meat cuts, packaging, aging and food safety will greatly improve the successful relationship between the cattle producer and the harvesting/processing service provider. In addition, clear and effective communications will also contribute to success. Additional information in the UT Extension publication titled “How Much Meat to Expect from a Beef Carcass” also provides useful information for cattle producers who are involved in direct meat marketing.





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