

How much meat should you expect?

Dr. Brandi Karisch – Extension Beef Cattle Specialist, Mississippi State University

The COVID-19 pandemic has caused massive disruptions in the beef supply chain, and had dramatic impacts on cattle markets. Beef producers are seeing record demand for local beef, and this has led to many conversations of “the processor must’ve stolen some of my meat”. Many are often surprised by the amount of packaged beef that they receive, and struggle with how to plan their freezer space. This may often be a point of contention and misunderstanding between consumers, beef producers, and beef processors. This article is in the process of being published as an MSU Extension publication with more detail. For more information on Beef Grades and Carcass Information please visit Publication 2522.

There are several factors that explain why when we purchase a 1,200 lb beef animal we do not get 1,200 lb of beef in the freezer. As beef is processed, the removal of skin, fat, bone, and organs drastically reduces the final weight. Factors affecting the final amount of beef are dressing percent as well as cooler shrink. It is important to note that with every cut made to the carcass the final take home weight decreases.

Dressing Percentage

Many beef producers are already familiar with the term dressing percentage. The dressing percent is hot carcass weight as a percentage of the weight of the live animal at harvest. The hot carcass weight is calculated after the head, hide, and internal organs have been removed. A common misconception is that the consumer will be bringing home 60% of the animal’s live weight (average dressing percentage). However this 60% includes bone, fat and moisture which when processed will be lost.

To calculate the dressing percentage the following formula is used:

$$(\text{hot carcass weight} \div \text{live animal weight}) \times 100$$

where hot carcass is the weight of the unchilled carcass after the removal of the head, hide, and internal organs.

The average dressing percentage of beef cattle is 60 to 64 percent. However dressing percentage can vary. For example from a 1,200 lb steer with a hot carcass weight of 756 lbs would have a 63% dressing percentage. It is important to remember that hot carcass weight includes bone, excess fat, and moisture loss that will not end up in the final packaged beef.

Dressing percentage is affected by a number of factors. The weight of the head, hide, horns, gut fill, and mud and manure on the hide will all impact dressing percentage. In addition, animal type, breed, and even how an animal is finished will have an effect on the dressing percentage. For example, we expect grass finished cattle to have a lower than average dressing percentage, while we might expect an animal that has been over-finished (fat) to have a higher than average dressing percentage.

Although there is a standard formula to calculate dressing percentage across animal types, it is important to note that some processors weigh animals on the farm prior to shipping (allowing

time for the digestive tract to empty) and some weigh animals right before harvest. Dressing percentage does not give a precise amount of beef for the freezer, as it is just the first step of many where weight is lost.

Carcass Chill and Primal Cuts

The next step in the process is to chill the carcass. Chilling will affect carcass weight because of moisture loss from water evaporation. A beef carcass is approximately 70 to 75 percent water. This moisture is lost in the cooling process and this loss is not accounted for in the dressing percent. As the carcass is cooled, water evaporates from the carcass causing losses of 2 to 5 percent of the hot carcass weight. This occurs in a 24 hour time period, and is called cooler shrink.

After the carcass is chilled, it will be further processed into cuts. First the carcass will be split in half, and then each half will be split into quarters. Often consumers may not want to purchase a whole animal on their own, and may go on halves or quarters with others. From this point the quarters are then fabricated to primals, often referred to as wholesale cuts. The round, loin, rib, and chuck are the major primal cuts. The front quarter gives the rib, chuck, brisket, and plate. The hindquarter gives the flank, round, and loin. These primal cuts are further divided into subprimal cuts.

Subprimals, or retail cuts, are cuts of meat that allow tender muscle to be separated from less tender muscle, thick muscle to be separated from thin muscle, more valuable cuts to be separated from less valuable cuts, and lean to be separated from fat. As the carcass is processed and more bone and fat are removed, final weight is further reduced.

One of the biggest benefits of having a beef animal custom butchered is the flexibility in determining which cuts are desired. For example, for families who like to grill, they might prefer as many steaks as possible. Whereas families on the go may rely on the crockpot and desire more roasts, etc. Thorough communication with the butcher is necessary to insure satisfaction of the final product. If you have questions and are unsure about something, don't be afraid to ask!

Factor Affecting Yields of Retail Cuts

The amount of final packaged meat is impacted by factors such as fat, bone, aging, and muscularity of the carcass. Carcass fat has the greatest impact on the amount of product from the carcass. If an animal has more external fat, this results in more trim that will be lost. Improved carcass muscularity will actually increase the percent retail product of a carcass. For example, dairy type animals will have decreased product amount compared to beef type animals. However, it is important to note that carcass fat has a greater impact on decreasing final product amount than muscle has on increasing retail product.

Cutting directions will also impact the amount of product from a carcass. If more boneless cuts are selected, expect the amount of retail product to decrease. Trimming of retail cuts will also lead to decreased yield as well as decreased fat in ground beef.

Aging will also have an impact on yield. While aging is desirable to improve tenderness and increase beef flavor, longer aging periods result in increased moisture loss from the carcass due to increased water evaporation. In addition, increased dry aging results in increased dehydration of the surface of the carcass, which can lead to dry leathery areas that need to be trimmed off. Loss from longer aging is increased in carcasses with little external fat.

Specific factors impacting retail yield:

Carcass Fat- External fat over ¼ inch thick is trimmed from retail cuts. The trimming of this fat is one of the greatest losses in weight from the carcass resulting in a lower percent of retail cuts from the carcass.

Muscularity- The more muscular a carcass the greater the retail cut yield.

Bone- in verses boneless cuts- Boneless cuts will result in lower total weight of retail cuts.

Ground beef type- a leaner ground beef will have less fat therefor a lower final yield weight and take home product.

Carcass abnormalities- Carcass abnormalities include bruising and abscesses. If present they are removed from the cuts resulting in lower total poundage of retail cuts.

Aging- While aging improves tenderness, it has a negative effect on total yield. The longer meat is aged the greater the carcass weight loss. The loss occurs for two reasons. The first being that the dehydration of the carcass removes water weight. Second if the meat is dehydrated for an extended period of time the dehydrated dry areas are removed reducing the yield.

Example:

If you purchase a 1,200 lb steer with a dressing percent of 63% you can expect a hot carcass weight of 756 lb., If there is a 4% cooler shrinkage after the carcass is chilled, it will have a weight of about 726 lb. Then another 30%- 40% will be lost as fat trim and bone; this puts you at approximately 470 lb of beef that will be put into the freezer. Note that these are only estimates and actual values vary based on the type of animal, fabrication choices, etc. as mentioned above. This is ONLY an example. More bone in cuts would increase the take home beef yield while boneless and ground beef will decrease yield.

For more information about beef cattle production, contact an office of the Mississippi State University Extension Service, and visit extension.msstate.edu/beef.