

Cattle Business in Mississippi – August 2008 **“Stocker Cents” article**

Interpreting Carcass Data

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Mississippi’s “Farm to Feedlot” program gives cow-calf producers the opportunity to retain ownership of their calf crop through the finishing phase. They then receive data on feedlot performance and carcass quality for each of those calves and make genetic selection decisions that improve the quality and value of the feeder calves they produce. Currently, the Farm to Feedlot program feeds calves through the Tri County Steer Carcass Futurity Cooperative (TCSCF), a program administered by Iowa State University Extension. The closeout reports from this program are comprehensive and include a great deal of detail specific to carcass quality. The most common of those traits, and their impact on value, will be discussed in this article.

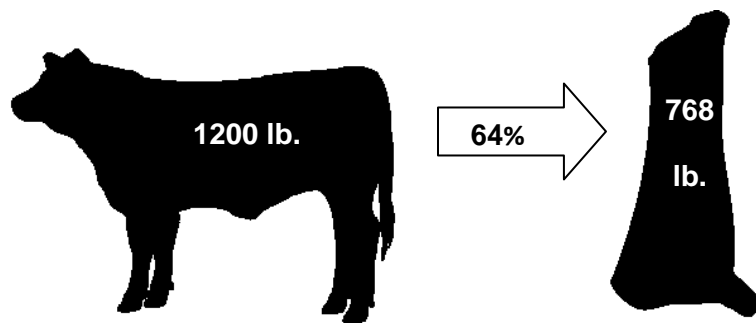
Hot Carcass Weight (HCW) and Dressing Percentage (Dress %)

Hot carcass weight (HCW) is the hot or unchilled weight after harvest and removal of the hide, head, gastrointestinal tract, and internal organs. It is sometimes reported as carcass weight. Carcass weight is a major factor in determining carcass value when cattle are sold on a dressed weight basis or on a value-based grid. Hot carcass weight is also used in Yield Grade calculations. Generally, the percentage of retail product decreases as cattle increase in weight because of increased fat deposition.

Packers severely discount heavyweight (> 950 lb.) and lightweight (< 550 lb.) carcasses that do not fit their specifications. The 2000 National Beef Quality Audit outlined a range of 650 to 850 lb. as an industry target for carcass weight. Carcass size is genetically influenced and can be changed with an emphasis on frame size and growth rate in breeding decisions.

Dressing percentage is hot carcass weight as a percentage of the live weight of the animal at harvest. It typically ranges from 60 to 64 percent for the majority of fed cattle and averaged 63 percent for the Mississippi Farm to Feedlot cattle from 1993 through 2007. To calculate dressing percentage, divide hot carcass weight by animal live weight. The result is expressed as a percentage. For example, if a 1200 pound steer produces a 768 lb. carcass, then the dressing percentage is 64 percent ($768 \div 1200 \times 100\% = 64\%$).

Similarly, animal live weight times the dressing percentage yields the carcass weight (Figure 1).



1200 lb. steer x 64% dressing percentage = 768 lb. carcass

Figure 1. Dressing percentage example

Ribeye Area

Ribeye area (REA) is an indicator of muscling and an important factor in determination of Yield Grade. As ribeye area increases, retail product yield increases. Ribeye area is determined by measuring the area of the *longissimus dorsi* (ribeye) muscle exposed by cutting or “ribbing” the carcass between the 12th and 13th ribs. Ribeye area is expressed in square inches and is often determined using a grid device or by ribeye tracing.

Both excessively small and excessively large ribeyes are quality challenges for the beef industry. An optimum range for ribeye area is 11 to 15 sq. in. Ribeye area targets should be approximately 1.6 to 1.8 sq. in. per 100 pounds of carcass weight. Results from the Mississippi Farm to Feedlot Program show that ribeye area per 100 pounds of carcass weight averaged 1.74 sq. in.

Fat Thickness

Fat thickness (backfat) is a measure of external fat thickness on a carcass. External fat is the most important determinant of retail yield. Fat thickness is measured at a point $\frac{3}{4}$ of the length of the *longissimus dorsi* muscle from the split chine bone.

As fat thickness increases, cutability and percentage of retail product decrease resulting in less desirable Yield Grades. Cutability is the percentage yield of closely trimmed, boneless cuts. Excessively low amounts of external fat on a beef carcass are undesirable as well. This can increase the risk of cold shortening (chilling of the carcass too rapidly leading to increased toughness). An optimum range for fat thickness is 0.2 to 0.5 inches. Mississippi Farm to Feedlot Program carcass backfat thickness averaged 0.48 inches over the past 15 years of the program.

Internal Fat

Kidney, pelvic, and heart (KPH) fat is also called internal fat. Internal or KPH fat is expressed as a percentage of hot carcass weight and is used in Yield Grade determination. The percentage of retail product yield decreases as KPH fat increases.

Intramuscular Fat

Intramuscular fat (IMF) is often called marbling. Marbling refers to the flecks of fat within the muscle tissue. Sufficient marbling is important for beef tenderness, juiciness and flavor. Degree of marbling is the primary factor determining Quality Grade. For official

grading purposes, marbling is assessed in the *longissimus dorsi* muscle exposed between the 12th and 13th ribs. One of the ten following marbling scores (common abbreviation) is assigned to a carcass:

- Very abundant (VAB)
- Abundant (AB)
- Moderately abundant (MAB)
- Slightly abundant (SAB)
- Moderate (MD)
- Modest (MT)
- Small (SM)
- Slight (SL)
- Traces (TR)
- Practically devoid (PD)

Each marbling score is divided into 100 subunits. Superscripts ranging from 00 (least amount of marbling) to 99 (greatest amount of marbling) are assigned within each marbling score.

Quality Grade

As described above, marbling and carcass maturity are determinants of Quality Grade. Better Quality Grades are achieved with higher degrees of marbling and lower degrees of carcass maturity. Beef Quality Grades are typically divided into thirds or halves for meat judging, carcass evaluation and value-based marketing programs. The most common divisions in order from the highest quality grade to the lowest Quality Grade are:

- Prime (thirds)
- Choice (thirds)
- Select (halves)
- Standard (halves)
- Commercial (thirds)
- Utility (thirds)

Symbols used to designate these grade divisions are: + (high), o (average) and – (low). For example, Choice– indicates the lower one-third of the Choice grade. A “no roll” category refers to all carcasses that do not meet the requirements for the USDA Select grade and would likely grade USDA Standard if graded. A grade stamp is not rolled on these carcasses. Bull beef is not Quality Graded, and cow beef is not eligible for the Prime grade. In addition, Commercial, Cutter and Canner grades are not applicable to bullock beef.

Yield Grade

Yield Grades classify carcasses for differences in cutability or yield of boneless, closely trimmed retail cuts from the round, loin, rib and chuck. The five Yield Grades are numbered 1 through 5. Carcasses in Yield Grade 1 have the highest cutability while carcasses in Yield Grade 5 have the lowest cutability.

The Yield Grade of a beef carcass is determined by considering four characteristics: (1) the amount of external fat (backfat), (2) the amount of kidney, pelvic and heart fat, (3) the area of the ribeye muscle, and (4) the hot carcass weight. Yield Grades are based on the following equation:

Yield Grade = 2.50 + (2.5 x adjusted fat thickness, in.) + (0.2 x percentage kidney, pelvic and heart fat) + (0.0038 x hot carcass weight, lbs.) – (0.32 x area of ribeye, sq. in.)

Conclusions

Understanding the traits that determine carcass value are most important for producers that retain ownership and market on a quality and/or yield grid. However, it is still important for producers who sell feeder calves to understand that these traits are often linked back to the region or specific farm that produced the calves. Furthermore, striving to produce the best possible beef product, regardless of how the cattle are marketed, will ultimately maintain consumer confidence and demand. For more information on beef cattle carcass data interpretation, contact an office of the Mississippi State University Extension Service.