

Understanding Beef Carcass Data Reports

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The Five-State Beef Initiative (FSBI) will provide livestock producers with a level of information about their cattle rarely obtainable previously. Producers will receive information allowing evaluation of their cattle for health and performance in the feed-yard and carcass data from the packing plant. This information will be useful in making genetic changes to improve the herd. This information may also be used as a very effective marketing tool. However, before it can be used for either of these purposes, it must be understood by the producer. This publication provides producers with a basic explanation of the terms on a carcass data report to enhance their understanding and use of the data.

Producers may receive reports from several different sources such as Cattlemen’s Carcass Data Service, packer grid reports, marketing alliance grid reports, and others. Terminology may be slightly different among the various reports, but the common and most important ones for use in herd management are discussed below.

Hot Carcass Weight

Hot carcass weight (HCW), or carcass weight on some reports, is the hot or unchilled weight of the animal in pounds after slaughter and after the hide, head, intestinal tract, and internal organs have been removed. For the majority of fed cattle, HCW will range from 60% to 64% of the live weight of the animal at slaughter. Obviously, HCW is a major factor in determining total revenue when animals are sold on a grid or “in the meat” basis. Price discounts usually occur for carcasses weighing fewer than 550 pounds or more than 900 pounds. A few packers do not begin the heavyweight discount until carcass weight reaches 950 pounds.

Marbling Score

Marbling, or intramuscular fat, is the distribution of fat within the lean of the ribeye muscle. Graders evaluate the amount and distribution of marbling at the cut surface of the ribeye between the 12th and 13th ribs. Degree of marbling is the primary determinant of quality grade. Each marbling score is divided into 100 subunits such that scores are assigned a superscript ranging from 00 to 99, representing the least and greatest amount of marbling within the score. Marbling scores with their resultant quality grades are shown in Table 1.

Table 1. Relation of minimum marbling score and carcass quality grade for “A” maturity score cattle.

USDA Quality Grade	Marbling Score (Abbreviation)
Prime +	Abundant ⁰⁰ (Ab)
Prime average	Moderately Abundant ⁰⁰ (MdAb)
Prime -	Slightly Abundant ⁰⁰ (SIAb)
Choice +	Moderate ⁰⁰ (Md)
Choice average	Modest ⁰⁰ (Mt)
Choice -	Small ⁰⁰ (Sm)
Select +	Slight ⁵⁰ (SI)
Select -	Slight ⁰⁰ (SI)
Standard +	Traces ⁰⁰ (Tr)
Standard -	Practically Devoid ⁰⁰ (Pd)

Quality Grade

A quality grade is an evaluation of the factors that influence palatability, or eating quality, of beef as reflected by tenderness, juiciness, and flavor. Beef carcass quality grades are based on degree of marbling and degree of carcass maturity. Carcass maturity groups are stratified from A to E and refer to the physiological age of the animal; they are used to estimate the live age. Maturity group A cattle are estimated to be from 9 to 30 months of age at slaughter, while maturity group E cattle would be estimated in excess of 96 months of age.

Maturity groups are determined by using bone characteristics, ossification of cartilage, and color and texture of the ribeye. Virtually all of the cattle in the FSBI will be maturity group A and eligible for the quality grades of Standard, Select, Choice, or Prime.

Maturity score is not generally shown on carcass data reports but is important to understand. Quality grade is a major factor in grid pricing systems, with greater pricing placed on higher grading carcasses. Quality grades and the necessary marbling scores are shown in Table 1.

Fat Thickness

Fat thickness, occasionally reported as backfat, is a measure of the thickness of external fat on a carcass. The measurement is taken on the cut surface of the ribeye between the 12th and 13th ribs at a point three-fourths of the ribeye length from the split chine bone. The measurement may be adjusted to reflect unusual amounts of fat elsewhere on the carcass. Fat thickness is a major influence determining yield grade of the carcass.

Ribeye Area

This is the total area of the ribeye muscle between the 12th and 13th ribs. The measurement is expressed in square inches and is generally determined by the use of a grid device. Ribeye area is also used in the equation to determine yield grade.

Internal Fat

Internal fat and the designation Kidney, Pelvic, and Heart (KPH) fat are the same. Some reporting services list % KPH, and some list internal fat as a percentage. Both are listed as a percentage of the hot carcass weight. Internal fat, or % KPH, is used in the yield grade equation. When the equation was developed, an average carcass KPH or internal fat was 3.5%. Carcasses with 3.5% KPH have zero adjustment for yield grade.

Yield Grade

For beef carcasses, yield grade is an estimate of the amount of boneless, closely trimmed, retail cuts from the round, loin, rib, and chuck, or the high value portion of the carcass. The rating is also reflective of yield of retail cuts from the entire carcass.

Yield grades are expressed as numeric scores of 1, 2, 3, 4, and 5. Yield grade 1 carcasses are expected to have the greatest percentage of boneless, closely trimmed, retail cuts, or greater cutability. Yield grade 5 carcasses would have the lowest percentage of boneless, closely trimmed, retail cuts, or the least cutability. The relationship between yield grade scores and percent boneless, closely trimmed, retail cuts is shown in Table 2.

Table 2. Relationship of yield grade and estimated percentage of boneless, closely trimmed retail cuts (BCTRC) from the round, loin, rib, and chuck of beef carcasses.

Yield grade	% BCTRC
1	≥ 52.3
2	52.2 to 50.0
3	49.9 to 47.7
4	47.6 to 45.4
5	< 45.4

An example of a step-wise procedure for determining the yield grade of a carcass is also shown to better demonstrate the influence of factors on carcass yield grade.

Comments

Some carcass reports show a comments column. This column is used to report unusual situations with the carcass such as “dark cutter,” “blood splash,” or “condemnation of the carcass.”

Procedure for Determining Yield Grade of Beef Carcasses

First, determine the preliminary yield grade (PYG) of the carcass. The PYG is determined by the amount of backfat or external fat opposite the ribeye. A carcass with no external or backfat is assigned a PYG of 2.00. For each tenth of an inch increase in backfat, add 0.25 to the PYG. A range of PYG and external fat is shown in Table 3.

Table 3. Relationship of external fat and preliminary yield grade (PYG).

External fat, inches	PYG
0	2.00
0.2	2.50
0.4	3.00
0.6	3.50
0.8	4.00
1.0	4.50
1.2	5.00

The second step is to adjust PYG for the relationship between ribeye area and hot carcass weight. The relationship of hot carcass weight and necessary ribeye area is shown in Table 4. Find the needed hot carcass weight and necessary ribeye area in the table. For each square inch more ribeye than shown in the table for the carcass weight, subtract 0.3 from the PYG. For each square inch less ribeye than shown in the table for the carcass weight, add 0.3 to the PYG.

Table 4. Relationship of hot carcass weight-ribeye area and preliminary yield grade.

Hot carcass weight, pounds	Ribeye area, square inches
500	9.8
550	10.4
600	11.0
650	11.6
700	12.2
750	12.8
800	13.4
850	14.0
900	14.6

The third and final step is to adjust PYG for % KPH, or internal fat. An average carcass has an average KPH value of 3.5%. For each 1% greater than 3.5%, add 0.2 to the PYG. For each 1% less than 3.5%, subtract 0.2 from PYG. Now the final yield grade has been determined.