Beef Logic

by R.A. "Bob" Long

Fat and carcass evaluation

Breeders who wish to improve carcass traits in their herds must first understand how carcasses are evaluated and be able to recognize an ideal one. The U.S. Department of Agriculture (USDA) currently describes carcasses by a dual-grading system, which assigns both a "quality grade" and a "yield grade."

The quality grade is concerned only with tenderness, juiciness and flavor of the meat (eating quality). Unfortunately, many cattlemen have confused the issue by using the word *quality* with reference to any desirable carcass characteristic. The word *quality* should only be used in connection with the quality grade.

The USDA quality grades for steer and heifer carcasses are, in order of value, Prime, Choice, Select, Standard and Utility. These grades are determined by marbling, maturity, color and texture.

Marbling is the major factor that determines the quality grade. *Marbling* is the term applied to the visible specks and streaks of fat in a cross section of the ribeye muscle. First, the chilled carcass is ribbed by dividing the carcass side into quarters, cutting between the 12th and 13th ribs. The USDA grader looks at the cut surface of the ribeye and declares a marbling score.

The ten marbling scores, from none to most, are (1) devoid, (2) practically devoid, (3) traces, (4) slight, (5) small, (6) modest, (7) moderate, (8) slightly abundant, (9) moderately abundant, and (10) abundant. Carcasses with sufficient marbling scores to be eligible for Prime are scores 8, 9 and 10; Choice are 5, 6 and 7; Select is score 4; and Standard is 2 and 3. *Certified Angus Beef* ™ standards require a score of 6 (modest) or better.

Maturity is a measure of age. It is a better measure of physiological age than calendar age because some animals mature in a shorter time than others. Maturity is determined by observing the color of the cut surface of the spinal column and the degree of ossification of the cartilage.

The maturity scores are A, B, C, D and E with A being youngest and E being oldest. "A" maturity ranges from about 10 to 30 months of age and, since almost all steers and heifers are slaughtered within that age group, maturity is not usually important in determining quality grade. Even so, younger animals are better, as long as adequate marbling is present.

Color and texture of the meat are also considered in quality grading but are rarely of importance.

The yield grade is concerned only with the percent yield of boneless, closely trimmed retail cuts from the round, loin, rib and chuck. As such, it is a good measure of salable meat and is a major basis for value-based marketing.

The yield grades are 1, 2, 3, 4 and 5, with 1 being the most desirable. Yield grade is determined by fat thickness at the 12th rib; the area of the ribeye at the 12th rib; the hot-carcass weight; and percent kidney, pelvic and heart (KPH) fat.

Fat thickness has the greatest influence on yield grade and, because fat-deposition patterns can vary widely, the USDA grader must often adjust the fat thickness. First, the USDA grader establishes a preliminary yield grade (PYG) on the basis of fat thickness.

Then the PYG is adjusted by subtracting 0.3 point for each square inch of ribeye in excess of 11.0 square inches. Likewise, 0.3 point is added for each square inch of ribeye short of 11.0 square inches. In mathematical terms, the adjustment is [-0.3 point × (REA-11.0)].

Next, for each 25 pounds (lb.) of hot-carcass weight heavier than 600 lb. the grader adds 0.1, or for each 25 lb. lighter than 600 the grader subtracts 0.1. Finally, 0.1 yield grade is added for each 0.5% KPH fat above 3.5%, or 0.1 yield grade is subtracted for each 0.5% below 3.5%.

The yield grade is calculated in tenths — 2.4 or 3.6, for example. However, the carcass is stamped only with whole numbers, and herein lies a problem. A Yield Grade (YG) 2.0 carcass will contain approximately 2% more trimmed, boneless retail cuts than a carcass grading 2.9, yet both carcasses are stamped 2 and sell for the same amount per unit of weight.

A YG 2.0 carcass will yield 52.3% boneless retail cuts; a YG 2.9 will yield only 50.3%. In a 700-lb. carcass this amounts to 14 lb. of boneless product that sells for $3-$4/lb., for a difference in real value of $40-$50 between the two carcasses.

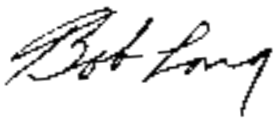
Therefore, yield grades always should be expressed in tenths instead of whole numbers.

The ideal carcass should weigh approximately 700 lb., carry 0.25 inch adjusted fat thickness, have a ribeye area of 15.0 sq. in., exhibit moderate marbling and be 12-14 months of age. Such a carcass would be assigned a USDA Choice$^+$ Quality Grade and a USDA Yield Grade of 1.5 and would please feeders, packers, retailers, restaurateurs and consumers and cost no more to produce than today's average carcass, which is too fat, deficient in muscling and lacking in marbling.

Unfortunately, memorizing this information will not equip a breeder to embark upon a successful carcass-improvement program. Also required is hands-on experience with actual carcasses and the ability to identify differences in fatness, fat-deposition patterns, ribeye area and marbling.

Finally, the fact that current beef supplies are too fat, deficient in muscling and lacking in marbling must be realized and accepted.

My next column will deal with muscling and its contribution to overall carcass excellence.



EDITING CORRECTIONS

Table 1 in November's "Beef Logic" column (page 113) should have been titled "Percent separable fat" instead of "Percent soluble fat."

The sentence reading "Therefore, fat-deposition patterns must be given attention in selection and as a single measurement at the 12th rib," should have instead read, "Therefore, fat-deposition patterns must be given attention at selection, in addition to a 12th-rib measurement."

We apologize for these editing errors.