

The Feeder Calf Grading System

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Grading systems are important to the cattle industry for several reasons. They provide a common language for describing various types of cattle. Transactions can be made without a buyer seeing the cattle. In the case of feeder cattle, a grading system allows one to predict the feedlot performance and carcass characteristics of the finished cattle. They can also be used by the owner of cattle to evaluate the current breeding program.

U.S. beef cattle herds were once mainly descended from three British breeds. Today, more than 40 different breeds are being used. This and other changes prompted the U.S. Department of Agriculture to revise the Official United States Standards for Grades of Feeder Cattle. These grades provide a common terminology to describe cattle in market reports. The current USDA feeder cattle grading system is based on frame size and muscle thickness. The system also has projected slaughter weights of the animals. The grades have three frame sizes and three thickness grades.

Nine possible combinations (three frame sizes, three muscle thicknesses) of feeder cattle grade exist for thrifty animals, as well as an Inferior grade for unthrifty animals. The Inferior grade includes feeder cattle which are unthrifty due to mismanagement, disease, parasitism, or lack of feed. An animal grading Inferior could qualify for a muscle thickness and frame size grade at a later date, provided the unthrifty condition was corrected. "Double-muscled" animals are included in the Inferior grade, although such animals have a large amount of muscle. They are graded U.S. Inferior because of their inability to produce carcasses with an acceptable degree of meat quality.

Frame

Frame size is used because frame is an inherited characteristic that is not greatly affected by normal management practices. Frame size relates to height but also to the weight at which an animal will produce a carcass of a given grade. Larger framed cattle typically reach equal fat thickness at heavier weights than smaller framed cattle.

The three frame scores normally used are Large, Medium and Small, referred to as L, M and S, respectively.

Large Frame (L): Large frame cattle are thrifty, tall and long bodied for their age. Steers would be expected to produce the amount of external (subcutaneous) fat opposite the 12th rib, usually about .5 inch, normally associated with the U.S. Choice grade when their live weight exceeds 1200 pounds. Heifers would not be expected to produce Choice carcasses until their live weight exceeds 1000 pounds.

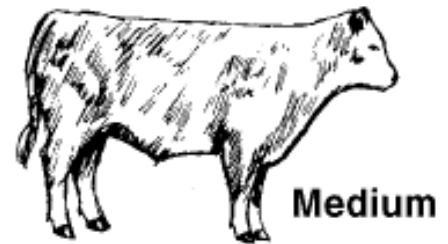
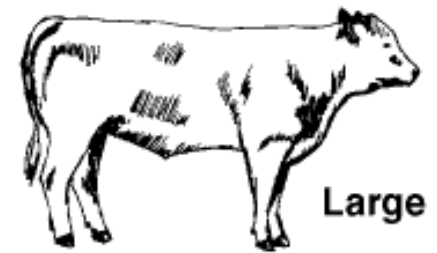
Medium Frame (M): Medium frame cattle are thrifty and moderate in height and body length for their age. Steers would be expected to produce U.S. Choice carcasses, about .5 inch fat at 12th rib, at live weights of 1000 to 1200 pounds. Heifers would be expected to produce Choice carcasses at 850 to 1000 pounds.

Small Frame (S): Small frame cattle are thrifty but are shorter in height and body length than specified for Medium frame cattle. Steers would be expected to produce U.S. Choice carcasses, about .5 inch fat at 12th rib, at live weights less than 1000 pounds. Heifers would be expected to produce Choice carcasses at live weights of about 850 pounds.

The frame size portion of the grade standard must be determined by an evaluation of the animal's skeletal size in relation to its age. For example, two feeder cattle with the same height and body length but differing substantially in age would not be the same frame size. The appearance of feeder cattle can be used to estimate age. As feeder cattle mature, their ears decrease in size in relation to their heads; the muzzle becomes wider; the head becomes longer in relation to its width; and the tail increases in length and exhibits a more prominent switch.

Frame size and breed should not be automatically equated. It is very possible for the largest cattle in a small mature size breed to be as large as the smallest cattle in a large mature size breed.

Frame Size



Thickness

Thickness is related to the muscle-to-bone ratio at a given degree of fatness to carcass yield grade. An example would be a thinly muscled animal having a Choice, Yield Grade 3 carcass, while the carcass of a thickly muscled animal may be Choice, yield Grade 2. The three muscle thickness grades are designated by Number 1, Number 2 and Number 3.

Fat can visibly alter the perception of muscling. Therefore muscle thickness is appraised at a constant degree of fatness (slightly thin). Some feeder cattle may carry more than a thin degree of fat and should be appraised for the degree of muscling they would have possessed at a slightly thin fat cover.

Number 1: Number 1 muscle thickness feeder cattle typically have a high proportion of beef breeding. They must be thrifty and thick throughout. They are full in the forearm and exhibit muscularity over the back and through the loin with moderate width between the legs. Cattle can exhibit thickness with even a slightly thin covering of fat; however, cattle eligible for this grade may carry varying degrees of fat.

Number 2: Number 2 muscle thickness feeder cattle are thrifty and somewhat narrower through the fore- and hindquarters. The forearm is thin and the back and loin have a sunken appearance. The legs are set close together. Cattle exhibit this narrowness with a slightly thin covering of fat; however, cattle eligible for this grade may carry varying degrees of fat.

Number 3: Feeder cattle in this grade are thrifty and have less thickness than the minimum requirements specified for the Number 2 grade.

The Number 1 grade includes all feeder cattle previously under the 1964 Prime and Choice grades. The Number 2 grade includes cattle previously under the 1964 Good and Standard grades and the Number 3 grades includes all cattle that would have been less than Standard. Approximately 90 percent of all feeder cattle are in the Number 1 muscling grade, about 10 percent are number 2 grade, and less than 1 percent are in the Number 3 grade. The vast majority of cattle of beef breeding will be in the Number 1 grade and dairy crosses will be in the Number 2 grade.

Thickness



Terminology

Radio and newspaper market reports will use terms such as L1, M2, etc. L1 refers to large frame-number 1 muscle thickness. M2 means medium frame-number 2 muscle thickness. Number 1, 2, 3 muscle thickness is also seen as No. 1, No. 2, and No. 3 in other market reports.

Frame Size and Muscling Effects on Feedlot Performance

Kansas researchers compiled feedlot records from more than 5000 steer calves involved in their 1974-1983 steer futurity program (Table 1.). Producers consigned the calves for performance testing, usually in commercial feedlots. All steers involved were classified according to frame. In general, as frame size increased, calves were heavier at the start of feeding, daily gain increased, fat thickness decreased, yield grades were improved and USDA quality grade decreased. According to the researchers, there seemed to be a diminishing return for steers as they got above what was termed 6 frame score. Optimum frame size will be a function of carcass weight, yield grade and the prevailing price spread between Prime, Choice and Select grades at time of marketing.

Table 1. Effect of Frame Score on Steer Performance in Kansas Futurities (1974-1983)

Frame Score	1	2	3	4	5	6	7	8
Number of steers	22	127	305	526	593	483	203	56
Yearling hip height (in.)	38	40	42	44	46	48	50	52
Initial Weight (lb.)	496	536	576	602	641	683	706	752
Final Weight (lb.)	939	993	1039	1102	1174	1240	1274	1313
Daily Gain (lb./day)	2.6	2.8	2.8	3.1	3.2	3.4	3.4	3.5
Dressing Percent	61	61	61	61	61	61	61	61
Carcass Weight (lb.)	571	606	634	672	716	757	777	801
Fat Thickness (in.)	.42	.44	.44	.42	.39	.37	.32	.31
Rib-eye Area (in. ²)	11.9	11.9	12.1	12.8	13.4	13.7	13.9	1.43
Yield Grade	2.5	2.6	2.6	2.5	2.4	2.4	2.2	2.2
Quality Grade*	7.3	7.2	7.0	6.8	6.7	6.5	6.4	6.1
Days on Feed	172	166	165	162	163	165	167	162
Return	\$53	\$62	\$62	\$65	\$76	\$83	\$86	\$85

*6=USDA high Select, 7=USDA low Choice

A Colorado study (Table 2.) compared performance of steers of each of the USDA Feeder Grade frame sizes. Small, Medium and Large Fame steers were fed a finishing ration for 135 days. As in the Kansas study, total gains, daily gains, final weight, carcass weight and rib-eye area were greater as frame size increased.

Table 2. Feedlot Performance of Small, Medium and Large Frame Steers

Frame Score	Small	Medium	Large
Initial Weight (lb.)	651	770	880
Final Weight (lb.)	1016	1186	1313
Daily Gain (lb./day)	2.7	3.1	3.2
Feed Intake (lb.)	19.1	22.3	24.1
Feed to Gain	7.0	7.2	7.4
Carcass Weight (lb.)	621	739	817
Fat Thickness (lb.)	0.5	0.5	0.5
Rib-eye Area (in. ²)	11.9	12.8	13.9
Yield Grade	2.8	3.0	2.9
Quality Grade*	6.1	5.8	5.6

*5=USDA low Choice, 6=USDA average Choice

It is important to note that while Large Frame steers had more rapid gains than Small Frame steers, the Small Frame steers were the most efficient. Although it may seem odd that faster gaining cattle could be less efficient, two facts must be considered. First, large cattle require more feed for maintenance and therefore must gain faster to maintain equal feed efficiency. Second, the final backfat thicknesses for all three frame sizes in the Colorado trial were similar, indicating that all the cattle were slaughtered at about the same physiological maturity and carcass composition. Quality grade also decreased as frame size increased.

Summary

The USDA Feeder Cattle Grading System allows for a common terminology for describing feeder cattle. It allows livestock producers to evaluate different groups of calves and predict their future performance. It is important to understand these grades since they are the basis for many livestock reports. A certain amount of sorting may be required for each group to attain their optimum carcass weight and not be over- or under-fed.

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