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Improving the Value of Feeder Cattle

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Introduction

The Arkansas beef cattle industry consists of cow-calf operations with approximately 80 percent of the farms having less than 50 cows. Most of these producers market feeder calves through local livestock auctions. As feeder calves are viewed, buyers must look at the feeder calf/calves, make some assessment regarding the makeup of the calf and potential production and then place a bid. At most livestock auctions, buyers must make a rapid assessment of the animal's production potential.

Although cattle producers are "price takers," there are ways to improve the value of feeder calves. When buyers look at feeder calves, they must assess the muscle thickness, frame score, breed composition and other management factors to determine a sale price. This publication will address the importance of these factors and provide guidelines on how cow-calf producers can improve feeder calf value.

Throughout this publication, discounts for certain traits or characteristics are reported. These discounts were reported from the Arkansas Livestock Market Survey conducted in 2005. The objective of the survey was to determine the significant factors affecting the selling price of feeder cattle. The amount of discounts can vary as feeder calf supply and demand change. Over the long term, however, these traits or characteristics are usually discounted, but the amount of the discount may change.

Muscle Thickness

Muscle thickness is related to muscle-to-bone ratio at a given degree of fatness to carcass yield grade. USDA developed a standard muscle scoring system (USDA, 2000). The scoring system is 1, 2, 3 and 4.

Muscle score 1 cattle are thrifty and moderately thick throughout. They are moderately thick and full in the forearm and gaskin, showing a rounded appearance through the back and loin with moderate width between the legs, both front and rear.

Muscle score 2 cattle show a high proportion of beef breeding, are thrifty and tend to be slightly thick throughout. They tend to be slightly thick and full in the forearm and gaskin, showing a rounded appearance through the back and loin with slight width between the legs, both front and rear.

Muscle score 3 cattle express a forearm and gaskin that are thin, and the back and loin have a sunken appearance. The legs are set close together, both front and rear.

Muscle score 4 cattle are thrifty but have less thickness than the minimum requirements specified for the No. 3 grade.

Table 1 summarizes the selling price of feeder cattle based on muscle score. The discounts due to lack of muscling were large regardless of feeder calf weight. The discount comparing a No. 2 to a No. 1 was $9.14 per cwt., or $45.70 for a 500-pound feeder calf. The selling discount

more than doubled for No. 3s ($24.17 discount per cwt., or $120.85 per 500-pound feeder calf). The discount continued to increase when comparing No. 4s to No. 1s ($38.24 per cwt., or $191.20 per 500-pound feeder calf). Light-muscled feeder cattle come from light-muscled cows bred to light-muscled bulls. Culling light-muscled cows and replacing them with moderate-muscled cows is the first step to producing heavier-muscled feeder cattle. Selecting sires with a full forearm and gaskins, showing rounded appearance through the back and loin with moderate width between the legs, is very important.

Table 1. The Average Selling Price for Feeder Cattle Based on Muscle Score

Muscle Score	Average Selling Price[a] (Value/cwt.)	Discount Compared to No. 1 (Value/cwt.)
Number 1s	$120.45	---
Number 2s	$111.31	-$9.14
Number 3s	$96.28	-$24.17
Number 4s	$82.21	-$38.24

[a]Averages across muscle scores are different from each other ($P < 0.0001$).

Frame Score

The "frame score" is determined by measuring cattle standing naturally on a flat, firm surface, legs squarely under the body and head in a normal position. Measurement should be made directly over the hooks or hips (Figure 1). This can be done with a device consisting of a cross-arm (with a bubble level) attached in a 90-degree angle to an upright. The upright contains a rule or gauge for measuring.

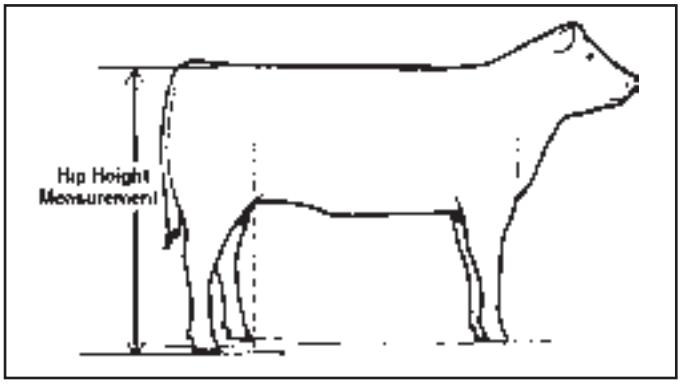

Figure 1. Height Measurement

Frame scores are determined based on the revised U.S. Standards for Grades of Feeder Cattle (USDA, 2000). According to the standards, frame size is related to the weight at which, under normal feeding and management practices, an animal will produce a carcass that will grade USDA Choice. USDA large-framed steers and heifers are expected to weigh over 1,250 and 1,150 pounds, respectively, to grade USDA Choice. USDA medium-framed steers and heifers are expected to weigh 1,100 to 1,250 and 1,000 to 1,150 pounds, respectively, to grade USDA Choice, and USDA small-framed steers and heifers are expected to weigh less than 1,100 and 1,000 pounds, respectively. Large-framed animals require a longer time in the feedlot to reach a given grade and will weigh more than a small-framed animal would weigh at the same grade.

Therefore, USDA Feeder Cattle Grade Medium is equal to hip height frame scores 4 and 5, Small is equal to or less than 3 and Large is equal to or greater than 6. The ideal calf should be between a frame score of 5 to 6. That means at 205 days of age males should be 44.1 to 46.1 inches tall and heifers should be 43.3 to 45.3 inches tall at the hip (Table 2). It is much easier to produce frame score 5 to 6 calves from frame score 5 to 6 cows. Therefore, it may be important to frame score the cow herd and bulls and eliminate extremely large- and small-framed cattle.

Table 2. Frame Score Chart for Growing Calves

Age (Months)	Frame Score (inches)					
	4		5		6	
	Bulls	Heifers	Bulls	Heifers	Bulls	Heifers
6	40.8	40.3	42.9	42.3	44.9	44.4
205 days	42.1	41.2	44.1	43.3	46.1	45.3
8	43.2	42.1	45.2	44.1	47.2	46.2
10	45.3	43.7	47.3	45.7	49.3	47.7
365 days	47.0	45.0	49.0	47.0	51.0	49.0
14	48.5	46.1	50.4	48.0	52.4	50.0
16	49.6	49.6	51.6	49.9	53.6	50.8
18	50.5	47.5	52.4	49.5	54.4	51.4

Source: Beef Improvement Federation

Table 3. The Average Selling Price for Feeder Cattle Based on Frame Score

Frame Score	Average Selling Price (Value/cwt.)	Discount Compared to Large Frame (Value/cwt.)
Large	$118.27[a]	---
Medium	$118.15[a]	-$0.12
Small	$95.43[b]	-$22.84

[a,b]Averages without a common superscript differ ($P < 0.01$).

In the Arkansas Livestock Auction Survey, USDA small-framed feeder cattle sold with severe discounts, over $22.00 per cwt. compared to large- and medium-framed feeder cattle. Feeder cattle that are small-framed (less than 43.3 inches tall at 205 days of age) will generally have more backfat at slaughter than

large- or medium-framed cattle. The excessive backfat negatively affects yield grade and red meat yield. The selling prices between large- and medium-framed feeder cattle were not different. Therefore, large- and medium-framed cattle sold for the same price.

Breed Composition

It has often been stated that there is as much variation within a breed as there is across breeds. This statement is very true. Therefore, it becomes very difficult to recommend to the commercial cow-calf producer that one breed type fits all needs and environments. When designing breeding programs, it becomes very important to truly identify those superior animals within a breed. The results of crossbreeding can have a greater impact when superior purebred animals are used. The major advantage to using superior animals in crossbreeding programs is heterosis, or "hybrid vigor," and breed complementation.

In the Arkansas Livestock Auction Survey, 23 breeds or breed combinations were analyzed. Livestock market reporters evaluated each feeder calf and determined its breed or breed type based on frame score, muscle thickness, color, breed characteristics and body structure. Breed or breed combinations were based on common industry perception rather than actually knowing the breed composition. This, however, is what an order buyer must do before a selling price can be offered.

Feeder cattle perceived to be Hereford x Charolais crosses, Angus x Hereford crosses, Angus, Charolais x Limousin crosses, Angus x Limousin crosses, Angus x Charolais crosses and Hereford x Angus x Brahman crosses brought a higher selling price than all other breeds or breed types (Table 4).

Many cattle breeds were very similar in selling price. For example, the prices received for Angus x Hereford crosses, Angus, Charolais x Limousin crosses and Angus x Limousin crosses calves were not different. This is designated by the common superscript "b." Another example of how the superscripts can be used is that Angus x Limousin crosses, Angus x Charolais crosses and Hereford x Angus x Brahman breeds or breed combinations are not different from one another. They share the superscript "d."

Table 4. The Average Selling Price for Feeder Cattle Based on Breed or Breed Composition

Breed or Breed Types	Average Selling Price (Value/cwt.)	Deviation From Overall Average (Value/cwt.)
Hereford x Charolais	$122.66[a]	$4.56
Angus x Hereford	$121.74[b]	$3.64
Angus	$121.43[b,c]	$3.33
Charolais x Limousin	$121.33[b,c]	$3.23
Angus x Limousin	$120.83[b,c,d]	$2.73
Angus x Charolais	$120.59[c,d]	$2.49
Hereford x Brahman x Angus	$120.01[d]	$1.91
Charolais	$118.12[e]	$0.02
Charolais x 1/4 Brahman	$117.91[e]	-$0.19
Hereford x Limousin	$117.87[e]	-$0.23
Brangus	$117.69[e]	-$0.41
Limousin	$116.86[f]	-$1.24
1/2 Brahman Cross	$116.62[f,g]	-$1.48
Angus x Brahman	$116.15[f,g]	-$1.95
Limousin x 1/4 Brahman	$115.29[f,h]	-$2.81
Hereford x 1/4 Brahman	$114.94[h]	-$3.16
Hereford x Simmental	$114.15[g,h,i]	-$3.95
1/4 Brahman Cross	$112.15[i]	-$5.95
Simmental	$111.91[j]	-$6.19
Salers	$110.17[k]	-$7.93
Brahman	$108.24[k]	-$9.86
Hereford	$107.25[k]	-$10.85
Longhorn	$89.38[l]	-$28.72

[a, b, c, d…l]Averages without a common superscript differ ($P < 0.01$).

When reviewing the breeds or breed combinations above the average, note that a number of breeds or breed combinations are not significantly different from each other. The same was true with the breeds or breed combinations below the average; many breeds or breed combinations are not different. The selling prices of Salers, Brahman and Hereford are not different from each other (superscript "k"), but these breeds or breed types were different from the price received for Longhorn calves (superscript "l"). Also note that the discounts on the breeds or breed types listed on the bottom are far greater than the premium for the breeds or breed types listed at the top.

Breeds or breed types do affect the selling price of feeder cattle. This is due to the perception by the order buyer as to how different breeds or breed types perform (gain, sick rate, quality grade, etc.). For many years, a perception existed that if cattle were black they had some degree of Angus breeding. Today that may or may not be true. Many beef breeds have animals that are black, such as Limousin, Simmental and Gelbvieh, to name a few. The perceptions regarding certain breeds and subsequent performance may be right or wrong, but they exist. With a high percentage of feeder cattle sold in livestock auctions weighing less than 550 pounds, the majority of these cattle are purchased for placement in a backgrounding grazing program. Backgrounding programs are forage based (native pasture, wheat, etc.), and buyers are looking for the breeds or breed combinations that perform best under those conditions. Cow-calf producers should be aware that the breeds or breed types that perform best under backgrounding programs might not be the breeds or breed types that make good replacements. Cow-calf producers must be attentive to this and design an appropriate breeding program.

Color

The color of the calf affects selling price (Table 5). Yellow-white faced ($120.44), yellow ($120.29) and black-white faced ($120.03) colored calves brought higher selling prices compared to all other calf colors. Spotted or striped calves ($107.37) brought the lowest price. Black ($119.24) calves brought a higher selling price than gray ($117.66). Gray and gray-white faced ($116.79) calves were similar in value. For unlike breed or breed combinations, most colors were different from each other.

Management Factors Affecting Market Price

Castration

Although bulls gain faster than steers (approximately 6 to 7 percent) and can have acceptable carcasses, the mainstream beef industry does not want to feed bulls. The main reason for castrating bulls is to control behavior and disposition. If a cow-calf producer sells weaned bull calves, somebody will castrate them eventually. Table 6 summarizes the selling price for steers, bulls and heifer feeder calves.

Steer calves sold for a higher selling price than bull calves regardless of the selling weight group (Table 7). The price difference between steers and bulls across the different weight groups varied very little. For the selling weight groups of 300 to 499 pounds, the selling price of steer calves was $5.37 to $8.00 higher than the selling price of bull calves. As the selling weight increased to 650 to 699 pounds, the difference between the selling prices of steers and bull calves stayed approximately $6.00. The discount over steers of heavier bulls over 800 pounds increased to over $11.00. Heavier bulls experience more stress due to castration compared to lightweight bull calves. This results in a longer recovery time and larger discount. The selling price of heifers experienced a greater discount compared to the

Table 5. The Average Selling Price for Feeder Cattle Based on Calf Color

Calf Color	Average Selling Price (Value/cwt.)	Deviation From Overall Average (Value/cwt.)
yellow-white face	$120.44 [a]	$2.34
yellow	$120.29 [a]	$2.19
black-white face	$120.03 [a]	$1.93
black	$119.24 [b]	$1.14
gray	$117.66 [c]	-$0.44
gray-white face	$116.79 [c,d]	-$1.31
white	$116.01 [d]	-$2.09
red-white face	$114.58 [e]	-$3.52
red	$113.92 [f]	-$4.18
spotted or striped	$107.37 [g]	-$10.73

[a, b, c, d … g]Averages without a common superscript differ (P < 0.005).

Table 6. The Average Selling Price for Feeder Cattle Based on Calf Gender

Calf Gender	Average Selling Price[a] (Value/cwt.)	Discount Compared to Steers (Value/cwt.)
Steers	$124.20	---
Bulls	$117.93	-$6.27
Heifers	$112.81	-$11.39

[a]Averages are different from each other (P < 0.0001).

selling price of steers for the lightweight selling weight groups ($11.00 to $18.00) compared to the heavier weight groups (approximately $6.00).

Table 7. Comparison Between the Calf Gender by Weight Groups on the Selling Price of Feeder Cattle[a]

Weight Groups (pounds)	Average Selling Price (Value/cwt.)		
	Steers	Bulls	Heifers
< 300	$141.07	$139.55	$129.12
300 to 349	$146.71	$138.71	$128.04
350 to 399	$137.65	$131.14	$122.54
400 to 449	$131.21	$125.15	$118.11
450 to 499	$124.18	$118.81	$113.25
500 to 549	$119.75	$114.46	$110.12
550 to 599	$114.95	$109.58	$106.79
600 to 649	$111.08	$105.41	$103.88
650 to 699	$107.79	$101.17	$100.72
700 to 749	$104.72	$97.15	$98.17
750 to 799	$100.89	$92.79	$93.83
> 800	$96.20	$85.14	$89.80

[a]Calf gender by weight group interaction (P < 0.0001).

Fill

When compared to the average fill selling price ($116.77), selling prices for gaunt ($119.63) and shrunk ($120.22) feeder cattle were higher (P < 0.01). The selling prices for feeder cattle classified as full and tanked were $110.05 and $92.80, respectively. Feed and water can be purchased for less, relative to the selling price of cattle, but those animals exhibiting excessive fill were discounted. Order buyers discounted feeder calves that showed excessive potential for shrinkage. This affected the cow-calf producer in two ways. The producer not only absorbed the extra feed cost that resulted in the extra fill, but also the calf was discounted when it was sold.

Body Condition

Feeder calves in average body condition sold for $118.14. The only body condition classification that sold for a higher price than the average body condition was very thin feeder cattle ($119.55). All of the other body condition classifications sold for less than the average body condition (thin: $116.80, fleshy: $112.28 and fat: $101.98). Calves that are over-conditioned have usually been on a high plane of pre-weaning nutrition (creep feeding, etc.). Subsequent to weaning, the level of nutrition may decrease and the over-conditioned feeder cattle may actually lose weight for a period. Order buyers will not pay for that weight and time loss, thus the large discounts seen with fleshy and fat feeder calves.

Horned Cattle

Most of the feeder cattle were polled or dehorned (86 percent). Polled, or dehorned, feeder cattle sold for $118.57, and horned feeder cattle sold for $114.57 (P < 0.0001). The 1995 Beef Quality Assurance Audit reported that bruise damage significantly increased from the 1991 Beef Quality Audit. Because horns can damage loins, cow-calf producers should change management practices to reduce the presence of horns.

Sick or Lame Cattle

Over 98 percent of the feeder cattle sold was healthy. Healthy feeder cattle sold for $118.21, which was higher (P < 0.01) than for any of the unhealthy categories. Calves sold as preconditioned ($122.36) brought a $4.15 per cwt. premium (P < 0.01) above healthy calves that were not preconditioned. Discounts on unhealthy cattle were greatest with sick ($80.22) and lame feeder cattle ($84.74), which were not different from each other (P > 0.10). Selling prices of feeder cattle that had dead hair or had bad eye(s) were $105.55 and $104.39, respectively, and were not different from each other (P > 0.10). Calves classified as stale sold for $100.01.

Size and Uniformity

Arkansas primarily produces feeder cattle that weigh less than 550 pounds. Most of the feeder cattle were sold individually (75 percent). The selling price for feeder cattle sold in groups of greater than five head ($122.61) was higher than the selling price of feeder cattle sold in groups of two to five head ($120.12), which was higher than feeder calves sold as singles ($117.26; P < 0.0001).

Summary

Cow-calf producers can do more to improve the quality and selling price for feeder cattle sold through Arkansas livestock auctions. Through genetic selection and management changes, feeder calf value can be improved and overall total returns increased.

The keys to improving feeder calf value are:

- Increase muscle thickness.
- Produce calves with frame scores 5 to 6.

- Establish a crossbreeding system that improves hybrid vigor and takes advantage of breed complementation.
- Castrate bull calves.
- Dehorn.
- Maintain average fill and body condition.
- Keep animals healthy.

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