Factors affecting the selling price of feeder cattle sold at Arkansas livestock auctions in 2005

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ABSTRACT: Data were collected from 15 Arkansas livestock auctions to determine factors affecting selling price. Data included how calves were sold (single or groups), sex, breed or breed type, color, muscle thickness, horn status, frame score, fill, body condition, age, health, BW, and price. Data were randomly collected on 52,401 lots consisting of 105,542 calves. Selling prices for steers ($124.20 ± 0.07), bulls ($117.93 ± 0.12), and heifers ($112.81 ± 0.07) were different from each other (P < 0.001). Hereford × Charolais feeder calves sold for the highest price ($122.66 ± 0.14) and Longhorns sold for the lowest price ($74.52 ± 0.46). Yellow feeder cattle received the highest selling price ($96.47 ± 0.21), and spotted or striped feeder cattle received the lowest price ($83.84 ± 0.23). The selling price of singles was lower than the price for calves sold in groups of 6 or more ($117.26 ± 0.06 vs. $122.61 ± 0.21; P < 0.001). For cattle classified as having muscle scores of 1, 2, 3, and 4, selling prices were $120.45 ± 0.05, $111.31 ± 0.09, $96.28 ± 0.44, and $82.21 ± 1.87, respectively. Polled feeder cattle sold for $118.57 ± 0.05, and horned feeder cattle sold for $114.87 ± 0.14 (P < 0.001). Interactions (P < 0.001) were detected between frame score and BW groups, and muscle score and BW groups on the selling price of cattle. A number of management and genetic factors affected the selling price of feeder cattle.

Key words: feeder cattle, livestock auction, selling price, beef cattle

INTRODUCTION

The southeastern region of the United States (13 states) contains 52.6% of the country’s beef cattle operations and 46.9% of the country’s beef cows (USDA-National Agricultural Statistics Service, 1999). In this region, 82.6% of the beef cattle operations contain fewer than 50 beef cows. Across the United States, 86.9% of the beef cattle operations with fewer than 50 cows used livestock auctions as their method of selling cattle (National Animal Health Monitoring System, 1997). Marketing options for smaller producers are limited because of their relative size (Schmitz et al., 2003). A greater percentage (28.7%) of large operations (>300 cows) use private treaty direct sales to market feeder cattle compared with smaller producers (<50 cows; 9.5%; National Animal Health Monitoring System, 1997).

Cow-calf producers are challenged to produce feeder calves that are acceptable to the industry. When buyers at a livestock auction view feeder calves, they must appraise individual characteristics (muscle thickness, frame score, breed composition, etc.) as predictors of quality and animal performance and adjust their bids accordingly. Many of these factors, such as breed or breed type, are subjective. Therefore, many cow-calf producers believe that feeder cattle are priced inconsistently. Producers do not understand why some phenotypic characteristics are discounted and others are not. Most feeder calf market reports list the selling prices of steers and heifers by BW group and by frame and muscle scores. Other reports have indicated that breed or breed type, health, sex, frame and muscle scores, and other noticeable factors do affect feeder calf selling price (McLemore et al., 1993; Brown and Morgan, 1998; Neel et al., 1998; Smith et al., 1999). Therefore, the objective was to determine factors that affect the selling price of feeder cattle in Arkansas weekly livestock auctions.

MATERIALS AND METHODS

Animal Care and Use approval was not obtained for this study because data were visually collected on ani-
Figure 1. The mean selling price for year 2005 and the 5-, 10-, and 20-yr averages for 181- to 227-kg BW feeder cattle by month (main effect of month on selling price, $P < 0.001$; all least squares means are different except in February and August, $P < 0.01$).

Statistical Analysis

The percentages of calves within age, group size, sex, breed or breed type, color, horn status, frame score, muscle score, fill, condition, health, and weight group were determined by the FREQUENCY procedure (SAS Inst. Inc., Cary, NC) based on the number of lots sold. The mean selling price was $118.32 \pm 15.13$ (mean $\pm$ SD). Calf characteristics were analyzed individually as dependent variables in which the model included month and BW as covariates. All other variables contributed to the error sum of squares. An ANOVA was performed with the GLM procedure of SAS. Least squares means ($\pm$SE) were generated and separated based on predicted differences, and both are reported throughout. Because all colors are not represented within each breed or breed type, color and breed or breed type data are somewhat inherently confounded. All selling prices are reported in US dollars per 45.45 kg.

RESULTS AND DISCUSSION

Selling price varied by month, with greater prices recorded in the spring (February, March, and April) and lower prices in the late summer and early fall (August, September, and October; $P < 0.001$; Figure 1). This seasonal trend followed the 5-, 10- and 20-yr average seasonal trend (Cheney and Troxel, 2006). More than 75% of the cattle sold weighed less than 249 kg (Figure 2). Troxel et al. (2002) noted similar results for a survey taken in 2000. Smith et al. (1999) reported that 86 and 70% of calves weighed less than 272 kg in 1997 and 1999, respectively, in eastern Oklahoma livestock auctions. As selling BW increased, price per kilogram decreased. Most of the feeder cattle were sold as individuals (74.8%) rather than in groups. The selling price for feeder cattle sold in groups of 2 to 5 calves was greater than that of feeder cattle sold as singles ($120.12 \pm 0.12$ vs. $117.26$...
The selling price of singles was lower than the selling price for those sold in groups of 6 or more ($117.26 ± 0.06 vs. $122.61 ± 0.21; \( P < 0.0001 \); Table 1). The selling price of feeder cattle sold in groups of 2 to 5 calves compared with groups of 6 or more was also different ($120.12 ± 0.12 vs. $122.61 ± 0.21; \( P > 0.001 \)). The results show a financial advantage for marketing calves in groups as opposed to marketing them as individuals. Troxel et al. (2002) showed that calves sold in groups of 2 to 5 calves sold for more than calves sold as individuals, but a significant difference was not found between singles and groups of 6 or more. Faminow and Gum (1986) reported a quadratic relationship between prices received and group size. Selling price maximized at approximately 60 calves per lot. In a 4-yr study conducted in Iowa, price premiums were offered on large lots of cattle (Lawrence and Yeboah, 2002).

Heifers were 45.8% of cattle sold, whereas steers and bulls made up 40.0 and 14.2%, respectively (Table 2). The selling prices for steers ($124.20 ± 0.07), bulls ($117.93 ± 0.12), and heifers ($112.81 ± 0.07) were all different (\( P < 0.001 \); Table 2). Troxel et al. (2002) reported a much greater percentage of bulls marketed in 2000, with slightly lower price spreads between bulls and steers and a similar price spread between steers and heifers. Smith et al. (1999) reported that in 1997 and 1999, respectively, bulls sold for $3.56 and $2.24 less than steers and heifers sold for $10.56 and $7.43 less than steers. Castration is a common practice to reduce management problems associated with aggressive and sexual behavior (Adams and Adams, 1986) associated with commingling bull calves. Prices received for bulls were lower because of the expected reduction in animal performance experienced with these animals subsequent to castration. Brazle and Kuhl (1992) reported that feeder cattle purchased at livestock auctions as bulls and then castrated upon arrival at the feedlot gained less and required more treatments subsequent to castration.

A total of 383 different breeds or breed types were identified in the survey. Eighteen breeds or breed types represented 98% of the total feeder cattle in the data set. The breeds or breed types were based on common

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**Table 1.** The frequency and mean selling price of feeder cattle sold by group size

<table>
<thead>
<tr>
<th>Group size</th>
<th>Frequency percentage</th>
<th>Selling price(^a)</th>
<th>Deviation from overall average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>74.8</td>
<td>$117.26 ± 0.06(^a)</td>
<td>−$0.84</td>
</tr>
<tr>
<td>2 to 5 calves</td>
<td>19.4</td>
<td>$120.12 ± 0.12(^b)</td>
<td>$2.02</td>
</tr>
<tr>
<td>&gt;6 calves</td>
<td>5.8</td>
<td>$122.61 ± 0.21(^c)</td>
<td>$4.15</td>
</tr>
</tbody>
</table>

\(^a\)Least squares means within a column without a common superscript differ (\( P < 0.001 \)).

\(^b\)Main effect of group size on selling price (\( P < 0.001 \)).

\(^c\)Least squares mean ± SE ($/45.45 kg).

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**Table 2.** The frequency and mean selling price of feeder cattle sold based on calf sex

<table>
<thead>
<tr>
<th>Calf sex</th>
<th>Frequency percentage</th>
<th>Selling price(^a)</th>
<th>Deviation from overall average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bull</td>
<td>14.2</td>
<td>$117.93 ± 0.12(^a)</td>
<td>−$0.17</td>
</tr>
<tr>
<td>Steer</td>
<td>40.0</td>
<td>$124.20 ± 0.07(^b)</td>
<td>$6.10</td>
</tr>
<tr>
<td>Heifer</td>
<td>45.8</td>
<td>$112.81 ± 0.07(^c)</td>
<td>−$5.29</td>
</tr>
</tbody>
</table>

\(^a\)Least squares means without a common superscript differ (\( P < 0.001 \)).

\(^b\)Main effect of calf sex on selling price (\( P < 0.001 \)).

\(^c\)Least squares mean ± SE ($/45.45 kg).
industry perception rather than on actually knowing the breed composition. This is what a buyer must do before a selling price can be offered. The main effect of cattle breed or breed type on the selling price of feeder cattle was significant ($P < 0.001$; Table 3). There was a $33.28$ difference between the Hereford × Charolais feeder cattle, which sold for the highest price ($122.66 ± 0.14$), and Longhorn feeder cattle, which sold for the lowest price ($89.38 ± 1.02$). Breeds or breed types that sold for above-average prices included Hereford × Charolais, Angus × Hereford, Charolais × Limousin, Angus × Limousin, Angus × Charolais, Hereford × Brahman × Angus, and Charolais. Longhorn feeder calves sold for lower prices than all other breeds or breed types in the survey ($P < 0.001$).

During 1996, a livestock auction survey was conducted in Georgia (Brown and Morgan, 1998). Results show that Angus cattle received a $3.01$ premium selling price over the overall mean and that Hereford, Limousin, and Simmental feeder cattle were discounted by $2.01$, $2.27$, and $2.73$, respectively. This report agrees with the data reported in this study. In the current study, Angus feeder cattle received a premium selling price above the overall mean, and Limousin, Hereford, and Simmental feeder cattle were discounted compared with the overall mean selling price, but the discounts for Hereford and Simmental were much greater than the discounts reported by Brown and Morgan (1998). The differences between these 2 reports may be due to location (Georgia vs. Arkansas), year, feeder cattle supply, and demand.

Smith et al. (1999) compared selling prices of different breeds or breed types relative to the selling price of Angus cattle. In 1997 and 1999, Hereford steers were discounted by $8.37$ and $4.76$, respectively, compared with the selling price of Angus. In the current data set, Herefords were discounted by $14.18$ compared with the selling price of Angus. In each year (1997, 1999, and 2005), the selling price of Herefords would appear to be less than that of Angus, but how much less may depend on the supply and demand of feeder cattle. Smith et al.

### Table 3. The frequency and mean ± SE selling price of feeder calves sold based on breed or breed type

<table>
<thead>
<tr>
<th>Breed or breed type</th>
<th>Frequency percentage</th>
<th>Selling price $^2$</th>
<th>Deviation from overall average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hereford × Charolais</td>
<td>2.1</td>
<td>$122.66 ± 0.14 ^a$</td>
<td>$4.56$</td>
</tr>
<tr>
<td>Angus × Hereford</td>
<td>7.2</td>
<td>$121.74 ± 0.21 ^b$</td>
<td>$3.64$</td>
</tr>
<tr>
<td>Angus</td>
<td>11.1</td>
<td>$121.43 ± 0.14 ^bc$</td>
<td>$3.33$</td>
</tr>
<tr>
<td>Charolais × Limousin</td>
<td>4.7</td>
<td>$121.33 ± 0.22 ^ad$</td>
<td>$3.23$</td>
</tr>
<tr>
<td>Angus × Limousin</td>
<td>0.5</td>
<td>$120.83 ± 0.74 ^bd$</td>
<td>$2.73$</td>
</tr>
<tr>
<td>Angus × Charolais</td>
<td>3.2</td>
<td>$120.59 ± 0.51 ^d$</td>
<td>$2.49$</td>
</tr>
<tr>
<td>Hereford × Brahman × Angus</td>
<td>2.9</td>
<td>$120.01 ± 0.31 ^d$</td>
<td>$1.91$</td>
</tr>
<tr>
<td>Charolais</td>
<td>11.7</td>
<td>$118.12 ± 0.14 ^a$</td>
<td>$0.02$</td>
</tr>
<tr>
<td>Charolais × one-fourth Brahman</td>
<td>3.0</td>
<td>$117.91 ± 0.28 ^a$</td>
<td>$0.19$</td>
</tr>
<tr>
<td>Hereford × Limousin</td>
<td>2.5</td>
<td>$117.87 ± 0.31 ^a$</td>
<td>$0.23$</td>
</tr>
<tr>
<td>Brangus</td>
<td>5.3</td>
<td>$117.69 ± 0.21 ^a$</td>
<td>$0.41$</td>
</tr>
<tr>
<td>Limousin</td>
<td>8.3</td>
<td>$116.86 ± 0.16 ^a$</td>
<td>$1.24$</td>
</tr>
<tr>
<td>One-half Brahman Cross</td>
<td>7.8</td>
<td>$116.62 ± 0.17 ^a$</td>
<td>$1.48$</td>
</tr>
<tr>
<td>Angus × Brahman</td>
<td>13.6</td>
<td>$116.15 ± 0.32 ^a$</td>
<td>$1.95$</td>
</tr>
<tr>
<td>Limousin × one-fourth Brahman</td>
<td>2.3</td>
<td>$115.29 ± 0.33 ^b$</td>
<td>$2.81$</td>
</tr>
<tr>
<td>Hereford × one-fourth Brahman</td>
<td>1.8</td>
<td>$114.94 ± 0.37 ^b$</td>
<td>$3.16$</td>
</tr>
<tr>
<td>Hereford × Simmental</td>
<td>0.4</td>
<td>$114.15 ± 1.46 ^b$</td>
<td>$3.95$</td>
</tr>
<tr>
<td>One-fourth Brahman Cross</td>
<td>6.1</td>
<td>$112.15 ± 0.20 ^b$</td>
<td>$5.95$</td>
</tr>
<tr>
<td>Simmental</td>
<td>0.9</td>
<td>$111.91 ± 0.52 ^b$</td>
<td>$6.19$</td>
</tr>
<tr>
<td>Salers</td>
<td>0.6</td>
<td>$110.17 ± 0.62 ^b$</td>
<td>$7.93$</td>
</tr>
<tr>
<td>Brahman</td>
<td>0.9</td>
<td>$108.24 ± 0.52 ^b$</td>
<td>$9.86$</td>
</tr>
<tr>
<td>Hereford</td>
<td>1.5</td>
<td>$107.25 ± 0.39 ^b$</td>
<td>$10.85$</td>
</tr>
<tr>
<td>Longhorn</td>
<td>0.6</td>
<td>$89.38 ± 1.02 ^b$</td>
<td>$28.72$</td>
</tr>
</tbody>
</table>

$^a,b$Least squares means without a common superscript differ ($P < 0.05$).

$^1$Main effect of breed or breed type on selling price ($P < 0.001$).

$^2$Least squares mean ± SE ($$/45.45$$ kg).

### Table 4. The frequency and the mean selling price of feeder calves sold based on calf color

<table>
<thead>
<tr>
<th>Calf color</th>
<th>Frequency percentage</th>
<th>Average selling price $^2$</th>
<th>Deviation from overall average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow-white face</td>
<td>3.7</td>
<td>$120.44 ± 0.26 ^a$</td>
<td>$2.34$</td>
</tr>
<tr>
<td>Yellow</td>
<td>10.2</td>
<td>$120.29 ± 0.15 ^a$</td>
<td>$2.19$</td>
</tr>
<tr>
<td>Black-white face</td>
<td>10.2</td>
<td>$120.03 ± 0.15 ^a$</td>
<td>$1.93$</td>
</tr>
<tr>
<td>Black</td>
<td>35.4</td>
<td>$119.24 ± 0.08 ^a$</td>
<td>$1.14$</td>
</tr>
<tr>
<td>Gray</td>
<td>7.5</td>
<td>$117.66 ± 0.18 ^a$</td>
<td>$0.44$</td>
</tr>
<tr>
<td>Gray-white face</td>
<td>0.8</td>
<td>$116.79 ± 0.53 ^d$</td>
<td>$1.31$</td>
</tr>
<tr>
<td>White</td>
<td>5.7</td>
<td>$116.01 ± 0.20 ^d$</td>
<td>$2.09$</td>
</tr>
<tr>
<td>Red-white face</td>
<td>7.0</td>
<td>$114.58 ± 0.18 ^e$</td>
<td>$3.52$</td>
</tr>
<tr>
<td>Red</td>
<td>11.8</td>
<td>$113.92 ± 0.14 ^f$</td>
<td>$4.18$</td>
</tr>
<tr>
<td>Spotted or striped</td>
<td>1.8</td>
<td>$107.37 ± 0.37 ^f$</td>
<td>$10.73$</td>
</tr>
</tbody>
</table>

$^a,b$Least squares means without a common superscript differ ($P < 0.05$).

$^1$Main effect of calf color on selling price ($P < 0.001$).

$^2$Least squares mean ± SE ($$/45.45$$ kg).
Table 5. The frequency and the mean selling price of feeder calves sold based on calf muscle score, horn status, frame score, fill, condition, and health status.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>Percentage</th>
<th>Average selling price&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Deviation from overall average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Muscle score</td>
<td>1</td>
<td>75.3</td>
<td>$120.45 ± 0.05&lt;sup&gt;a&lt;/sup&gt;</td>
<td>$2.35</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>22.6</td>
<td>$111.31 ± 0.09&lt;sup&gt;b&lt;/sup&gt;</td>
<td>−$6.79</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>1.1</td>
<td>$96.28 ± 0.44&lt;sup&gt;c&lt;/sup&gt;</td>
<td>−$21.82</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>0.1</td>
<td>$82.21 ± 1.87&lt;sup&gt;d&lt;/sup&gt;</td>
<td>−$35.89</td>
</tr>
<tr>
<td>Horn status</td>
<td>Horned</td>
<td>12.8</td>
<td>$114.87 ± 0.14&lt;sup&gt;e&lt;/sup&gt;</td>
<td>−$3.23</td>
</tr>
<tr>
<td></td>
<td>Polled</td>
<td>85.8</td>
<td>$118.57 ± 0.05&lt;sup&gt;f&lt;/sup&gt;</td>
<td>$0.47</td>
</tr>
<tr>
<td>Frame score</td>
<td>Large</td>
<td>64.6</td>
<td>$118.27 ± 0.06&lt;sup&gt;g&lt;/sup&gt;</td>
<td>$0.17</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>34.3</td>
<td>$118.15 ± 0.09&lt;sup&gt;h&lt;/sup&gt;</td>
<td>$0.05</td>
</tr>
<tr>
<td></td>
<td>Small</td>
<td>0.6</td>
<td>$95.43 ± 0.63&lt;sup&gt;i&lt;/sup&gt;</td>
<td>−$22.67</td>
</tr>
<tr>
<td>Fill</td>
<td>Gaunt</td>
<td>21.4</td>
<td>$119.63 ± 0.11&lt;sup&gt;j&lt;/sup&gt;</td>
<td>$1.53</td>
</tr>
<tr>
<td></td>
<td>Shrunk</td>
<td>26.5</td>
<td>$120.22 ± 0.10&lt;sup&gt;k&lt;/sup&gt;</td>
<td>$2.12</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>49.4</td>
<td>$116.77 ± 0.07&lt;sup&lt;l&lt;/sup&gt;</td>
<td>−$1.33</td>
</tr>
<tr>
<td></td>
<td>Full</td>
<td>2.7</td>
<td>$110.05 ± 0.30&lt;sup&gt;m&lt;/sup&gt;</td>
<td>−$8.05</td>
</tr>
<tr>
<td></td>
<td>Tanked</td>
<td>0.1</td>
<td>$92.80 ± 2.03&lt;sup&gt;n&lt;/sup&gt;</td>
<td>−$25.30</td>
</tr>
<tr>
<td>Condition</td>
<td>Very thin</td>
<td>21.7</td>
<td>$119.55 ± 0.11&lt;sup,o&lt;/sup&gt;</td>
<td>$1.45</td>
</tr>
<tr>
<td></td>
<td>Thin</td>
<td>12.2</td>
<td>$116.80 ± 0.15&lt;sup&gt;p&lt;/sup&gt;</td>
<td>−$1.30</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>63.2</td>
<td>$118.14 ± 0.06&lt;sup&gt;q&lt;/sup&gt;</td>
<td>$0.04</td>
</tr>
<tr>
<td></td>
<td>Fleshy</td>
<td>2.9</td>
<td>$112.28 ± 0.29&lt;sup&gt;q&lt;/sup&gt;</td>
<td>−$5.82</td>
</tr>
<tr>
<td></td>
<td>Fat</td>
<td>0.1</td>
<td>$101.98 ± 1.96&lt;sup&gt;s&lt;/sup&gt;</td>
<td>−$16.12</td>
</tr>
<tr>
<td>Health</td>
<td>Sick</td>
<td>0.2</td>
<td>$80.22 ± 1.69&lt;sup&gt;t&lt;/sup&gt;</td>
<td>−$37.88</td>
</tr>
<tr>
<td></td>
<td>Lame</td>
<td>0.4</td>
<td>$84.74 ± 1.04&lt;sup&gt;u&lt;/sup&gt;</td>
<td>−$33.36</td>
</tr>
<tr>
<td></td>
<td>Stale</td>
<td>0.1</td>
<td>$100.01 ± 0.83&lt;sup&gt;v&lt;/sup&gt;</td>
<td>−$18.09</td>
</tr>
<tr>
<td></td>
<td>Bad eye(s)</td>
<td>0.3</td>
<td>$104.39 ± 0.88&lt;sup&gt;w&lt;/sup&gt;</td>
<td>−$13.71</td>
</tr>
<tr>
<td></td>
<td>Dead hair</td>
<td>0.2</td>
<td>$105.55 ± 1.16&lt;sup&gt;x&lt;/sup&gt;</td>
<td>−$12.55</td>
</tr>
<tr>
<td></td>
<td>Healthy</td>
<td>95.5</td>
<td>$118.21 ± 0.05&lt;sup&gt;y&lt;/sup&gt;</td>
<td>$0.11</td>
</tr>
<tr>
<td></td>
<td>Preconditioned</td>
<td>3.3</td>
<td>$122.36 ± 0.28&lt;sup&gt;z&lt;/sup&gt;</td>
<td>$4.26</td>
</tr>
</tbody>
</table>

<sup>a–e</sup>Least squares means within each variable and category combination without a common superscript differ (<i>P</i> < 0.05).

<sup>1</sup>Main effect of each variable on selling price (<i>P</i> < 0.001).

<sup>2</sup>Least squares mean ± SE ($/45.45 kg).

(1999) reported that Longhorn steers were discounted by $26.82 and $23.69 in 1997 and 1999, respectively, compared with the selling price of Angus. Longhorns were discounted by $32.05 compared with the selling price of Angus in the current data set. Breed or breed type affected the selling price of feeder cattle. This was due to the perception by buyers of how different breeds or breed types would perform while in a pasture or feedlot (gain, sick rate, quality grade, etc.).

A total of 280 different colors or color combinations were recorded in the survey. Ten colors represented 94% of the total population (Table 4). Yellow-white faced, yellow, and black-white faced feeder cattle received the greatest selling price ($120.44 ± 0.26, $120.29 ± 0.15, 120.03 ± 0.15, respectively) but were not different from each other (<i>P</i> > 0.05). Spotted or striped feeder cattle received a lower selling price ($107.37 ± 0.37) than cattle of all other colors in the study (<i>P</i> < 0.001). In the current study, black-white face feeder cattle received a $1.93 premium above the overall mean, which was less than the $3.29 premium above the mean reported in the Georgia study (Brown and Morgan, 1998).

The percentages of feeder cattle classified by using the USDA muscle scoring system of 1, 2, 3, and 4 were 75.3, 22.6, 1.1, and 0.1, respectively. Muscle score affected the feeder cattle selling price (<i>P</i> < 0.001). For cattle classified as having muscle scores of 1, 2, 3, and 4, selling prices were $120.45 ± 0.05, $111.31 ± 0.09, $96.28 ± 0.44, and $82.21 ± 1.87, respectively. Selling prices for each of the muscle scores are different (<i>P</i> < 0.001). In 1998, light-muscled steers (3 in the 1980 muscle scoring system and 4 in the 2000 muscle scoring system) sold at large discounts ($26.48) compared with heavy-muscled steers in Oklahoma (Smith et al., 1999). That large discount was reduced up to $10.00 in 1999 but returned to $24.51 in 2000 (Smith et al., 1999).

Most feeder cattle were polled (85.8%). Polled feeder cattle sold for $118.57 ± 0.05, and horned feeder cattle sold for $114.87 ± 0.14 (<i>P</i> < 0.001). When cattle buyers were surveyed to determine which preweaning production practices they attributed to increased revenues and if they would be willing to pay more, dehorning was listed as fifth (Castro et al., 1998).

Frame score (large, medium, or small) affected feeder cattle selling prices (<i>P</i> < 0.001). Large-framed feeder cattle constituted 64.6% of the population and sold for $118.27 ± 0.06 (Table 5). The selling price of medium-framed feeder cattle was $118.15 ± 0.09 and consisted
Table 6. Number of breeds or breed types and calf colors observed that had below average, average, and above average selling price by weight group.

<table>
<thead>
<tr>
<th>BW group, kg</th>
<th>Below average selling price</th>
<th>Average selling price</th>
<th>Above average selling price</th>
<th>Below average selling price</th>
<th>Average selling price</th>
<th>Above average selling price</th>
</tr>
</thead>
<tbody>
<tr>
<td>136 to 158</td>
<td>5</td>
<td>18</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>159 to 181</td>
<td>10</td>
<td>8</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>182 to 203</td>
<td>9</td>
<td>7</td>
<td>7</td>
<td>5</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>204 to 226</td>
<td>7</td>
<td>8</td>
<td>8</td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>227 to 249</td>
<td>7</td>
<td>11</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>250 to 271</td>
<td>6</td>
<td>13</td>
<td>4</td>
<td>4</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>272 to 294</td>
<td>3</td>
<td>18</td>
<td>2</td>
<td>1</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>295 to 317</td>
<td>3</td>
<td>19</td>
<td>1</td>
<td>0</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>318 to 339</td>
<td>1</td>
<td>22</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>340 to 362</td>
<td>0</td>
<td>23</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>&gt;362</td>
<td>0</td>
<td>23</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>0</td>
</tr>
</tbody>
</table>

1Number of breeds for each variable was determined by counting the number of breeds or breed types or colors that had selling price least squares means that were significantly above or below the average ($P < 0.05$).

of 34.3% of the population, which was not different ($P > 0.05$) from large-framed feeder calves (Table 5). The selling price of small-framed feeder cattle was different from the selling price of large- and medium-framed feeder cattle ($95.43 ± 0.63; P < 0.0001; Table 5). Small-framed feeder cattle represented 0.6% of the feeder cattle surveyed. In 1997, small-framed steers were discounted $18.86 compared with large-framed steers (Smith et al., 1999), which is slightly less than the current data set ($22.67$).

The percentages of feeder cattle that were classified as gaunt, shrunk, average, full, and tanked were 21.4, 26.5, 49.4, 2.7, and 0.1, respectively (Table 5). The main effect of fill was significant, with all the means being different from one another ($P < 0.001$). When compared with the average fill selling price ($116.77 ± 0.07$), the selling prices for gaunt ($119.63 ± 0.11$) and shrunk ($120.22 ± 0.10$) feeder cattle were higher ($P < 0.001$; Table 5). The selling prices for feeder cattle classified as full and tanked were $110.05 ± 0.30$ and $92.80 ± 2.03$, respectively (Table 5). Buyers discounted feeder calves that appeared to have the potential for excessive shrinkage.

Body condition affected feeder calf selling prices ($P < 0.001$). Feeder calves in average body condition sold for $118.14 ± 0.06$, which was higher than thin calves ($116.80 ± 0.15; P < 0.0001; Table 5). This finding is somewhat surprising, because buyers tend to prefer cattle that are slightly thin, hoping to take advantage of compensatory gain. Feeder calves in very thin condition sold for the highest value ($119.55 ± 0.11$). All other body condition classifications sold for less than the average

![Figure 3](image.png)

Figure 3. The interaction between frame score and BW group on the selling price of feeder cattle ($P < 0.001$; least squares means for large- and medium-frame scores were not different, $P > 0.05$).
Figure 4. The interaction between muscle score and BW group on the selling price of feeder cattle ($P < 0.001$).

body condition (fleshy: $112.28 ± 0.29$; fat: $101.28 ± 1.96$; $P < 0.001$). The percentages of very thin, thin, average, fleshy, and fat body condition were 21.7, 12.2, 63.2, 2.9, and 0.1, respectively (Table 5). Calves that are overconditioned have usually been on a high plane of preweaning nutrition (creep feeding, etc.). Subsequent to weaning, the level of nutrition may be of lower quality and the overconditioned feeder cattle may lose BW for a time. Buyers appeared not to pay for that BW loss, thus the large discounts seen with fleshy and fat feeder calves.

More than 98% of the feeder cattle sold were healthy. The sale prices on unhealthy cattle were lowest for sick ($80.22 ± 1.69$) and lame feeder cattle ($84.74 ± 1.04$), which were not different from each other ($P > 0.10$). Selling prices of feeder cattle with dead hair, that were stale, or that had bad eye(s) were $105.55 ± 1.16$, $100.01 ± 0.83$, and $104.39 ± 0.88$, respectively, and were not different from each other ($P > 0.05$). Calves that were announced as preconditioned at the time of sale had a higher sale price than healthy calves ($122.36 ± 0.28$ and $118.21 ± 0.05$, respectively; $P < 0.001$). Only normal sales were recorded; no special preconditioned sales are represented in the data set.

Interactions were detected ($P < 0.001$) for breed or breed type by BW group and for feeder cattle color by BW. Table 6 presents data on those breeds or breed types and calf colors that sold for less than the mean selling price ($P < 0.05$), greater than the mean selling price ($P < 0.05$), and the same as the mean selling price within their respective BW group ($P > 0.05$). As the

Figure 5. The interaction between calf sex and BW group on the selling price of feeder cattle [$P < 0.001$; least squares means for calf sex by weight groups were different ($P < 0.01$), except for heifers and bulls in the 295- to 317-kg, 318- to 339-kg, and 340- to 363-kg BW groups).
selling BW increased, fewer and fewer breed or breed types and colors sold for greater or less than the mean. Therefore, breed or breed type and calf color were very important factors in determining the selling price of lightweight feeder cattle, but as BW increased, these factors played a less prominent role in determining the selling price. When purchasing lightweight feeder cattle, buyers must predict calf performance before making bids. Breed or breed type and feeder calf color are 2 factors used by buyers to predict future feeder calf performance. When purchasing heavier feeder cattle, buyers viewed the more developed phenotypic appearance of feeder calves, and therefore priced cattle on other factors such as muscle and frame scores.

There were interactions (\(P < 0.001\)) between frame score and BW group (Figure 3) and muscle score and BW group (Figure 4) on the selling price of cattle. Compared with large- and medium-framed cattle, small-framed feeder cattle were discounted from $18.66 in the heavier BW groups to $54.36 for the lighter BW groups. There were no differences (\(P > 0.05\)) in the selling price of large- and medium-framed cattle across all BW groups. Muscle score was a major factor affecting the selling price of feeder cattle regardless of the BW group (\(P < 0.05\); Figure 4). Buyers must rely on the phenotypic expression of muscle and frame size more for younger calves and calves of lighter BW to predict future gain performance. Once the calves reach the upper end of feeder cattle weights, those traits seem to become less relevant to buyers in determining the selling price.

An interaction was detected (\(P < 0.001\)) between calf sex and BW group on selling price (Figure 5). The selling price of steer feeder calves weighing between 136 to 158 kg was $6.50 higher than the selling price of bull feeder calves. As the selling BW increased to calves weighing more than 363 kg, the difference between the selling prices of steers and bull calves increased to $11.05 (Figure 5). The selling price difference between steers and bulls was expected to increase as BW increased, because buyers become less willing to absorb the production loss following castration of a larger calf. Heifer selling prices were discounted more than steer selling prices for the lightweight BW groups compared with the heavier BW groups. No differences were observed (\(P > 0.05\)) between the selling price of 295- to 317-kg, 318- to 339-kg, and 340- to 363-kg bull and heifer feeder calves. Bull calves weighing more than 363 kg had the lowest selling price of all genders (\(P < 0.05\)).

The majority of cow-calf producers in Arkansas sell feeder cattle at local livestock auctions. The major factors affecting the selling prices of feeder cattle were calf health, perceived breed or breed type, muscle thickness, frame score, fill, color, and body condition. Other factors that affected selling price were calf sex, horn status, and selling in groups. The combination of all these factors determined the final selling price. Most of the major factors affecting selling price can be addressed through genetic selection. Once the impact of these factors is identified and understood, cow-calf producers can make cost-effective management changes that can improve feeder calf value and total returns. Research can also be directed toward assisting in determining optimal performance levels for these factors.

**LITERATURE CITED**


