

Factors Affecting the Selling Price of Replacement Cows Sold at Arkansas Livestock Auctions¹

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Story in Brief

Data were collected from 15 Arkansas livestock auctions to determine the factors affecting replacement cow selling price. Data collected included pregnancy status, breed or breed type, color, horn status, frame score, muscle thickness, fill, number of brands, brand location, health, BW, age, and price. Data were randomly collected on 9,598 cows. The mean selling price for replacement cows was $\$48.39 \pm \0.09 , and all main effects reported were significant ($P < 0.001$). Replacement cows in their third trimester sold for the highest price ($\$50.33 \pm \0.17) followed by cows not checked for pregnancy ($\$48.97 \pm \0.17), second trimester ($\$47.59 \pm \0.14), first semester ($\$45.67 \pm \0.26), and cows not pregnant ($\$43.86 \pm \0.25). Buyers who were purchasing replacement cows paid more for English breed types and less for cows that contained dairy, Longhorn or Continental breeds or breed types. The selling prices for large-, medium-, and small-frame replacement cows were $\$47.08 \pm \0.15 , $\$49.46 \pm \0.12 , and $\$48.11 \pm \0.25 , respectively, and were different from each other ($P < 0.001$). A number of management (fill, horn status, and health) and genetic (color, frame score, and muscle thickness) factors affected the selling price of replacement cows.

Introduction

Nearly one out of every four U.S. beef cows is located in the Southeast. In 2002, the number of beef cows in the Southeast increased by 107,000 head, or a little over 1%. Arkansas experienced an increase in cow number by 22,000 in 2002. Looking forward, beef cow numbers in the Southeast are expected to increase in 2003. Prospects for a profitable calf market over the next 1 to 2 years should result in increased beef cow numbers for this area (CattleFax, 2003). Consequently, there may be immediate opportunities for Arkansas cattle producers to sell replacement stock (cows and/or heifers). Very little information is available that identifies what management and genetic factors improve the value of replacement cows sold at livestock auctions. When buyers at a livestock auction view replacement cows they must appraise phenotypic characteristics (muscle thickness, frame score, breed composition, etc.) as predictors of quality and adjust their bids accordingly. Many of these factors such as breed or breed type are very subjective. Therefore, the objective was to determine the factors that affect the selling price of replacement cows in Arkansas weekly livestock auctions.

Experimental Procedures

Five USDA-certified livestock market reporters collected data from 15 weekly livestock auctions in Arkansas from March 1, 2001 to May 31, 2001 and September 1, 2001 to November 30, 2001. The livestock auctions were located in Ash Flat, Charlotte, Conway, Fort Smith, Glenwood, Green Forest, Harrison, Hope, Marshall, Morrilton, Ola, Ozark, Pocahontas, Ratcliff, and Springdale. All cows were sold as individuals. During the six reporting months, data were randomly collected on 9,598 animals (every second to third cow).

The data collected included pregnancy status (not checked, not pregnant, or first, second or third trimester), breed or breed type, color, horn status (polled or horned), frame score, muscle thickness, fill (gaunt, shrunk, average, full or tanked), number of brands, brand

location (ribs, shoulder, or hip), health (dead hair, stale, sick, bad eye(s), lame or healthy), BW, age, and selling price. Cows were classified as replacement on visual appraisal and buyer identification. For those cows checked for pregnancy, a veterinarian employed by the livestock auction examined cows by rectal palpation. Pregnancy status was either written with a paintstik or a tag glued to the hip. The frame score was defined as large (over 1,100 lb), medium (900 to 1,100 lb), and small (less than 900 lb) frame based on the expected BW when cows are carrying 0.20 inches fat cover at the 12th rib. Muscle scores were determined using the 1, 2, and 3 scale with "1" being the thicker-muscled cows and "3" the thinner-muscled cows. Healthy cows showed no signs of sickness, lameness or any other unhealthy condition. Dead hair cows demonstrated a "lack luster" hair coat that could have indicated a heavy internal parasite load. Cows classified as stale had lost their effervescence and were apathetic in appearance. Sick cows showed signs of a sick condition (coughing, running nose, water eyes, etc.). Cows that had spot(s) in their eyes (bovine ocular squamous cell carcinoma) were noted, as well as, cows that demonstrated lameness on any leg. A livestock auction employee examined the teeth and estimated each cow's age.

Data analyses. The percentage of cows within pregnancy status, breed or breed type, color, horn status, frame score, muscle thickness, fill, number of brands, brand location, age and health were determined by the frequency procedure of SAS (SAS Inst., Inc., Cary, NC). Due to the unbalanced nature of the data, the month, sale barn and cow characteristics were analyzed as independent variables. The model included week, age, and weight as covariates. Sale price was the dependent variable. All other variables contributed to the error sum of squares. When analysis of variance was performed for month of sale, week was excluded as a covariate. The analysis of variance was performed with the General Linear Model procedure (GLM) of SAS. Least-squares means were generated and separated based on the PDIF option. Both are reported throughout this discussion. Since 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 reported are in dollars/cwt.

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Results and Discussion

The mean selling price for replacement cows was $\$48.39 \pm \0.09 . There were no differences ($P > 0.10$) among the selling prices of replacement cows for March ($\$51.97 \pm \0.21), April ($\$51.98 \pm \0.19) or May ($\$51.60 \pm \0.19), but prices for the fall months were different from each other (September: $\$47.48 \pm \0.23 , October: $\$45.01 \pm \0.19 and November: $\$43.11 \pm \0.20 ; $P < 0.01$). The selling prices from the fall (September, October and November) were lower than the selling prices from the spring (March, April and May; $P < 0.01$). As selling weight increased for replacement cows, price per cwt. increased ($P < 0.001$). The positive relationship between weight and price per cwt. for cows is opposite of the relationship between weight and price per cwt. for feeder cattle (Troxel, et. al., 2001).

Replacement cows in their third trimester sold for the greatest price ($\$50.33 \pm \0.17) followed by cows not checked for pregnancy ($\$48.97 \pm \0.17), second trimester ($\$47.59 \pm \0.14), first trimester ($\$45.67 \pm \0.26) and cows not pregnant ($\$43.86 \pm \0.25). All means were different from each other ($P < 0.01$).

Twenty-six breeds or breed types represented 99.0% of the total cows sampled (Table 1). The breed or breed types were based upon common industry perception rather than actual knowledge of the breed composition. This, however, is what a buyer must do before a selling price can be offered. The price spread from the highest to lowest priced breed or breed type for replacement cows was $\$5.05$. It appeared the buyers who purchased replacement cows paid more for English breeds or breed types and less for cows that contained dairy, Longhorn and Continental breeding.

Eleven colors represented 99% of the total population (Table 2). For replacement cows, black ($\$49.59 \pm \0.16) and gray ($\$49.42 \pm \0.39) cows sold for the greatest prices and white ($\$47.17 \pm \0.38), spots or striped ($\$47.05 \pm \0.34), red-white faced ($\$47.04 \pm \0.21) and brown or brown white-faced ($\$46.09 \pm \0.74) sold for the lowest prices ($P < 0.01$). As reported for cow breed or breed types, the price spread between the greatest to least priced replacement cows was small ($\$2.13$).

The selling prices of muscle score 1 and 2 replacement cows were not different from each other ($\$48.72 \pm \0.12 and $\$48.44 \pm \0.44 , respective; $P > 0.05$). Replacement cows with muscle scores 1 and 2 had higher selling prices than replacement cows with muscle score 3 ($\$46.33 \pm \0.12 ; $P < 0.01$).

The selling price between replacement polled or horned cows was different ($\$48.63 \pm \0.09 and $\$46.81 \pm \0.81 , respectively; $P < 0.001$). At this pricing level, there is not much of a price incentive to encourage cow-calf producers to eliminate horns. There may, however, be other incentives for producers to eliminate horns (management and safety concerns, etc.).

The selling prices for large-, medium-, and small-frame replacement cows were $\$47.08 \pm \0.15 , $\$49.46 \pm \0.12 , and $\$48.11 \pm \0.25 , respectively, and were different from each other ($P < 0.001$; Table 3). Buyers interested in purchasing replacement cows paid more for medium- and small-framed replacement cows than for large-framed replacement cows.

The selling price based on body fill is summarized in Table 3. Body fill was rated as gaunt, shrunk, average fill, full, and tanked. All selling prices due to body fill were different from each other ($P < 0.01$). Cows that were classified as full and tanked were discounted due to potentially high levels of shrink. Very few of the replacement cows had brands ($< 8.0\%$). There were no differences ($P > 0.10$) between the selling price of replacement cows with one brand ($\$48.39 \pm \0.31 ; Table 3), with two or more brands ($\$48.63 \pm \0.67)

or with no brands ($\$48.39 \pm \0.09). There was no difference in selling price of replacements due to brand location (side, hip, and/or shoulder).

Over 94% of the cows surveyed were healthy. Selling price of healthy replacement cows ($\$48.47 \pm \0.09), cows with lumps ($\$47.23 \pm \0.58) and bad eyes ($\$45.31 \pm \1.85) were not different ($P > 0.10$). The selling price for lame ($\$43.85 \pm \1.29) and sick ($\$40.25 \pm \1.80) replacement cows did not differ from those with lumps or bad eyes ($P > 0.10$).

The average selling price for replacement cows decreased with age (Table 4). All selling prices among ages were different ($P < 0.01$) from each other except for the selling prices for the 7- and 8- yr old replacement cows.

Implications

Prospects for a profitable calf market over the next two years may result in increased beef cow numbers in Arkansas. Consequently, there may be opportunities for producers to sell replacement stock for additional income. To improve the value of replacement cows, producers should pay attention to breed or breed type, frame score, muscling, body fill and cow health. Once these factors are identified, producers can make management changes to improve replacement cow returns.

Literature Cited

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Troxel, T.R., et al., 2001. Prof. Anim. Scientist 18:227.

Table 1. Selling price of replacement cows based on breed or breed type.

Breed or breed type ^a	N	Selling price ^b
AC	193	\$50.96 ± 0.56 ^c
A	765	\$50.72 ± 0.29 ^c
Abq	785	\$50.62 ± 0.28 ^c
HC	222	\$50.30 ± 0.54 ^{cd}
AH	549	\$50.29 ± 0.34 ^{cd}
Lm	460	\$49.82 ± 0.38 ^{cd}
AHBq	174	\$49.67 ± 0.61 ^{cde}
ContBq	198	\$48.72 ± 0.58 ^{cde}
AB	709	\$48.52 ± 0.32 ^{de}
CLm	154	\$48.50 ± 0.64 ^{de}
B	205	\$48.23 ± 0.56 ^{de}
CBq	231	\$48.15 ± 0.52 ^{de}
HBA	277	\$47.89 ± 0.50 ^{de}
C	484	\$47.76 ± 0.36 ^e
Bq	1,221	\$47.59 ± 0.23 ^e
HLm	241	\$47.52 ± 0.53 ^{ef}
Cont	116	\$47.47 ± 0.73 ^{ef}
HB	228	\$47.26 ± 0.54 ^{ef}
EngBq	514	\$47.31 ± 0.35 ^{ef}
EngCont	242	\$47.30 ± 0.51 ^{ef}
Lg	292	\$47.29 ± 0.50 ^{ef}
Dairyx	123	\$46.89 ± 0.73 ^{ef}
CB	109	\$46.35 ± 0.77 ^{ef}
H	513	\$46.32 ± 0.36 ^f
Bx	122	\$46.03 ± 0.77 ^f
Sm	299	\$45.91 ± 0.46 ^f

^a Breed type = A - Angus, AB - Angus x Brahman, ABq - Brangus, AC - Angus x Charolais, AH - Angus x Hereford, AHBq - Angus x Hereford x 1/4 Brahman, B - Brahman, Bq - 1/4 Brahman x other crosses, Bx - Brahman x other crosses, C - Charolais, CB - Charolais x Brahman, CBq - Charolais x 1/4 Brahman, CLm - Charolais x Limousin, Cont- other Continental breeds, ContBq - other Continental breeds x 1/4 Brahman, Dairyx - Dairy crosses, EngBq - other English breeds x 1/4 Brahman, EngCont - other English x other Continental crosses, H - Hereford, HB - Hereford x Brahman, HBA - Hereford x Brahman x Angus, HC - Hereford x Charolais, HLm - Hereford x Limousin, Lm - Limousin, Lg - Longhorn, Sm - Simmental.

^b Least-squares mean ± SE (dollars/cwt.).

^{c,d,e,f} Means within columns without a common superscript differ (P < 0.01).

Table 2. Selling price of replacement cows based on color.

Color	n	Selling price ^a
Black	2,695	\$49.59 ± 0.16 ^b
Gray	420	\$49.42 ± 0.39 ^{bc}
Black-white face	1,163	\$48.76 ± 0.24 ^{cd}
Yellow-white face	345	\$48.73 ± 0.43 ^{cd}
Red	1,483	\$48.50 ± 0.21 ^{cd}
Yellow	573	\$47.78 ± 0.34 ^{de}
Gray-white face	166	\$47.56 ± 0.62 ^{de}
White	459	\$47.17 ± 0.38 ^f
Spots or striped	592	\$47.05 ± 0.34 ^f
Red-white face	1,553	\$47.04 ± 0.21 ^f
Brown and brown white face	131	\$46.09 ± 0.74 ^f

^a Least-squares mean ± SE (dollars/cwt.)^{b,c,d,e,f} Means within columns without a common superscript differ (P < 0.01).**Table 3. Selling price of replacement cows based on frame score, body fill, brands and health.**

Item:	n	Selling price ^a
Frame score:		
Large	3,397	\$47.08 ± 0.15 ^b
Medium	4,857	\$49.46 ± 0.12 ^c
Small	1,343	\$48.11 ± 0.25 ^d
Body fill:		
Gaunt	1,116	\$47.57 ± 0.27 ^b
Shrunk	2,670	\$49.78 ± 0.16 ^c
Average	4,235	\$48.13 ± 0.13 ^d
Full	1,407	\$46.33 ± 0.22 ^e
Tanked	167	\$44.35 ± 0.66 ^f
Brands:		
None	8,779	\$48.39 ± 0.09 ^b
One	671	\$48.39 ± 0.31 ^b
Two or more	141	\$48.63 ± 0.67 ^b
Health:		
Healthy	9,348	\$48.47 ± 0.09 ^b
Lumps	178	\$47.23 ± 0.58 ^{bc}
Lame	36	\$43.85 ± 1.29 ^c
Sick	18	\$40.25 ± 1.80 ^c
Bad eyes	18	\$45.31 ± 1.85 ^{bc}

^a Least-squares mean ± SE (dollars/cwt.)^{b,c,d,e,f} Means within columns within item without a common superscript differ (P < 0.01).**Table 4. Selling price of replacement cows based on age.**

Age (yr)	n	Selling price ^a
2	574	\$59.51 ± 0.33 ^b
3	609	\$55.78 ± 0.32 ^c
4	865	\$53.84 ± 0.27 ^d
5	1,642	\$50.73 ± 0.19 ^e
6	1,617	\$49.95 ± 0.19 ^f
7	1,271	\$47.67 ± 0.22 ^g
8	1,794	\$47.30 ± 0.18 ^g
> 8	717	\$41.71 ± 0.29 ^h

^a Least-squares mean ± SE (dollars/cwt.)^{b,c,d,e,f,g,h} Means within columns without a common superscript differ (P < 0.01).