

# Arkansas Steer Feedout Program 2005-2006

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## Story in Brief

The objective of the Arkansas Steer Feedout Program is to provide cow-calf producers information about the post-weaning feedlot performance and carcass characteristics of their calves. For the 2005-2006 feedout, quality grade, initial weight, hot carcass weight, yield grade and medicine costs were all factors that affected ( $P < 0.05$ ) the feedlot return over specified costs. Cow calf producers who participated in the program can use the information to evaluate how their cattle breeding programs fit the needs of the beef cattle industry.

## Introduction

The University of Arkansas Cooperative Extension Service Steer Feedout Program provides cow-calf producers the opportunity to acquire information about post-weaning performance and carcass characteristics of their calves. It also points out factors that influence value beyond the weaned calf phase of beef production. The program is not a contest to compare breeds or breeders or to promote retained ownership. The Feedout Program creates an opportunity for producers to determine how their calf crop fits the needs of the beef industry. The program also provides the information needed to determine if changes in genetics and/or management factors are warranted for producers to be competitive in beef production.

## Experimental Procedures

On November 10, 2005, 139 steer calves from 16 Arkansas producers representing 11 counties were placed on feed at Wheeler Brothers Feedyard in Watonga, Oklahoma. Producers were required to administer 5-way modified live vaccinations to all calves and were encouraged to precondition the calves for a minimum of 30 days prior to shipment. Calves were weighed and processed on November 11, 2005. Processing included weight collection, deworming, implanting with a growth implant, and ear tagging with a feedlot lot tag. All calves were placed in one pen. Management factors such as processing, medical treatments and rations were the same as the other cattle in the feedyard. This was the first year that electronic ear tags (EID) were used in the program. The EID tags helped the feedyard and Extension personnel manage individual animal medicine costs and weights. The feedyard manager and Extension personnel selected animals for each of the 3 harvest groups when they reached the weight and condition regarded as acceptable for the industry and market conditions. Cattle were sold on a carcass basis with premiums and discounts for various quality grades, yield grades and carcass weights. Feed, processing and medicine costs were financed by the feedyard. All expenses were deducted from the carcass income, and proceeds were sent to the owners. Of the 139 steers that started on feed in the fall, one died (0.99% death loss). One calf suffered from severe

bloat, and was sold to a local packing plant where its carcass was condemned. These 2 calves were not included in the statistical analyses; therefore, 137 steers were used in the analyses.

Carcasses were placed in 2 groups according to industry standards for carcass merit. Carcass groups were 1) fit industry standards (at least USDA Choice, Yield Grade  $< 3.5$ , and hot carcass weight between 550 and 950 lb) or 2) did not fit industry standards. The main effect of carcass group and the interaction with dependent variables carcass value, average daily gain (ADG), and net return were determined using PROC GLM of SAS (SAS Inst. Inc., Cary, N.C.). Least-squares means were calculated with the PDIF option and reported.

Calves were sorted into categories based upon their feedlot return (income minus feedlot direct expenses). Data from calves in the top 25% and bottom 25% were sorted out for further analysis. Factors affecting feedlot return for the top 25% and the bottom 25% were determined using the Stepwise method of PROC REG of SAS. Independent variables included initial (arrival) weight; percentage Brahman, English, and Continental breeding; ADG; Yield Grade; Quality Grade; feed cost per pound of gain; hot carcass weight; days on feed; medicine cost; ribeye area; ribeye area per 100 lb of hot carcass weight; and dressing percentage. The breeding percentages were provided by the producer upon delivery.

## Results and Discussion

The financial summary is reported in Table 1. Average gross income per head was \$1,029.17 (range = \$504 to \$1,315). The feedlot return averaged \$686.76; whereas, the calculated returns, accounting for the initial value of the calf at arrival, averaged \$32.99 (range = \$-188 to \$259).

The sick pull rate was high with 80 calves (56%) treated for sickness. Still, this is a dramatic improvement over last year's 80% pull rate. The pull rate was high for cattle that were all listed as being preconditioned. The average medicine cost for the entire pen was \$13.39 per head, \$30 less than last year's average. The health status of cattle in the feedyard usually has a major impact on performance and profit. Healthy steers had numerically higher feedlot net returns (\$703) than steers that became sick (\$674) but this difference was not statistically significant. No differences were noted

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between healthy and sick steers for ADG, hot carcass weight, feed cost per pound of gain, total cost per pound of gain, dressing percentage, yield grade, ribeye area, and ribeye area per cwt. of carcass weight ( $P > 0.10$ ). Previous feedout data indicate that health status (healthy vs. sick) negatively impacts feedlot and carcass performance. Given past health issues that cattle in the program have faced, Arkansas producers need to implement a sound health management plan. Arkansas producers should consult with their veterinarian on designing a vaccination program for their herd. By implementing a sound vaccination program at the ranch of origin, predictability and consistency of calves increases along with product value, and calves have the opportunity to express their genetic potential.

The performance of the steers in the top 25% and bottom 25% for feedlot return are shown in Table 2. The average steer arrival weight and final weight were 609 pounds (range = 373 to 889 lb) and 1,284 pounds (1,057 to 1,528 lb), respectively. Average daily gain was 3.47 pounds and ranged from 2.17 to 4.67 pounds. The average number of days on feed was 194 days, and the average total cost of gain was \$0.47. Overall, 40 percent of the steers graded Choice, which is lower than the national average (56.8%). One head graded Prime, and 10 head received a premium for Certified Angus Beef or Angus Pride Choice. Carcass standards for the beef cattle industry are Choice quality grade, yield grade of less than 4, and hot carcass weight between 550 and 950 pounds. Thirty-five percent of the steers fit these industry standards. The steers that met the industry standards averaged \$171 per head more than those that did not fit the industry standards ( $P < 0.001$ ). They had higher carcass values because they graded Choice, and they were not discounted for yield grades greater than 4.0 or for carcasses outside the weight range. Of the steers that were in the top 25% based on feedlot net return, 94% met the industry standards, and for those in the bottom 25% based on feedlot net return, 100% did not meet the industry standards.

Listed below are the significant ( $P < 0.01$ ) factors that affected feedlot net return over specified costs for steers in the 2005-2006 program. Specified costs include feed, freight, insurance, processing, medicine, Beef Check-off dues, and interest. Factors are listed in descending order of importance.

**Quality Grade** - Cattle that graded Prime, Choice, Select, and No Roll had feedlot net returns of \$835, \$782, \$621 and \$543 per head, respectively. All feedlot net returns based on quality grades differed ( $P < 0.001$ ) from each other. Marbling is the primary factor that affects a calf's ability to grade Choice. Three main factors that affect marbling are: (1) the genetic ability to marble; (2) the maturity or the physiological age, not the chronological age; and (3) ration. Some cattle breeds report marbling EPD's in their sire summaries. Carcass traits such as marbling are highly heritable; therefore, selecting high marbling EPD bulls can be effective for improving the marbling ability of their calves. Breed can also influence a calf's ability to grade Choice. Calves with a high percentage of English breeding usually have an increased ability to grade Choice.

Physiological age influences frame score. Large-frame cattle must be older (chronologically) to reach the same physiological age to express marbling as compared to smaller-frame cattle. Steers

should be medium to large frame, and extremes at both ends of the scale (small and extremely large) should be avoided.

**Initial Weight** - The relationship between initial weight and feedlot net return was negative indicating that as initial weight increased feedlot net return decreased. This relationship is slightly misleading though. The main reason initial weight was present as a significant factor was due to the market at the time of harvest. The first group of steers harvested received the lowest carcass price of the 3 harvest groups. This first harvest group of steers was largely made up of the calves with heavier initial weight. Generally, the heavier the calf upon entrance to the feedyard the fewer days they take to reach harvest weight. Nonetheless, in this year's program, heavier calves were at a disadvantage due to the market. It is not recommended to change the type and size of calf entering the feedlot based upon this finding.

**Hot Carcass Weight** - The relationship between hot carcass weight and feedlot net return was positive; therefore as hot carcass weight increased, so did feedlot net return. The more carcass pounds sold, the greater the gross income and feedlot net return. Table 3 shows the relationship between hot carcass weight, total cost of gain, average daily gain, feedlot net return, and calculated return.

Factors that affect hot carcass weight include frame size, muscle thickness, and backfat. Muscle thickness is a major factor that relates to carcass weight. Thickness, depth and fullness of quarter, and width (without excessive fat) of back, loin, and rump are indications of muscling.

**Yield Grade** - As yield grade increased from 1 to 5, feedlot net return changed very little (\$630, \$657, \$714, \$712, \$742 per head for yield grades 1, 2, 3, 4 and 5, respectively). There were no differences ( $P > 0.05$ ) between feedlot net returns for Yield Grades 1 and 5, although there appeared to be a trend that the higher yield grade showed an increase in feedlot net return. Backfat, ribeye area, hot carcass weight and percentage of kidney, pelvic and heart fat are the factors that determine yield grade. As yield grade (1 to 5) increases, the amount of fat increases in relation to the amount of lean making a lower numerical yield grade more desirable.

**Medicine Cost** - Healthy calves outperformed sick calves. A good preconditioning vaccination program will not guarantee a healthy feedyard calf, but it is the best management tool available. Healthy calves had a higher feedlot net return (\$703 vs. \$674 per head) than calves that were treated for illness. A higher percentage of healthy steers graded Choice than did the sick calves.

## Implications

Both high and low feedlot returns are affected by calf health (medicine costs), feedlot performance factors, and carcass characteristics. Value based or grid marketing is increasing in use and various forms of value based marketing are spreading to all levels of the industry. A producer's goal should be to produce a product that meets the demands of all segments of the beef industry and beef consumers – those who do this will be more competitive in the ever changing marketplace.

**Table 1. Financial results summary, 2005-2006 Arkansas Steer Feedout Program.**

Item	Average per head (\$) <sup>a</sup>	Range (\$)
Gross income	1,029.17	504 to 1,315
Expenses		
Feed	275.18	213 to 336
Freight, interest, etc.	61.43	57 to 87
Medicine	13.39	0 to 63.31
Total feedlot expenses	342.41	273 to 427
Feedlot net return	686.76	484 to 912
Calf initial value <sup>b</sup>	653.77	442 to 889
Calculated return	32.99	-188 to 259

<sup>a</sup> 137 head<sup>b</sup> An Arkansas Livestock Market News Reporter placed an arrival value on each calf bases upon arrival weight and frame and muscle scores.**Table 2. Performance summary of the bottom 25%, top 25% and average steers based on feedlot net return.**

Item	Bottom 25%	Top 25%	Average
Number of steers	35	35	137
Gross Income per head (\$)	890 <sup>a</sup>	1,184 <sup>b</sup>	1,029
Carcass value per lb (\$)	1.17 <sup>a</sup>	1.36 <sup>b</sup>	1.25
Initial value per head (\$)	592 <sup>a</sup>	702 <sup>b</sup>	653
Medicine per head (\$)	17.39 <sup>c</sup>	12.17 <sup>d</sup>	13.00
Feed cost per head (\$)	261 <sup>a</sup>	286 <sup>b</sup>	272
Total expense per head (\$)	331 <sup>a</sup>	353 <sup>b</sup>	339
Feedlot net return per head (\$)	559 <sup>a</sup>	831 <sup>b</sup>	686
Calculated return per head (\$)	-32 <sup>a</sup>	128 <sup>b</sup>	30.59
Days on feed	198	196	194
Feed cost per lb of gain (\$)	0.38	0.37	0.38
Total cost per lb of gain (\$)	0.47	0.47	0.47
Arrival weight (lb)	543 <sup>a</sup>	651 <sup>b</sup>	609
Muscle score	1.8	1.6	1.7
Frame score			
Percent large	35%	42%	35%
Percent medium	65%	58%	65%
Final weight (lb)	1,256 <sup>a</sup>	1,390 <sup>b</sup>	1,284
Average daily gain (lb)	3.36 <sup>a</sup>	3.49 <sup>b</sup>	3.47
Hot carcass weight (lb)	762 <sup>a</sup>	867 <sup>b</sup>	825
Carcass value (\$/lb)	1.17 <sup>a</sup>	1.36 <sup>b</sup>	1.24
Dressing percentage	63.1% <sup>a</sup>	65.2% <sup>b</sup>	64.3%
Ribeye area (sq in)	13.6	13.8	13.6
Backfat (in)	0.41 <sup>c</sup>	0.58 <sup>d</sup>	0.52
REA per 100 lb carcass weight	1.77 <sup>a</sup>	1.59 <sup>b</sup>	1.65
Quality grade			
Percent Prime	0% <sup>a</sup>	3% <sup>b</sup>	0.7%
Percent Choice	0% <sup>a</sup>	91% <sup>b</sup>	40%
Percent Select	92% <sup>a</sup>	6% <sup>b</sup>	57%
Percent No roll	8% <sup>a</sup>	0% <sup>b</sup>	2.2%
Yield grade	2.32	2.7	2.61

<sup>a,b</sup> Values within rows with unlike superscripts differ (P < 0.0001).<sup>c,d</sup> Values within rows with unlike superscripts differ (P < 0.001).**Table 3. Summary of hot carcass weight, total cost of gain, average daily gain, feedlot net return and calculated return.**

Hot carcass weight (lb)	Total cost of gain (\$)	ADG (lb)	Feedlot net return per head (\$)	Calculated return per head (\$)
600-699	0.52	2.5	545	-33
700-799	0.46	3.3	617	23
800-899	0.47	3.5	703	30
900-999	0.47	3.8	798	74