

Arkansas Steer Feedout Program

2002-2003 Summary Report



USDA Choice
Yield Grade: 2



USDA Select
Yield Grade: 2



No Roll
Yield Grade: 2

Table of Contents

Introduction	1
Calf Management	1
In-Depth Summary of the 2002-2003 Feedout Program	2
Health Status and Death Loss	2
Financial Results	3
Performance Results	4
Carcass Results	4
Industry Standards	5
Factors Affecting Steers' Feedlot Net Return	5
Summary	9

Arkansas Steer Feedout Program 2002-2003

Tom R. Troxel, Shane Gadberry, Jane Parish, Sammy Cline and Doug Kratz
University of Arkansas Cooperative Extension Service
Animal Science Section

Introduction

The University of Arkansas Cooperative Extension Service Steer Feedout Program provides cow-calf producers the opportunity to acquire information about postweaning 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 to be competitive in beef production.

Calf Management

On November 7, 2002, 170 steer calves from 23 Arkansas producers representing 16 counties were placed on feed at Oklahoma Feeders Inc., Coyle, Oklahoma. Calves were eartagged, weighed and processed on November 8, 2002. Calves were sorted into two feeding groups based on weight, frame and flesh condition. Management factors such as processing, medical treatments and rations were the same as the other cattle in the feedyard. The feedyard manager and Extension personnel selected animals for harvest 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 170 steers that started on feed in the fall, three died (2.8% death loss). Four carcasses were used by IBP (Iowa Beef Processors) for quality control checks and were not included in the statistical analyses. Therefore, 163 steers were used in the analyses.

In-Depth Summary of the 2002-2003 Feedout Program

Health Status and Death Loss

The sick rate was very low with only 8 calves (4.7%) treated for sickness. The average medicine cost per sick calf was \$48.13. Feedlot management implemented a preventive treatment for the steers in one pen. Depending on body temperature, calves received a preventive treatment of Baytril and Banimine, NuFlor or no treatment (normal body temperature). Fifty-two calves received the preventive treatment with an average cost of \$24.23 per head. Only three calves that received the preventive treatment required additional medical attention.

The health status of cattle in the feedyard usually has a major impact on performance and profit. Healthy steers had higher feedlot net returns (\$610) than steers that became sick (\$483; $P < 0.001$). In addition, healthy steers had higher in weights (689 pounds vs. 632 pounds; $P < 0.06$), higher in values per head (\$501 vs. \$452; $P < 0.01$), fewer days on feed (174 vs. 186; $P < 0.05$), lower total cost of gain (\$0.69 vs. \$0.78; $P < 0.01$), and higher carcass weights (761 pounds vs. 713 pounds; $P < 0.01$) than steers that became sick. No differences between healthy and sick steers were detected for average daily gain, dressing percentage, feed cost of gain, carcass value, ribeye area per cwt. and yield grade. This was probably because so few steers got sick.

Sickness impacted the calves' ability to grade Choice. More healthy steers (56%) graded Choice than steers that were treated for sickness (25%) or received the preventive treatment (47%). The percentages that graded Select for healthy, preventive treatment and sick calves were 35%, 53% and 62%, respectively ($P < 0.03$).

Blood selenium, copper and zinc levels were determined because these minerals play an important role in immune function. When comparing these mineral levels of the healthy, preventive treatment and sick calves, no differences were detected for any of the three minerals. One reason why no differences were detected may have been because so few calves got sick, which was good for the program but not good for this analysis.

This vividly points out the need to adhere to a sound health management plan. 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. Most deaths in a feedyard are due to pneumonia. In this year's feedout program, three steers died due to respiratory problems.

Variability in health is built into the calf market. Buyers factor this into what they are willing to pay for calves. There are cattle feeding operations that are willing to pay more for good quality cattle that have been properly immunized and properly backgrounded. The amount they are willing to pay is dictated by the increase in the added value of benefits and also the quantity of similar type cattle, which can be purchased and managed as a unit.

Financial Results

Table 1 is a summary of the financial statement.

Table 1. Financial Results Summary, 2002-2003^a

	Average per head (\$)	Range (\$)
Gross Income	945.59	451 to 1,221
Expenses		
Feed	312.35	109 to 399
Freight, yardage, processing, interest, etc.	35.30	24 to 40
Medicine	<u>10.01</u>	<u>0 to 96</u>
Total	357.41	155 to 437
Feedlot Net Return	571.50	211 to 805
In Value	471.34	386 to 654
Calculated Return	97.81	-129 to 279

^a 163 head

A farm break-even value was calculated by dividing the feedlot net return by the in weight. If the feeder calf could have been sold in the fall of 2002 for more than the farm break-even value, financially it would have been better to sell the calf last fall than to feed it. The steers' farm break-even averaged \$0.79 per pound (average in weight was 600 pounds) and ranged from \$0.45 to \$1.33 per pound. For the week ending November 8, 2002, 600 to 700 pound steers were selling for \$72 to \$82 per cwt., or \$0.72 to \$0.84 per pound.

Table 2 is a financial summary of the bottom 25%, top 25% and average for steers based on feedlot net return.

Table 2. Financial Summary of the Bottom 25%, Top 25% and Average Steers Based on Feedlot Net Return

	Bottom 25%	Top 25%	Average
Number of Steers	41	42	163
Gross Income per head (\$)	819 ^a	1,078 ^b	946
Carcass Value Per Lb. (\$)	1.20 ^a	1.34 ^b	1.27
In Value per head (\$)	446 ^a	529 ^b	471
Medicine per head (\$)	18.92 ^c	3.63 ^d	10.01
Feed Cost per head (\$)	290 ^a	337 ^b	312
Total Expense per head (\$)	341	378	357
Feedlot Net Return per head(\$)	421 ^a	701 ^b	572
Calculated Return per head (\$)	-24 ^a	172 ^b	98
Days on Feed	187 ^a	167 ^b	176
Feed Cost Per Lb. of Gain (\$)	0.57 ^a	0.62 ^b	0.60
Total Cost Per Lb. of Gain (\$)	0.67	0.69	0.69

^{a, b} Values within rows with unlike superscripts are different (P < 0.01).

^{c, d} Values within rows with unlike superscripts are different (P < 0.02).

Performance Results

The average steer in weight and final weight were 660 pounds (range = 444 to 876 lb.) and 1,191 pounds (781 to 1,459 pounds), respectively. Average daily gain was 3.01 pounds and ranged from 1.62 to 4.28 pounds. The performance summary of the bottom 25%, top 25% and average based on feedlot net return is shown in Table 3.

Table 3. Performance Summary of the Bottom 25%, Top 25% and Average Steers Based on Feedlot Net Return

	Bottom 25%	Top 25%	Average
In Weight (lb.)	590 ^a	730 ^b	660
Muscle Score	1.8 ^c	1.5 ^d	1.6
Frame Score			
Large	59% ^a	93% ^b	82%
Medium	41% ^a	7% ^b	18%
Final Weight (lb.)	1,113 ^a	1,280 ^b	1,191
Average Daily Gain (lb.)	2.84 ^a	3.29 ^b	3.01

^{a, b} Values within rows with unlike superscripts are different (P < 0.01).

^{c, d} Values within rows with unlike superscripts are different (P < 0.06).

Carcass Results

Overall, 51 percent of the steers graded Choice, which is close to the national average (59%). Less than one percent graded Prime (0.6%), and 10 head received a premium for Certified Angus Beef. Table 4 summarizes the carcass data.

Table 4. Carcass Summary of the Bottom 25%, Top 25% and Average Steers Based on Feedlot Net Return

	Bottom 25%	Top 25%	Average
Hot Carcass Weight (lb.)	684 ^a	808 ^b	741
Carcass Value (\$/lb)	1.20 ^a	1.33 ^b	1.27
Dressing Percentage	61.4% ^a	63.1% ^b	62.2%
Ribeye Area (sq. in.)	11.8 ^a	13.2 ^b	12.6
Backfat	0.36 ^a	0.47 ^b	0.42
REA per 100 lb. carcass weight	1.74 ^c	1.64 ^d	1.71
Quality Grade			
Prime	0%	2%	0.6%
Choice	5% ^a	93% ^b	51%
Select	73% ^a	5% ^b	41%
No Roll	20% ^a	0% ^b	6%
Standard	2%	0%	0.6%
Yield Grade	2.00 ^c	2.29 ^d	2.72

^{a, b} Values within rows with unlike superscripts are different (P < 0.01).

^{c, d} Values within rows with unlike superscripts are different (P < 0.03).

Industry Standards

The carcass standards for the beef cattle industry are Choice quality grade, yield grade of # 3.5, and hot carcass weight between 550 and 950 pounds. Fifty-one percent of the steers fit these industry standards. Table 5 shows the steers that met the industry standards averaged \$115 per head more than those that did not fit the industry standards ($P < 0.01$). They also had higher average daily gains and carcass values because they graded Choice and were not discounted for yield grades greater than 4.0 or for carcasses outside the weight range. The average breed composition of those cattle that fit the industry standards was 35% Continental, 57% English and 8% Brahman.

Table 5. Feedlot Net Return, Average Daily Gain and Carcass Value for Steers that Did or Did Not Meet Industry Standards^a

Item	Met Standards	Did Not Meet Standards	Difference
Feedlot Return	\$643	\$528	\$115 ^b
Average Daily Gain (Lb)	3.10	2.96	0.14 ^c
Carcass Value	\$1.34	\$1.21	\$0.13 ^b

^a USDA Quality Grade Choice, yield grade ≤ 3.5 and carcass weight of 550 to 950 pounds

^b $P < 0.01$

^c $P < 0.03$

Factors Affecting Steers' Feedlot Net Return

Listed below are the significant ($P < 0.01$) factors that affected feedlot net return for steers in the 2002-2003 program. Factors are listed in descending order of importance.

<u>Rank</u>	<u>2002 – 2003</u>
1.	Hot Carcass Weight
2.	Quality Grade
3.	Days On Feed
4.	Yield Grade
5.	Dressing Percentage
6.	Medicine Cost
7.	Feed Cost of Gain

1. **Hot Carcass Weight** - The relationship between hot carcass weight and feedlot net return was positive. 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 6 shows the relationship between hot carcass weight, total cost of gain, average daily gain, feedlot net return and calculated return.

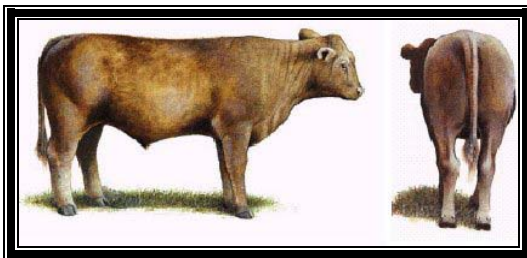
Table 6. Summary of Hot Carcass Weight, Total Cost of Gain, Average Daily Gain, Feedlot Net Return and Calculated Return

Hot Carcass Weight (lb.)	Total Cost of Gain (\$)	ADG (lb.)	Feedlot Net Return per Head (\$)	Calculated Return per Head(\$)
< 600	0.70	2.1	346	-50
600-699	0.66	2.8	520	78
700-799	0.69	3.0	586	95
800-899	0.70	3.3	676	139

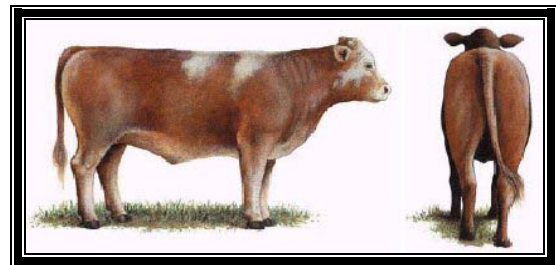
Hot carcass weight discounts were observed for carcasses weighing less than 550 pounds and greater than 950 pounds.

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. Muscling is inherited through the sire and dam.

The current USDA Feeder Cattle Grades utilize four muscle thickness scores (1 = thick, 2 = slightly thick, 3 = narrow and 4 = very narrow). Thickness is related to muscle-to-bone ratio at a given degree of thickness. Thicker muscled animals will have more lean meat. "Double-muscled" animals are included in the Inferior grade (unthrifty animals). Although such animals have a superior amount of muscle, they are graded U.S. Inferior because of their inability to produce acceptable degrees of meat quality.



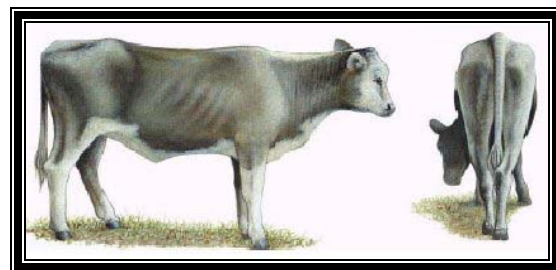
Muscle Score 1



Muscle Score 2



Muscle Score 3



Muscle Score 4

The ideal calf should be Feeder Cattle Grade U.S. 1. Number 1 is 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.

2. **Quality Grade** - Cattle that graded Choice, Select, Standard and Dark Cutter had feedlot net returns of \$643, \$528, \$502 and \$490 per head ($P < 0.001$), respectively. 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. Breeds 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.



USDA Choice
Yield Grade: 3
ADG: 3.34 lb.
Calculated Net Return: \$173



USDA Select
Yield Grade: 3
ADG: 3.12 lb.
Calculated Net Return: -\$7

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.

Cattle are more likely to grade Choice at a lighter weight when fed a high concentrate ration versus a high forage diet. Successful feedlots feed a high concentrate ration to finishing cattle; therefore, cattle diet was not a limiting factor for steers in this program.

3. **Days on Feed** - Cattle were sold on either April 15 or May 20, 2003. A negative relationship existed between days on feed and feedlot net return. That means that on the average, the longer the steers were on feed the lower the net returns (Table 7).

Table 7. Effect of Days on Feed on Average Daily Gain, Total Cost of Feed, Carcass Value and Feedlot Net Return

Slaughter Date	Days on Feed	ADG (lb.)	Total Cost of Gain (\$)	Carcass Value per pound (\$)	Feedlot Net Return per head (\$)
April 15	156	3.2	0.71	1.30	637
May 20	190	2.9	0.67	1.25	549

A factor that affected the relationship between days on feed and feedlot net return was the price difference between Choice and Select quality grades. On April 15, there was a price spread of \$7.00 per cwt. between Choice and Select Yield Grade 3 carcasses and by May 20 that spread increased to \$14.00 per cwt. Generally, there is a seasonal pattern for price spreads between Choice and Select. Often, the spread between Choice and Select is very low early in the year. The spread starts to widen during the late spring months and usually continues to widen into early fall. The Choice-Select spread is usually widest during the late fall and winter period.

It was interesting to note that although the price of Choice Yield Grade 3 carcasses from April 15 to May 20 remained about the same (\$130 to \$132 per cwt.), feedlot net return decreased. This was because fewer steers harvested on May 20 graded Choice as compared to the steers harvested on April 15. Consequently, more of the May 20th harvested steers graded Select, No Roll or Standard or were discounted for light carcasses.

4. **Yield Grade** - As yield grade increased from 1 to 3, feedlot net return decreased (\$599, \$570 and \$616 per head for yield grades 1, 2 and 3, respectively). There were no significant differences between feedlot net returns for Yield Grades 1 and 3, but feedlot net returns for Yield Grades 1 and 3 were significantly higher than the feedlot net return for Yield Grade 2. 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 4) increases, the amount of fat increases in relation to the amount of lean.
5. **Dressing Percentage** - The relationship between dressing percentage and feedlot net return was positive. As dressing percentage increased, so did feedlot net return. Many of the factors that affect hot carcass weight (addressed in Number 1) also affect dressing percentage. The top 25% of steers (based on feedlot return) had a dressing percentage of 63.1% compared to 61.4% for the steers in the bottom 25%.
6. **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 (\$610 vs. \$483 per head) than calves that were treated for illness. A higher percentage of healthy steers graded Choice than did the sick calves.
7. **Feed Cost of Gain** - Feed cost of gain takes into account many different factors such as average daily gain, health, feed cost, feed efficiency, frame score, muscle score, etc. Generally, feed cost of gain is inversely related to average daily gain. That is, as average daily gain increases feed cost of gain decreases. Therefore, as feed cost of gain goes down, feedlot net return increases.



USDA Choice
Yield Grade: 1
ADG: 3.04 lb.
Calculated Net Return: \$146



USDA Select
Yield Grade: 1
ADG: 3.04 lb.
Calculated Net Return: \$127



No Roll
Yield Grade: 2
ADG: 2.30 lb.
Calculated Net Return: -\$107

Summary

The purpose of the Arkansas Steer Feedout Program is to provide the opportunity for cow-calf producers to determine how their cattle fit the needs of the industry. With the large price spread between Choice and Select, it was very important to the “bottom line” that calves graded Choice. The program demonstrates that when cattle are sold on a grade and yield formula, it is very important that the cattle grade Choice and yield grade less than 3.5. Whether cattle are sold on a grade and yield formula or not, the industry wants cattle that do grade and yield. No matter the selling formula used (included live pricing), quality grade and yield are considered when determining the bidding price.

We want to congratulate the producers who participated in the 2002-2003 Steer Feedout Program. It takes courage to put calves in the feedyard and obtain this data. Hopefully, these cattle producers will take this information and make beef cattle genetic changes to improve their cattle herds.

The University of Arkansas Cooperative Extension Service would like to thank Farm Credit Services of Western Arkansas for supporting the Steer Feedout Program and the 4-H Adopt-a-Pen Feedout Program.