



Choice – Yield Grade 2



Select – Yield Grade 2



No Roll – Yield Grade 2

Arkansas

Feedout

Program

2000-2001

Summary Report

Table of Contents

	Page
Introduction	1
Calf Management.....	1
In-Depth Summary of the 2000-2001 Feedout Program	2
Health Status and Death Loss.....	2
Financial Results	3
Performance Results	4
Carcass Results	5
Industry Standards	6
Calf Breed Type	6
Factors Affecting Feedlot Net Return	7
Summary.....	12

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Arkansas Feedout Program

2000-2001

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Introduction

The University of Arkansas Cooperative Extension Service Feedout Program provides cow-calf producers the opportunity to acquire information about postweaning performance and carcass characteristics of their calves. It also points out the 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 2, 2000, 415 calves (50 heifers and 365 steers) from 45 Arkansas producers representing 20 counties were placed on feed at Neill Cattle Company, Welch, Oklahoma. Calves were eartagged, weighed and processed on November 3, 2000. Steers were sorted into four feeding groups based on weight, frame and flesh condition. Heifers were placed in a pen and fed separately. Management factors such as processing, medical treatments and rations were the same as the other cattle in the feedyard. The feedyard manager 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 owner.

Because there were only 50 heifers, the heifer data are reported as averages and were not statistically analyzed. Of the 365 steers that started in the fall, three died and two carcasses were used by IBP (Iowa Beef Processors) for quality control checks. These steers were not included in the statistical analyses. Therefore, 360 steers were used in the analyses.

In-Depth Summary of the 2000-2001 Feedout Program

Health Status and Death Loss

A total of 32 calves (7.8%) were treated for sickness. The average medicine cost per sick calf was \$35.21. The medicine cost for the entire group averaged \$2.73 per head. The health status of cattle in the feedyard usually has a major impact on performance and profit. Healthy steers had higher feedlot net returns (\$666) than steers that became sick (\$541; $P < 0.001$). In addition, healthy steers had a higher dressing percentage (63.6% vs. 62.0%; $P < 0.001$), lower total cost of gain (\$0.48 vs. \$0.55; $P < 0.001$) and higher carcass value (\$120.26 vs. \$113.98 per cwt.; $P < 0.001$) than steers that became sick.

Unlike in past years, there were no differences detected in average daily gain, end weight, feed cost of gain and days on feed between healthy steers and steers that were treated for an illness. One reason for the lack of differences detected may have been that there were only 32 head treated.

Sickness impacted the calf's ability to grade Choice. More healthy steers (47%) graded Choice than steers that were treated for sickness (34%; $P < 0.001$). In addition, only 0.6% of the healthy calves were classified as dark cutter whereas 10.3% of the steers that were treated for a sickness were dark cutters ($P < 0.001$). The abnormally dark color of the lean is referred to as Dark Cutters. The color of the muscle can range from dark red to nearly black and has both a sticky texture and a high water-holding capacity. Dark cutters are caused by low muscle glycogen at the time cattle are harvested. Glycogen depletion of dark-cutting beef can be caused by strenuous muscular activity or by psychological stress. It has also been shown that the differences between the daytime highs and the nighttime low temperatures can affect dark cutting in beef. During late April and early May when the steers were slaughtered, the daytime highs were seasonally above normal. This could have caused an increase in dark cutters especially in the steers that were already somewhat stressed as a result of being sick.

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 product value and calves have the opportunity to express their genetic potential. Most deaths in a feedyard are due to pneumonia. In this feedout program, two steers died due to respiratory problems, and one steers died due to bloat. These three calves were not included in the data analyzed.

Variability in health is built into the calf market. Buyers factor this into what they are willing to pay because they buy calves as a commodity. 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 can pay is dictated by the increase in the added value of benefits and the quantity of similar type cattle, which can be purchased and managed as a unit.

Financial Results

Tables 1 and 2 show a summary of the financial statement for steers and heifers respectively.

**Table 1. 2000-2001 Arkansas Feedout Summary
Financial Results - Steers^a**

	Average (\$)	Range (\$)
Gross Income	930.10	428 to 1,192
Expenses		
Feed	236.85	186 to 288
Freight, yardage, processing, interest, etc.	35.19	24 to 40
Medicine	2.89	0 to 104
Total	274.92	220 to 364
Feedlot Net Return	655.18	181 to 888
In Value	551.47	396 to 693
Calculated Return	103.71	-312 to 279

^a 362 head

**Table 2. 2000-2001 Arkansas Feedout Summary
Financial Results – Heifers^a**

	Average (\$)	Range (\$)
Gross Income	841.68	453 to 1,089
Expenses		
Feed	232.26	178 to 278
Freight, yardage, processing, interest, etc.	33.23	31 to 35
Medicine	1.61	0 to 52.50
Total	267.10	226 to 312
Feedlot Net Return	574.58	192 to 777
In Value	505.12	403 to 649
Calculated Return	69.46	-229 to 206

^a 50 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 2000 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 \$1.02 (average in weight was 643 pounds) and ranged from \$0.33 to \$1.40 per pound. The heifers' farm break-even averaged \$0.93 (average in weight was 624 pounds) and ranged from \$0.39 to \$1.25.

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

	Bottom 25%	Top 25%	Average^a
Number of Steers	90	90	
Gross Income (\$)	782 ^b	1,063 ^c	930
Carcass Value Per Lb. (\$)	1.12 ^b	1.26 ^c	1.20
In Value per head (\$)	499	597	551
Medicine per head (\$)	7.61 ^b	0.25 ^c	2.91
Feed Cost Per Head (\$)	231	239	237
Total Expense (\$)	274	274	275
Feedlot Net Return (\$)	508 ^b	789 ^c	655
Calculated Return (\$)	9 ^b	192 ^c	104
Days on Feed	185 ^b	161 ^c	174
Feed Cost Per Lb. of Gain (\$)	0.43 ^d	0.41 ^e	0.42
Total Cost Per Lb. of Gain (\$)	0.51 ^b	0.47 ^c	0.49

^a Number of Head

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

^{d, e} Values within rows with unlike superscripts are significantly different (P < 0.05).

Table 4. Financial Summary for the Heifers Feedlot Net Return

	Average	Range
Number of Heifers	50	
Gross Income (\$)	842	454 – 1,089
Carcass Value Per Lb. (\$)	1.19	89 – 127
In Value per head (\$)	505	403 – 649
Medicine per head (\$)	1.61	0 – 53
Feed Cost Per Head (\$)	232	178 – 278
Total Expense (\$)	227	226 – 312
Feedlot Net Return (\$)	575	192 – 777
Calculated Return (\$)	69	-229 – 206
Days on Feed	176	
Feed Cost Per Lb. of Gain (\$)	0.52	0.40 – 0.79
Total Cost Per Lb. of Gain (\$)	0.59	0.45 – 90

Performance Results

The average steer in weight and final weight were 643 pounds (range = 400 to 950 lb.) and 1,221 pounds (816 to 1,526 lb.), respectively. Average daily gain was 3.33 pounds and ranged from 1.47 to 4.99 pounds. The performance summary of the bottom 25%, top 25% and average based on feedlot net return is shown in Table 5, and the heifer averages are summarized in Table 6.

Table 5. Performance Summary of the Bottom 25%, Top 25% and Average Steers Based on Feedlot Net Return

	Bottom 25%	Top 25%	Average
In Weight (lb.)	566 ^a	720 ^b	643
Muscle Score	1.5 ^a	1.3 ^b	1.3
Frame Score			
Large	22% ^c	58% ^d	39%
Medium	77% ^c	42% ^d	60%
Small	1%	0%	< 1%
Final Weight (lb.)	1,123 ^a	1,310 ^b	1,221
Average Daily Gain (lb.)	3.00 ^a	3.66 ^b	3.33

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

^{c, d} Values within rows with unlike superscripts are significantly different (P < 0.001).

Table 6. Performance Summary for the Heifers

	Average	Range
In Weight (lb.)	624	480 – 810
Muscle Score	1.5	1 to 3
Frame Score		
Large	54%	
Medium	46%	
Final Weight (lb.)	1,081	826 – 1286
Average Daily Gain (lb.)	2.59	1.73 – 3.43

Carcass Results

Overall, 46 percent of the steers and 38 percent of the heifers graded Choice, which is less than the national average. Two steers graded Prime and 17 head received a premium for Certified Angus Beef. Tables 7 and 8 summarize the carcass data for steers and heifers, respectively.

Table 7. 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.)	699 ^a	843 ^b	775
Dressing Percentage	62.2% ^a	64.4% ^b	63.5%
Ribeye Area (sq. in.)	11.7 ^a	14.1 ^b	13.0
Backfat	0.48 ^c	0.54 ^d	0.52
REA per 100 lb. carcass weight	1.69	1.67	1.68
Quality Grade			
Prime	0%	1%	0.6%
Choice	19% ^e	73% ^f	46%
Select	62% ^e	23% ^f	47%
Standard	13% ^e	3% ^f	6%
Dark Cutter	6%	0%	1%
Yield Grade	2.31	2.42	2.25

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

^{c, d} Values within rows with unlike superscripts are significantly different (P < 0.05).

^{e, f} Values within rows with unlike superscripts are significantly different (P < 0.05).

Table 8. Heifer Carcass Summary

	Average	Range
Hot Carcass Weight (lb.)	707	510 – 861
Dressing Percentage (%)	65.3	60 – 70
Ribeye Area (sq. in.)	14.0	11.0 – 8.5
Backfat	0.46	0.12 – 1.08
REA per 100 lb. carcass weight	1.98	1.63 – 2.61
Quality Grade		
Prime	0	
Choice	38%	
Select	54%	
No Roll	6%	
Dark Cutter	2%	
Yield Grade	1.74	

Industry Standards

The standards for the beef cattle industry are Choice quality grade, yield grade of # 3.5, and hot carcass weight between 550 and 950 pounds. Forty-four percent of the steers fit these industry standards. Table 9 shows the steers that met the industry standards had higher ADG (3.4 lb. vs. 3.2 lb.) and averaged \$100 per head more than those that did not fit the industry standards ($P < 0.01$). They also had higher carcass values (\$1.25 vs. \$1.18) because they graded Choice and were not discounted for yield grades greater than 4.0 or for carcasses outside the weight range.

Table 9. Feedlot Net Return^a for Steers that Did or Did Not Meet Industry Standards (1998-99, 1999-2000 and 2000-2001)

Program Year ^b	Met Standards ^c	Did Not Meet Standards ^c	Difference ^d
1998	\$502	\$426	\$76
1999	\$650	\$588	\$62
2000	\$713	\$613	\$100
Three year Average	\$622	\$542	\$80

^a Average carcass value minus feedlot cost

^b Year effect = $P < 0.0001$

^c Industry standard = $P < 0.0001$

^d Year by Standard interaction ($P = 0.03$)

Calf Breed Type

The percentage of English, Continental and Brahman breeding was determined for each calf. Steers that were at least 50% English, no more than 50% Continental and less than 25% Brahman were sorted into one group and those steers that did not satisfy the breed-type criteria were placed in a second group. Table 10 summarizes performance and carcass data for those steers that did and did not fit the breed-type criteria.

Table 10. Performance and Carcass Data of Arkansas Steers That Fit the Breed Criteria and Those That Did Not Fit the Breed Criteria^a

	Fit the Criteria	Did Not Fit the Criteria	Significance
Percentage Choice (%)	74	48	P < 0.01
Yield Grade	2.3	2.0	P < 0.001
Ribeye Area (sq. in.)	12.3	13.0	P < 0.001
REA per 100 lb carcass weight	1.61	1.68	P < 0.001
Average Daily Gain (lb.)	3.30	3.19	P < 0.01
Dressing Percentage (%)	63.3	64.3	P < 0.001
Carcass Value (\$)	119.88	120.55	NS ^b
Hot Carcass Weight (lb.)	771	766	NS ^b
Feed Cost Per Lb. of Gain (\$)	0.41	0.45	P < 0.001
Feedlot Net Return (\$)	583	591	NS ^b
Percentage meeting industry standards (%) ^c	58	41	P < 0.001

^a At least 50% English, no more than 50% Continental and less than 25% Brahman

^b NS = Not significant

^c Choice quality grade, yield grade # 3.5, 550-950 lb. carcass

Factors Affecting Feedlot Net Return

Listed below are the significant (P < 0.01) factors that affected feedlot net return for steers and heifers in the 2000-2001 Feedout Program and the factors analyzed for the past three feedouts (1998-1999, 1999-2000, and 2000-2001). Most of the factors that affected feedlot net return in 2000-2001 were the same factors that affected feedlot net return in previous years (1998 to 2000). Factors are listed in descending order of importance.

Rank	2000-2001		Summary of Three Feedouts (1998 To 2001)
	Steers	Heifers	
1.	Hot Carcass Weight	Hot Carcass Weight	Hot Carcass Weight
2.	Days On Feed	Quality Grade	Year
3.	Quality Grade	Medicine Cost	Days on Feed
4.	Yield Grade	Yield Grade	Quality Grade
5.	Medicine Cost	Dressing Percentage	Yield Grade
6.	Dressing Percentage		Medicine Cost
7.	Back Fat		Feed Cost of Gain
8.	Feed Cost of Gain		Dressing Percentage

1. **Hot Carcass Weight** – The relationship between hot carcass weight and feedlot net return was positive. That is to say 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 11 shows the relationship between hot carcass weight, total cost of gain, average daily gain, feedlot net return and calculated return.

Table 11. 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 (\$)	Calculated Return (\$)
< 600	0.63	2.2	360	-117
600-699	0.52	2.8	509	19
700-799	0.49	3.2	641	95
800-899	0.40	3.7	735	155

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 or natural fleshing is inherited through the sire and dam.

The current USDA Feeder Cattle Grades utilize four muscle thickness scores (1 = thicker, 2 = slightly thick, 3 = narrow and 4 = very narrow). Thickness is related to muscle-to-bone ratio and at a given degree of fatness to carcass yield grade. 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.

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. **Days on Feed** – Cattle were sold on April 11, May 2 or May 14, 2001. There was a negative relationship between days on feed and feedlot net return. That means that on the average, the longer the steers were on feed the lower the returns (Table 12). Days on feed were not a factor affecting the feedlot net return for the heifers because all heifers were sold and slaughtered on the same days.

Table 12. 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 (\$)	Feedlot Net Return (\$)
April 11	156	3.4	0.50	126	754
May 2	176	3.5	0.49	118	658
May 14	188	3.2	0.48	116	563

One 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 11, there was a carcass discount of \$4.00 per cwt. between Choice and Select but on May 2 and May 14 the carcass price spread widened to \$6.00 and \$8.00 per cwt., respectively. Generally, there is a seasonal pattern regarding discounts between Choice and Select. Often, the spread between Choice and Select is very low early in the year. That 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.

A second factor that affected the relationship between days on feed and feedlot net return was decrease in the price of cattle from April 11 to May 2 and 14. Choice Yield Grade 3 carcasses were sold for \$127 per cwt. on April 11, but the price dropped to \$120 per cwt. for the cattle sold on May 2 and 14.

- Quality Grade** – Cattle that graded Prime, Choice, Select, Standard and Dark Cutter had feedlot net returns of \$739, \$704, \$627, \$551 and \$426, respectively. Marbling is the main 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) diet. Some cattle breeds report marbling EPDs in their sire summary. Carcass traits such as marbling are highly heritable; therefore, selecting high marbling EPD bulls can impact the marbling ability of their progeny. 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.



Choice
Carcass Value = \$129.50/cwt.



Select
Carcass Value = \$116.50/cwt.



Standard
Carcass Value = \$110/cwt.

The physiological age versus chronological age influences frame score. Large frame cattle must be older (chronological) to reach the same physiological age to express marbling as compared to smaller frame cattle. Steers should have frame scores of 5 to 6. That means that at 7 months of age a steer should be 44 to 46 inches tall at the hips.

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, the cattle diet is not a factor.

4. **Yield Grade** – As yield grade increased from 3 to 4, feedlot net return decreased (\$632, \$666, \$664 and \$505 for yield grades 1, 2, 3 and 4, respectively). Yield grade 4 is not desired by the beef industry and thus receives a large discount in price. 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. **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 dressing percentage (63.6% vs. 62.0%) and higher feedlot net return (\$666 vs. \$541) than calves that were treated for illness. A higher percentage of healthy steers graded Choice and fewer of the healthy steers were classified as dark cutters. Healthy calves had a calculated return of \$134 more than sick calves.

6. **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 64.2% compared to 62.2% for the steers in the bottom 25%.



Dressing Percentage = 65.7%



Dressing Percentage = 61.2%

7. **Backfat** – As backfat increases, feedlot net return decreases. Backfat thickness is a major factor that determines yield grade. Yield Grade 4 carcasses were discounted \$20 per cwt. For an 800-pound carcass, this equals a discount of \$160. Often, carcasses from small-framed cattle have 0.8 inch or more fat thickness and are yield grade 4's. Therefore, calves less than 42 inches tall (at the hip) at seven months of age are too small.



Choice
Backfat = 0.16 in.



Choice
Backfat = 0.44 in.



Standard
Backfat = 0.88 in.

8. **Feed Cost of Gain** – Feed cost of gain takes into account many different factors. These factors include 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.



Feed Cost of Gain = \$0.34



Feed Cost of Gain = \$0.59

Summary

The purpose of the Arkansas Feedout Program is to provide the opportunity for cow-calf producers to determine how their cattle fit the needs of the industry. We want to congratulate the producers who participated in the 2000-2001 Feedout. It takes courage to put calves in the feedyard and obtain this data. Sometimes we don't like what we find. Hopefully, these cattle producers will take this information and make beef cattle genetic changes to improve their cattle herd.