January 2002

Economic Analysis of Calf Versus Yearling Finishing

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Steers grown over the winter at a faster rate of gain were economically superior to either calf-finishing or a growing/finishing system using a slow rate of winter gain.

Summary

The objective of this report was to compare economics of calf- and yearling-finishing systems. Yearling steers were wintered at 1.54 lb/day (fast) or 0.42 lb/day (slow) then grazed over the summer followed by finishing. Calf-fed steers were purchased in the fall and finished. Profit was based on 1992 to 1999 average price levels. Steers on the fast treatment profited $21.00/head compared to -$20.66/head for slow and -$23.18/head for calf feds. Calf-feeding was also compared to only the finishing phase of yearling systems. Steers on the fast system profited $29.78/head compared to $17.83 for slow and -$23.18 for calf feds.

Introduction

Cattle may be placed into a feedlot setting immediately after weaning or they may be grown for any length of time in a backgrounding program before finishing. The extent to which backgrounding programs are used largely depends on the costs of backgrounding versus feedlot diets and profitability associated with calf-finishing or yearling systems. The objective of this report was 1) to compare the performance and carcass data of calf- and yearling-finishing systems and 2) to evaluate the economics of calf- and yearling-finishing systems.

Procedure

Experiments

Data from calf-finishing (CALF) and yearling grow/finish systems at the University of Nebraska from 1995 to 1998 were used. For the yearling systems, two winter systems were evaluated. In one system, steers were grown over the winter at 0.42 lb/day average over four years (SLOW). In the second system, steers were grown at 1.54 lb/day average over 4 years (FAST). The SLOW system represented 160 steers fed in 14 pens, while the FAST system represented 212 steers fed in 18 pens. Calf-finishing trials began in the fall (October and November). The calves were sorted from a pool of animals from which calves placed directly into the yearling systems originated. The CALF treatment represented 1,257 head of steers fed in 128 pens. Comparisons were made both between CALF and the entire yearling system (winter, summer, and finishing phases), and between CALF and only the finishing phase of the yearling systems.

Yearling Trials

The procedures for the yearling system and the economic analyses were described previously (*2001 Nebraska Beef Cattle Report*, pp. 29-34; *2002 Nebraska Beef Cattle Report* pp. 25-29).

Economic Analysis of Yearling Finishing. In order to economically compare CALF and yearling systems solely in the finishing period, some modifications were made to the economic procedures for the yearlings which were previously discussed. A purchase price was determined for the yearlings using the actual feedlot initial weight of the pen and a regression equation developed using September-October USDA 1992-1999 average feeder steer prices to determine price paid for the animals. The regression equation was: $y = 0.00005x^2 - 0.1071x + 127.3$ where y = price paid and x = pen weight ($r = 0.987$) and was based on price regressed on weight. Otherwise, calculations were made according to the procedures previously discussed for the finishing period of the yearling grow/finish systems.

Calf Trials

Economic Analysis. Calf-finishing slaughter breakevens were calculated on pens of animals from each of the respective trials. Initial animal cost was loosely based on the USDA 1992-1999 average October feeder cattle price of $78.44/cwt. for 600-650 lb steer calves. However, data from Oklahoma suggest approximately $2.66/cwt. (total = $81.10/cwt.) should be added back to the purchase price for black exotic-cross steers. In our calf-finishing trials, black exotic-cross steers were purchased. Additionally, calf purchase data compiled at Nebraska over the past seven years shows that $81.65/cwt. was paid for animals weighing 600-650 lb. An average between Oklahoma and Nebraska data was used to arrive at a purchase price of $81.38/cwt. for 600-650 lb steers used for calf-finishing. Interest was applied to initial cost of the animal over ownership. Health, processing, and implanting were assessed a flat rate of $25.00/head. Feed charges for the CALF treatment were based on the same finishing diet cost charged to the yearlings ($115.14/ton). Average DM intake for each pen was used to determine feed consumption. Yardage was charged at $0.30/head/day. Interest was charged on the finishing diet and yardage for half of the feeding period. A 2% death loss was applied to

Table 1. CALF vs. yearling steer performance and carcass data.

Item	CALF	FAST	SLOW
Winter			
Initial weight, lb	—	521	524
ADG, lb	—	1.54	0.42
Summer			
Initial weight, lb	—	763	592
ADG, lb	—	1.21	1.65
Finishing			
Days on feed	182	91	105
Initial weight, lb	612[a]	931[b]	814[c]
ADG[d]	3.47	4.59	4.39
Slaughter weight, lb[e]	1234[a]	1360[b]	1254[c]
DM intake[d]	21.0	31.0	29.5
Feed/Gain[d]	6.06	6.76	6.71
Carcass			
Weight, lb	777[a]	858[b]	790[c]
Fat, in	0.47	0.49	0.47
Yield grade	2.44[a]	2.64[b]	2.59[b]
Marbling score[f]	497	555	531

[a,b,c]Means within a row with unlike superscripts differ ($P < 0.05$).
[d]Year × treatment interaction ($P < 0.05$; Figures 1-3).
[e]Calculated from hot carcass weight adjusted to a common dressing percentage (63).
[f]400^{00} = slight, 500^{00} = small; treatment x year ($P < .01$).

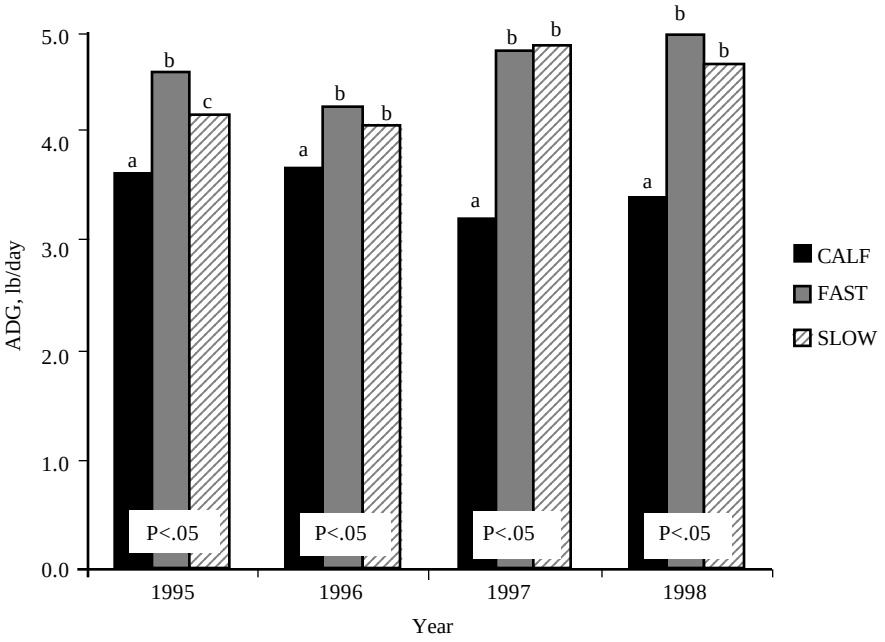

Figure 1. Feedlot ADG year × treatment interaction.

all of the calves. To calculate slaughter breakeven, total cost was divided by slaughter weight.

Profitability was determined for both CALF and yearling (FAST and SLOW) systems. Profitability was calculated using the 1992-1999 average May-June USDA Choice slaughter steer price ($66.21/cwt.) for the CALF data. Likewise, the 1992-1999 average December-January USDA Choice slaughter steer price ($67.48/cwt.) was used for yearling data.

Results

Animal Performance

Animal performance data are presented in Table 1. Initial weight (before the winter period) of the yearling-finishing systems were 521 and 524 lb for FAST and SLOW, respectively. Gains over the winter period were imposed to evaluate any potential compensatory growth response in the subsequent summer grazing period. Final winter and initial summer weights were 763 and 592 lb for FAST and SLOW, respectively. Average daily gains on grass were 1.21 lb/day for FAST and 1.65 lb/day for SLOW. Steers in the SLOW system exhibited some compensatory growth during the summer period as a result of lower winter gains.

Final weights off grass and initial feedlot weights were 931 lb for FAST and 814 lb for SLOW. Steers on the CALF treatment entered the feedlot weighing 612 lb. Significant year × treatment interactions ($P < 0.05$) were found for ADG (Figure 1), DM intake (Figure 2), and feed efficiency (Figure 3). For ADG, steers on the FAST system gained faster ($P < 0.05$) compared to SLOW, which gained faster ($P < 0.05$) compared to CALF in 1995. In 1996, 1997, and 1998 steers on the FAST and SLOW systems gained similarly compared to one another, but both gained faster ($P < 0.05$) compared to CALF. Steers on the FAST system consumed more feed ($P < 0.05$) compared to SLOW which consumed more ($P < 0.05$) compared to CALF in 1995 and 1996. In 1997 and 1998, DM intake for steers in the FAST and SLOW yearling systems were similar but increased ($P < 0.05$) compared to CALF. Calves were more efficient compared to yearling systems ($P < 0.05$) in 1995, 1996, and 1998; however, no differences in efficiency were noted in 1997. It is likely that inclement weather affected feed efficiency in the analysis. In three of the four years analyzed, calves were more efficient than yearlings; however, in the winter and spring of 1997 significant mud was encountered which likely decreased performance of the calves. Yearlings were on feed in the fall and early winter, and therefore were not exposed to the mud encountered by the calf-feds in 1997. Steers on the FAST system were heavier ($P < 0.05$) at slaughter compared to both SLOW and CALF. Steers on the SLOW system

(Continued on next page)

were heavier ($P < 0.05$) compared to CALF. The FAST cattle had 126 lb heavier final weights than CALF even though they were 91 lb lighter at the initiation of the feeding system.

Carcass Data

Steers on the FAST (858 lb) system produced heavier carcass weights ($P < 0.05$) compared to SLOW (790 lb), which were heavier ($P < 0.05$) compared to CALF (777 lb; Table 1). No differences were noted in fat depth over the 12th rib although yearlings (FAST and SLOW) had higher USDA yield grades ($P < 0.05$) compared to CALF. Marbling scores were higher for the FAST and SLOW cattle than CALF. There was a treatment by year interaction for marbling score ($P < .01$) but FAST cattle had higher scores than CALF each year. SLOW cattle had higher scores than CALF two of the four years.

Economic Analysis

Calf-Finishing vs Yearling Grow/Finish Systems. For slaughter breakeven and profit/loss, year × treatment interactions ($P < 0.05$) were found. However, despite the interactions it is acceptable to present the averages as this is real in terms of producer profitability over time. The four year averages for slaughter breakeven were $66.00, 68.10, and 69.21/cwt. for FAST, CALF, and SLOW, respectively. However, slaughter breakeven may not always be appropriate when comparing groups which were fed, and therefore sold and slaughtered, at different times. Profitability is likely a better measure, because it accounts for different marketing times. The FAST yearling system was the most profitable ($P < 0.05$) compared to CALF or SLOW, showing an average profit of $21.00/head over the four-year period. Losses incurred by CALF and SLOW were -23.18 and -20.66 ($/head), respectively.

Previous Nebraska work indicated similar results for slaughter breakeven when cattle were finished as calves compared to a yearling-finishing program (*1989 Nebraska Beef Cattle Report*, pp. 29-31). Cost of gain and slaughter breakeven were reduced for yearling-finishing systems, except when the price of corn was very low in relation to other inputs. Data from Kansas showed large deviations in the price spread for calves can occur with changes in the price of corn (*2000 Kansas State Cattleman's Day*, pp. 88-91). For example, the price differential between 500 and 800 lb steers with below average corn price ($1.68/bushel) is approximately $20.00/cwt.; however, when corn price rises to $3.56/bushel, the price differential can diminish to $7.00/cwt. for the same steers. Price differential paid for calves for calf-finishing compared to calves which will be grown in a yearling program can greatly impact breakeven and profitability. The impact of variations in corn price cannot be evaluated without considering the interaction between corn and steer price.

Another variable which could have an impact on the relative slaughter breakevens and profit/loss between CALF and yearling treatments is the price of summer forage. In the present analysis, $0.50/head/day was charged for summer forage. Increasing the charge to $0.70/head/day would result in similar slaughter breakevens between FAST and CALF treatments. A further increase to $0.75-0.80/head/day would be required to result in similar values for profitability.

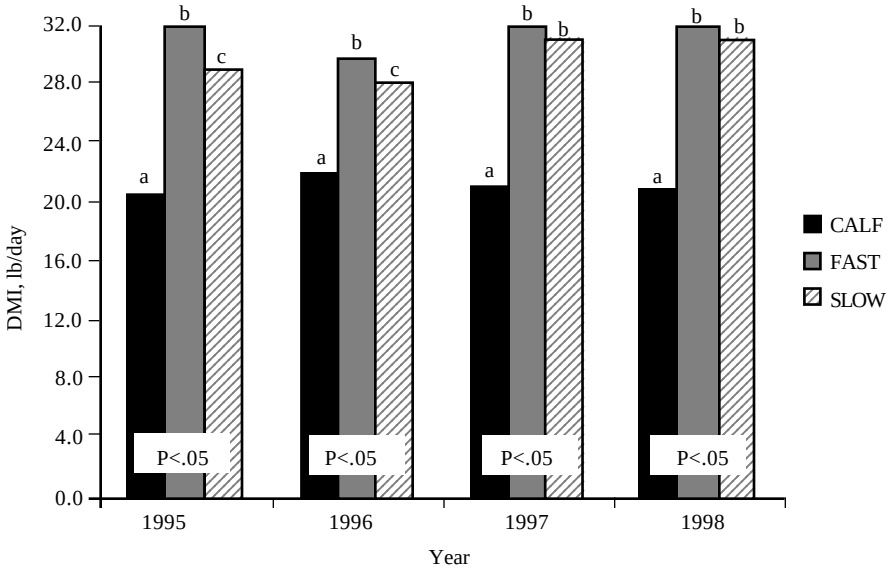

Figure 2. Dry matter intake year × treatment interaction.

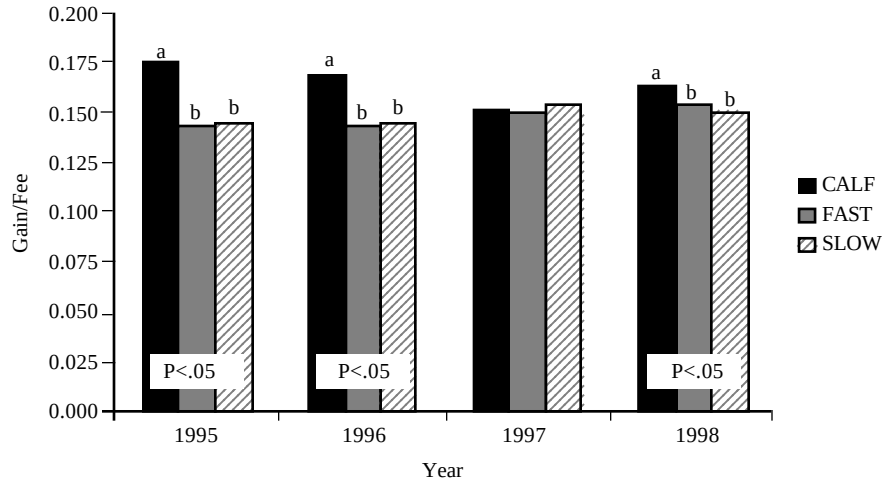

Figure 3. Feed efficiency year × treatment interaction.

Several factors may interact with slaughter breakeven and profitability such as purchase price, the cost of forage, the price of corn, and slaughter cattle price. In the absence of high levels of compensatory growth, yearlings produced with increased rates of winter gain result in the sale of more carcass weight and have reduced slaughter breakevens compared to yearlings grown over the winter with minimal inputs. While calf-feeding was not advantageous in the present analysis, reduced corn price combined with a narrow price spread for heavy and lighter weight calves would enhance calf feeding profitability.

In the present analysis, slaughter weight was the largest determining factor in terms of both slaughter breakeven and profit/loss, explaining 21% and 30% of the variation, respectively, based on regression analysis. Steers on the FAST system had more slaughter and carcass weight ($P < 0.05$) compared to both SLOW and CALF treatments, resulting in reduced slaughter breakeven and increased profitability.

Calf-Finishing vs Yearling-Finishing. Year × treatment interactions ($P < 0.05$) were found for both slaughter breakeven and profit/loss. However, the averages are meaningful and profit/loss is likely the best indicator. Average profits were $29.78/head for FAST compared to $17.83/head for SLOW, and $-23.18/head for CALF. When evaluated only during the finishing period, the yearling steers had higher profitability compared to calf-finishing.

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