grid marketing

SOLUTIONS

Implications of Grid Marketing for Retained Ownership

Introduction

The number of U.S. fed cattle marketed through a value-based or grid marketing system is increasing dramatically. Most grids reward Choice or better quality grades, with some grids also paying premiums for yield grade. Similar to trends in the pork industry, beef producers are responding to price signals by adjusting feeding and/or breeding practices to receive higher grid premiums. However, few producers are asking about the cost of achieving a premium in terms of reduced animal efficiency and performance. Yet animal genetics and management decisions that are known to alter quality and yield grades also influence production efficiency. Furthermore, some carcass traits are thought to be antagonistic with performance traits. Thus there is a trade-off between traits that influence costs and those that influence revenue that are not fully apparent when selling on average prices.

The research reported here compare feedlot profitability to cow characteristics and maintenance costs to determine if the least cost cow produces the most profitable feedlot steer[1]. We then evaluate these profit contribution relationships over a range of grid scenarios. The results of this analysis will allow cowherds that retain ownership of their calves to evaluate beef systems' profits and determine how best to manage their resources.

Table 1. Example Base Grid Used for Calculating Final Carcass Value.

Base Price	$103.51
Quality Grade Adjustments	
Adjustment	
Prime	$7.00
CAB (Ch+ and Ch^o)	3.00
NonBlack (Ch+ and Ch^o)	2.00
Select ($ off of Choice)	(8.00)
NoRoll ($ off of Select)	(2.00)
Standard ($ off of Choice)	(20.00)
Off Grades ($ off of Choice)	(35.00)
Carcass Weight Adjustments	
Under 500 lbs	($35.00)
500-599 lbs	(10.00)
550 - 950 lbs	0
951 - 999 lbs	(10.00)
1000 lbs and up	(35.00)
Yield Grad Adjustments	
Yield Grade 1	$5.00
Yield Grade 2A	3.50
Yield Grade 2B	2.50
Yield Grad 3A	0
Yield Grade 3B	(1.00)
Yield Grade 4	(15.00)
Yield Grade 5	(25.00)

Grid Marketing

Grid marketing is increasingly used by packers to reward better grading cattle and discount poorer quality cattle. Unlike live or in-the-meat selling, cattle are individually weighed, graded, and valued. Hot carcass weight, quality grades and yield grades each play a major role in establishing the net carcass value of animals coming out of the feedlot. Variation in carcass value in grid pricing depends heavily on discounted characteristics such as Select and Standard carcasses, Yield Grade 4-5 carcasses, light and heavy carcasses, and non-conforming or "out" carcasses. As a result, value differences within a pen or even a truckload of fed cattle can vary widely and often exceeds $350 per head[2]. Beef cowherds are also concerned with cow size as 50-70 percent of the total beef cow cost is feed cost. How does the equation change if the cowherd owner retains ownership of the calf through the feedlot and markets the finished steer on a grid? Does the least cost cow produce the most profitable calf for the feedlot?

Data

To address these questions we examined four years (1996-99) of data from retained ownership herds feeding calves in a

centralized steer test. The Tri-County Steer Carcass Futurity Program (TCSCF) in southwest Iowa has provided an opportunity for cowherds to learn more about how their cattle perform in the feedlot and on the rail for more than 20 years. Cowherds retain ownership of their calves in a central feedlot where the calves are sorted into commercial sized feeding groups by sex, weight, and expected marketing date. Individual animal performance and carcass data are recorded. Five herds were selected that put all or nearly all of their steer calves in the TSCSF each fall. These herds also provided detailed cow and calf information, i.e., birth date and weight, cow and sire breed, cow age, cow weight and body condition score (BCS) at weaning. Focusing on these five herds reduces the selection bias that may result from herds sending only their best calves to the Futurity. Seventy-eight percent of these cows were Angus or Angus crossbred and 90 percent were identified as British or British crossbred cows suggesting some degree of consistency across the five herds.

Table 2. Correlation Matrix of Performance, Carcass, and Beef Cow Traits.

	Cow Age	Cow Wt	Stored FC	Cow BCS
Cow Age	1.00			
Cow Weight	0.39	1.00		
Stored Feed Cost	0.36	0.94	1.00	
Cow BCS	0.14	0.30	-0.05	1.00
Cow Frame Score	0.21	0.26	0.30	-0.04
Marbling Score	-0.02	-0.16	-0.14	-0.07
Average Daily Gain	-0.12	-0.06	-0.05	-0.04
Feed Efficiency	-0.11	0.11	0.14	-0.07

Feedlot Analysis

Feedlot costs and returns were calculated for each steer. Total feedlot cost per head is the sum of each animal's feed cost, yardage charge, feeder animal cost, and interest on the feeder and half the feed cost. Feed cost is based on standardized feed prices, total gain, and feed efficiency (FE). In this analysis FE is calculated for each animal using pen level feed disappearance, individual animal gain and carcass yield grade. Using this information, a growth model was used to prorate total pen feed consumption across the individual animals based on the amount and composition of gain, lean or fat[1]. As a result the FE variable explicitly incorporates average daily gain.

Input and output prices were standardized across years and marketing periods to isolate profit differences due to efficiency and carcass traits. Feed prices were standardized for the cost per pound of feed delivered to the cattle. The base feeder price used was calculated using data from Medium #1 Steer Calves in Oklahoma City, from 1995-1999 and was $72.17/cwt for a 550 lb steer calf. The spread between weight categories was calculated using the same data. Fed cattle were valued using a representative grid system with premiums and discounts reflecting conditions in early 2002 (Table 1). The carcass base price used was $103.51, which reflects the average price over the four-year period and the Choice - Select spread initially was $8.

Cowherd Costs

Estimated stored feed cost per cow was based on the original TCSCF data (cow weight, frame score, and BCS). Cow weights were adjusted to a BCS of 5 by adding (subtracting) 80 pounds for each condition score below (above) 5. The average weight of cows with an actual BCS of 5 (1213 pounds) was used as a baseline and cows were indexed by dividing their adjusted weight by the average metabolic weight. Estimated feed cost was determined by multiplying their index value by the feed costs of the average BCS 5 cow feed costs. Feed costs and quantities were based on Iowa State University Estimated Livestock Budgets, from 1995-1998.

Table 2 shows the correlations between cow traits and feedlot and carcass traits for the 267 head in this subset. First, notice that most cow and feedlot traits are lowly correlated, .17 or less. Second, the traits are negatively correlated with the exception of cow weight, cow feed cost, and feedlot feed efficiency. However, a higher FE (pounds of feed per pound of gain) is a negative on profit. Marbling score is important to feedlot profitability because marbling impacts quality grade. It is negatively correlated with cow weight and stored feed cost for the cow, suggesting that a smaller cow that is cheaper to feed also has offspring with a higher marbling score.

The feedlot profit data of the 267 steers from five herds were sorted into two groups (Low and High) by estimated cow stored feed costs (Table 3). The average cow feed cost of the two groups differed by $20 per cow

Table 3. Average Feedlot Net Return for Various Choice – Select Spreads and Cow Stored Feed Costs Sorted by Cow Feed Cost.

		Feedlot Returns by C-S Spread		
Cow cost	Cow cost	$4	$8	$12
Low	$ 148.50	$ 48.46	$ 41.36	$ 32.93
High	$ 168.43	$ 41.97	$ 33.03	$ 24.07
Average	$ 158.43	$ 45.23	$ 37.21	$ 28.52

Table 5. Cowherd Return and Cow Feed Costs Sorted by Owner

Herd	Retained Ownership Return		Feedlot Return to Cowherd		Stored Feed Cost per Cow	
	Average	Range	Average	Range	Average	Range
A	273.79	277.60	430.09	253.79	156.29	59.62
B	228.56	362.30	392.99	322.64	164.43	42.61
C	272.49	272.05	435.40	268.91	162.91	72.01
D	258.86	349.38	415.35	357.67	156.48	60.22
E	287.53	186.22	442.76	167.05	155.23	30.89

(P<.0001). The average feedlot return for steers from these cow groups differed by $6.50 to nearly $9.00 per head depending on the C–S spread. Statistically, the means of feedlot returns using the $8 C-S spread were not significantly different (P<.20), but in general lower cost cows had higher profit calves in the feedlot and vice-versa.

The feedlot returns calculated above value the feeder calf going into the feedlot at market price, but cowherds retaining ownership of their calves would be more interested in a return over feedlot and stored feed costs for the cow. This retained ownership return (ROR) was calculated using an $8 C-S spread as total revenue less feedlot cost (feed and yardage) and stored feed cost for the cow. This residual would be the return to other cowherd and marketing expenses (pasture, interest, vet-med, transportation, supplies, etc.) and the owner. Note that 1996-99 was an unprofitable period of the cattle cycle and this retained ownership return was relatively small (Table 4).

There is over $90 per head average difference between High ROR and Low ROR groups and approximately 90 percent of the difference is due to feedlot returns largely influenced by grid marketing. The overall range in ROR was more than $400 per cow, and one producer had a $350 difference within the same herd. Much of the extremely low returns is due to large grid discounts as discussed earlier, and perhaps could have been reduced with different feedlot management. In spite of the lesser importance on total ROR, cow stored feed cost was statistically different and lower for the more profitable cattle. Thus, the more profitable cattle for retained ownership are those rewarded (or at least not heavily discounted) in marketing grids marketing, with good feedlot performance and that are from cows that are affordable to feed.

Differences in the returns and cost existed across the five herds even after standardizing prices and feed costs (Table 5). Retained ownership returns differed by nearly $60 per cow with $50 difference due to the feedlot and approximately $10 difference in cow stored feed cost. Note that the range from high to low within a herd is also quite wide suggesting that there is room for improvement within most herds. It is worth noting that the top herd was best in all three categories and had the narrowest range across individual animals.

Summary

Biological correlations are important factors to consider when cattle producers evaluate grid marketing. The positive and negative correlations between carcass traits and carcass and performance traits result in economic tradeoffs that change across input costs and quality grade premiums and discounts. The data also suggests that cow size (positively related to feed cost) and marling score are negatively correlated, albeit weakly. This suggest that lower cost cows, defined by estimated stored feed costs, also produce the more profitable calf for the feedlot.

The Choice-Select boxed beef price spreads increased 55 percent, over $3/cwt between 1989-91 and 1999-01. This recent emphasis on quality grade premiums suggests that marbling score will be of more interest in the future. With grid marketing a greater portion of feedlots' net returns are explained by marbling score as the Choice-Select spread widens. The current trend to rewarding higher quality grading cattle will have the added benefit of reduced cow cost.

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[1] [4] Perry, T.C., D.G. Fox. "Predicting Carcass Composition and Individual Feed Requirements in Live Cattle Widely Varying in Body Size" *Journal of Animal Science.* (1997) 75:300-307

[2] Forristall, Cody, John Lawrence, and Gary May. "Assessing the Cost of Beef Quality" Proceedings, NCR-134 Conference on Applied Market Forecasting, Risk Management, and Commodity Marketing, April, 2002.

[3] Strohbehn, Daryl. Marketing What's Under the Hide. Iowa State University Extension, IBC-1, 1999.

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Written and prepared by:
John D. Lawrence, associate professor of economics, Iowa State University
Cody Forristall, graduate assistant, department of Economics, Iowa State University
Gary May, Department of Economics
Tri-County Steer Carcass Futurity Program
Wendy Miller, communications specialist, Iowa Beef Center