Effect of Disposition on Feedlot Gain and Quality Grade

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Summary

A total of 13,315 beef calves fed at eight Iowa feedyards were used to evaluate the effect of disposition during the feedlot period on feedlot gain and carcass quality. The calves, representing 12 states, were consigned to the Iowa Tri-County Steer Carcass Futurity and were weighed upon arrival, after 35 days, at re-implant, and prior to harvest. A disposition score (Beef Improvement Federation Six Point Scoring System – 1 = very docile and 6 = very aggressive) was assigned at on test weighing, re-implant time, and pre-harvest, and these disposition scores were averaged to calculate a mean disposition score. The mean disposition score was used to classify calves into three groups for analysis – 1 and 2 = docile (n=9,642), 3 and 4 = restless (n=2,915), and 5 and 6 = aggressive (n=758). A common diet and health program was utilized at each feedlot. Calves were sorted and harvested when they were visually evaluated to have 0.4 inches of fat cover. Arrival weight (lb) and ADG (lb/day) were 630.5 and 3.17; 626.4 and 3.11; and 610.8 and 2.91 for docile, restless, and aggressive calves, respectively. Morbidity rate was significantly (P=.0009) affected by disposition class 19.23, 16.82 and 16.18% for docile, restless and aggressive calves, respectively. However, disposition score did not affect mortality rate (P=.1985). The percent prime, choice, select, and standard carcasses for docile, restless, and aggressive calves were 1.69, 72.45, 23.29, and 2.55; 1.17, 67.91, 27.49, and 3.43; and 0.13, 58.12, 36.20, and 5.55, respectively. Disposition score influenced the percentages of carcasses in each quality grade (P<.001). Acceptance rates for black-hided Angus-type calves eligible for the *Certified Angus Beef* ® Program (CAB®) were 29.07, 22.83, and 14.31 (P<.0001) for docile, restless, and aggressive calves, respectively. When considering the effect of disposition on quality and yield grade, feedlot gain, death loss, and treatment costs, docile calves returned $62.19/head more than aggressive calves. Calves with poor disposition were lighter upon arrival at the feedlot, gained less, had reduced quality grade, and reduced CAB® acceptance rates compared with docile calves.

Introduction

Disposition has long been recognized by cattle producers as one of those convenience traits that can greatly impact the handling of cattle while increasing the risk of injury to the workers.

Research has shown that disposition is a heritable trait that can be improved by proper culling strategies. Extensive research has shown the impact of disposition on performance and carcass bruising, but virtually no data exists on its impact on quality grade.

As use of grid marketing expands, factors reducing premiums or accentuating discounts merit consideration.

The objective of this report was to determine the effect of disposition of beef calves on 1) feedlot performance, 2) carcass quality grade, and 3) economic return.

Materials and Methods

Data on 13,315 beef calves fed at eight Iowa feedyards in 2002-2004 were used to determine the effect of calf disposition on feedlot performance, carcass quality grade, and economic implications.

The calves, representing 12 states, were consigned to the Iowa Tri-County Steer Carcass Futurity program.

All calves were weighed upon arrival, after 35 days, at re-implant, and prior to harvest. All calves were vaccinated upon arrival, implanted, and placed on a starting feedlot diet. A common dietary energy level was used at all eight feedlots. Detailed health records were kept at each feedlot.

A disposition score (Beef Improvement Federation Six Point Scoring System – 1 = very docile and 6= very aggessive) was assigned at on test weighing, re-implant time, and pre-harvest. These three or four disposition scores were used to calculate a mean disposition score for each calf. For purposes of analysis, the Six Point System was condensed to three classifications – 1and 2 = docile (n=9,642), 3 and 4 = restless (n=2,915), and 5 and 6 = aggressive (n=758).

Calves were sorted and harvested when they were visually assessed to have 0.4 inches of fat cover. Upon harvest, detailed carcass data was collected.

Results and Discussion

Least square means for feedlot performance traits and rates for health and carcass quality grades are shown in Table 1. The percentage of calves classified with serious disposition problems (5 and 6 = aggressive) was 5.7% of the total.

Some difference in reduced feedlot performance and carcass quality traits existed between cattle classified as docile and restless, but the greatest effect was in calves scored aggressive in behavior. When compared to docile calves, the feedlot gain was reduced by approximately 0.3 lb/day and the mortality rate nearly doubled for calves with aggressive behavior.

This was further accentuated when carcass quality grade was analyzed. Only 58.25% of aggressive calves graded Choice or Prime versus 74.14% for calves classified as docile. Since marbling is the major factor affecting acceptance into the *Certified Angus Beef* ® Program, the percentage acceptance was reduced by over fifty percent in poor disposition calves (14.31% vs. 29.07%).

When considering disposition effect on quality and yield grade, feedlot gain, death loss, and treatment costs, docile calves returned $62.19/head more than aggressive calves (Table 2).

The mode of action of how disposition affects marbling deposition could not be determined by this study. Since reduced gain occurred, this may have impacted the translocation of energy prioritization to adipocyte development.

Implications

Disposition of calves can clearly impact feedlot performance with an even greater impact noted in carcass quality grade.

Acknowledgments

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Table 1. The effect of disposition on feedlot performance, calf health, and carcass traits in the 2002-2004 Iowa Tri-County Steer Carcass Futurity.

	Disposition Score			
	1 and 2 (docile)	3 and 4 (restless)	5 and 6 (aggressive)	P value
Number of calves	9,642	2,915	758	
Arrival weight, lbs.	630.5[a]	626.4[a]	610.8[b]	<.0001
Feedlot ADG, lbs/day	3.17[a]	3.11[b]	2.91[c]	<.0001
Health				
Morbidity rate, %	19.23	16.82	16.18	.0009
Mortality rate, %	1.09	1.02	1.91	.1985
Quality Grade				
Prime, %	1.69	1.17	0.13	.0002
Choice, %	72.45	67.91	58.12	<.0001
Select, %	23.29	27.49	36.20	<.0001
Standard, %	2.55	3.43	5.55	<.0001
Certified Angus Beef ®,%	29.07	22.83	14.31	<.0001

Calves were fed at eight feedlots in Iowa.
[a, b, c]Values within arrival weight and feedlot ADG without a common superscript differ (P<.05).
Health and quality grade rates were analyzes using the Mantel-Haenszel Chi-square procedure.

Table 2. Effect of disposition on the difference in net dollars returned on a per head basis.

	Disposition Score		
	Docile	**Restless**	**Aggressive**
Quality Grade premium	$18.73	$12.29	PAR
Yield Grade premium	PAR	$0.87	$3.50
Light/heavy carcass weight discount	-$0.16	PAR	-$1.29
Dark cutter/hardbone discount	PAR	-$0.19	-$0.72
ADG Bonus*	$37.80	$28.91	PAR
Death loss discount**	-$0.90	PAR	-$8.75
Treatment Cost***	-$0.54	-$0.08	PAR
Net Dollars Returned	**$54.93**	**$41.80**	**-$7.26**
$ Difference	**$62.19**	**$49.06**	**PAR**

*Based on pounds of additional carcass weight gained during the feeding period.
**Accounts for cost of gain investment and lost carcass value.
***Includes medicine, labor, and chute/equipment charges.