BEEF CATTLE RESEARCH UPDATE

Britt Hicks, Ph.D., PAS
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September 2011

Relationship between Feeding Behavior and Performance of Feedlot Steers

Recently published Canadian research evaluated the relationship between feeding behavior and performance using 274 Charolais cross feedlot steers from two consecutive years averaging 646 lb for year 1 (115 head) and 770 lb for year 2 (159 head).[1] In each year, the steers were fed in feedlot pens equipped with radio frequency identification systems (GrowSafe Systems). Each pen contained 5 feeding stalls that allowed individual animal access to a feed tub suspended on load cells. The system recorded animal identification, duration, and frequency of feedings as well as the amount of feed consumed during each visit (dry matter intake: DMI). Daily variation in DMI (DVI), calculated as the absolute difference in DMI from one day to the next, as well as eating rate were determined for each steer. The steers were fed barley-based diets ad libitum over 213 day and 181 day feeding periods for year 1 and 2, respectively. A 77.9% concentrate finishing diet (contained ~91 Mcal NEm/cwt and 59 Mcal NEg/cwt) was fed during the last 116 and 101 days of feeding in years 1 and 2, respectively. To relate feeding behavior to performance, the steers were grouped by average daily gain (ADG) and gain to feed ratio (G:F) and categorized as high, medium, or low (based on one standard deviation ± the mean).

The relationship between ADG classification categories, feeding behavior, intake, and gain efficiency over the entire feeding period is shown in Table 1. High ADG steers had greater DMI and DVI values as well greater G:F than low or medium ADG steers in both years of the study. High ADG steers visited the bunk less frequently then low or medium ADG steers in both years . The bunk attendance duration did not differ between ADG categories in year 1. However, in year 2, high ADG steers spent more time each day at the bunk then low or medium ADG steers. In addition, the eating rate per feeding event was greatest for high ADG steers in both years of the study.

Table 1. Effect of ADG classification category on feeding behavior, DMI, and G:F in feedlot steers over the entire trial.

	Year 1			Year 2		
Item	Low	Medium	High	Low	Medium	High
# steers	18	90	7	25	98	36
ADG category range, lb/day	<2.65	2.65 to 3.53	>3.53	<2.65	2.65 to 3.53	>3.53
DMI, lb/day	16.3^{c}	18.1^{b}	19.6^{a}	16.1^{c}	17.4^{b}	19.0^{a}
Bunk attendance frequency, visits/day	5.9^{a}	5.9^{a}	4.7^{b}	5.9^{a}	5.3^{a}	4.9^{b}
Bunk attendance duration, min/day	94.3^{a}	93.1^{a}	93.1^{a}	77.2^{d}	81.6^{c}	83.9^{b}
Eating rate, lb/min	0.29^{d}	0.33^{c}	0.38^{a}	0.34^{b}	0.35^{b}	0.37^{a}
DVI, lb/day	5.7^{c}	6.4^{b}	7.1^{a}	6.2^{c}	6.2^{c}	6.4^{b}
G:F	0.156^{c}	0.170^{b}	0.182^{a}	0.180^{c}	0.206^{b}	0.234^{a}

$^{a-c}$Within a row, means without a common superscript letter differ ($P < 0.05$).
Adapted from Schwartzkopf-Genswein et al., 2011.

The relationship between G:F classification categories, feeding behavior, intake, and ADG over the entire feeding period is shown in Table 2. In both years of the study, the more efficient steers (high G:F) consumed less feed and gained faster than low or medium G:F steers. Daily variation in DMI did not differ between G:F groups in either year of the study. High G:F steers visited the bunk less frequently and spent less time at the bunk then low or medium G:F steers in each year of the study. The eating rate per feeding event was greatest for high G:F steers in both years of the study.

These researchers concluded that the best-performing (gain and efficiency) cattle have the most variable feeding patterns (greater DVI and eating rate) which is contrary to industry perception.

Table 1. Effect of G:F classification category on feeding behavior, DMI, and ADG in feedlot steers over the entire trial.

	Year 1			Year 2		
Item	Low	Medium	High	Low	Medium	High
# steers	50	49	16	29	110	20
G:F category	<0.156	0.156 to 0.178	>0.178	<0.189	0.189 to 0.227	>0.227
DMI, lb/day	18.7^{a}	17.9^{bc}	16.8^{d}	18.1^{c}	17.6^{c}	16.5^{d}
Bunk attendance frequency, visits/day	6.6^{a}	5.8^{c}	5.4^{d}	6.3^{b}	5.3^{d}	4.2^{e}
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Eating rate, lb/min	0.31^{e}	0.33^{d}	0.34^{c}	0.34^{c}	0.35^{b}	0.37^{a}
DVI, lb/day	6.2	6.2	6.4	6.2	6.0	6.4
ADG, lb/day	2.87^{c}	2.87^{b}	3.09^{bc}	2.87^{c}	3.09^{b}	3.53^{a}

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Economics of Preconditioning Calves Prior to Sale by Cow-Calf Producers

A 2007 USDA survey found that about one-half of beef cow-calf operations (49.8%) that sold calves for purposes other than breeding sold them immediately at the time of weaning (Figure 1).[2] This data also showed a higher percentage of operations with 1 to 49 beef cows did not hold weaned calves (56%) compared with operations with 100 or more beef cows (44.8, 27, and 34% for 50 to 99, 100 to 199, and 200 or more head, respectively.) Furthermore, a higher percentage of operations in the Southeast United States sold their calves immediately at weaning (60.9%) than in the West (35.9%) or Central (26%) United States. In addition, 60.6% of beef cow-calf operations did not vaccinate beef calves for respiratory disease from birth to sale and 30.9% of calves marketed were on these operations that did not vaccinate.

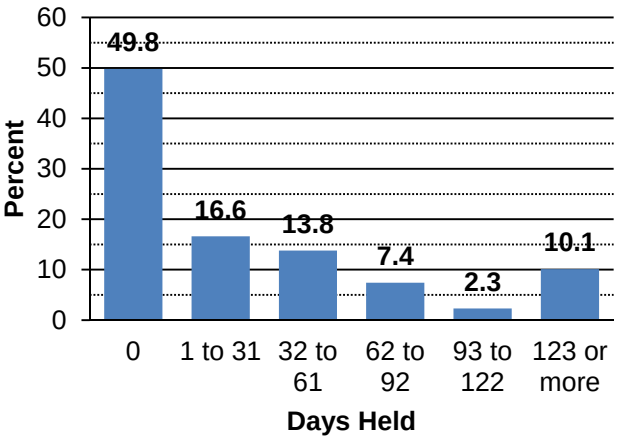

Figure 1. Percentage of cow-calf operations that sold weaned calves intended for purposes other than breeding during 2007 by the number of days weaned calves were held before leaving the operation, Source: USDA-APHIS. 2010.

Numerous studies have shown that preconditioning weaned calve for 30 to 45 days postweaning is beneficial to stocker and feedlot operations (less morbidity and mortality, improved postweaning performance, and higher carcass quality). However, the financial benefits of preconditioning to cow-calf producers are less well established. Researchers with the University of Kentucky and the University of Florida recently reviewed a number of studies that evaluated the economics of preconditioning.[3]

These researchers summarized 11 studies that compared the selling price of calves that received some degree of preconditioning before being sold with the selling price of non-preconditioned calves. The premiums for preconditioned calves ranged from $1.43 to $6.15/cwt in those studies that showed statistically significant differences. These premiums are similar to those observed at Superior Livestock Auction video sales from 1995 through 2004.[4] During this 10 year period, the premium paid for VAC 45 calves averaged $4.37 per cwt and ranged from a low of $2.47/cwt in 1995 to a high of $7.91/cwt in 2004. Moreover, a survey of feedyard managers from the Texas Cattle Feeders Association reported that these managers perceived preconditioned calves to be worth $5.25/cwt more than non-preconditioned calves.[5]

Although this summary indicates that buyers pay more for preconditioned calves, that does not necessarily mean that preconditioning programs will be profitable for cow-calf producers. A summary of 13 studies showed that the net profit per calf ranged from a loss of $86.92 to a gain of $53.71. These authors noted that the profitability of a preconditioning program is a function of several variables; however, the major influencing factors are seasonal prices of calves and cost of supplemental feed. In summary, these researchers recommended that cow-calf producers need to develop a reputation for integrity and market calves through special preconditioning sales in order to realize the greatest economic benefit from preconditioning.

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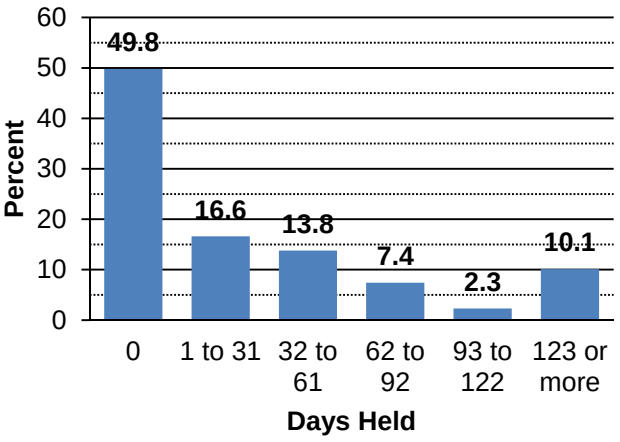

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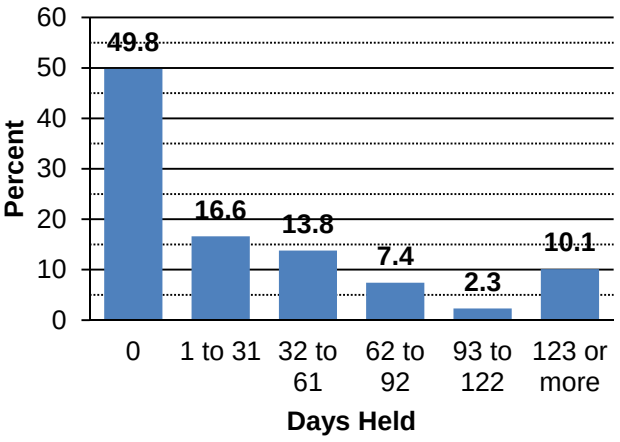

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Although this summary indicates that buyers pay more for preconditioned calves, that does not necessarily mean that preconditioning programs will be profitable for cow-calf producers. A summary of 13 studies showed that the net profit per calf ranged from a loss of $86.92 to a gain of $53.71. These authors noted that the profitability of a preconditioning program is a function of several variables; however, the major influencing factors are seasonal prices of calves and cost of supplemental feed. In summary, these researchers recommended that cow-calf producers need to develop a reputation for integrity and market calves through special preconditioning sales in order to realize the greatest economic benefit from preconditioning.

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