BEEF CATTLE RESEARCH UPDATE

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Effect of Length of Preconditioning Period on Feedlot Performance

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). These studies have generally shown a greater benefit from preconditioning for approximately 45 days as compared to 30 days or less. A recently published study from southwest Louisiana (McNeese State University) illustrates this.[1] In this study, 131 steer calves (average initial weight of 617 lb) were weaned in mid-September of two successive years (2008 and 2009) and preconditioned an average of 36 days. The calves were preconditioned in 2 acre paddocks with a mixture of bermudagrass, bahiagrass and carpetgrass and free choice bermudagrass hay (≥8% protein). In addition, the calves were provided a 14% protein preconditioning ration in troughs with a dry mater intake of 1-2% of bodyweight. After preconditioning, the calves were shipped 797 miles to the Henry C Hitch Feedlot in Guymon, OK where they were fed to an average slaughter weight of 1327 lb (range of 981 to 1603 lb). These researchers reported that steers that were maintained on a preconditioning routine for 37 to 42 days had greater ($P < 0.05$) slaughter weights, backfat thickness, and numerical USDA yield grades than calves preconditioned 36 days or less. They also reported that large framed calves with at least moderate muscling had increased ($P < 0.05$) preconditioning gain, slaughter weight, and carcass weight when compared with medium framed calves with at least moderate muscling. An economic analysis of this data was not reported.

The results of this study were similar to that observed in a summary of steers enrolled in the New Mexico Ranch to rail Program (834 steers) from 2001 to 2004.[2] In this summary, steers were classified into one of four categories based on the duration of preconditioning: 0 to 20 days, 21 to 40 days, 41 to 60 days, and 61 days or more. The impact of preconditioning duration on feedlot performance, carcass characteristics, and profitability was evaluated. These researchers reported that steers preconditioned 41 to 60 days had the highest average daily gain (in feedlot) of 3.25 lb/day followed by steers preconditioned 21 to 40 days (3.17 lb/day), 61 days or more (2.97 lb/day), and 0 to 20 days (2.95 lb/day). Furthermore, marbling scores increased as preconditioning duration increased, while fat thickness and calculated yield grade peaked at 41 to 60 days. Net income per head increased as preconditioning duration increased, with minimal change among steers preconditioned longer than 41 to 60 days. This summary suggested the optimum preconditioning duration was achieved when steers were preconditioned 41 to 60 days.

The results of both the Louisiana and New Mexico studies support the commonly practiced VAC 45 program which requires calves to be preconditioned a minimum of 45 days before leaving the ranch. Data collected at Superior Livestock Auction video sales from 1995 through 2004[3] showed that buyers will pay a greater premium for VAC 45 calves than VAC 34 calves compared to non-preconditioned calves. During this 10 year period, the premium paid for VAC 45 or VAC-34 calves averaged $4.37 or $1.91 per cwt, respectively.

Relationships between Feedlot Health, Daily Gain, and Carcass Traits in Angus Steers

Recently published Kansas State University research used data on 17,190 Angus steers fed at a single southwestern Kansas feedlot between 1997 and 2007 to evaluate the relationships between feedlot health, average daily gain (ADG), and carcass traits (USDA quality grade and yield grade).[4] The cattle in this feedlot were not commingled and were predominantly preconditioned and backgrounded before shipment to the feedlot. The cattle were individually weighed upon arrival at the feedlot and individual final weights were determined from carcass weight divided by the average

dressing percentage of the group from which the animal was marketed. The steers were marketed at a target backfat thickness of 0.5 inches based on visual appraisal.

In the analysis of this data, the cattle were divided into four health status categories based on the number of treatments for respiratory or other diseases (0, 1, 2, or ≥3). Since the cattle were predominantly preconditioned and backgrounded, only 7.7% of the cattle were treated (Table 1). As the number of treatments increased, ADG, final weight, carcass weight, quality grade (QG), and yield grade (YG) all decreased linearly ($P < 0.01$). In addition, as the number of treatments increased, the percentage of cattle grading Choice decreased ($P < 0.01$) and the percentage of carcasses qualifying for a Premium Choice program was greatest for cattle never treated ($P < 0.01$). The percentage of USDA yield grade 1 and 2 carcasses increased linearly as the number of treatments increased ($P < 0.01$). Numerous other studies have shown that morbidity and extent of treatment have major consequences on feedlot performance and carcass traits.[2,5,6,7,8]

Table 1. Effect of number of times treated for morbidity on feedlot performance and carcass traits.

	Number of Times Treated				P-value
Item	0	1	2	≥3	Linear
# Head	10,700	333	204	360	
Initial weight, lb	798	710	730	745	<0.01
Final weight, lb	1272	1292	1244	1228	<0.01
ADG, lb	3.62	3.68	3.26	3.26	<0.01
Carcass weight, lb	820	833	805	794	<0.01
USDA QG[1]	2.72	2.70	2.58	2.56	<0.01
Premium Choice, %	18.6	13.0	11.5	12.4	<0.01
Choice, %	69.0	65.5	58.3	57.1	<0.01
Select, %	27.9	32.3	39.4	40.2	<0.01
USDA YG	2.70	2.73	2.64	2.53	<0.01
YG 1 and 2, %	25.8	25.0	32.0	37.3	<0.01

[1]QG: 4 = Prime, 3 = Choice, 2 = Select.
Adapted from Reinhardt et al., 2012.

These researchers also reported that as quality grade decreased that ADG, final weight, and carcass weight decreased in both a linear and quadratic manner ($P < 0.01$). The percentage of cattle that graded Prime or Choice increased 16.8 percentage units between YG 1 and 2 cattle and YG 3 cattle but only increased an additional 2.1 percentage units in YG 4 and 5 cattle. There was little difference in ADG between cattle that graded Prime, Choice, or Select (3.51, 3.66, and 3.55 lb/day, respectively), but ADG dramatically dropped for those cattle that were ungraded (3.20 lb/day).

In conclusion, these researchers concluded that the strong interrelationship between ADG, YG, and QG suggests that beef producers who are attempting to raise and market highly marbled beef do not need to choose between the genetics for performance versus genetics for marbling but instead can select for high-performance cattle with high marbling potential.

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