BEEF CATTLE RESEARCH UPDATE

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Pasture Preconditioning Calves

Numerous studies have shown that backgrounding weaned calves for 45 days prior to feedyard placement can improve performance and reduce morbidity. New Mexico State University research demonstrated that low-input pasture preconditioning systems are more profitable than high-input drylot systems during both backgrounding and finishing phases.[1] In addition, both this New Mexico research and Ohio State University research have suggested that pasture based preconditioning programs can result in improved health (reduced morbidity and/or mortality) during a finishing phase compared with dry-lot programs.[1,2] In the New Mexico research it was suggested that the combined stressors of dietary change and environmental change experienced by calves preconditioned in a dry lot may negatively affect subsequent health[1.]

Recent New Mexico State University research compared low- and high-input pasture preconditioning programs to evaluate performance and profit during the preconditioning (weaning to 49 to 53 days) and finishing phases (end of preconditioning to slaughter).[3] In this study, over two years, 132 steer calves (481 lb initial weight) were used to evaluate the two preconditioning programs. In both years, the calves were fence-line weaned for 7 days and then moved to native range pastures (2 pastures per year per treatment). The high-input calves had ad libitum access to a self-fed corn- and wheat middlings-based pellet (15.8% protein, dry matter basis). The low-input calves were supplemented with a 32% protein range cube delivered 3 times per wk to average 1.25 lb/day.

It was reported that at the end preconditioning the high-input calves were 42 lb heavier than the low-input calves (daily gains of 1.80 vs. 1.10 lb/day). Due to their heavier weights, the high-input calves had about a $21/calf greater final value. However, the feed and total costs were about $42/calf greater for high-input steers. During preconditioning, low-input steers had a net income advantage of $20.54/calf.

After preconditioning, the calves were finished at a commercial feedlot (fed in a single pen each year). During finishing, preconditioning methods had no impact on daily gains, final body weights, or carcass characteristics. However morbidity during finishing was greater for low-input calves compared with high-input calves (24.6 vs. 7.9%) resulting a in a $6.93/calf greater medicine cost. No statistically significant differences in finishing net income due to preconditioning method were reported (P = 0.49). However, there was a numerical advantage in profitability for the high-input calves (~$26/calf). Overall net income from weaning to slaughter was similar for the two preconditioning methods (P = 0.90).

In summary, this data suggest that providing a higher plain of nutrition to calves during preconditioning in a pasture may better precondition calves to cope with the immune challenges associated with shipping to a commercial feedlot. However, the increased feed input costs required to achieve a higher rate gain on pasture may not be cost effective relative to a lower cost approach if calves are sold after preconditioning or retained through slaughter.

Effect of Body Condition Score on Heifer Performance

Recent University of Florida research used Simmental X Angus heifers (initial weight of 975 lb) to evaluate if initial body condition score (BCS) affects how heifers respond to energy restriction and repletion.[4] In this research, the heifers were fed to reach a BCS of either 5 (moderate condition; MOD) or 7 (heavy condition; FAT). Once each heifer had reached the desired BCS, they were then fed only 30% of calculated maintenance energy requirements until they became anestrous (based

on serum progesterone levels). After the heifers became anestrous, they were fed high energy diets until estrous cycles resumed (based on two normal cycles as determined by serum progesterone level).

The results of this research are shown in Table 1. These researchers reported that during energy restriction that FAT heifers were still cyclic for 148 days compared to 61 days for MOD heifers. At the onset of anestrous, both groups had similar body weights, BCS, and body fat content. Heifers in both treatment groups recommenced estrous activity after a similar number of days (54 days) of energy repletion. However, near onset of estrous cycles, heifers in FAT condition were heavier and had greater BCS and body fat content than those in MOD condition.

Table 1. Least square means for body weight, BCS, body fat composition, and days to onset of anestrous and estrous cycle resumption for heifer in FAT or MOD condition.

Period	FAT	MOD	P-value
Restriction, day 1			
Body Weight	1136	937	<0.001
BCS	7.1	5.0	<0.001
Body Fat, %	26.8	18.8	<0.001
Days to anestrous	148	61	<0.001
Onset of Anestrous			
Body Weight	838	781	0.15
BCS	3.3	3.1	0.54
Body Fat, %	12.5	11.7	0.54
Days to estrous	58	49	0.43
Onset of Estrous			
Body Weight	1131	1003	0.002
BCS	6.0	5.2	0.01
Body Fat, %	22.6	19.4	0.01

Adapted from Cassady et al., 2009.

In summary, these data show that initial BCS influences the ability of heifers to maintain estrous cycles in response to energy restriction. Once heifers become anestrous, initial BCS has no effect on the time required for heifers to resume estrous cycles in response to repletion. However, initial BCS did influence the degree of fatness required to resume estrous cycles. These researchers concluded that these data demonstrated that cattle with greater BCS may withstand periods of nutrition stress longer before sacrificing estrous cyclicity.

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[1] Mathis, C. P., S. H. Cox, C. A. Löest, M. K. Petersen, R. L. Endecott, A. M. Encinias, and J. C. Wenzel. 2008. Comparison of low-input pasture to high-input drylot backgrounding on performance and profitability of beef calves through harvest. Prof. Anim. Sci. 24: 169-174.

[2] Boyles, S. L., S. C. Loerch, and G. D. Lowe. 2007. Effects of weaning management strategies on performance and health of calves during feedlot receiving. Prof. Anim. Sci. 23:637-641

[3] Mathis, C. P., S. H. Cox, C. A. Löest, M. K. Petersen, and J. T. Mulliniks. 2009. Pasture preconditioning calves at a higher rate of gain improves feedlot health but not postweaning profit. Prof. Anim. Sci. 25: 475-480.

[4] Cassady, J. M., T. D. Maddock, A. DiCostanzo, and G. C. Lamb. 2009. Body composition and estrous cyclicity responses of heifers of distinct body conditions to energy restriction and repletion. J. Anim. Sci. 87: 2255-2261.