Two Energy Levels For Crossbred Drylot Beef Cows

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Drylot beef cows have the ability to convert feeds and forages that have little cash value to a salable product — beef. Improving efficiency in terms of salable beef per unit of feed inputs requires dilution of the maintenance requirement. Faster growing calves nursing cows with superior milk production should be more efficient, as a smaller portion of the energy intake is required for maintenance.

Past research has evaluated how much more (or less) productive a lactating beef cow can be by offering more (or less) energy than suggested by the National Research Council (NRC) Nutrient Requirements of Beef Cattle (1984). Bartle *et al* (1984) concluded that extra energy did not affect milk production or calf growth during lactation for Hereford and Hereford x Angus cows fed 85 percent, 100 percent or 120 percent of NRC (1976) requirements. Wyatt *et al* (1977) reached the same conclusion with drylot Hereford cows on moderate and high levels of supplementation. Previous work at this station also concluded straightbred Hereford cows are not more efficient in terms of weaning weight and economic returns when fed additional energy (Anderson, 1986).

Crossbred cows in drylot are more productive than Herefords when fed to NRC (1984) requirements (Anderson, 1987). Wyatt *et al* (1977) working with Hereford x Holstein crossbred cows reported cows on moderate and high energy supplemented diets tended to increase in milk production and weaning weight but not at a significant level ($P < .05$). Neville *et al* (1960) reported milk production increased in average milking cows from 8.5 pounds to 11.5 pounds on low to high energy diets at four months after calving. Calf weight also improved from 218 to 273 pounds.

Is there any potential to increase performance and economic returns in higher milking crossbred cows in drylot? The objectives of a trial conducted in a commercial setting at the Carrington Research Extension Center Livestock Unit were to evaluate cow weight change, calf growth, feed costs and reproduction of moderate size crossbred cows fed moderate and superior energy levels.

At the conclusion of calving in early May of 1987 and 1988, Red Angus x Hereford and Tarentaise x Hereford crossbred cows were allotted within breed group to one of two treatment groups: (1) moderate energy or (2) superior energy. Moderate and superior energy diets targeted 15 and 20 pounds of milk production per day, respectively, according to NRC Nutrient Requirements of Beef Cattle (1984). The energy requirements for cows producing 15 pounds of milk per day was interpolated as halfway between average (10 pounds of milk per day) and superior (20 pounds of milk per day) levels. Red Angus x Hereford females with Tarentaise sired calves made up one repetition and Tarentaise x Hereford females with Red Angus sired calves made up a second repetition each of the two years.

Cow rations were completely mixed in a truck mounted feed wagon and fed once daily in fenceline bunks. Cows on the superior energy diet were fed 48 pounds of corn silage and 15 pounds of alfalfa/brome hay per day. The moderate energy ration consisted of 40 pounds of corn silage and 12 pounds of alfalfa/brome hay. Trace mineral salt and 12:12 (calcium-phosphorus) mineral were fed free choice to all cows.

The 135-day trial started in early May and concluded at weaning in mid September. Creep feed was offered in specially designed high forage self feeders starting the first week of June. Creep feed consisted of 50 percent whole barley, 50 percent chopped alfalfa/brome hay in 1986 and 50 percent grain sorghum, 50 percent chopped alfalfa/brome hay by weight in 1987. Trace mineral salt was added as 1 percent of the ration. Breeding was done by natural service sires. One bull was turned in to each pen with bulls rotated within breed group at day 22 of the 45-day breeding season.

RESULTS

Cows on the superior diet gained more ($P < 0.1$) weight than cows on the moderate diet for a net difference of 65 pounds at the end of the trial. Cow weight change is in agreement with condition score, both indicating cows on superior energy gained more weight and became more fleshy. Calf weights and average daily gains were similar in both groups. Cows of different breed groups on the same treatment performed similarly, suggesting no interaction between breed group and energy level. Table 1 summarizes the performance of cow/calf pairs by treatment.

The average calving interval (Table 2) was three days shorter for cows on moderate energy, but the difference was not sigificant. Cows on the superior diet may have been cycling before the breeding season and already had been through a heat cycle resulting in a net loss of a few days. Three cows on the superior diet were diagnosed open after a 45-day breeding season while only one cow on moderate energy did not conceive.

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Table 1. Performance of Drylot Crossbred Cow/Calf Pairs on Two Energy Levels.

	Energy Level	
	Moderate	Superior
Number of pairs	66	73
Age of cows	3.85	3.62
Starting cow weight (lbs.)	1193	1176
Ending cow weight (lbs.)	1150**	1198**
Cow weight change (lbs.)	-43	+22**
Starting cow condition score[1]	5.22	5.26
Ending cow condition score	5.07**	5.36**
Condition score change	-.15**	+.10**
Starting calf weight (lbs.)	159	159
Ending calf weight (lbs.)	521	515
Total calf gain (lbs.)	359	356
Calf average daily gain (lbs.)	2.69	2.67

** Values are significantly different ($P < .01$)

[1]Condition score is an evaluation of fatness, 1 = emaciated, 10 = obese.

Table 2. Reproductive Performance of Crossbred Drylot Beef Cows on Two Energy Levels

	Energy Level	
	Moderate	Superior
Number of cows	66	73
Calving interval (days)	363	366
Number of cows open	1	3

The moderate ration cost $.700 per cow per day while the superior diet is priced at $.855 when corn silage is valued at $20 per ton and alfalfa hay at $50 per ton. Adding the creep feed increases feed cost per pair per day to $.844 for the moderate diet and $1.024 for the superior diet. A weight advantage for cows on the superior diet of 65 pounds due to ration treatment could be used to offset added feed cost if cows were sold for slaughter at the end of the summer feeding period.

This trial concluded that for optimum returns, lactating drylot beef cows in average condition should be fed only enough to meet their maintenance requirements and to match their genetic potential for milk production.

DISCUSSION

Feed is the single highest input for any cattle enterprise. Feeding lactating drylot beef cows more than they are genetically capable of utilizing for milk production increases food cost and weight gains of the cow but does not increase weight gain of the calf. It is prudent, then, for cattlemen to know the milk production potential of their cows, balance diets to meet that requirment, and maintain females in good condition throughout the lactation period.

The practice of feeding more energy than cows are capable of using for milk and maintenance may be useful and profitable for producers in certain situations. Thin or older cows may use extra feed that is of little cash value to gain weight. Thin cows fed to gain weight besides lactate may offer a positive return to feed costs depending on the market price of each.

Table 3. Economic Analysis of Crossbred Drylot Beef Cows on Two Energy Levels

	Moderate Energy	Superior Energy
Daily cost of cow rations ($)*	.700	.855
Daily cost of creep feed ($)*	.144	.169
Total daily feed cost per pair ($)	.844	1.024
Total feed cost for summer ($)	113.89	138.24
Feed cost per pound calf gain ($)	.325	.380
Feed cost per pound of cow and calf gain combined ($)	.325	.304

* Feed costs based on alfalfa hay @ $50/ton, corn silage @ $20/ton and barley @ $1.50/bu.

While control of a cow's intake is possible in drylot, intake for range cows is not controllable, suggesting lower milking cows could be getting more energy than needed or higher milking cows may not be producing to their genetic potential. The only way to control the intake of grazing animals is to confine them to a small area or overgraze. It is possible to very precisely control feed intake of lactating beef cows in drylot.

Managing cows in drylot increases efficiency of the entire farming enterprise by (1) feeding cows to specific needs, (2) increasing pounds of beef produced per acre, (3) providing a market for excess, damaged, marginal or low quality feeds or forages and (4) collecting manure for return to the cropland as fertilizer. Herds with different types of cows that vary in milk production potential and body condition should be sorted and fed according to these traits. Machine harvest of forages is more efficient than grazing animals. Less productive cows may subsist on large amounts of properly supplemented crop residues such as small grain straw or corn or milo stover. Manure accumulation is when returned to the soil in place of crop products removed.

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