BEEF CATTLE RESEARCH UPDATE

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Effects of Body Condition and Late Gestation Supplementation on Cow and Calf Performance

Recent Oregon State University research evaluated the influence of cow body condition score (BCS) and dried distillers grains (DDGS) supplementation during late gestation on cow and calf performance.[1] In this study, the cows were grouped by BCS (4 or 6) and supplemented or not supplemented during late gestation (approximately January thru March). All cows received 28 lb/day of low quality hay (6.4% crude protein) and supplemented cows received the equivalent of 2 lb/day of DDGS (fed three times weekly). The calves were weaned at approximately 140 days of age. Approximately 45 days after weaning, the steer calves were placed in a commercial growing lot for 60 days and then finished in a commercial feedlot.

The effects of cow BCS and supplementation during late gestation on cow and calf performance are shown in Table 1. The initial weight of BCS 6 cows was 137 lb heavier than the BCS 4 cows with BCS of 5.7 and 4.3, respectively for BCS 6 and BCS 4 cows. At both calving and weaning, weights and BCS were greater for BCS 6 cows than BCS 4 cows. As would be expected, the supplemented cows weighed more at calving and tended to weigh more at weaning compared to unsupplemented cows. In addition, the supplemented cows had greater BCS at both calving and weaning than unsupplemented cows. The percentage of live calves at birth (100 vs. 90%) and at weaning (99 vs. 88%) was greater for BCS 6 cows than BCS 4 cows. Supplementation did not influence the proportion of live calves at calving or weaning. After a 60 day breeding season, the pregnancy rate for BCS 6 cows was greater than that of BCS 4 cows (91 vs. 79%). Supplementation had no affect on cow pregnancy rate.

Both calf birth and weaning weights were greater for BCS 6 cows than BCS 4 cows (6 and 12 lb greater, respectively). However, daily gains from birth to weaning did not differ between groups. Calf birth weights, weaning weights and daily gains to weaning were increased by about 4% with supplementation of the dams during late gestation. No differences in steer calf performance in the growing lot or feedlot due to BCS or supplementation were observed.

Table 1. Cow and calf performance relating to cow BCS and supplementation during late gestation.

Item	BCS 4	BCS 6	P-value	No Supp	Supp	P-value
Cow Data						
Initial weight, lb	1108	1245	<0.001	1179	1174	0.65
Calving weight, lb	1131	1222	<0.001	1139	1214	<0.001
Weight at weaning, lb	1140	1206	<0.001	1163	1183	0.10
Initial BCS	4.36	5.71	<0.001	5.07	5.00	0.14
Calving BCS	4.45	5.35	<0.001	4.76	5.04	<0.001
Weaning BCS	4.68	5.25	<0.001	4.90	5.02	0.02
Live calf at birth, %	90.0	100	<0.001	96.7	93.4	0.22
Live calf at weaning, %	88.4	99.2	<0.001	95.9	91.7	0.16
Pregnancy rate, %	79.0	91.4	0.005	85.4	85.0	0.93
Calf Data						
Birth weight, lb	85.4	91.3	0.002	86.8	90.0	0.05
Weaning weight, lb	405	417	0.05	402	419	0.01
ADG to weaning, lb	2.32	2.33	0.81	2.28	2.36	0.02

Adapted from Bohnert et al., 2010.

Table 2 shows the estimated net returns of treatments broken down in 4 production phases; cow-calf, growing lot, feedlot, and retained ownership. These data show that cow BCS had a major

impact on net returns. The BCS 6 cows returned approximately $71 per cow more than the BCS 4 cows if calves were sold at weaning and approximately $130 per cow more with retained ownership of the calves through the feedlot. These researchers noted that the primary reason for the disparity in net returns was due to more live calves at weaning. Supplementation had minimal effects on net returns with the greatest benefit occurring in the cow-calf phase where supplemented cows had a $7 per cow greater net return than unsupplemented cows. These researchers noted that health cost during the feedlot phase was about 5 times greater for calves from unsupplemented cows compared with supplemented cows ($8.28 vs.$1.65 per head).

Table 2. Net returns ($) relating to cow BCS and supplementation during late gestation.

Item	BCS 4	BCS 6	BCS Difference	No Supp	Supp	Supp Difference
Cow-Calf Phase	376.11	447.57	71.46	408.2	415.48	7.28
Growing Lot Phase	6.58	10.77	4.19	9.12	8.24	-0.88
Feedlot Phase	77.34	61.38	-15.96	80.02	58.7	-21.32
Retained Ownership	460.03	589.69	129.66	531.99	517.73	-14.26

Adapted from Bohnert et al., 2010.

In summary, these data clearly illustrate the potential economic importance of managing cows to achieve a good BCS (≥ 5) prior to entering the last third of gestation. In this study, BCS 6 cows had about 10% more live calves at birth and weaning, and had an 11% greater pregnancy rate than BCS 4 cows.

Genetics of Calving Date and Age at First Calving in Angus Heifers

The responsibility of the beef female is to conceive early in the breeding season, deliver a healthy calf, and wean a calf to its full genetic potential, making fertility the primary driving factor of profitability in a cow-calf operation.[2] However, due to difficulties in data collection, in most breeds there are limited ways to evaluate fertility in females on a between-herd basis. Calving day (CD) and age at first calving (AFC) are data that are easy to collect. Recent Kansas State University and Iowa State University research determined the heritabilities (direct and maternal) for CD and AFC in Angus heifers and evaluated the potential for using these traits in genetic improvement of female fertility.[3] Records on 2,082 Angus heifers from two herds were used in this analysis. Calving day was calculated for each heifer by subtracting the calving date of the first heifer to calve in that contemporary group from the calving date of the heifer. For example, within each contemporary group of heifers, heifers that calved on the first day of the calving season were given a CD of 1, heifers that calved on the next day had a CD of 2, etc.

The researchers reported that the heritability of CD was low (~0.10), whereas, the heritability of AFC was moderate (~0.30). However, there was a high negative direct-maternal genetic correlation for AFC, indicating that selecting on AFC may favor heifers that are themselves born later in the season. For example, if a young heifer that calved early (indicating good fertility) had a heifer calf, her heifer calf would not be selected because she was older and had no opportunity to have a very young AFC, in spite of her possible good fertility. These researchers concluded that even though AFC has a greater heritability than CD, selection on AFC could have unwanted consequences, such as selecting heifers that happen to be born later with respect to calving season. Thus, they suggested that CD may be more useful than AFC in selecting for female fertility in beef cattle.

[1] Bohnert, D. W., R. R. Mills, L. A. Stalker, A. Nyman, and S. J. Falck. 2010. Late gestation supplementation of beef cows: Effects on cow and calf performance. Proc. West. Sec. Am. Soc. Anim. Soc. 61: 255-258.
[2] Encinias, M. 2011. Managing fertility in cows. In 2011 Southwest Beef Symposium Proc., Amarillo, TX.
[3] Bormann, J. M., and D. E. Wilson. 2010. Calving day and age at first calving in Angus heifers. J. Anim. Sci. 88: 1947-1956.