

# THE IMPORTANCE OF BODY CONDITION AT CALVING ON REPRODUCTION IN BEEF COWS

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## Story in Brief

Body condition scores at calving were related to pregnancy rate and days from calving to subsequent conception in 110 cows. Pregnancy rates were reduced (50%) in cows that were body condition score = 4 at calving compared to 81%, 88%, and 90% for cows with body condition score = 5, 6, and 7, respectively. Days from calving to conception were not significantly different for cows calving in body condition score greater than 5.3 vs. cows with body condition score less than 5.3 (89 and 100, respectively) but pregnancy rates were different (90% and 66%, respectively). Additional feed costs to maintain body condition above 5.3 were compensated and returned an additional \$27.00 per cow in the herd.

(Key Words: Beef Cow, Body Condition, Reproduction)

## Introduction

Body condition at the time of calving has been related to reproductive performance in beef cows. The processes of fetal development, parturition, lactation, and involution of the reproductive tract are all physiological stresses. These stresses require the availability and use of substantial quantities of energy to enable cows to be re-bred within 85 days. Additional energy intake, as grain or forages, will be costly if they must provide all of the calories needed to meet these requirements. Energy to meet some of these needs must be provided by stored body energy or fat (condition). Consequently, if nutrient intake after calving is equal, cows with extra body energy stores will meet the caloric needs of parturition, lactation, reproductive tract repair and re-breeding more readily than thin cows. With this thought in mind, a study was undertaken to quantify the differences in reproduction in cows of various body conditions (or fatness) at calving.

## Materials and Methods

Body condition scores and reproductive performance from 110 Hereford cows (65 cows in year one; 45 cows in year two) were analyzed. Cows were weighed and body condition scores (BCS; scale: 1 = emaciated; 9 = obese) were assigned biweekly from fall (Nov 15) through calving in March and April. Cows were blocked by age, weight, and BCS into four nutritional treatments designed to create differences in body condition at calving. All cows were wintered on standing native range near Stillwater, Oklahoma. One fourth of the cows (M) were fed (cottonseed

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meal, 41% crude protein) to maintain fall weight to precalving. The remainder of the cows were supplemented to lose 5% of the fall weight by Jan 20 (6 weeks prepartum), then were divided into three other supplementation groups. One group was further restricted in nutrient intake (LL) to lose another 5% of fall weight by calving. Cows in the LM group were fed with the M cows the last 6 weeks prepartum, while those in LH treatment group were fed 140% of the supplement received by the M cows. Cows were fed free choice grass hay and 4 pounds of supplement after calving until summer pastures were available.

Groups of two or more bulls (approximately 20 cows/bull) were rotated among breeding pastures starting on May 1. Pregnancy was determined by rectal palpation 60 days after the end of the 90 day breeding season. The dates of conception were calculated from the next year's calving date minus a 281 day gestation. Body condition scores were assigned in half-score increments, by two or more technicians and then averaged.

Previous research had indicated that cows with BCS greater than 5.3 at calving had a greater likelihood of becoming pregnant than cows with lesser body condition. Therefore cows in this analysis were divided at 5.3 BCS at calving to examine differences in pregnancy rate, days to conception, and return to management and labor.

### Results and Discussion

Cows in both years had similar BCS at initiation of the winter supplement program (6.4 and 6.2, respectively). The range of average precalving BCS for treatment groups was 5.0 for LM cows in year two to 6.6 for M cows in year one. Fourteen cows calved in a BCS less than 5.0. The majority of the cows were in the BCS of 5 and 6 (43 cows in each). Only 10 cows were classified as BCS greater than or equal to 7 at the time of calving. Pregnancy rates for cows in the various BCS at calving are presented in Figure 1. Cows calving in BCS less than 5.0 had the lowest pregnancy rates (50%) compared to cows in other BCS groups. There is little if any advantage in pregnancy rate for cows calving in a BCS 7 compared to those with BCS 6.

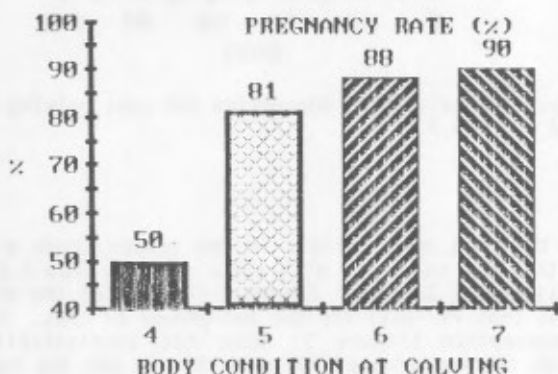


Figure 1. Pregnancy rates (percentage of cows) for cows calving as BCS = 4,5,6, and 7

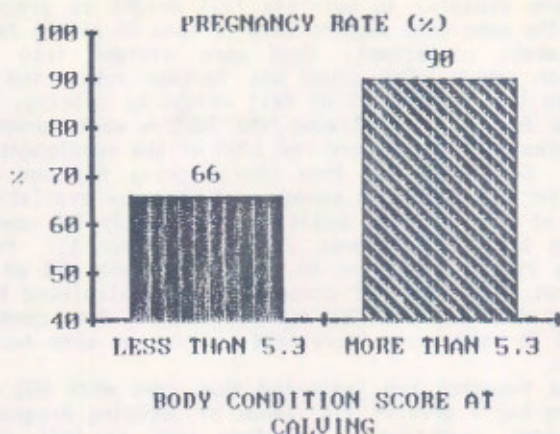


Figure 2. Pregnancy rates (percentage of cows) for cows calving as BCS < 5.3 and BCS > 5.3

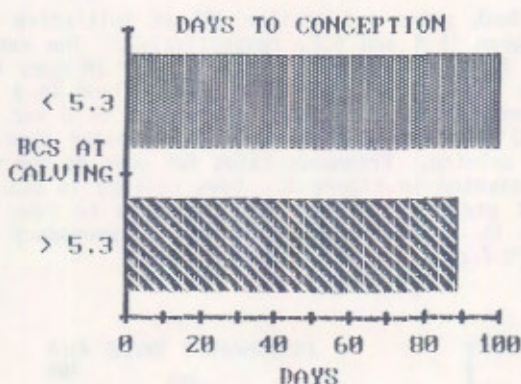


Figure 3. Days from calving to conception for cows calving as BCS < 5.3 and BCS > 5.3

When the cows were divided in two groups (cows with a BCS at calving less than 5.3 and those with a BCS greater than 5.3), the lower BCS group consisted of 32 cows. Figure 2 illustrates the differences in pregnancy rates (66% vs 90%) for the two groups of cows. The days from calving to conception (Figure 3) were not statistically different ( $P < .05$ ) between the two groups (100 d vs 89 d), yet the trend for cows with greater body condition to conceive in a shorter time is consistent with previous findings (Dunn and Kaltenbach, 1980). Body condition at calving is an important factor influencing reproductive performance in beef cows during their next breeding season.

## Economic Considerations

The cost effectiveness of achieving the greater BCS at calving, with extra hay and supplement inputs, were examined using several important assumptions:

1. Cows found nonpregnant via palpation were left in the herd for the subsequent year. All cows found pregnant maintained the pregnancy and weaned a calf.
2. Receipts from the calf crop were computed by a market value for all calves. The ratio of steer to heifer calves sold is 1:1.
3. Steer calves were valued at \$8.00/cwt more than heifer calves.
4. Calves from cows with greater BCS were 10% heavier at weaning due to increased milk production, and the calves average 11 days older at weaning. The heavier calves were priced \$1.00/cwt less than lighter calves.
5. Cows with less than 5.3 BCS at calving had a 70% pregnancy rate, and cows with greater than 5.3 BCS at calving had a 90% pregnancy rate.
6. Cows with greater than BCS of 5.3 (at calving) consumed an average of 3 lbs cottonseed meal (41% C.P.; @\$180/Ton) per day for 165 days (such as fed to M cows described above) and 2.5% of body weight in grass hay (@\$40/Ton) during 70 days.
7. Cows with less than BCS of 5.3 consumed an average of 2 lbs cottonseed meal per day for 165 days (such as fed to LL cows described above) and 2% of body weight in grass hay for 25 days of inclement weather.
8. Pastures were rented and 75% of operating capital was borrowed at 14% interest (A.P.R.) for 9 months.
9. Fixed costs consisted of interest on investment, insurance, depreciation, and taxes.

Table 1 compares the generalized inputs and receipts from cows fed to maintain a fall body condition score (>5.3) until calving compared to cows expected to lose body condition to less than 5.3 at calving. The sizeable fixed costs (much of which is interest on borrowed capital) causes both groups of cows to be non-profitable. However, the extra variable costs incurred with cows fed to maintain body weight are more than compensated with the increased calf sales.

Table 1. Economic comparisons (per cow) of cows fed to maintain a BCS greater than 5.3 at calving with cows fed to lose body condition and calve at less than 5.3

|                      | Cows > 5.3 | Cows < 5.3 |
|----------------------|------------|------------|
| Variable costs       | \$192.07   | \$149.73   |
| Fixed costs          | 97.27      | 97.27      |
| Total costs          | 289.34     | 247.00     |
| Receipts             | 249.16     | 179.16     |
| Return to Management | -40.18     | -67.84     |

## Literature Cited

- Dunn, T. G., and C. C. Kaltenbach. 1980. Nutrition and the postpartum interval of the ewe, sow, and cow. *J. Anim. Sci.* 51:29 (Suppl. II).