

Body Condition Scoring I: Managing Your Cow Herd Through Body Condition Scoring

A. Manuel Encinias
Extension Associate
Co-Products Initiative

Greg Lardy
Beef Cattle Specialist
NDSU Extension Service

Department of
Animal and Range Sciences

Importance of Body Condition Scoring to Cattle Producers

Body condition scoring of beef cattle can be an effective management tool for evaluating the energy reserves of cows and the whole nutritional program throughout the year. Adjusting the nutritional program to obtain desired body condition at different stages of production is necessary to enhance production efficiency. Females that are too thin or too fat can be an expensive investment. Thin cows can have difficulty rebreeding, while fat cows are prone to calving problems and excessive feed costs. Body condition scores (BCS) allow producers, extension personnel, and researchers to communicate more effectively regarding the herd's nutritional status.

What is Body Condition Scoring?

A common scoring system has been developed to estimate the average body condition of cows in a herd. This system provides producers a relative score based on an evaluation of fat deposits in relation to skeletal features.

The most widely used body condition scoring system for beef cattle in the U.S. (Figure 1) assigns scores from 1 (emaciated and carrying virtually no fat) to 9 (excessively fat).



	Score	Description
thin	1	Severely emaciated; starving and weak; no palpable fat detectable over back, hips or ribs; tailhead and individual ribs prominently visible; all skeletal structures are visible and sharp to the touch; animals are usually disease stricken. Under normal production systems cattle in this condition score are rare.
	2	Emaciated; similar to BCS 1, but not weakened; little visible muscle tissue; tailhead and ribs less prominent.
	3	Very thin; no fat over ribs or in brisket; backbone easily visible, slight increase in muscling over BCS 2.
borderline	4	Borderline; individual ribs noticeable but overall fat cover is lacking; increased musculature through shoulders and hindquarters; hips and backbone slightly rounded versus sharp appearance of BCS 3.
optimum	5	Moderate; increased fat cover over ribs, generally only 12 th and 13 th ribs are individually distinguishable; tailhead full, but not rounded.
	6	Good; back, ribs, and tailhead slightly rounded and spongy when palpated; slight fat deposition in brisket.
fat	7	Fat; cow appears fleshy and carries fat over the back, tailhead, and brisket; ribs are not visible; area of vulva and external rectum contain moderate fat deposits; may have slight fat in udder.
	8	Very fat; squared appearance due to excess fat over back, tailhead, and hindquarters; extreme fat deposition in brisket and throughout ribs; excessive fat around vulva and rectum, and within udder; mobility may begin to be restricted.
	9	Obese; similar to BCS 8, but to a greater degree; majority of fat deposited in udder limits effective lactation. Under normal production systems cattle in this condition score are rare.

Figure 1. Body condition scoring system for beef cattle. Adapted from Wagner et al., 1988. Journal of Animal Science

Nutritional Priorities of Cows

Individual herds vary by breed, frame, or type (i.e., English or Continental) but their nutritional priorities are similar (Figure 2). When nutrient intake fulfills the highest priority requirements, the excess is used to fill lower priority requirements. When all current requirements are fulfilled, the excess is stored as fat.

Most English and Continental beef breeds tend to deposit

excess fat externally (subcutaneous), whereas dairy and Brahman-influenced breeds deposit more fat internally (KPH or mesenteric). During periods of low energy intake, excess external body fat is the first body tissue used to meet nutritional requirements. When energy is insufficient, fat stores may not be enough to fulfill requirements. When this happens, muscle

(protein) is broken down to satisfy energy demand.

Cattle generally deposit external (subcutaneous) fat in the body in the following order: 1) back or loin, 2) ribs, 3) tailhead, 4) brisket, 5) flank, 6) vulva and/or rectum, 7) udder or mammary gland (Figure 3). When requirements exceed nutrient intake and external fat is broken down, it is utilized in the reverse order.



Figure 2. Prioritization of nutritional requirements for the beef cow.
Adapted from Short et al., 1990.
Journal of Animal Science

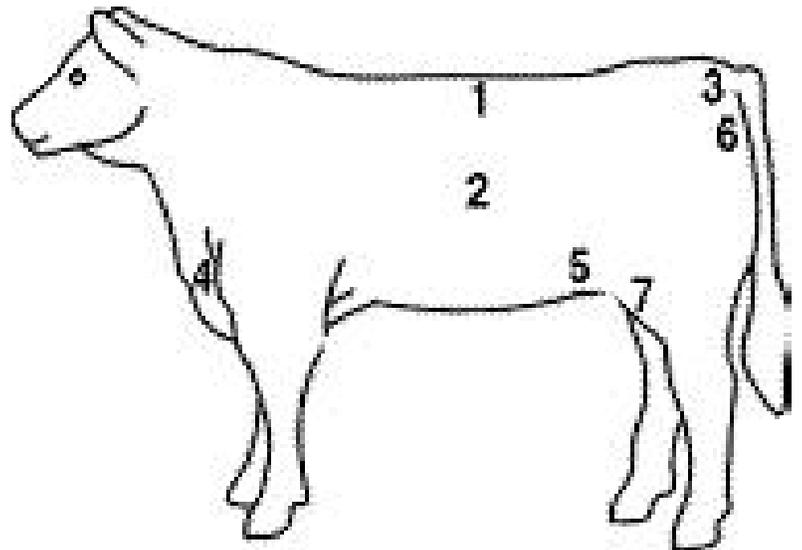


Figure 3. Fat deposition sites in the cow.

Visual Body Condition Scoring

Cattle can normally be scored solely by visual observation (Figures 4 through 9); however, certain circumstances may occur in which manual palpation along with visual observation may be desirable. Cattle commonly score in the range from 3 to 7. Scores on the extreme ends of the scale (1, 2, 8 and 9) are rarely observed.

Research has shown a strong correlation between the current scoring system and actual fat deposition in the animal (Table 1). This scoring system takes into account 80 to 90 percent of the total variation in fat of a beef cow.



Figure 4. Body Condition Score 3.

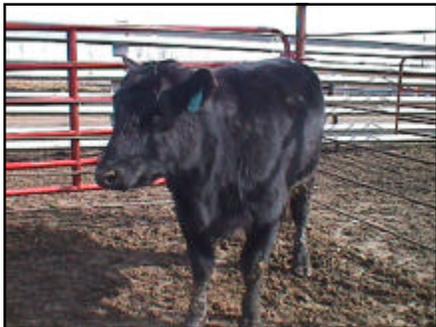


Figure 5. Body Condition Score 4.



Figure 6. Body Condition Score 5.

Table 1. Relationship between body condition score and body fat.

BCS	Total Body Fat	Subcutaneous Fat	BCS	Total Body Fat	Subcutaneous Fat
	(%)	(in)		(%)	(in)
1	0.7	0	6	22.3	0.29
2	5.0	0.004	7	26.7	0.41
3	9.3	0.005	8	31.0	0.54
4	13.7	0.11	9	35.3	0.68
5	18.0	0.19			

*Table adapted from
Hardin, 1990.
Georgia Cooperative
Extension Service C-817*



Figure 7. Body Condition Score 6.



Figure 8. Body Condition Score 7.

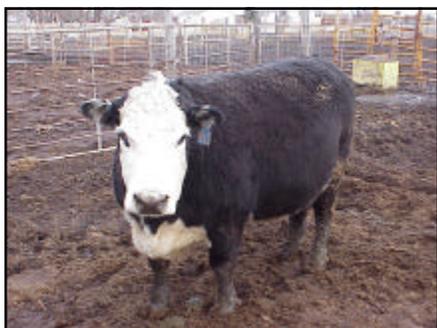


Figure 9. Body Condition Score 8.

Important Factors to Consider When Body Condition Scoring

For consistent herd evaluations, a single individual should score cattle over successive years. The subjectivity of the scoring system may result in variation between individuals assigning scores.

Many factors influence how cattle look or feel at observation time. It is important to remember that the scoring system is a subjective evaluation of fleshing and fat deposition (energy reserves), not gut fill, hair coat, or body weight.

Consider cow age, breed, and frame size when determining body condition score. Older cattle tend to carry less condition over their top than younger cattle. Fat deposition varies by breed or type of cattle with dairy- and Brahman-influenced cattle carrying less subcutaneous fat and more internal fat than British or Continental type cattle. Small to moderate framed cows (Angus and Hereford) are often scored higher than larger cattle.

Keep the scoring system simple. A thin cow looks sharp and angular, whereas a fat one appears smooth and square. Consistency and simplicity are key in evaluating energy balance of a cowherd.

Using Body Condition Score to Evaluate Your Herd

Body condition scoring should be used to achieve optimal body condition of the cow at calving. This will maximize the overall reproductive and economic efficiency of the herd. It is important, however, to evaluate body condition throughout the year. A general rule of thumb is every 90 to 120 days and specifically at: 30 days prior to breeding, 90 days post-breeding, weaning, 100 days prior to calving, and calving.

Altering body condition takes time. One body condition score is equal to about 60 to 80 pounds of body weight in small to moderate frame cows. Large frame cows require 100 to 150 pounds of body weight to change a single condition score.

Many factors are associated with changing body condition throughout the year. Following calving, high nutritional requirements for lactation make maintaining or improving body condition during the first 60 days of the suckling period almost impossible. It is common for beef cattle to lose one condition score during this period. In addition to maintenance and lactation demands, the cow must prepare for rebreeding during this time. Normal reproductive function requires a certain level of fat reserves. Mature cows of all

breeds and crosses should be at BCS 5 or greater at calving to achieve adequate reproductive function by the subsequent breeding season. Body condition scores below 5 in mature cows adversely affect time to first functional estrus or heat (Table 2).

Recommended body condition score at calving for a two-year-old, first-calf heifer is BCS 6. First-calf heifers are more likely than mature cows to fail to rebreed. Additional body condition provides some insurance against reproductive failure. However, excessive fleshing beyond BCS 6 prior to calving in first-calf heifers may result in increased incidence of dystocia (calving difficulty).

Cows below BCS 5 at calving should be sorted off and fed with first-calf heifers that are receiving a higher quality diet than mature cows. Table 3 provides a guide to predict gain required to achieve desired body condition at breeding based on BCS at calving.

Table 2. Effect of body condition score on number of cows in heat at beginning of breeding season.

BCS at Calving	Days after Calving	
	60 days	90 days
	— Cows in Heat (%) —	
Thin (3-4)	46	66
Optimum (5-6)	61	92

Table adapted from Whittier and Stevens, 1993. Missouri Cooperative Extension Service G2230

Evaluation of body condition midway through the summer grazing season (approximately 90 days post-breeding) is suggested because it allows a manager to identify postpartum nutritional effects and estimate current range or pasture status. It is also helpful in determining alternatives for cows that are inefficiently contributing (i.e., low milk production) to the operation. Cows identified as thin during mid-summer evaluation will probably be thin at weaning, and fat cows will probably be fat at weaning.

The period from weaning to calving is a time when it is easy to alter cow body condition since a dry cow's only nutritional requirements are body maintenance and fetal development. Cows with adequate or optimum BCS at weaning will usually maintain or increase body condition after suckling has ended and may not need to be evaluated until approximately 100 days prior to calving.

Determining the nutritional status of the herd through BCS scoring at weaning or 100 days prior to calving is critical. It allows a producer time to develop nutritional programs that achieve optimum BCS at calving. This practice is fundamental for maintaining a cow's overall productivity, ability to suckle and wean a calf, and ability to rebreed.

Cows with a BCS lower than 5 during summer grazing can be sorted at weaning to provide sufficient time to achieve a desired calving BCS. Table 4 provides a guide to predict gain in moderate frame cows to achieve a desired body condition at calving based on BCS at weaning. In spring-calving herds within the Northern Great Plains region, it is recommended that weaning occur by early to mid October to ensure ample time for improving body condition when maintenance and gestation requirements are generally lowest and cold stress is not an issue.

A greater percentage of cows that calve early will rebreed than those that calve later due to the added days to "cycle back." Body condition scoring at least 30 days prior to the beginning of the breeding season allows a producer to increase diet quality on thinner cows (BCS 3 to 4) and first-calf heifers to increase the probability of rebreeding.

Cows in moderate BCS (greater than BCS 5) at calving also tend to have healthier calves, according to data gathered at Colorado State University. Calves nursing cows in BCS 3 or 4 had lower serum immunoglobulin (a measure of potential disease

Table 3. Predicting body weight gains in nursing cows in different body conditions.

BCS		Body Weight Gain Needed for Breeding, lbs		
At Calving	Needed at Breeding	Total Pounds Needed ¹	Days to Breeding	ADG
				(lbs)
3	5	160	80	2.0
4	5	80	80	1.0
5	5	0	80	0
3	5	160	60	2.7
3	5	160	40	4.0

¹ pounds to change BCS in moderate frame cows

Table adapted from Corah et al., 1991. Kansas Cooperative Extension Service C-842

Table 4. Body weight gains (lbs) required in pregnant cows in varying body condition scores from 100 to 200 days prior to calving to achieve optimum calving body condition.

BCS Weaning	BCS Needed at Calving	Calf and Placenta Weight	Body Weight Gain ¹	Total Gain	Days to Calving	ADG
3	5	100	160	260	120	2.2
4	5	100	80	180	120	1.5
5	5	100	0	100	120	0.8
3	5	100	160	260	200	1.3
3	5	100	160	260	100	2.6

¹ pounds to change BCS in moderate frame cows

Table adapted from Corah et al., 1991. Kansas Cooperative Extension Service C-817

resistance) levels than calves nursing dams in BCS 5 or 6 (Table 5). Thin cows and those that have not been fed properly prior to calving typically produce lower volumes of colostrum (which contains immunoglobulins) and therefore have weak calves that tend to be more susceptible to disease.

Cows that are too thin at calving typically have higher incidences of calving difficulty and weaker calves at birth. In addition, these calves often have lower weaning weights.

Table 5. Effect of cow condition at calving on calf serum immunoglobulin level.

Item	Cow BCS			
	3	4	5	6
IgM ¹ (mg/dL)	146	157	193	304
IgG ² (mg/dL)	1998	2179	2310	2349

¹immunoglobulin M

²immunoglobulin G

Data adapted from Odde, 1997. *Proceedings Bovine Connection to Profit.*

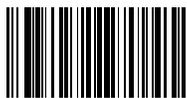
Early weaning (weaning 45 to 75 days prior to normal weaning date) is one management tool that can be used to increase BCS in thin cows during late summer. Removing the nutrient demands of lactation will increase energy available to the cow or heifer. This increase in available energy should allow for gain in fat reserves and increase in body condition. Young, thin cows (2- and 3-year olds; BCS less than 4) may be candidates for early weaning.

Summary

Body condition scoring is one tool producers can easily use to monitor nutritional programs in a cowherd. Body condition score at calving affects calf survival, calf vigor, and subsequent reproductive performance of the cow. Critical times to monitor body condition score of the cowherd are 30 days prior to breeding, 90 days post-breeding, weaning, 100 days prior to calving, and at calving.

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