



UNIVERSITY OF
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IFAS EXTENSION

Effect of Body Condition on Rebreeding¹

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The income and profit of a beef cattle operation is closely related to the rebreeding and reproduction rate of the herd. A 1986 survey of cattle producers in nine counties in central Florida indicated the number of calves sold was only 69% of the breeding age beef cows. Forty-eight percent of the 284 producers that responded indicated that nutrition was their biggest problem with reproduction and another 24% indicated that parasites were their biggest problem.

Nutrition and parasites were factors identified by over 70% of producers surveyed and both will affect the body condition of the beef cow. The body condition of the beef cow is related to reproductive performance and can be used by cattle producers to make management decisions. Grouping of cattle and the type and level of supplemental feed for maximum profit are decisions that must take body condition into consideration.

The purpose of this chapter is to review the relationship of body condition to performance, provide pictures of beef cattle representative of different body condition scores (BCS) and give a few examples of the use of body condition in making management decisions in your herd.

IMPORTANCE OF BODY CONDITION

Variation in body condition of beef cows has several implications that can be used for management decisions. The number of days to estrus and milk production is related to the conditions of cows at calving. The services per conception and calving interval of the cows is related to condition at breeding. The percentage of open cows, the calving interval of cows that breed, milk produced by the cow and subsequent weaning weight of the calf, is closely related to the condition of the cows at calving and during breeding.

Body condition affects the amount and type of supplements needed during the winter. Fat cows can lose body reserves and feeding of 1 to 2 lb/head/d of a high-protein supplement plus minerals and vitamins is sufficient in many situations. In contrast, thin cows have little body reserves and often need 4 to 6 lb/head/d or more of a high-energy supplement with 12 to 16% protein plus minerals and vitamins to avoid flesh losses and reductions in pregnancy rates.

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The term "plates," where used in this document, refers to color photographs that can be displayed on screen from CD-ROM. These photographs are not included in the printed document.

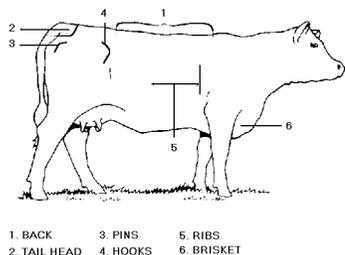
Body condition or changes in body condition is a more reliable indicator in evaluating nutritional status than liveweight or changes in liveweight. Although cows with higher BCS tend to have higher weight, the body weight alone is not a good estimate of body condition. Most herds have a range in frame and muscling in their cows that make BCS a better measure of body fat than liveweight. Liveweight is also affected greatly by gut fill and pregnancy status, which are seasonal depending on the breeding season, forage quality and forage availability. In winter feeding studies, the body condition loss is usually much higher than the body weight loss.

On many ranches, body condition can be evaluated regularly in circumstances where weighing may be impractical. This technique is easy to learn and can be very useful in making management decisions.

BODY CONDITION SCORES

Body condition of beef cows is scored from 1 (thin) to 9 (fat). This system has been used by many cattlemen and researchers as a guideline in evaluating the body condition. It should be realized that any visual scoring system will vary depending on the people doing the scoring and scoring by different people will not agree exactly. However, condition scores are not likely to vary by more than one score between experienced evaluators.

It is not difficult to evaluate body condition of cattle. The first step is to determine which areas of the body are most useful in determining body condition (Figure 1). Fat deposits are visible over the back, tail head, pins, hooks, ribs and brisket of cattle. A description of body condition scores is given in Table 1 and pictures of cows representative of BCS 2 to 8 are shown in Plates 1-15:



1. BACK 3. PINS 5. RIBS
2. TAIL HEAD 4. HOOKS 6. BRISKET

Figure 1.



Plate 1. *Bos indicus*, BCS 1



Plate 2. *Bos taurus*, BCS 2



Plate 3. *Bos taurus*, BCS 3



Plate 4. *Bos indicus*, BCS 3



Plate 5. *Bos taurus*, BCS 4



Plate 6. *Bos indicus*, BCS 4



Plate 11. *Bos taurus*, BCS 7



Plate 7. *Bos taurus*, BCS 5



Plate 12. *Bos indicus*, BCS 7



Plate 8. *Bos indicus*, BCS 5



Plate 13. *Bos taurus*, BCS 8



Plate 9. *Bos taurus*, BCS 6



Plate 14. *Bos indicus*, BCS 8



Plate 10. *Bos indicus*, BCS 6



Plate 15. *Bos taurus*, BCS 9

A BCS of 5 should look average — neither thin or fat. Once you have established what a BCS 5 looks like, it is much easier to determine variations from this. The fill or shrink from digestive contents or pregnancy can change the appearance of moderately fleshed cattle especially over the rib or in front of the hooks. Long hair is another factor that can make it more difficult to evaluate the amount of condition on a cow. When hair is long, handling the cattle over the back and ribs, and feeling the flesh over the horizontal process of the backbone in front of the hooks can be helpful. The amount of flesh over the transverse process or sharpness of feel of this bone can be used to help evaluate body condition.

Cattle with condition scores of 3 or lower have very little fat and are evaluated on degrees of muscle loss. The bone structure over the back and ribs is very visible and another useful indicator is the area from the hooks to the pins. Cattle with muscle loss show a depressed or sunken appearance in this area.

Cattle with condition scores of 6 or higher show a smoother appearance across the ribs and back. The breed type of cattle can influence where fat is deposited. Some cattle with Brahman breeding show very little fat over the ribs but will deposit fat over the hooks and pins. Other cattle show uniform deposits of fat across the ribs and back with no patchy deposits around the tail head.

The BCS has been related to 1986 the fat cover and carcass fat by Texas (Herd and Sprott, 1986) and Oklahoma (Wagner et al., 1988) researchers. A BCS range of 3 to 7 will include most beef cows in Florida. In slaughter trials, Texas and Oklahoma researchers have found that cows with body condition scores of 3, 5 and 7 had a carcass fat content of 7 to 9%, 15 to 18%, and 25 to 27%, respectively. A cow of medium frame size will weigh approximately 1100 lb at BCS 5 but only 950 lb at BCS 3. In this system, a medium frame beef cow would change in weight approximately 75 lb for each condition score.

RELATIONSHIP TO PREGNANCY RATE

The body condition score can be evaluated throughout the year. The relationship of BCS at calving to reproduction has been looked at in several

studies. A beef cow must conceive by 80 d after calving to maintain a 365 d calving interval that is desired in most management programs. Herd and Sprott (1986) reported 62% of beef cows with a BCS of 4 or lower at calving were in heat by 80 d after calving compared to 88% and 98% for cows in BCS 5 or 6 or higher. Other studies have shown that cows with BCS below 5 require more services per conception implying some depression in fertility of cycling beef cows.

A summary of eight trials with over 1000 beef cows showed that cows with a BCS of 4 or lower, 5, or 6 or higher at calving had pregnancy rates of 60%, 78% and 91%, respectively (Table 2). The pregnancy rate for each condition score was variable from trial to trial, reflecting differences in scoring of cows by different evaluators and other factors such as weight gain or loss after calving. However, the pregnancy rate improved in all trials when the BCS at calving improved from 4 to 6.

Cows with a higher BCS at breeding and pregnancy testing also showed improvements in pregnancy rate (Table 2). The BCS may vary 1 to 2 scores through the year on a herd of cows but the thinner cows in a herd usually remain the thinner ones throughout the year. The optimum BCS for cows evaluated at pregnancy testing appears to be BCS 5 in three trials in Florida (Table 2). This could be related to differences in evaluators.

CRITICAL BCS IS 5

Groups of cows with an average BCS of 4 or lower at calving, during the breeding season or at pregnancy testing had lower pregnancy rates compared to cows averaging BCS 5 or higher. BCS of 5 or higher resulted in good pregnancy rates provided other factors such as diseases were not reducing pregnancy rates. The relationship of BCS to calving interval also showed that cows with a BCS of 5 or higher had calving intervals of 360 d or less and BCS of 4 or lower resulted in calving intervals over 370 d (Figure 2). It is desirable for productive beef cows to have a BCS above 5 when this is accomplished through normal pasture management programs with reasonable costs of production.

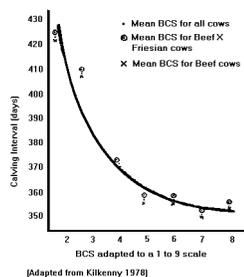


Figure 4.

SEASONAL CHANGES IN CONDITION SCORE

The body condition of the beef herd will change during the year. The condition is usually highest in mid to late summer then declines in the fall or winter and is lowest in late winter or early spring.

The loss of body condition during the fall and winter can reduce the amount of supplemental feed needed to maintain good pregnancy rates, calving intervals and calf gains. The loss of 75 lb from BCS 6 to 5 is equivalent to the energy and protein in 180 lb of shelled corn. At present prices, this is a savings of \$12/head in supplemental feed costs.

The rate of loss of body condition should be gradual and not extreme if possible. If a cow herd can lose one condition score during the fall and winter (75 lb of flesh), it is desirable for the cows to be supplemented to lose this gradually over 120 d instead of a very rapid loss in 45 d followed by feeding high levels of supplemental feeds in an attempt to prevent further condition losses.

It is our observation that some Brahman and Brahman crossbred cattle will lose condition faster than other types of cattle especially after calving. It is important that these cattle be monitored closely and that forage and supplemental feeds be adjusted to avoid high rates of condition loss.

USING BCS IN MANAGEMENT DECISIONS

A good ranch manager must evaluate many management alternatives and adjust the program based on the current situation in each herd. Decisions such as stocking rate, fertilization, supplemental feeding, grouping of cattle, parasite control, and

diagnosis of problems can use BCS to provide useful information about the overall nutritional status of the herd and individual cows in the herd. A few examples of using BCS in this process will be discussed to provide ideas on how BCS have been used.

The average BCS of a herd during the year can be used to evaluate the general nutritional status of the herd. If the BCS of the herd is low during the late summer or fall, several factors such as forage quality, stocking rate, mineral supplements and parasite control need to be evaluated to help determine possible causes and solutions.

The type, level and time to start supplemental feed should consider the BCS of cattle. Forage quality and quantity, time of calving, body condition, milk production level, breed type, pasture size, and weather all must be considered. If cattle have a higher BCS than normal, it may be possible to reduce the level of supplement provided. In other situations, the level of supplement given during the winter may need to be increased to maintain BCS. The amount of supplement usually needs to be adjusted to each herd and it may need to be adjusted during the winter depending on the conditions and cattle. An early frost or a drought can change the economically optimum levels of supplements.

It is desirable to have cows in BCS 5 or higher at calving and if there is a considerable range in BCS in a herd, it may be desirable to separate thin cows. It is usually economically prohibitive to supplement the entire herd if only half of the cows or fewer will respond to the higher level of nutrition. An alternative is to separate thinner cows and manage these cows to improve BCS prior to calving. Possible alternatives may include grazing on a higher quality pasture, providing additional supplements and(or) treating for parasites.

BCS of cows in a herd can be used to help identify if a problem exists within a herd. A ranch in Florida had a pregnancy rate lower than desirable and wanted to determine the cause if possible. At pregnancy testing in the fall, each cow was evaluated for breed type, year born, missing teeth, BCS and pregnancy status. This herd of 450 cows had a 75% pregnancy rate and from previous experience general

observations of the herd were not useful in determining possible management changes. A summary of individual cow records showed 95% of cows with BCS 5 or higher were pregnant (276 cows), 63% of BCS 4 were pregnant (83 cows), 45% of BCS 3 were pregnant (65 cows) and 4% of BCS 2 were pregnant (28 cows). Cows with two or more missing teeth (nine cows) averaged a BCS of 3.2, averaged 14 yr of age and 44% were pregnant. Cows 4 yr of age (78 cows) had an average BCS of 3.95 and 46% were pregnant. In this herd the pregnancy rate was closely related to BCS and 95% of cows in good condition were pregnant. Other factors, such as diseases that cause lower pregnancy rates, were probably not a major problem in this herd, since cows in good condition had a 95% pregnancy rate. Young cows (4 yr of age) had lower BCS and pregnancy rates. One possible solution was to manage these cows and perhaps others with a BCS 4 or lower as a separate herd to improve body conditions.

SUMMARY

A BCS of 5 or higher at calving and through breeding is needed for good reproductive performance. Proper stocking rates, a good mineral supplementation program and timely use of protein supplements offer the most potential for economically improving body condition and pregnancy rates. Separating cows by condition at pregnancy testing or 2 to 3 mo prior to calving and feeding both groups to calve in BCS 5 or above will maintain high reproductive performance while holding supplemental feed costs to a minimum. The routine use of BCS in each herd will provide needed information to manage the cow herd for a high calf crop and profitability.

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Table 1.

Table 1. Description of Body Condition Scores (BCS), (Herd and Sprott, 1986)		
BCS	Description	
1	Emaciated	Bone structure of shoulder, ribs, back, hooks and pins sharp to touch and easily visible. Little evidence of fat deposits or muscling.
2	Very Thin	Little evidence of fat deposits but some muscling in hindquarters. The spinous processes fell sharp to the touch and are easily seen with space between them.
3	Thin	Beginning of fat cover over the loin, back and foreribs. Backbone still highly visible. Processes of the spine can be identified individually by touch and may still be visible. Spaces between the processes are less pronounced.
4	Borderline	Foreribs not noticeable; 12th and 13th ribs still noticeable to the eye, particularly in cattle with a big spring of rib and ribs wide apart. The transverse spinous processes can be identified only by palpation (with slight pressure) to feel rounded rather than sharp. Full but straightness of muscling in the hindquarters.
5	Moderate	12th and 13th ribs not visible to the eye unless animal has been shrunk. The transverse spinous processes can only be felt with firm pressure to feel rounded - not noticeable to the eye. Spaces between the processes not visible and only distinguishable with firm pressure. Areas on each side of the tail head are fairly well filled but not mounded.
6	Good	Ribs fully covered, not noticeable to the eye. Hindquarters plump and full. Noticeable sponginess to covering of foreribs and on each side of the tail head. Firm pressure now required to feel transverse processes.
7	Very Good	Ends of the spinous processes can only be felt with very firm pressure. Spaces between processes can barely be distinguished at all. Abundant fat cover on either side of tail head with some patchiness evident.
8	Fat	Animal taking on a smooth, blocky appearance; bone structure disappearing from sight. Fat cover thick and spongy with patchiness likely.
9	Very Fat	Bone structure not seen or easily felt. Tail head buried in fat. Animal's mobility may actually be impaired by excess amount of fat.

Table 2.

Table 2. Relationship of Body Condition Score to Pregnancy Rate					
	% Pregnant				
	Body condition score ^a				
Scoring Period Location	2	3	4	5	6

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	% Pregnant				
	Body condition score ^a				
Scoring Period Location	2	3	4	5	6
Condition scored at calving					
Texas ^b	--	--	69(78) ^{cd}	80(10)	--
Texas ^b	--	--	24(25) ^c	60(139)	87(23) ^e
Texas ^b	--	--	12(32) ^c	50(60)	90(32) ^e
Texas	--	--	70(168) ^c	90(274)	92(197) ^e
Oklahoma ^f	--	12	28	55	84
Oklahoma ^f	--	--	50(14)	81(43)	88(43)
Oklahoma ^f	--	--	67(39)	85(107)	--
Oklahoma ^f	--	--	65(18)	78(44)	89(19)
Average (all cows)			60(374)	78(677)	91(314)
Condition scored during breeding season					
Texas			58(122) ^c	85(300)	95(619) ^e
Condition scored at pregnancy testing					
Deseret Ranch ^g	21(8)	41(31)	77(45)	95(17)	--
Nassau County	--	--	59(17) ^c	94(49)	100(5)
Manatee County	4(28)	45(65)	63(83)	93(276) ^h	--
^a Body condition score 1=Thin, 5=Average, 6=Fleshy.					
^b Herd and Sprott (1986).					
^c Condition score 4 and below.					
^d Numbers of cows in ().					
^e Condition score 6 and higher.					