Body Condition Score for Beef Cows

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Introduction

Body condition score (BSC) is a subjective visual assessment of the amount of fat covering a cow, reflecting the cow's nutritional status. Therefore, the score reflects the plane of nutrition to which an animal has been exposed for a reasonable time. The scale typically ranges from 1 to 9, with 1 indicating an extremely thin cow and 9 indicating an obese cow. Although the BCS system uses a 1 to 9 scale, cows typically fall within the range of BCS 3 to 7. The extremes, BCS 1 to 2 and 8 to 9, are rarely seen in commercial cattle operations. The BCS is a crucial management tool used by beef producers to evaluate and manage the body energy reserves of beef cattle and provides information to use when making management and feeding decisions. Body condition, or changes in body condition, are more reliable for evaluating the nutritional status of a cow compared to live weight or shifts in weight. Live weight can be misleading due to factors like gut fill and pregnancy, which prevent weight from accurately indicating a cow's true condition. Thus, live weight fails to reflect changes in nutritional status reliably. For instance, animals with larger frames may carry higher body weights but possess lower body reserves compared to smaller-framed animals with abundant reserves. Therefore, changes in body weight become more informative than body weight alone. The ideal BCS for most beef cows ranges from 5 to 6, depending on their production stage. In this section, we will outline the impact of the BCS on reproduction and overall productivity of cows and describe the key points for condition scoring beef cows.

Table 1. Percent Body Fat Associated with Body Condition Scores.

BCS	% Empty Body Fat
1	3.8
2	7.5
3	11.3
4	15.1
5	18.9
6	22.6
7	26.4
8	30.2
9	33.9

Adapted from NRC (1996)

Evaluation of Body Condition Score

Body condition score in beef cattle is assessed in six locations: back, tailhead, pins, hooks, ribs and brisket (Figure 1) and scored in nine criteria (Table 2). Additional information can be found in the fact sheet: Body Condition Scoring System (BCS) for Beef Cattle at the LSU AgCenter website (https://www.lsuagcenter.com/portals/communications/publications/publications_catalog/crops_livestock/beef/body-condition-scoring-system-bcs-for-beef-cattle).

Examples of body condition scores using the nine score criteria are shown below for reference (Figure 2). Additionally, a dynamic chart (Figure 6) developed by Philipe Moriel, of the University of Florida Institute of Food and Agricultural Sciences (UF/IFAS), can be used to easily assist in scoring beef cows.

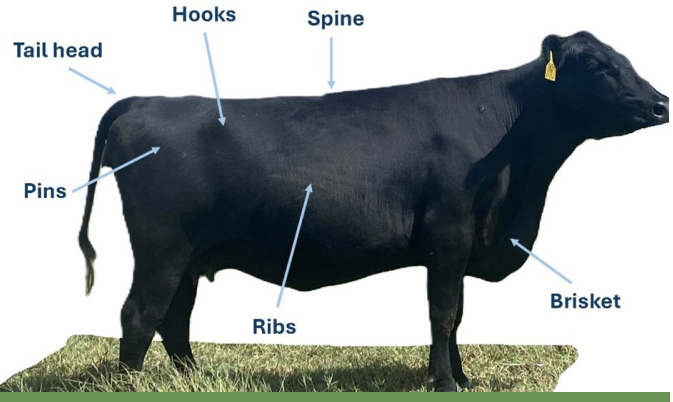

Figure 1. The ruminant digestive system.
Graphic created by authors using BioRender

Table 2. Detailed description of body condition in cattle.

1	The bone structure of the shoulder, ribs, back, hooks and pins are sharp and easily visible. Little evidence of fat deposits or muscling.
2	Low-fat deposition and muscling in the hindquarters. The spinous processes look sharp and are easily seen with space between them.
3	Fat begins to cover the loin, back and foreribs. Upper skeletal structures are visible. Processes of the spine can be easily identified. Spaces between are less pronounced.
4	The foreribs are not noticeable, but the 12th and 13th ribs are still noticeable. The transverse spinous processes can be identified only by palpation. Full, but straight muscling in the hindquarters.
5	Ribs are not visible unless the animal has been shrunk. Spinous processes spaces between the processes are not visible. Each side of the tailhead is well-filled but not mounded.
6	Ribs are fully covered and are not noticeable. Muscling in hindquarters is plump and full. Fat around tail head and covering the foreribs.
7	The ends of the spinous processes can only be felt with firm pressure. Spaces between processes can barely be distinguished. Abundant fat cover on either side of the tail head with evident patchiness.
8	Animals have a smooth and blocky appearance. Bone structure is difficult to identify. The fat cover is thick and abundant.
9	Structures are difficult to identify. The fat cover is excessive, and mobility may be impaired.

Adapted from Pruitt and Momont (1988)

Body Condition Score 3

Body Condition Score 4

Body Condition Score 5

Body Condition Score 6

Body Condition Score 7

Figure 2. Body condition score examples. Photos by Matheus Ferreira

Influence of Body Condition Score on Overall Productivity

The BCS score clearly influences the reproductive performance of beef cows because BCS essentially reflects the nutritional status of cows in a practical way. Research has consistently shown over the years that the BCS score at calving dictates reproductive performance during the next breeding season. The BCS at calving significantly affects pregnancy rates (Table 3) and the duration of postpartum anestrus (i.e., cow is not cycling, Figure 3). Cows with a low BCS (< 5) at calving often experience delays in returning to estrus, leading to extended intervals between calving events and a subsequent decrease in lifetime productivity. For optimal production, aiming for one calf per cow per year, a postpartum interval of 60 days or less is recommended. Therefore, maintaining a BCS of 5 to 6 is generally recommended to support optimal reproductive performance. However, this does not mean that a BCS over 6.5 is detrimental to reproduction; on the contrary, a higher BCS often correlates with better reproductive performance. Nonetheless, cows with extremely high BCS (7, 8, 9) may have calving problems once fat accumulation in the guts can reduce the pelvic area, making parturition challenging for those cows. Additionally, fat cows have higher energy requirements and thus are more costly to feed and maintain.

Table 3. Pregnancy rates (%) according to body condition score in beef cows.

BCS at calving (1-9)	Pregnancy Rate (%)			
	3	4	5	6
Rae et al. (1993)	31	60	.	89
Kunkle et al. (1994)	43	61	86	93
Spitzer et al. (1995)	.	56	80	96
Lake et al. (2005)	.	64	.	89
Renquist et al. (2006)	63	68	81	90
Lents et al. (2008)	.	56	88	.
Bohnert et al. (2013)	.	.	79	92
Mean	46	61	83	92

Calving with a BCS between 5 and 6 is crucial for adequate reproductive performance. It is natural for cows to lose BCS after calving, as their energy requirements increase significantly during this period to support milk production, while their dry matter intake may decrease due to physiological changes.

There is an old assumption that calving at adequate BCS will ensure that cows can lose some BCS without severely impacting reproduction. While this is true to a certain extent, a significant drop in BCS after the breeding season can result in pregnancy losses. Therefore, even if cows calve at an appropriate BCS, it is important to avoid further BCS loss from calving to early gestation, as this can negatively affect pregnancy rates.

Although losing BCS after calving is not recommended, pushing low BCS cows to gain BCS after calving will certainly not fix the impact already made on the next breeding season. An experiment conducted in Brazil with approximately 600 cows showed that cows with low BCS at calving (3 to 4), even if they gained BCS postpartum, did not achieve the same pregnancy rates as cows that calved with an adequate BCS and simply maintained it postpartum (33% vs 55%, respectively).

However, when it comes to boosting offspring performance, it is important that cows gain BCS during gestation. Studies have shown that calves born from cows that gained 1.5 points of BCS during mid or late gestation had greater weaning weight compared to cows that just maintained BCS throughout gestation. There is an order of nutrient utilization for cows, and during pregnancy, cows will always prioritize the development of the fetus. So, when cows gain BCS during gestation, we maximize the amount of nutrients being delivered to the fetus.

In summary, effective BCS management is key to maximizing productivity. Cows should gain BCS throughout gestation and calve with a BCS between 5 and 6. Avoiding BCS loss after the breeding season is critical to preventing pregnancy losses. Figures 2 and 3 present the target BCS during the year for fall and spring calving in grazing systems in Louisiana.

When is the best time to assess BCS? Key times in the production cycle include weaning, 90 to 60 days before calving, at calving and at the start of the breeding season. Maintaining an optimal BCS year-round is vital for reproductive efficiency and the overall health of both cows and calves. Figures 4 and 5 show an ideal and realistic BCS to achieve at key times during the production cycle for both fall- and spring-calving systems.

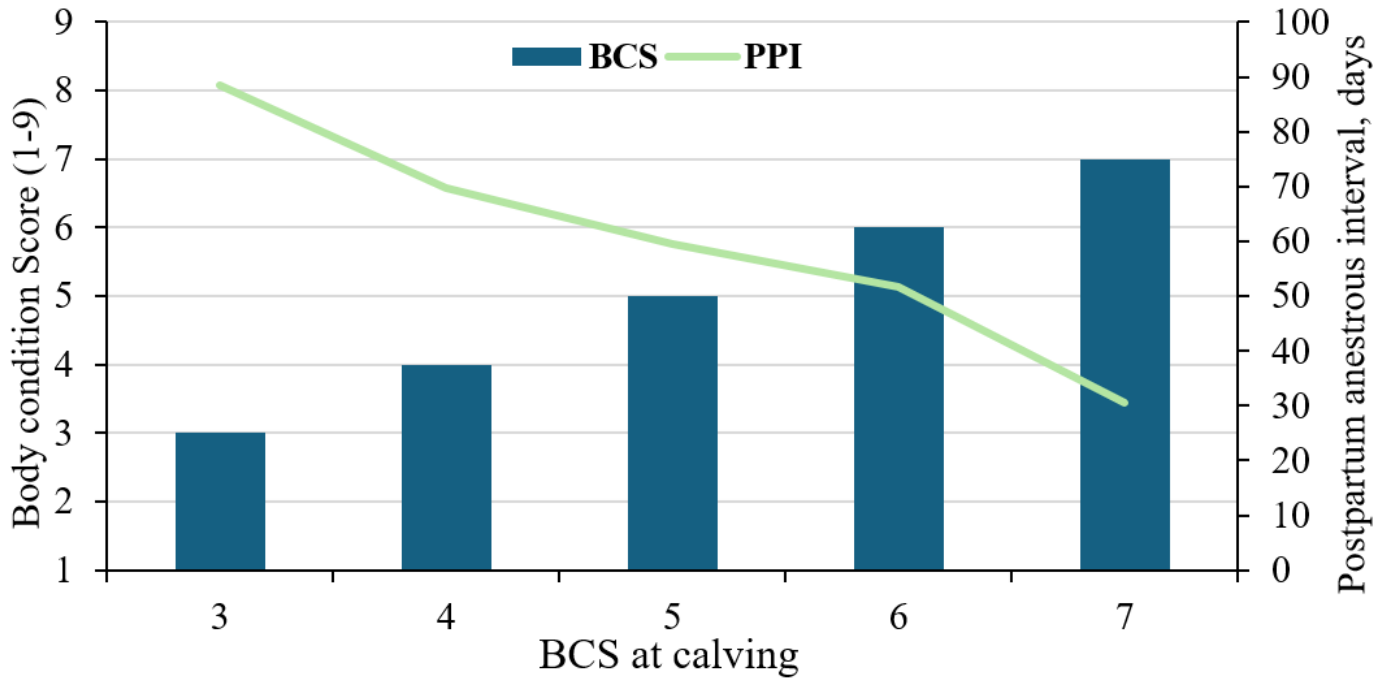

Figure 3. Effect of body condition score (BCS) at calving on postpartum anestrus interval (PPI). Adapted from Houghton et al., 1990

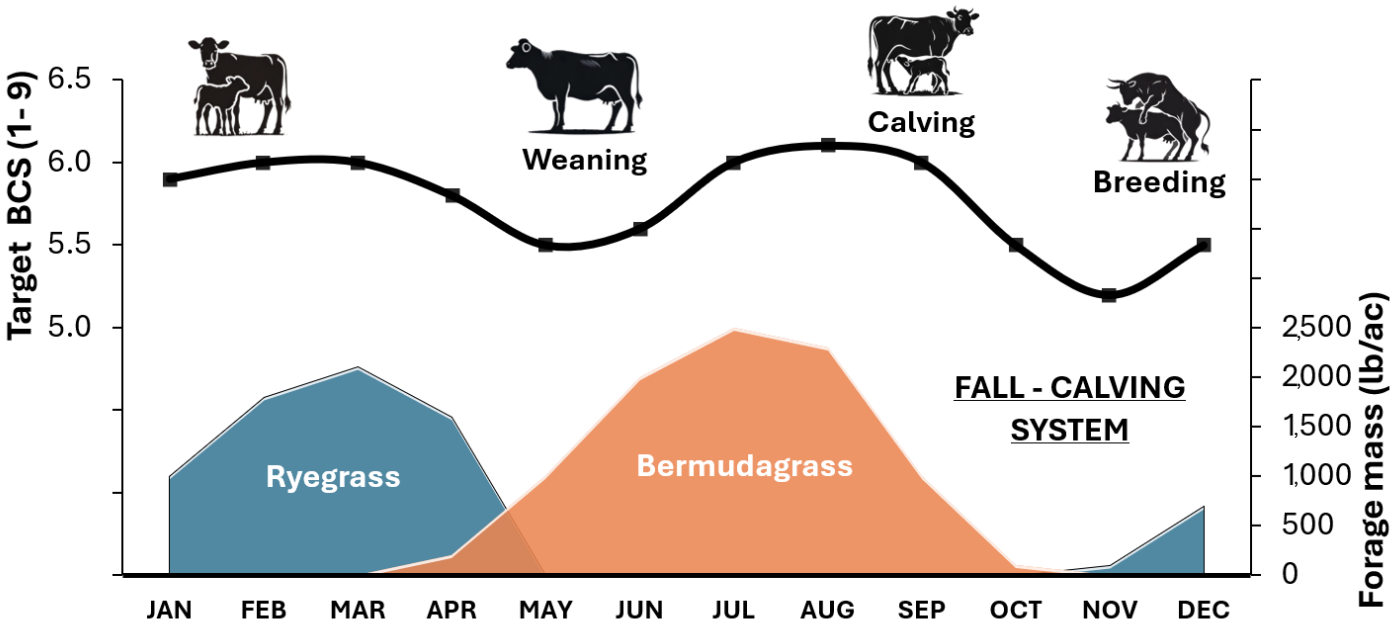

Figure 4. Target body condition score (BCS) and illustrative year-round forage mass production in a fall calving system in Louisiana.

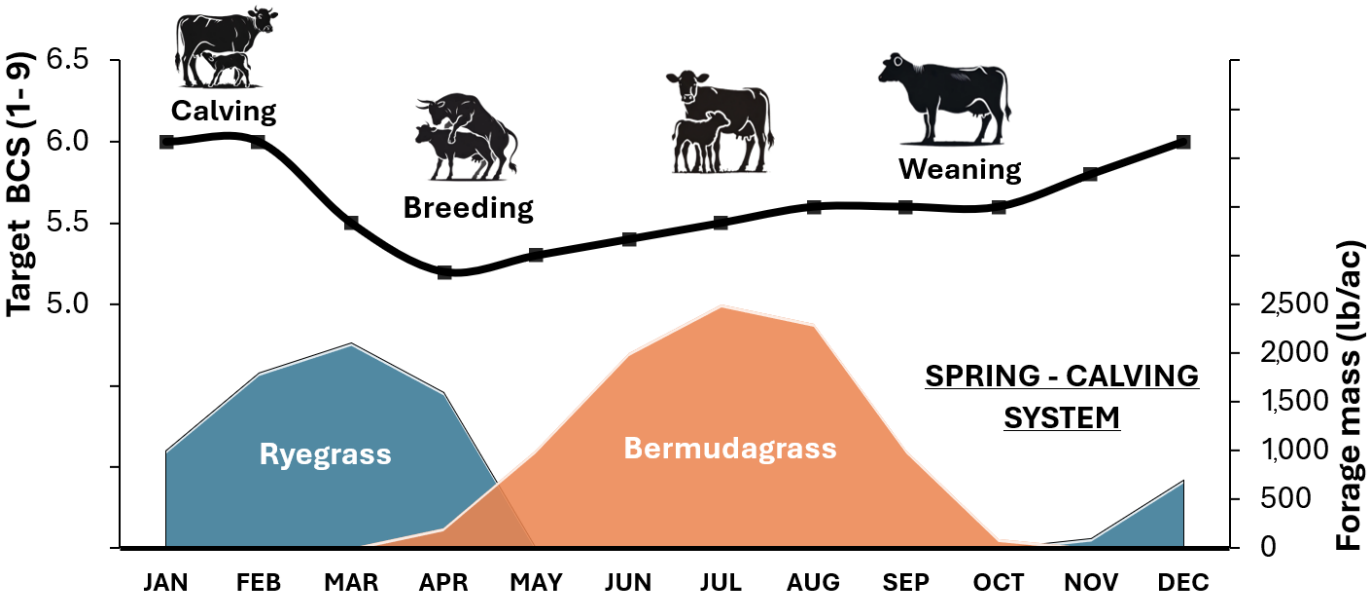

Figure 5. Target body condition score (BCS) and illustrative year-round forage mass production in a spring calving system in Louisiana.

Conclusions

Monitor the BCS and adjust the diet to ensure cows calve at a BCS of around 6. This is essential for optimizing reproductive performance, maintaining overall health, and promoting greater offspring growth.

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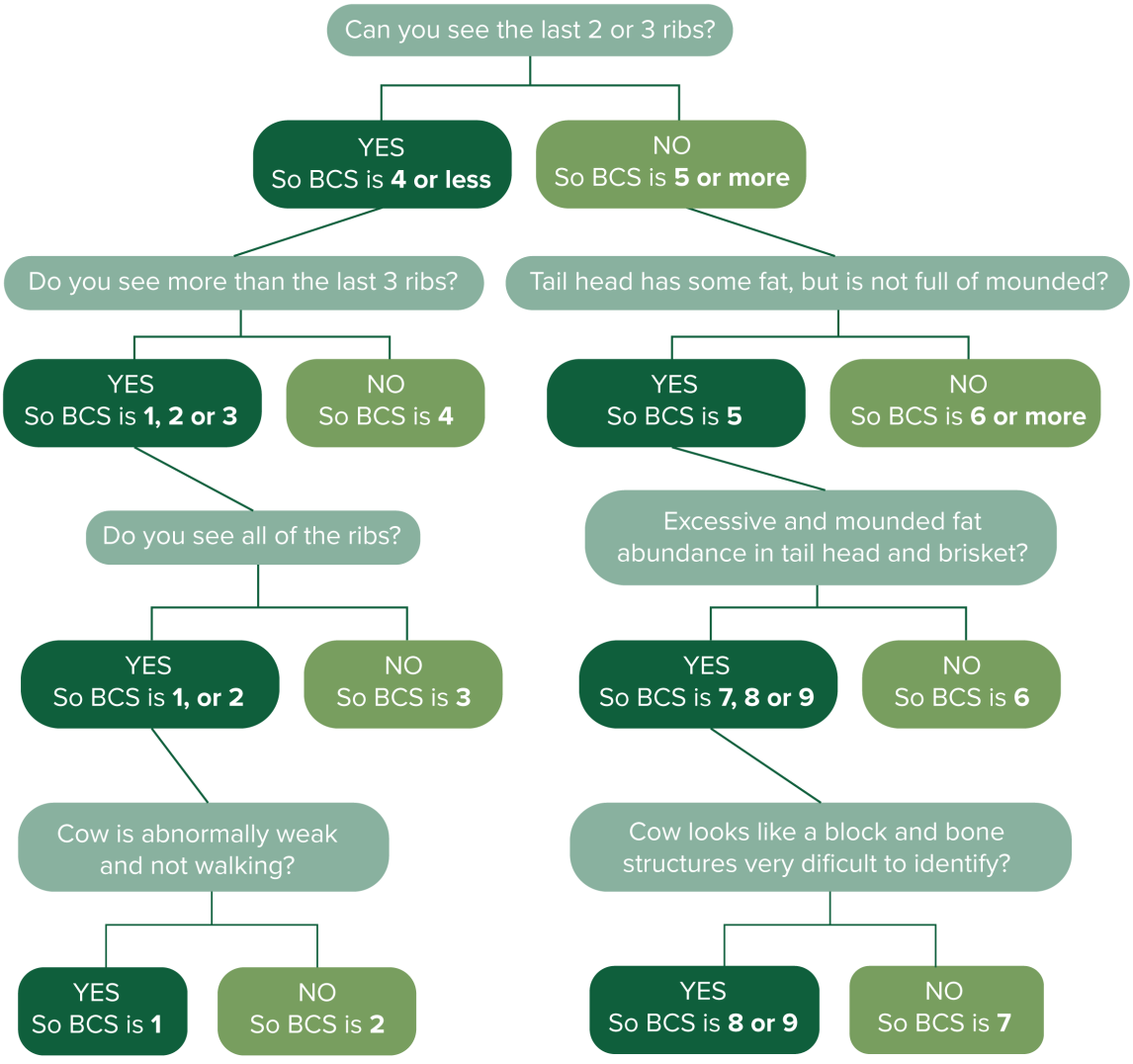

Figure 6. Dynamic chart for body condition score (BCS) evaluation. Adapted from Philipe Moriel, IFAS/REC, University of Florida

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