Body Condition Scoring as Equine Management Tool

► All horses occasionally need adjustments to their feeding or exercise program to help them maintain an ideal weight. Body condition scoring is an effective way to monitor the overall effectiveness of a regimen designed to help horses lose, gain, or maintain weight.

The body condition score (BCS) system was developed by Don Henneke in 1983 during his PhD program at Texas A&M University. Although this system was created on a project featuring nonpregnant mares, it is universal for all classes of horses and is based on the fat deposition or cover on an individual animal. Evaluating a horse's current BCS is a valuable tool for assessing the horse's general health and determining if the nutrition program implemented is working. This is essential information for any equine owner, breeder, manager, or competitor.

Body Condition Score Basics

The BCS system is a numerical 1 to 9 scale, with 1 being a poor animal that is extremely emaciated and 9 being an extremely fat animal. These scores are determined by both visual and tactile (touch) appraisal of six specific regions of the horse: along the neck, along the withers, behind the shoulder, across the ribs, crease down the back (loin), and around the tailhead (figure 1). Only the fat cover, not muscle tone, is being evaluated on the horse. Although BCS can be estimated by looking at a horse, a more accurate assessment can be obtained by touching the horse to determine fat deposits. The horse should be standing still and approximately square when being evaluated.

To become more accurate in assigning numerical values, enlist the help of someone experienced in assigning standardized scores. The more horses that are felt and assessed of varying condition scores, the better. Although the scoring system is widely used, it is subjective. Reading the definitions provided for each score can help improve score accuracy (table 1). There is no perfect mathematical formula to determine the BCS of a horse based on the six regions, and horses may carry fat deposition differently based on breed or sex (for example, draft horses and stallions often have cresty necks). Because of this, some people prefer to use half-point increments (4.5, 5.5, etc.) to describe the BCS of their horse. A good starting place is to look and feel over the rib cage. A horse with at least a faint outline of ribs visible will most likely fall under a BCS of 5. Figures 2 through 5 are examples of various BCS.

Figure 1. The six areas of reference for body condition scoring: along the neck, along the withers, behind the shoulder, across the ribs, crease down the back (loin), and around the tailhead.

High, Low, or Just Right?

The ideal body condition score will vary depending on the class of horse being evaluated. Generally, a BCS of 5 or 6 is considered healthy; however, there are numerous disciplines, such as elite racehorses and endurance horses, where a BCS of 4 is acceptable. These horses are not unhealthy, but for their discipline carry less fat, which has the potential to slow them down. It is, however, important to understand the pros and cons of horses with too high or too low BCS. An old saying goes "The best color of horse is fat." Recent evidence even suggests that horse show judges are more likely to penalize a horse that is too thin over one that is too fat. Although many people believe there is no detriment

Table 1. Description of Individual Body Condition Scores	
Body Condition Score	**Description**
1	**Poor.** Horse is extremely emaciated with spinous processes, ribs, tailhead, tuber coxae (hooks), and tuber ischii (pins) projecting prominently. The bone structure of the withers, shoulders, and neck are easily noticeable with no fatty tissue felt.
2	**Very thin.** Horse is emaciated with slight fat covering over the base of the spinous processes. The spinous processes, ribs, tailhead, hooks, and pins are prominent. The withers, shoulders, and neck structures are faintly discernible.
3	**Thin.** Fat is built up over portions of the spinous processes. Slight fat cover can be felt over the ribs, but the spinous processes and ribs are easily discernible. The tailhead is prominent, but individual vertebrae cannot be seen. Hooks are visible but appear rounded and pins cannot be seen. The withers, shoulders, and neck are accentuated.
4	**Moderately thin.** The horse has a negative crease along its back with a faint outline of ribs. Fat can be felt around the tailhead. Hooks cannot be seen, and the withers, neck, and shoulders do not look obviously thin.
5	**Moderate.** The back is level, and the ribs cannot be seen but can be easily felt. Fat around the tailhead feels slightly spongy. The withers look rounded, and the shoulder and neck blend smoothly into the body.
6	**Moderately fleshy.** There may be a slight crease down the back. Fat around the tailhead feels soft, and fat over the ribs feels spongy. Fat begins to be deposited along the sides of the withers, behind the shoulders, and along the sides of the neck.
7	**Fleshy.** There may be a crease down the back. Individual ribs can be felt, but with noticeable fat filling between the ribs. Fat around the tailhead is soft and noticeable along the withers, the neck, and behind the shoulders.
8	**Fat.** The horse has a crease down the back. Spaces between ribs are so filled with fat that the ribs are difficult to feel. The area along the withers is filled with fat, and fat around the tailhead feels very soft. The space behind the shoulders is filled in flush, and some fat is deposited along the inner buttocks.
9	**Extremely fat.** The crease down the back is obvious. Patchy fat appears over the ribs. Bulging fat appears around the tailhead, along the withers, behind the shoulder, and along the neck. Fat along the inner thighs may also rub together.

From Henneke et al. (1983)

to an overconditioned horse (7 or greater BCS), many downsides exist. Performance horses that are obese will exert extra stress on their joints and may be more at risk for injury as well as heat or exercise intolerance. Obesity also increases inflammation and a horse's risk of equine metabolic syndrome, insulin dysregulation, altered glucose dynamics, and laminitis. Although mares that are overconditioned do not demonstrate adverse effects on reproductive performance, such as an increase in dystocia rates, smaller foal size, or subfertility as seen in cattle, overnutrition during late gestation may alter maternal insulin sensitivity and foal pancreas cell structure, muscle fibers, and cell signaling. On a more practical side, keeping a horse overconditioned can be financially wasteful, resulting in more money spent to achieve an unnecessarily higher BCS.

As many equine producers would expect, a horse that is too thin is certainly problematic. Thin performance horses do not have energy reserves to pull from during intense work, thus reducing work output. These horses may also be more prone to fatigue-related injury. Reproductive problems also exist for mares that are too thin, with thin females having longer interovulatory intervals, decreased pregnancy rates, decreased ovarian activity, delay in the seasonal onset of estrus and ovulation, and an increased number of cycles to conception. Because of these numerous detriments to thin horses, especially in terms of reproduction, it is advised for mares to enter the breeding season at a BCS of 5 to 6.5. Mares are expected to lose condition during lactation, so ensuring appropriate BCS at the time of foaling can help prevent the mare from falling below a 5 during lactation, which may subsequently affect getting rebred.

Figure 2. A horse with a body condition score of 1 that was a neglect case. Notice the very prominent negative crease created by a lack of fat deposition around the spinous processes. (Photo credit: Mississippi Horse Rescue)

Figure 3. A horse with a body condition score of 1 that was a neglect case. Notice the very prominent negative crease created by a lack of fat deposition around the spinous processes. (Photo credit: Mississippi Horse Rescue)

Figure 5. A horse with a body condition score of 8 to 9. This would be an instance where feeling fat deposition can help determine the exact body condition score. The horse has a large amount of fat deposited over the crest of the neck and patchy fat across the ribs and around the tailhead. (Photo credit: Mississippi Horse Rescue)

Figure 4. A horse with a body condition score of 5. You cannot see the ribs and the neck, shoulders, and withers blend smoothly into the body. (Photo credit: Mississippi Horse Rescue)

Changing Body Condition Scores

Changing a horse's BCS takes time, but it can be done when paying attention to exercise and dietary needs. Working with a veterinarian and equine nutritionist can help determine the best course for achieving an appropriate BCS, as some challenges exist when dealing with secondary morbidities, such as laminitis. In general, horses that are obese should have a gradual increase in exercise and a decrease in digestible energy. This can be achieved by monitoring what the horse eats and, depending on the situation, restricting intake using a grazing muzzle, dry lot, or weighing hay. Thin horses should have dietary alterations made gradually, as horses chronically in a nutrient deficit can suffer from refeeding syndrome if reintroduced to rich feeds too rapidly. The University of California–Davis evaluated refeeding-emaciated horses using three different diets and created a protocol called UC Davis Recommendations for Refeeding a Starved Horse, which is commonly called The Emaciated Horse Diet. This protocol is widely used by equine rescue organizations, veterinarians, and nutritionists in cases of severe emaciation and outlines feeding an alfalfa hay-only diet until the horse is healthy enough to consume other feedstuffs.

Body Condition Score Takeaways

- The BCS system is a practical and important tool for assessing the nutritional status and general health of horses.
- Most horses have an ideal BCS of a 5 to 6 on a 1 to 9 scale, but this may vary depending on a horse's use or discipline.
- Determining a horse's BCS requires assessment both visually and through touch.
- A BCS too high or low can have negative implications for horses.
- Make BCS changes over the course of 4 to 6 weeks per 1 point change, ideally under the guidance of a veterinarian and equine nutritionist if there are additional health concerns.

References

- Henneke, D. R., G. D. Potter, J. L. Kreider, and B. F. Yeates. 1983. Relationship between condition score, physical measurements, and body fat percentage in mares. Equine Veterinary Journal. 15(4):371-372.
- Munjizun, A., and S. Pratt-Phillips. 2021. A survey: Horse show judges' perception on equine industry. Journal of Equine Veterinary Science. 100:103549.
- Garlinghouse, S. E., and M. J. Burrill. 1999. Relationship of body condition score to completion rate during 160 km endurance races. Equine Veterinary Journal. 31(S30):591-595.
- Hoffman, R. M., R. C. Boston, D. Stefanovski, D. S. Kronfeld, and P. A. Harris. 2003. Obesity and diet affect glucose dynamics and insulin sensitivity in Thoroughbred geldings. Journal of Animal Science. 81(9):2333-2342.
- Vick, M. M., A. A. Adams, B. A. Murphy, D. R. Sessions, D. W. Horohov, R. F. Cook, B. J. Shelton, and B. P. Fitzgerald. 2007. Relationships among inflammatory cytokines, obesity, and insulin sensitivity in the horse. Journal of Animal Science. 85(5):1144-1155.
- Rutter, L. M., and R. D. Randel. 1983. Postpartum nutrient intake and body condition: Effect on pituitary function and onset of estrus in beef cattle. Journal of Animal Science. 58: 265-273.
- Richards, M. W., J. C. Spitzer, and M. B. Warner. 1986. Effect of varying levels of postpartum nutrition and body condition at calving on subsequent reproductive performance in beef cattle. Journal of Animal Science. 62:300-306.
- Kubiak, J. R., J. W. Evans, G. D. Potter, P. G. Harms, and W. L. Jenkins. 1989. Postpartum reproductive performance in the multiparous mare fed to obesity. Theriogenology. 32 (1):27-36.
- Smith, S., C. M. Marr, C. Dunnett, and N. J. Menzies-Gow. 2016. The effect of mare obesity and endocrine function on foal birthweight in Thoroughbreds. Equine Veterinary Journal. 49(4):461-466.
- Bradbery, A. N., J. A Coverdale, C. J. Hartz, A. A. Millican, M. S. Goehring, K. K. Fikes, E. Picking, C. J Hammer, K. A. Dunlap, R. C. Cardoso, T. A. Wickersham, J. L. Leatherwood, and M. C. Satterfield. 2021. Effect of maternal overnutrition on predisposition to insulin resistance in the foal: Maternal parameters and foal pancreas histoarchitecture. Animal Reproduction Science. 227:106720.
- Bradbery, A. N., J. A. Coverdale, C. J. Hammer, K. A. Dunlap, J. L. Leatherwood, and M. C Satterfield. 2021. Effect of maternal overnutrition on predisposition to insulin resistance in the foal: Foal skeletal muscle development and insulin signaling. Domestic Animal Endocrinology. 77:106648.
- Henneke, D. R., G. D. Potter, and J. L. Kreider. 1984. Body condition during pregnancy and lactation and reproductive efficiency of mares. Theriogenology. 21(6):897-909.
- Cavinder, C. A., M. M. Vogelsang, P. G. Gibbs, D. W. Forrest, and D. G. Schmitz. 2009. Variances in reproductive efficiency of mares in fat and moderate body conditions following parturition. Professional Animal Scientist. 25:250-255.
- Witham, C., and C. L. Stull. Metabolic responses of chronically starved horses to refeeding with three isoenergetic diets. 1998. Journal of the American Veterinary Medical Association. 212(5):691-696.

Revised by **Courtney Heaton**, *Equine Extension Specialist*, Lecturer, Animal Sciences, Auburn University.

Revised August 2024, ANR-1353