



A Guide to Body Condition Scoring Yaks

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Having issues with cows breeding back and raising a calf every year? Are your heifers taking longer to reach puberty than you think they should? Are some calves born weak and not able to stand quickly? Reproduction is closely associated with body-fat stores and muscling. Fat cells produce a hormone, leptin, that plays a role in the hormonal cascade regulating reproduction. Learning how to assess body reserves or condition as a management tool can help improve your reproductive efficiency and farm profitability.

What is a body condition score?

The amount of muscle and fat, particularly body fat, that an animal has is summarized in the industry term “condition.” Many livestock species have developed numerical scoring systems that correspond to varying degrees of body reserves. Beef and equine utilize a nine-point system while the sheep and dairy industries use a five-point scale. Bison and water buffalo have adopted a five-point scoring system. Think of a body condition score (BCS) scale as a body mass index system for livestock. Lower numbers reflect animals that are very thin and more emaciated while higher numbers reflect animals with increased muscle and fat reserves. In Table 1, the body condition score and corresponding backfat thickness is shown for water buffalo, dairy cattle, and both beef cows and cull beef cow carcasses. The purpose of Table 1 is to illustrate that different species have varying levels of backfat accumulation but can still be assessed for body condition to ensure overall animal productivity and well-being. Research comparing bison and beef carcass fat coverage revealed that bison may have equal or greater fat covering over the upper rib area but much less coverage than beef towards the brisket. This illustrates that yaks are expected to be different than cattle and more similar to bison where body fat accumulates. The red highlighted areas in the table indicate scores that would be considered either too thin for lower numbers or excessively conditioned for higher numbers. Ideal scores are shaded in green.

Animal condition or BCS scores can be evaluated at critical production periods. For instance, a BCS of 6 for a beef cow or 3 for water buffalo and dairy cows would be considered ideal condition at calving. Further, Table 1 illustrates that the ideal condition score and corresponding body fat amount will differ for species. The amount of backfat for an ideal score is the least for dairy cows at 0.20 cm, intermediate for water buffalo at 0.36-0.50 cm, and greatest for beef cows being near 0.4-0.8 cm.

There has not been an established body condition system developed for yaks. On a popular social media site, both a 1-10 and 1-7 numerical system have been shared. We propose a 1-9 scoring system that is in line with the beef and equine system as opposed to developing a completely new scale for yaks.

Yaks are expected to have less fat covering than beef animals and will be closer to dairy animals regarding the degree of accu-

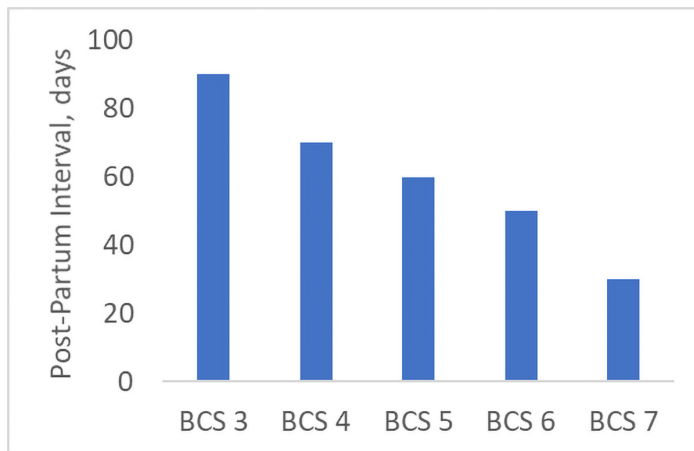
Table 1. Body condition scores and corresponding backfat thickness measurements based on research studies for water buffalo, dairy, and beef cows.

BCS	Backfat Thickness, cm ¹			
	Water Buffalo	Dairy Cow	Beef Cow Carcass	Beef Cow Live
1	<0.2	<0.05	--	--
1.5	--	0.05	--	--
2	0.21-0.35	0.10	0.05	--
2.5	--	0.15	--	--
3	0.36-0.50	0.20	0.10	--
3.5	--	0.25	--	--
4	0.51-0.70	0.30	0.44	0.35
4.5	--	0.35	--	--
5	>0.70	>0.35	0.39	0.86
6	--	--	0.84	0.95
7	--	--	1.52	1.33
8	--	--	2.73	2.34
9	--	--	--	--

¹ The red highlighted areas indicate scores that would be considered either too thin for lower numbers or excessively conditioned for higher numbers. Ideal scores are shaded in green.

mulation of fat and body reserves needed to remain productive and healthy. Reviewing several studies, the average backfat depth was 0.65 cm (0.26 inches) for yaks of mixed gender at harvest, having an average weight near 580 pounds. On a single farm, we scanned 22 mature yak cows in the middle of winter with an ultrasound to measure backfat depth. The cows averaged 640 pounds, heavier than the aforementioned yaks. Twenty-one of these female yaks were dry, non-lactating cows that had not nursed a calf for almost 11 months while one female yak was nursing a calf. The average backfat depth between the last two ribs was 1.25 cm or 0.49” (range = 0.4-1.8 cm). This information would indicate yaks may be more similar to beef cows than expected. However, upon palpation of the animal, it was noted that little fat covered the lower two-thirds of the ribs, over the shoulder and the hip region. From this, one may conclude that yaks are similar to bison depositing fat over the loin and along their back and less in other regions. As yaks continue to gain condition, fat is deposited around the tailhead, hips and shoulders. In comparison, beef animals often have 1 to 2 cm (0.4 to 0.8 inches) of backfat at harvest weights of 1,200-1,500 pounds, which would correspond to a BCS score of 6-8. Based on limited information, it is concluded that female yaks will be productive with much less total body fat than beef animals and condition scoring systems should account for this difference.

Figure 1. Increasing body condition score of beef cows at calving reduces the post-partum interval.



Source: Adapted from Houghton et al., 1990

Why body condition score animals?

Body condition scores reflect the plane of nutrition animals have been receiving in relation to their nutritional requirements. As animals consume more nutrients than needed, muscling and fat stores will increase leading to a higher BCS. If nutrient intake is less than the animal's requirement to support lactation, growth, grazing activity, or energy to maintain core body temperature during cold weather, body stores are mobilized and BCS will decline. Rapid decreases in BCS could reflect a diseased state.

Reproduction has been closely associated with BCS. Yak hybrid cows that were thin were observed to be open. Those with a BCS that was marginally thin had pregnancy rates of only 44% while 100% of cows with a BCS of ideal or greater were pregnant at the

end of the breeding season. To ensure short postpartum intervals, the time required to return to heat or estrus after calving, BCS should be maintained near ideal BCS (5-6) (Figure 1). Thin cows are likely not only to have lengthened anestrus periods, but they will also produce less colostrum with fewer antibodies reducing passive immunity to their progeny. Research in beef cattle has shown increased incidence of stillborn and calf death loss pre-weaning for cows having BCS less than ideal at calving. Likewise, excessive body condition is not desirable. Excessive body fat can accumulate in the pelvic area making the birthing canal smaller increasing the risk of dystocia or calving difficulty. Additionally, fat cells can accumulate in the udder lowering milk production. Accumulation of backfat and internal fat acts as a body insulator which is a positive in cold weather but can increase heat stress during warmer periods. Therefore, the ideal body condition scores are in the mid-range of the scoring system.

How to evaluate the condition of an animal?

Assessing the body condition of an animal involves both visual appraisal and physically feeling or palpating areas of the body. Animals are evaluated at various locations on the body such as the spine, ribs, hip area, brisket, shoulder, and hind quarters (Figure 2). Yaks can have thick hair coats making it difficult to solely use visual appraisal to assign a score. The shoulder, ribs, vertebrae of the mid-back, hips and tailhead can be palpated while the animal is restrained and compared to the descriptions listed in Table 2. To be the most accurate in scoring body condition in yaks, a combination of palpation and visual evaluation is necessary for yaks. With experience, palpation will improve the ability of the person assessing animals to visually appraise and assign scores reducing the need to restrain animals, although combining palpation with visual assessment is the most accurate. The photographs at the

Figure 2. Points of interest for evaluating the body condition of yaks.



end of the publication (figures 3-16) provide examples of varying condition scores for cows and bulls. Utilize the information in Table 2 in combination with the images to learn the basics of assigning body condition scores to animals. Additionally, Figure 17 illustrates the difference in high and low body condition scores when palpating and viewing the topline of an animal. Animals in good to excessive condition will have larger longissimus muscles and more subcutaneous fat resulting in the flatter back appearance and need for greater pressure to feel the spinal processes. Practice on real animals using both visual and palpation techniques using Table 2 as a guide.

When should BCS be scores be collected?

You can evaluate the body condition of your animals every time you are around them. However, it is recommended that a BCS be assigned and recorded 90 days pre-calving, at calving, 14-21 days pre-breeding and at weaning. Assessing animals 90 days pre-calving provides sufficient time to make feed adjustments to ensure

female yaks are a BCS of 5 to 6 at calving. Scoring at calving allows one to assess how well the cows' genetics for milk production are matching the forage nutrient supply. Assessing body condition pre-breeding aids in developing a breeding plan by assessing the probability of female yaks being anestrous. Cows which have lost body condition from calving to breeding may not breed back as quickly extending the calving interval. If cows maintain BCS after calving and are cycling, then other factors should be evaluated for troubleshooting reproductive issues.

Conclusion

Adoption of a BCS system for yaks will improve the production efficiency of yak operations. Feeding yak cows to near ideal BCS at calving and maintaining cows at an ideal BCS from calving until breeding will optimize reproductive success. Body condition scores should be assigned and recorded at 90 days pre-calving, at calving, and at weaning to effectively evaluate the nutritional plane provided to the yak herd.

Table 2. Palpation and physical description for assessing body condition of yaks.

1. Very thin. Bone structure of shoulder, ribs, vertebrae, and hips are sharp to the touch and can be visible with short hair. Shoulder has no muscle cover, spine/back is angular and tent-shaped. Hump sharp and narrow and flat-sided with sharp contrast between hump and shoulder. Muscle between hooks and pins is concave. Hindquarters has little expression, flat and triangular. Tailhead area devoid of fat and deeply sunken on sides giving appearance tailhead is very high above hips. Movement is impeded and animal may appear lethargic.
2. No evidence of fat. Bone structure of shoulder, ribs, vertebrae, and hips are sharp to touch. Some muscle over shoulder blade and less angularity of back. The hip area lacks muscle and is concave. Little muscle expression in hindquarter. Tailhead is angular and appears raised above hip/rump.
3. Back muscle is near flat with slight fat over the side edge. Ribs, point of shoulder and hip bones have no fat cover and are slightly sharp. Muscling over shoulder blade and muscle in hip area is near flat. No fat around tailhead. Hindquarter is flat.
4. Foreribs have some fat cover while last 2-3 ribs lack cover. Back is flat and has slight amount of fat coverage. Hip area is flat with some fat accumulation around tailhead. Hindquarter is full but has no expression appearing flat. Shoulder blade is covered with some fat while point of shoulder remains sharp. No brisket fat accumulation.
5. Back and hip region is flat and edges of vertebrae are only noted with firm pressure. All ribs have some fat coverage. Shoulder blade has some condition covering. Hump blends smoothly into shoulder. Hip bones still have none to little fat over them. Very slight tailhead fat accumulation. Hindquarter is full and has slight roundness and expression of muscling.
6. Ribs are covered with noticeable sponginess over foreribs and shoulder. Noticeable fat accumulation over rear hip bone (pins) and slight fat coverage over front hips (hooks). Back is flat and wide. Moderate fat accumulation around tailhead. Hindquarters are full and expressive.
7. Point of shoulder is not sharp but covered. Fat accumulation over hooks and pins quite noticeable. Tailhead is buried in fat. Sponginess felt over dorsal (upper) region of ribs.
8. Animal has smooth, slightly blocky or rectangular appearance. No bone structure is visible and firm pressure needed to feel skeletal features. May be slight patchiness of fat coverage. Significant coverage of ventral (lower) foreribs and mild amount of brisket fat. Hump is wide and round on top.
9. Extremely fat. No bone structure can be seen and requires firm pressure to feel ribs, vertebrae, hip bones. Brisket fat has accumulated. Tailhead and rear hip bones buried in fat. Animal underline appears saggy. The animal's mobility is impacted with a near waddling stride noted.

Figure 3. BCS 1 top view; note pointed spine, visible ribs.



Figure 4. BCS 1 side view with no muscle over shoulder, hip region or hind quarters; angular shape of back and tailhead.



Figure 5. BCS 3: the shoulder blade is visible, hooks and pins lack covering, little muscle in hindquarter, slight angularity to back and hump.



Figure 6. BCS 3 top view; notice steep angularity of hump, spine is easily visible and tail head is "tented."

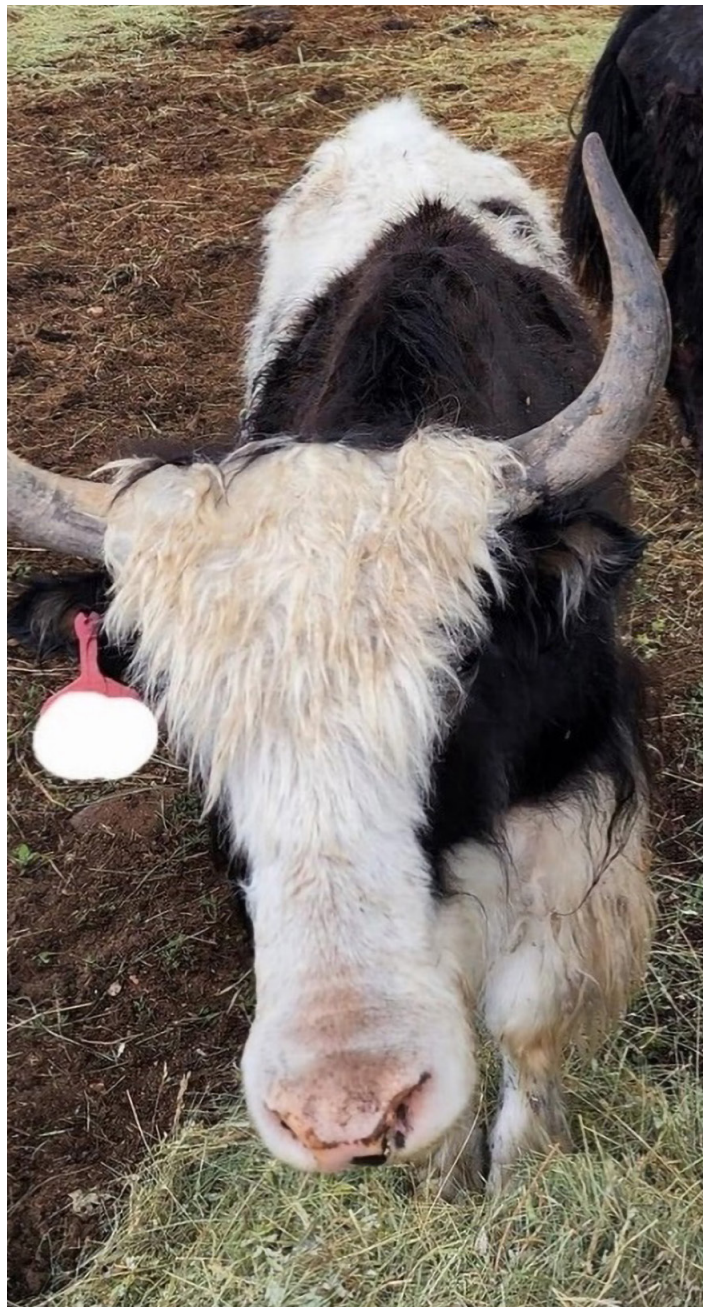


Figure 7. BCS 4; note her shoulder and hips are prominent, steeper slope of loin/back.



Figure 8. BCS 4 spine is quite noticeable and topline has a steep angle.



Figure 9. BCS 5; hump blends into shoulder, shoulder and ribs covered, hooks/pins appear smooth.



Figure 10. BCS 5 top view showing flat back, roundness in hump, slight angularity of tailhead.

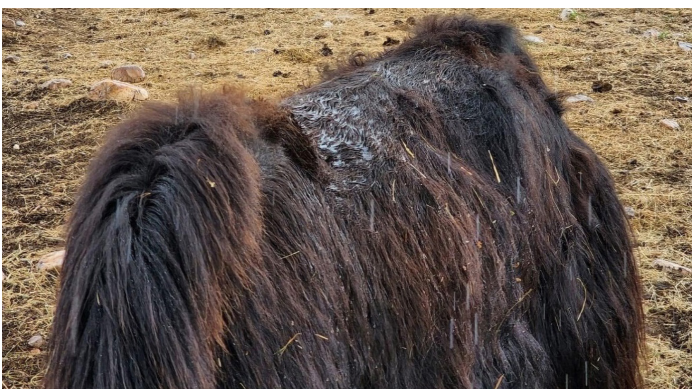


Figure 11. BCS 6: smooth body appearance, flat back and hip region, muscle expression over shoulder and hindquarter.



Figure 12. BCS 6 top view; note flat back and roundness over hump.

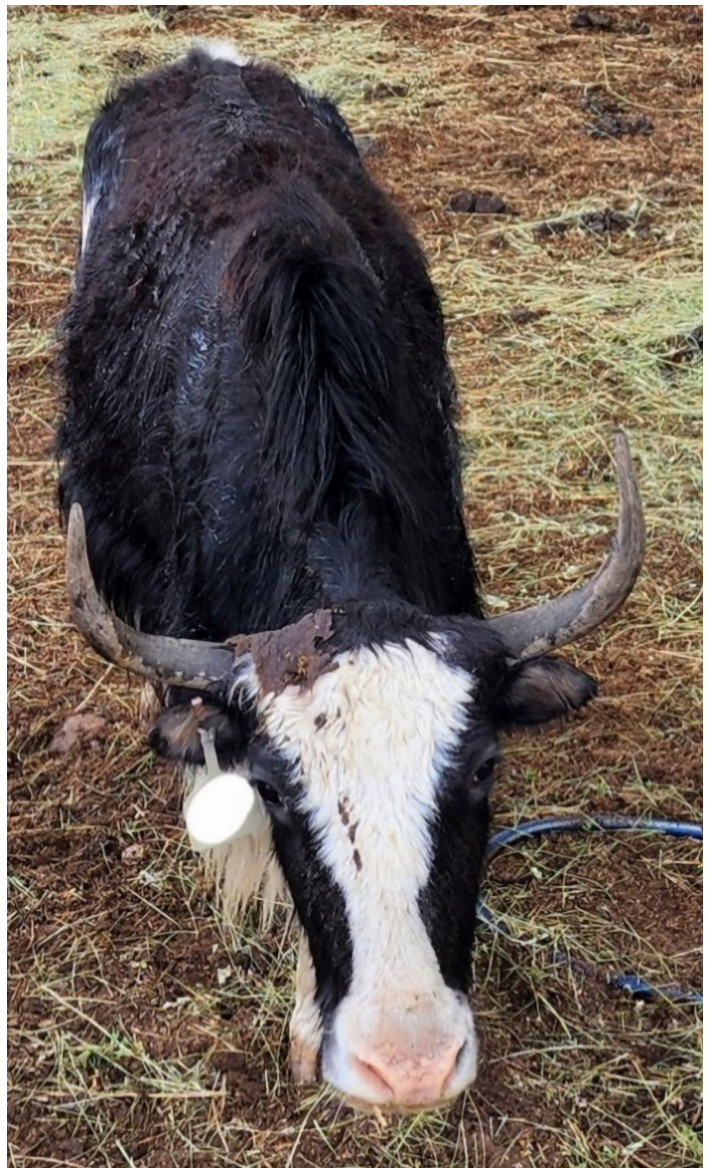


Figure 13. BCS 8; looking through the hair, the animal appears blocky in appearance.



Figure 14. BCS 8; very wide, flat back, wide hump, tailhead buried.



Figure 15. BCS 6; hump is round and blends smoothly into shoulder, back is wide and broad, ribs are covered, hooks/pins smooth, tailhead is showing some fat accumulation, overall slick and slightly blocky appearance.



Figure 16. BCS 4; hump and back showing some angularity, more sharpness to hook/pins with slight concave appearance of muscle between hip bones, tailhead slightly raised. Ribs and shoulders covered.



Figure 17. Depiction of a cross-section of the loin region showing a) left side being a high BCS having a full longissimus muscle and moderate subcutaneous fat and b) right side showing low BCS where the muscle mass and subcutaneous fat has been mobilized.



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