



## Body Condition Score (BCS) In Goats

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Goats make up 26% of the livestock population in India, and they are thought to be responsible for 70–80% of the country's sales of livestock products. Goats are typically held by underprivileged families, which has an impact on their livelihoods and financial security. This small ruminant farm animal has a great deal of potential to be projected as the "Future Animal" for rural and urban prosperity in the current situation of shifting agroclimatic circumstances (Gosh *et al.*, 2019).

Every goat farmer has either under- or over-conditioned animals that are either too thin or too fat. In terms of reduced fertility, higher disease or internal parasite incidence, decreased milk output, and increased operating costs, failing to identify these animals and take appropriate treatment will be costly. Goats must be kept in good level of body condition. So, the moderate body condition should be maintained, producers need to learn how to assess the body condition of their goats (Villaquiran *et al.*, 2005).

Several methods have been developed for evaluating the level of energy reserves in ruminants. These methods vary considerably in their complexity and in the equipment required as well as in the degree of precision of the estimates of stored fat. The methods include live weight (LW), Body Condition Score (BCS), Adipocyte size and ultrasonography (Mendizabal *et al.*, 2011).

Body Condition Score is the easiest and best method to evaluate the nutritional status or the amount of body fat deposit for goats. BCS is a widely used to indicate the post-nutritional state, because it is the best indicator of body fat stores that an animal can employ when faced with high energy demands, numerous stresses, or lack of food (Caldeira and Portugal, 2007).

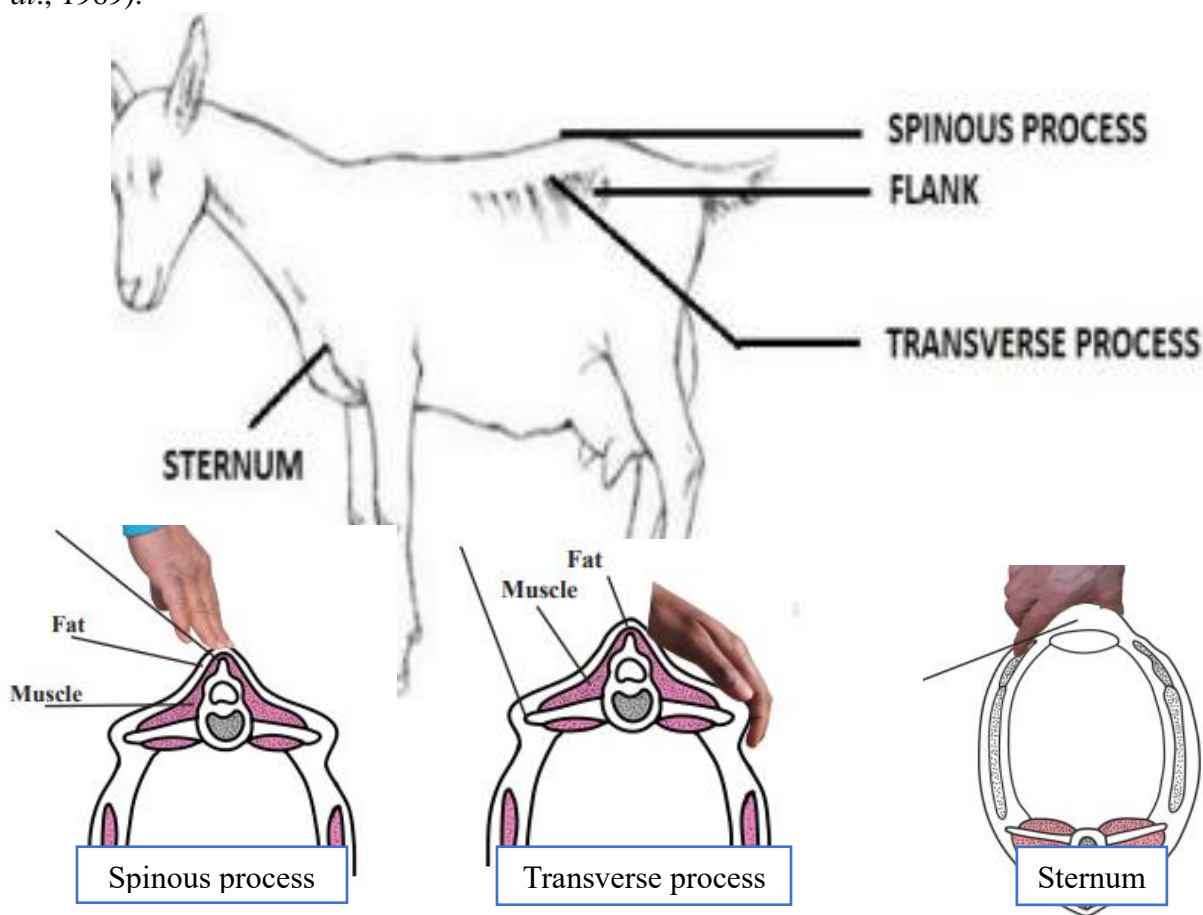
### Advantage of BCS over others

In farm, status of the animal is usually monitored by measuring the body weight or heart girth,

but the methods have number of disadvantages. Firstly, weight scales are unwieldy, expensive and difficult to transport. Secondly, weight alone does not accurately reflect an animal's health; an animal with a large frame may weigh more when its body reserves are low than an animal with a small frame and abundant reserves. For this reason, each animal must be identified separately in order to track the seasonal weight change.

Thirdly, significant changes in gut and bladder fill, pregnancy, and parturition can have an impact on live weight. Furthermore, weight fluctuations are caused more by tissue hydration than by major changes in the protein or fat composition (Ghosh *et al.*, 2019). The heart girth measurement requires individual animals to be restrained and results vary according to the posture, positioning and tension of the tape, coat thickness and gut fill.

BCS provides a measure of fat cover on the goat irrespective of body size. BCS accomplished by assigning a score to the amount of fat observed at several skeletal checkpoints on the goat (Fig. 1). These checkpoints include spinous processes, transverse processes, hooks, pins, and tail head (Russel *et al.*, 1969).



**Fig.1: Schematic diagram for Body Condition Score (BCS)****Methods of Scoring**

Goats are scored using a BCS that ranges from 1.0 to 5.0 in 0.5 increments. It is important to remember that BCS cannot be determined by just looking at an animal. The animal must be felt and palpated to determine the score (Detweiler *et al.*, 2008).

With practice, evaluating the BCS of an animal will only take about 10-15 seconds. For a healthy and productive herd, it is easy to monitor feeding and herd health programmes efficiently by include BCS as a regular part of the management programme.

A BCS of 1.0 is an extremely thin goat with no fat reserves and a BCS of 5.0 is an over-conditioned (obese) goat. In most cases, healthy goats should have a BCS of 2.5 to 4.0. BCS of 1.0, 1.5, or 2.0 indicate a management or health problem. A BCS of 4.5 or 5 is never observed in goats under normal management conditions; however, these BCS can sometimes be observed in show goats (Villaquiran *et al.*, 2005).

**Body condition score (BCS) grading**

**BCS 1.0:** The goat is visually emaciated and weak. The backbone is highly visible and forms a continuous ridge. The flank is hollow and ribs are clearly visible. There is no fat cover and fingers can easily penetrate into the intercostal spaces. The spinous process of the lumbar vertebrae can be grasped easily between the thumb and forefinger; the spinous process is rough, prominent, and distinct giving a saw-tooth appearance. Less amount of muscle and absence of fat can be felt between the skin and bone. There is a deep depression in the transition from the spinous to transverse process. The hand can easily grasp the transverse process of the lumbar vertebrae which is very prominent. Sternal fat can be easily grasped between thumb and fingers and moved from side to side. The cartilage and joints joining ribs and sternum can easily felt.

**BCS 2.0:** The goat's backbone is still visible with a continuous ridge. Some ribs can be seen and there is a small amount of fat cover. Ribs are still felt and intercostal spaces are smooth, can still be penetrated. The spinous process of the lumbar vertebrae is evident and can be grasped between the thumb and forefinger. There is an obvious depression in the transition from the spinous to transverse process. The hand can grasp the transverse process but the outline of the transverse process is difficult to see. Sternal fat is wider and thicker but can still be grasped and lifted by the thumb and forefinger. The fat layer can be moved slightly from side to side.



**BCS 3.0:** The backbone is not prominent; ribs are barely discernible and an even layer of fat covers the ribs. Intercostal spaces are felt applying pressure. The spinous process of the lumbar vertebrae cannot be easily grasped because the tissue layer covering the vertebrae is thick. When running a finger over the spinous process, a slight hollow is felt. There is a smooth slope in the transition from the spinous to transverse process. The outline of the transverse process of the lumbar vertebrae is slightly discernible. Sternal fat is wide and thick.

**BCS 4.0:** The backbone and ribs cannot be seen. The side of the animal is glossy in appearance. The Sternal fat is difficult to grasp because of its width and depth. Which cannot be moved from side to side. The spinous process of the lumbar vertebrae cannot be grasped, which is wrapped in a thick layer of muscle and fat. The outline of the transverse process of the lumbar vertebrae is no longer discernible. The transverse process forms a smooth, rounded edge, with no individual vertebrae discernible.

**BCS 5.0:** The backbone is buried in fat and the ribs are not visible. The rib cage is covered with excessive fat. The thickness of the muscle and fat is more. The spinous process forms a depression along the backbone and there is a bulging transition from the spinous to transverse process. The transverse process cannot be grasped. The sternal fat extends and covers the sternum, joining fat covering cartilage and ribs (Villaquiran *et al.*, 2005).

## References

- Caldeira, R.M., Portugal, A.V. (2007). Relationships of body composition and fat partition with Body Condition Score in Serra da Estrela ewes. *Asian-australas.J.Anim.Sci*, 20:1108-1114.
- Colomer, F., Morand-Fehr, P., Kirton, A. H. (1987). Standard Methods and Procedures for Goat Carcass Evaluation, Jointing and Tissue Separation. *Livest. Prod. Sci*, 17: 149–159.
- Detweiler, G.T., Gipson, R.C., Merkel, A. and Sahlu, T. (2008) Body Condition Score in Goats. In Proc. 23<sup>rd</sup> Ann. Goat Field Day, Langston University, Langston, 127-133.
- Ghosh, C. P., Datta, S., Mandal, D., Das, A. K., Roy, D. C., Roy, A. and Tudu, N. K. (2019). Body condition scoring in goat: Impact and significance. *J. Entomol. Zool. Stud*, 7(2), 554-560.
- Mendizabal, J. A., Delfa, R., Arana, A. and Purroy, A. (2011). Body condition score and fat mobilization as management tools for goats on native pastures. *Small Rumin.Res*, 98(1-3), 121-127.
- Russel, A.J.F., Doney, J.M. and Gunn, R.G. (1969). Subjective assessment of body fat in live sheep. *J. Agri. Sci*, 72:451-454.
- Villaquiran, M.T., Gipson, R.C., Merkel, A. and Sahlu, T. (2005). Body Condition Scoring for Improved Management. In Proc. 20<sup>th</sup> Ann. Goat Field Day, Langston University, Langston, 111-117.