

Condition scoring in herd management

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Profitability in the cattle business depends on meeting cow performance goals for growth, reproduction, replacement rates and production. Feed costs are generally the highest annual variable cost associated with cattle production (50-60% of the total costs).

Nutrition is also the most important factor influencing reproductive performance and productivity. Thus, the objective of any good feeding programme should be to ensure optimum fertility and production at the minimum cost to the producer.

A very important concept for nutritional management is the biological priority for nutrients (Fig. 1).

The main concept is that a cow will not reproduce unless all other requirements, such as maintenance,

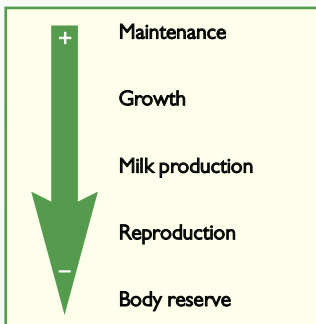


Fig. 1. Priority of nutritional requirements for the cow.

growth and milk production, are met. When all current requirements are fulfilled, the excess energy is stored as fat.

There are several criteria which can help to monitor energy balance in animals, such as, body condition score, milk protein percentage, milk production records, dietary analysis, and assessment of blood and liver concentrations of various metabolites or trace elements. One tool, body condition scoring (BCS), can be easily adapted and utilised by producers to evaluate the energy reserves of cows.

Essentially, BCS is a way to estimate the relative fatness or body energy reserves of the animal. This evaluation is accomplished by assigning a score to the amount of fat observed on several parts of the

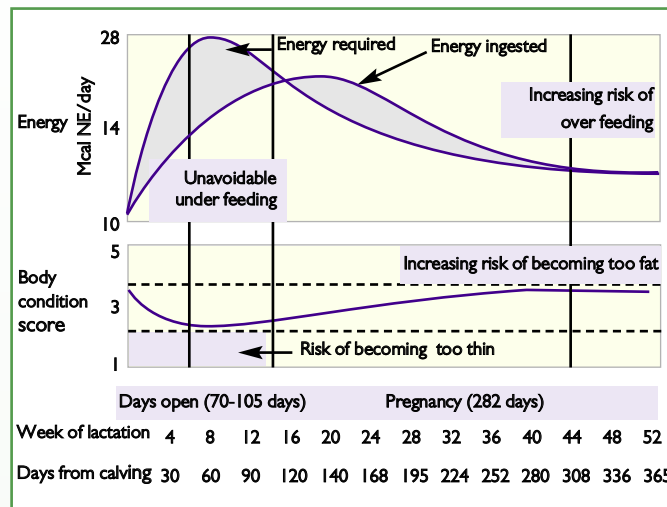


Fig. 2. Energy requirements and intake, and body condition score (Adapted from Michael A. Wattiaux, Babcock Institute, Winconsin University).

cow. Various systems are used to score the animal (in the United States and Ireland a five point BCS system is used for dairy cows, whereas, Australia and New Zealand use eight and ten point scales, respectively).

The most common BCS system ranks cows from one to five, with a score of one being thin, and a score of five being obese. It was developed in the 1980s and simplified in 1994 by J. Ferguson at the University of Pennsylvania.

Importance of BCS

It is common knowledge that feed intake in early lactating cows cannot support the energy and protein requirements for milk yield and maintenance.

Milk production reaches the maximum in the first third of lactation and is associated with exceptionally high nutritional demands. However, feed intake lags behind peak milk production by some weeks (Fig. 2).

As a consequence, the high yielding cow is often in negative energy balance and uses available body fat reserves to overcome the energy deficit, which results in some body weight loss. Thus, it is normal for

relationship of body condition to health, reproduction, feed intake, and milk production. Table 1 shows recommended BCS at various stages of the production cycle. The most important score is the body condition at calving, which is an essential factor for optimum reproductive performance.

Dairy cows that are over conditioned at calving are more susceptible to metabolic problems and infections and are more likely to have difficulty at calving.

On the other hand, under conditioning can frequently lower production and milk fat levels because of insufficient energy and protein reserves. Thin cows often do not show heat (increasing the interval from calving to oestrus) and decrease first service conception rates.

Cattle that lose more condition and weight after calving have increased incidence of certain diseases (such as ketosis, displaced abomasums, retention of placenta and metritis). Therefore, the goal is to have cows in good condition at calving: not too thin and not too fat.

Thin cows need to increase body condition and moderate condition cows need to maintain body condition. Correcting deficiencies prior to calving is easier and cheaper. It is generally agreed that cows should

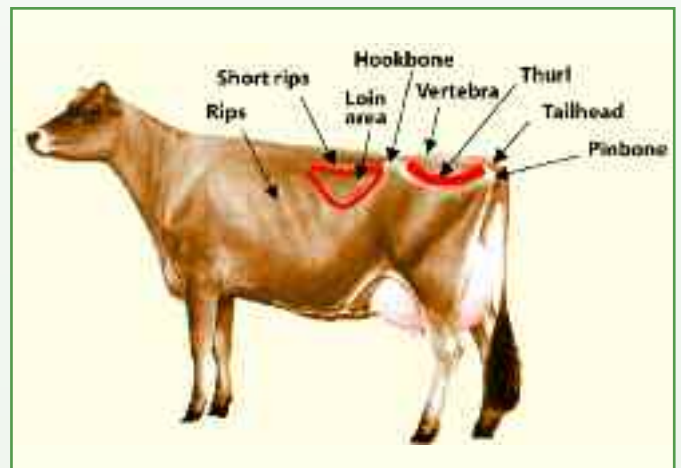
high producing cows to lose some weight in early lactation.

Adult cows can lose 30-60kg body mass during the first 80 days of lactation, representing a drop of 1.0-1.5 points in condition score.

The most important thing is that the cow starts lactation with enough but not too much energy reserves, and that the amount of fat and rate of fat mobilisation is not too high.

Research demonstrates the rela-

Fig. 3. Identification of some body parts used to assign body condition scores.



have an average body condition score of 3.5 at calving to ensure that there are enough body energy reserves available to supply the difference between dietary energy intake and the requirements for maintenance and milk production during early lactation.

Preventing excessive mobilisation of body fat in the first third of lactation is also of primary importance for subsequent fertility. To avoid metabolic problems, the most important thing is that the amount of fat mobilised and rate of fat mobilisation is not too high.

A loss of 0.5 body condition score in four to five weeks is normal and indicates proper management.

Excessive condition loss (>1 unit) and thin body condition at insemination (<2.5) have been associated with lower conception rates at first service. A major goal of proper feeding in this period is to maximise feed intake. The sooner a cow reaches high levels of feed intake, the sooner she moves out of negative energy balance. Additionally, increasing the energy density of the diets in the first three weeks of lactation is also essential.

Adequate dietary energy should come from high quality forages, grains or supplemental fats. Diets should be formulated to meet the cow's energy requirement without feeding excessive grain causing acidosis, metabolic disorders or off-feed problems.

By 80-120 days into the lactation, the nutritional objective is to meet or slightly exceed energy requirements so cows can begin to regain body condition, which will be essential for strong exhibition of oestrus and conception.

During the late lactation the recommended score is about 3.5 and the nutritional objective is to completely replenish body fat reserves, but without over-conditioning.

How to BCS dairy cows

The most prevalent method of body condition scoring is based on visual and tactile appraisal of subcutaneous fat in the the loin, rump, and tail head, in which cows are assigned a BCS based on a five point scale (1 = emaciated, 3 = average, and 5 = obese).

Although most body condition scoring is done from directly behind the animal, it is a good idea to observe the cow from the side to get some idea of the depression in the thurl and the loin area.

The scores are determined by various key areas of the cow – vertebrae, the ileal (hook bone) and ischeal (pin bone) tuberosities, the ligaments going to the hook and pin bones from the spine (sacral ligaments), the thurl area, the loin area, and the tailhead (Fig. 3 and 4).

STAGE OF LACTATION IDEAL SCORE (RANGE)

● Dry

3.5 (3.25-3.75)

Condition should be 'fit but not fat', and should be such to allow a moderate level of supplementation to prepare cows for early lactation.

● Calving

3.5 (3.25-3.75)

Failure to replenish energy reserves (BCS<3.25) will limit milk production during the upcoming lactation. Too much energy provided in late lactation or dry period can lead to a BCS>3.75. Feed low energy ration balanced for protein, mineral and vitamins.

● Early lactation

3.0 (2.50-3.25)

Dairy cows are under considerable nutritional stress and adequate feeding is essential to avoid excessive weight loss. Remember that high levels of milk production and good body condition can only be achieved when feed intake is maximised. Try to maintain cows in the score three range and allow the cow to regain positive energy balance. If many cows fall to score two, especially if they are not high producers, check feed intake. If cows remain in good condition (3-3.5), but do not peak very high, check for inadequate protein, macro minerals or water intake.

● Mid lactation

3.25 (2.75-3.25)

The nutritional objective is to meet or slightly exceed energy requirements so body reserves can be built-up. If cows become over-conditioned (3.5-4.0), reduce energy intake. If cows become under-conditioned (2-2.5 range), the ration is probably low in energy. Check the early lactation ration as well because the problem often begins at this time.

● Late lactation

3.5 (3.00-3.50)

The nutritional goals are to replenish body fat reserves, yet prevent over-conditioning. If cows are in the low three range, increase dietary energy to the mid-lactation group. Also, examine early lactation diets because conditioning problems in late lactation may begin during early as well as mid-lactation. If many cows reach the condition four range, reduce dietary energy concentration. BS>3.75 also may result from extended calving intervals.

Table 1. Target body condition scores at various stages of the production cycle (Adapted from Ferguson, et al. 1994, Richard J. Grant and Jeffrey F. Keown).

Studies have shown that the amount of fat at these points on the body is related to the amount of fat inside of the cow.

● The backbone and the rear view of the hook bones. The spinal processes of the backbone can be described by the degree with which the vertebrae 'stick out' and the degree to which they are surrounded by deep depressions on each side of them. If the depressions are very deep and the shapes of the vertebra are clearly visible the score will be one. If the skin is distended and the vertebra are hardly apparent because they are 'buried' deeply in adipose tissue then we talk of a score of four or five.

The pin and the hook bone are described by the degree of fat around, as 'angular' (BCS≤2.75 and ≤2.50, respectively) or 'rounded' (≥3.00 and ≥2.75, respectively).

● Site view of the line between the hook and the pinbones. It can be described by drawing an 'imaginary' line from the hook, to the thurl, to the pin bone (Fig. 3): 'V-shaped', 'U shaped' or flat. If the line forms a 'V', the score will be ≤3.00. If the line forms a 'U', the score will be ≥3.00. If the thurl is flat, the cow has a BCS of greater than 4.00.

● Cavity between tailhead and pin-

and the pin bones 'falls' into a 'sharp 'V' and is deeply sunken, and the inside of the pins is hollow, the cow is in score one. There is just no fat to keep the tail 'up'. Also, the absence of subcutaneous fat.

● Site view of the loin area and the short ribs. The view of the lateral side helps to make an additional decision. It is described by the degree to which the loin area is sunken and the amount of fat covering the short ribs and the ribs.

Conclusion

The cow's body condition relates to the animal's energy balance and overall performance. Therefore, body condition scoring can be an important tool in dairy herd management.

It is important to do the evaluation regularly, to record the results, and judge the changes of the body condition over the whole production cycle. This allows producers to make dietary changes to minimise excessive loss in early lactation or unwanted gain at the end of lactation.

Although it is a quite subjective assessment, what really counts is to be consistent in the pattern of discerning between scores. Therefore, the same person should always make the evaluation.

Otherwise one can compare the results only badly, and this is absolutely important for the evaluation of the changes in energy status of the herd over the lactation.

Target scores help determine what degree of fatness to aim for in the different stages of the production cycle. ■

bone. It can be described by depression around the tail: hollow or not hollow. If the area between the tail

Fig. 4. Body condition scores (Adapted by Michael A. Wattiaux; Edmondson, et al. 1989).

Body parts	Vertebrae in the loin area	Cross section at the hook bones	Line from hook bone to pin bone	Cavity between tailhead and pin bone
Score	Rear	Rear	Side	Rear Angled
1. Severe under conditioning or extremely thin				
2. Frame obvious				
3. Frame and covering well balanced				
4. Frame not as visible as covering				
5. Severe over conditioning or extremely fat				