



agriculture & rural development

Department:
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PROVINCE OF KWAZULU-NATAL

DAIRYING IN KWAZULU-NATAL

Condition Scoring of Dairy Cows

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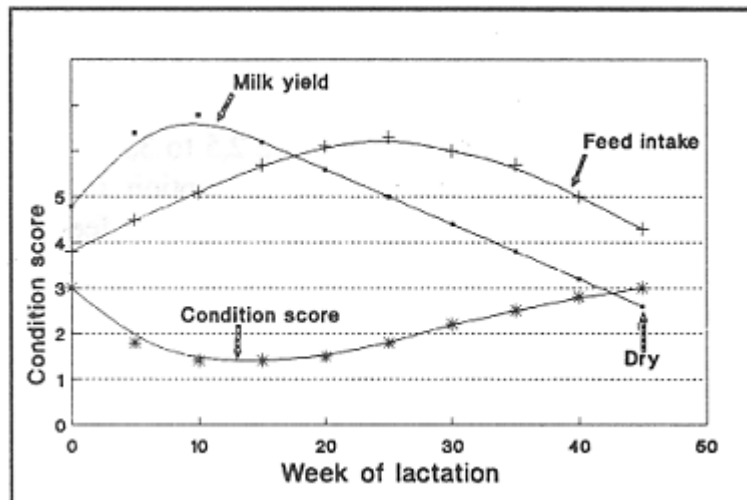
"Dairy cows have a remarkable ability to buffer nutritional insults."

- Dr William Broster

INTRODUCTION

In early lactation, high potential dairy cows frequently produce far more milk than can be supported by feed intake alone. They do this by drawing on body reserves that were built up before calving. This phenomenon is shown in Figure 1 where the condition score decreases due to the withdrawal of body reserves.

Figure 1. Relative changes in milk yield, feed intake and condition score over the lactation



Few farmers weigh their cows at regular intervals, and, even if they do, live-mass alone is not a good indicator of body reserves. Cows of similar mass could be small and fat, or large and thin. Similarly, cows could have the same body reserves and yet have very different

masses. Live-mass is also affected by gut fill and by pregnancy. Body condition scoring is a technique for quickly and reliably estimating the body reserves of cows. These scores can then be used in making management decisions.

THE TECHNIQUE

The local condition scoring technique is based on the method developed at the British National Institute of Research in Dairying (NIRD). Two score areas are involved namely the loin area and the tailhead area subjectively, by feeling with the hand the amount of fat cover over the transverse processes (horizontal projections) of the lumbar vertebrae, and around the tailhead. The cow is awarded a condition score on a scale of 0 (very poor) to 5 (grossly fat), with half scores to give an 11-point scale. In most cases, the tailhead score is used, but this may be adjusted by half a point if it differs greatly from the loin score (See page of definitions also depicting photographic and graphic standards of the scoring scale at the end of this leaflet. For practical use, it is suggested that this page be removed and stored in a plastic sleeve.)

SCORING METHOD

- Keep the page of definitions in one hand and check them frequently while scoring.
- Score the tailhead area by feeling the amount of fatness. This gives a better estimate than visual inspection alone because of the set of tailhead and thickness of coat.
- Score the loin area in a similar way, using the same hand, when the cow is relaxed.
- Assess the scores to the nearest half point. Cows must be handled for accurate assessment of half points.
- If the tailhead score differs from the loin score by one point or more, adjust the tailhead score accordingly by no more than half a point as shown in Table 1. The adjusted tailhead score is then used as the condition score.

Figure 2. The two score areas

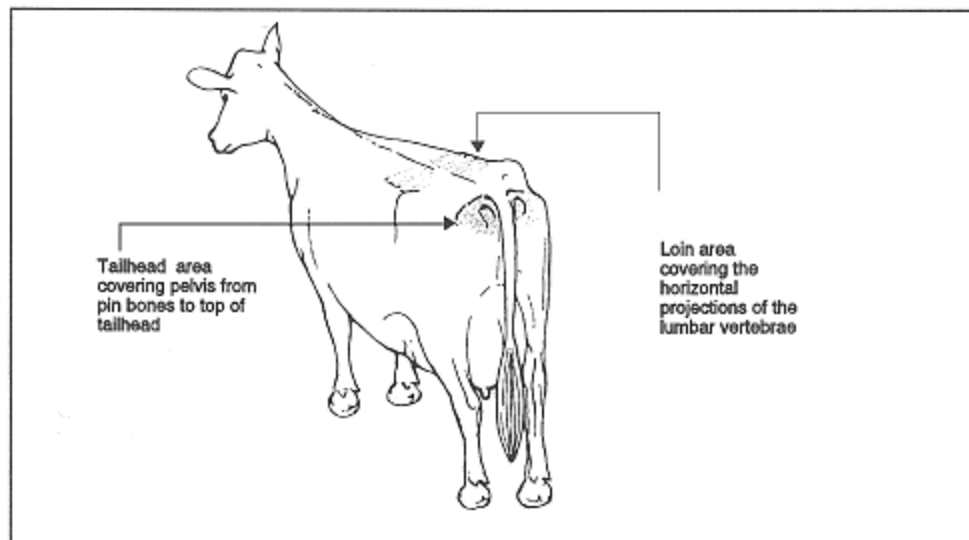


Table 1. Adjustment of tailhead score according to loin score

Tailhead score	Loin	Difference	Adjustment	Adjusted tailhead score
4.0	2.5	1.5	- 0.5	3.5
1.5	2.5	1.0	+ 0.5	2.0
3.0	2.5	0.5	none	3.0

Get together at regular intervals, at least twice a year, with other condition scorers to revise technique and scores. good stockmen who like their cows tend to over score. Experience has shown that people who work in isolation with only one herd tend to drift away from the definitions. For example, if that herd is generally a bit thin, and has few or no cows with condition scores greater than 2,5, the 2,5's will inevitably become 3's and so on. Regular comparison with friends and colleagues is essential.

CONDITION SCORE AND LIVE-MASS CHANGE

It is apparent that there is a relationship between condition score and live-mass change. This is not a straightforward relationship, however, as it is complicated by stage of pregnancy and age of cow. It is normal for high yielding adult cows to lose 30 to 60 kg body mass during the first 80 days of lactation, representing a drop of 1 to 1,5 points in condition score. In an investigation on the influence of condition score on live-mass at Cedara, it was found that one condition score point represented, for Holstein-Friesland, a change in live-mass of 44 kg for cows with the same frame size, determined by body measurements.

CONDITION SCORE AND MAIDEN HEIFERS

Work at the NIRD indicates that maiden heifers at service should be at condition score 2,5 to 3,5 to give the best conception rates. The conception rate of heifers below score 2 will respond to extra feeding both before and after service time (e.g. an extra 2 kg of concentrate 6 weeks before to six weeks after service). Do not allow heifers to reach a score of 4 or more, because conception rates will be reduced; restrict feed if necessary. Heifers should be fed to grow steadily from birth to first calving. They should not be suddenly pushed if they are too light or too thin at any time. Rather accept a slightly older age at first calving than try to compensate completely for past mistakes.

CONDITION SCORE AND MILK YIELD

The cow's milk production in any lactation is the result of interactions between genetic potential, nutritional and environmental factors including, specifically, body condition at calving and the system of management. The most important score is the score at calving. If this score is correct, it is possible to ensure that scores at other stages will also be correct. The condition at calving is dependent on the condition at the start of the dry period, and the level of feeding prior to calving. It is generally agreed that cows should have an average condition score of between 2,5 and 3,5 at calving. They therefore have the opportunity to mobilize reserves in early lactation and to 'milk off their backs'. One kilogram in live-mass can be converted to about 5 to 8 kg milk, clearly illustrating the importance of cows being good condition at

calving. Supporting evidence for this target condition score at calving on milk yield is presented in Table 2. Cows were classified into groups according to their score at calving, and actual performance related to predicted performance for the different groups.

Table 2. Effect of condition score at calving on milk yield (Haresign, 1981)

Score at calving	Number of cows	Difference in milk yield per day (kg)	Difference in total yield 0 to 84 days (kg)
0.5 to 1.5	283	- 1.8	- 150
2	159	0	0
2.5 to 3.5	213	+ 1.1	+ 95
4	8	- 1.8	- 150

Taking the yield of cows calving at a condition score of 2 as average (Table 2), those in poor condition and those at a condition score of 4 had markedly lower yields than average. It would be expected that these results would translate into losses of over 1 000 kg over the whole lactation for the very thin and very fat cows. The highest yields were obtained from cows calving at condition score 2,5 to 3,5. Cows at condition score 3,5 produced 182 kg more milk during the first 84 days of lactation than predicted. Cows which calve at a condition score of greater than 3,5 are more susceptible to severe metabolic and physical problems. Excess fat leads to fat infiltration of the liver (fatty liver). These cows have difficulty in establishing their normal feed intakes after calving, and this reduced intake, coupled with heavy lactation, leads to a rapid mass and condition loss. The result of this excessive fat mobilization, caused by the sudden energy crisis, is ketosis. Other conditions to which obese cows are more susceptible include milk fever, digestive disorders (displaced abomasum), infectious diseases (such as mastitis), and reproductive disorders such as retained placenta and metritis.

Several studies have shown differences in the response of milk yield to condition score at calving. These differences can be explained largely by differences in the composition of the rations fed to cows, and the feeding regime. Research indicates that there is a complex interaction between the cow's genetic potential and her level of body energy reserves on the one hand, and diet composition (fibre content and energy concentration) on the other hand. If a cow that is thin at calving is to achieve her potential milk yield, she must be given the opportunity of consuming sufficient dietary energy and protein to meet her requirements. Dietary factors such as grazing intake could prevent her from reaching a desired intake to meet her requirements. When diets with a high fibre content or low energy concentration are offered to cows, intake is more limited by the physical capacity of the rumen than by physiological mechanisms. The well-documented observation that fat cows eat less than thin cows is an indication of these physiological feedback mechanisms. Good stockmen should try to balance the various dietary factors and cow factors which physically and physiologically influence intake. Cows that are thin at calving can only achieve intakes of energy that are high enough to meet their requirements for milk production when offered diets that will not lead to substantial restriction by physical capacity. If restricted rumen capacity or bulky diets are a problem, the logical approach would be to have these cows in a better body condition at

calving, but keeping in mind that over-conditioned cows have a physiological mechanism which can also impair intake. From examination of intakes of cows on pasture systems, it is generally accepted that their intakes are lower than when the same cows are offered a high energy total mixed diet. In early lactation, it is therefore unlikely that the dietary intake of high-producing cows grazing pasture or consuming long hay will supply the total energy demand, and body reserves will be needed.

The whole process of cyclic changes in mass and condition score, with cows losing condition in early lactation and gaining condition again in late lactation or the dry period, is considered to be a biologically inefficient process. The efficiency of conversion of dietary energy to milk energy is 0.62, but when this energy is stored in body fat, and later used for milk production, the efficiency factor is 0.51. The indirect route is still less efficient if body reserves are laid down during the dry period. The dry period is not the time to condition cows. Body reserve recovery should take place from mid to late lactation, while the cow is still in milk. Cows in milk are about 25 per cent more efficient at feed conversion than are dry cows, therefore it is more cost effective to regain lost condition during lactation. Whether or not the differences in biological efficiency, shown above for energy utilization *via* the direct or the indirect route, can be directly related to economic efficiency, will depend on the relative costs of feeds used to increase condition before calving, and for milk production in early lactation. British results have shown that it is only economically more efficient to have cows in good condition at calving when the extra condition was produced from well-managed grassland.

CONDITION SCORE AND REPRODUCTION

A relationship between body condition and fertility has not been fully established. Despite this, there is evidence which suggests that conception rates are impaired if cows are served at condition scores below 2. When condition scores drop below 2, fewer cows come into oestrus, and conception rate in those that do is usually low. Work done at NIRD illustrates this trend (Table 3).

Table 3. Effect of condition score on conception rates (MAFF, 1978)

Condition score	Conception rate (%)
Below 1.5	52
1.5	56
2.0	68
2.0 +	72

Research has also shown that cows, with a condition score of above 3.5 at calving, lost more condition in early lactation, had longer intervals to first oestrus and conception, and required more services per conception. It is evident that the rate and extent of live-mass loss and mobilization of body reserves resulting from a negative energy balance, are associated with a reduction in reproductive efficiency. Cows of high potential milk yield have an even greater chance of their level of energy intake being inadequate for normal fertility. The cow should be in a stable or improving condition (and generally that means gaining mass) at the time of service. There is evidence that it is important to stem the tide of mass loss after calving as quickly as possible, and to stop the absolute loss from going too far. This 'trough mass'

should be reached at about 35 days after calving. Research has shown that the fertility of replacement heifers is also affected by level of nutrition, and change of condition score, during the mating period. The condition score at service, the rate of loss of condition score during the mating period, and nutrition before and around the time of service, are important factors which should be taken into account when attempting to improve reproductive efficiency. The emphasis should be on maintaining or improving the cow's condition during the mating period.

CONDITION SCORING AND DAIRY COW MANAGEMENT

The scoring method described above is simple, and can be carried out quickly. With a little practice it provides consistent scores. Cows can be scored when standing in abreast parlours, cubicles, crushes, feeding sheds, insemination stalls, or on cattle scales. The same scoring system can be used for dairy heifers and for different breeds.

With any recording system there are two problems to overcome. The first is to ensure that the information is recorded, the second is to ensure that it can be recovered and used. Monthly, or preferably fortnightly, recording of all cows is the simplest way of ensuring that the information is recorded. The simplest place to record condition scores, and for that matter, live-mass, is to use extra columns/rows in the milk recording book or cow byre sheet. This is especially appropriate for feeding programmes which require body score, live-mass and milk yield. The ideal cow byre sheet would have columns for milk yield, condition score, live-mass and butterfat and protein tests.

With a little practice, and with an assistant to do the writing, it is possible to weigh and score at the rate of three cows per minute. A major advantage of monthly recording is that a change in the average herd score, if any, could be an indication of feed availability to the whole herd and so ensure that supplementary feeding is appropriate. Fortnightly recording is desirable for users of computerized feeding programs or any rationing system which uses condition as a factor in determining feed requirements.

If monthly scoring is still too much trouble, then, provided that care is taken to ensure that the information is recorded conscientiously, cows can be scored at calving, when they will be isolated and handled anyway, and again at first service, pregnancy diagnosis, and drying off.

CONCLUSION

The feeding of dairy cows is a complex matter which clearly calls for an integrated approach, taking into consideration the level of energy reserves, genetic merit and diet composition. Efficient dairy production is dependent on the management of the cows' energy reserves. Monitoring body condition throughout lactation and the dry period is a useful management tool to assess these energy reserves. To get a reasonable compromise between milk yield and fertility, the aim should be to have a target condition score of 3 at calving, and a target score of 2 at service. Cows should therefore be dried off at a target score of 3 and fed to remain in this condition until calving. Scores in excess of 3,5 or less than 2,5 at both calving and drying off, must be avoided.

SCORE 3

Condition: Good

(A) Tailhead area

Fatty tissue easily felt over the whole area. Skin appears smooth but pelvis can be felt.

(B) Loin area

Ends of transverse processes can be felt with pressure but thick layer of tissue on top. Slight depression visible in loin.



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**SCORE 4**

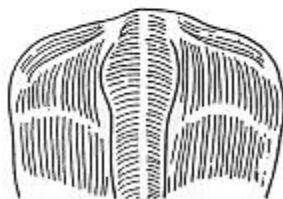
Condition: Fat

(A) Tailhead area

Folds of soft fatty tissue present. Patches of fat apparent under skin. Pelvis felt only with firm pressure.

(B) Loin area

Transverse processes cannot be felt even with firm pressure. No depression visible in loin between backbone and hip bones.



4

**SCORE 5**

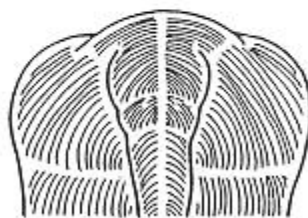
Condition: Grossly fat

(A) Tailhead area

Tailhead buried in fatty tissue. Skin distended. No part of pelvis felt even with firm pressure.

(B) Loin area

Folds of fatty tissue over transverse processes. Bone structure cannot be felt.



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Sketches reproduced by courtesy of Prof. J. Webster, University of Bristol, England.

SCORE 3

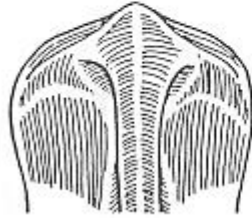
Condition: Good

(A) Tailhead area

Fatty tissue easily felt over the whole area. Skin appears smooth but pelvis can be felt.

(B) Loin area

Ends of transverse processes can be felt with pressure but thick layer of tissue on top. Slight depression visible in loin.

**3****SCORE 4**

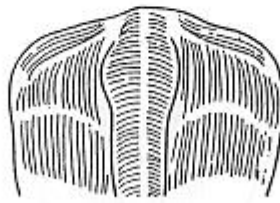
Condition: Fat

(A) Tailhead area

Folds of soft fatty tissue present. Patches of fat apparent under skin. Pelvis felt only with firm pressure.

(B) Loin area

Transverse processes cannot be felt even with firm pressure. No depression visible in loin between backbone and hip bones.

**4****SCORE 5**

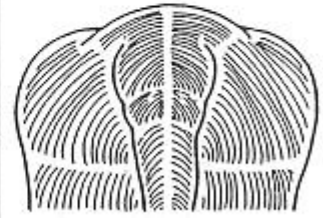
Condition: Grossly fat

(A) Tailhead area

Tailhead buried in fatty tissue. Skin distended. No part of pelvis felt even with firm pressure.

(B) Loin area

Folds of fatty tissue over transverse processes. Bone structure cannot be felt.

**5**

Sketches reproduced by courtesy of Prof. J. Webster, University of Bristol, England.

FURTHER READING

GARNSWORTHY, P.C., 1988. The effect of energy reserves at calving on performance of dairy cows, in *Nutrition and lactation in the dairy cow. Proc. of the 46th Univ. of Nottingham Easter School in Agric. Sci.*, edited by Garnsworthy, P.C. London: Butterworths.

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