Technical Note

TN588

Supporting the land-based industries for over a century

SAC

ISSN 0142 7695 • ISBN 1 85482 844 4 • January 2007

# Condition scoring the modern dairy cow

## SUMMARY


- **The condition score of a cow is a useful piece of information to have, particularly when it is recorded periodically throughout lactation and acted on**
- **Condition score is linked to fertility and energy balance**
- **Cows with a genetic tendency to lower condition scores have poorer fertility and shorter productive lives**


## The body condition scoring system

Body condition scoring of farmed livestock has been formally recognised for over 40 years as a practical and convenient way to characterise the nutritional status of animals. The use of simple observations on the animal to form a score describing the amount of fat cover is the essence of the method. The original UK work used a scale of 1 (thin) to 5 (fat) to describe cow condition. One common scoring system for dairy cows is described in the table below. Scoring methods such as these can be subdivided into half or quarter scores to make them more precise.

| **Method** | This condition scoring system is based on handling two areas of the cow to assess the level of fat cover. These are the loin area (i.e. between the hipbone and the last rib) and around the tail head. The fat cover over the loin area is the major area for condition scoring, especially thin animals. However, above a condition score of 3, the bones around the loin can no longer be felt and the amount of fat cover around the tail head is also used to assess the condition score of the cow. |
|---|---|
| **Score** | **Description** |
| **1** | The individual spinous processes are sharp to the touch and easily distinguished |
| **2** | The spinous processes can be identified individually when touched, but feel rounded rather than sharp |
| **3** | The spinous processes can only be felt with very firm pressure and the areas on either side of the tail head have some fat cover |
| **4** | Fat cover around the tail head is easily seen as slight mounds, soft to the touch. The spinous processes cannot be felt |
| **5** | The bone structure of the animal is no longer noticeable and the tail head is almost completely buried in fatty tissue |

Different scoring systems are used in different countries (1-5 in USA, UK, Ireland; 1-10 in New Zealand and 1-8 in Australia). The major difference between systems, apart from the actual score used, is whether they are entirely visual or whether they involve handling the animal, as outlined in the table above.

Body condition scoring has also been adapted by the Holstein United Kingdom (HUK) breed society as part of its Type Classification Scheme, in this case a 1 to 9 scale is used to describe body condition based on visual scores, rather than handling. Whatever the scoring system, all have the same underlying objective; to describe the fat content of the animal in a straightforward manner. One important feature of any condition scoring system is that it is independent of cow size. Thus a large cow and a small cow can have the same condition score and this indicates that they have both a similar nutritional status and a similar proportion of fat.

©The Scottish Agricultural College 2007. West Mains Road, Edinburgh EH9 3JG.
SAC receives support from the Scottish Executive Environment and Rural Affairs Department

## Why is body condition scoring important?

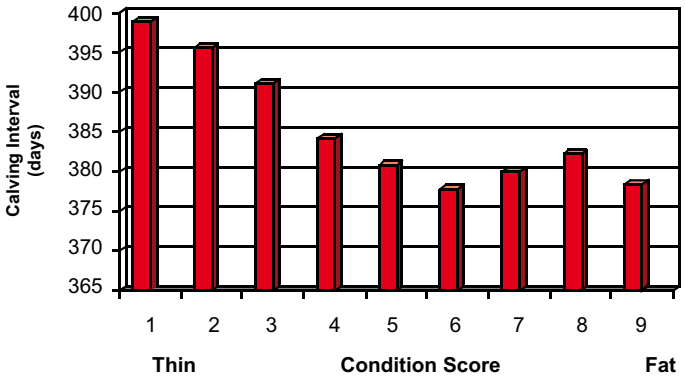
The amount of observable fat on the cow is an indication of how much energy the cow has stored away for future use. This is a useful piece of information on its own. However, it is the change in body condition that is also important for dairy cow management. Thus animals should be condition scored periodically and the consecutive scores on a particular cow compared. The action then taken because of any change is the critical feature of using the system.

The most common application for condition scoring is monitoring the effects of nutrition on the animal. However condition score is not only indicative of the nutritional status of the animal but can also be a useful guide to both fertility and efficiency. Research at SAC and elsewhere has repeatedly found a link between low condition scores and poor fertility, even after the effects of high milk yield on body reserves have been taken into account. There is also a link between high scores and infertility but high yielding cows tend not to get into this condition these days. Other research has shown that cows which have a tendency to lay down more body fat are less efficient at turning food energy into milk than thinner cows.

Recent research at SAC has shown the close link between body condition score and energy balance throughout lactation such that condition score can be used in place of energy balance in a range of breeding scenarios. Both condition score and energy balance have been shown to have a genetic basis. This allows either trait to be improved through selective breeding, which can be brought about when traits are combined together with other production and health traits into a selection index. Typical indexes found currently in the UK dairy industry are £PIN and £PLI which combine milk production and other traits into an economic index for breeding.

## Condition score and fertility

In order to achieve an annual calving, cows must become pregnant again at about 80 days after calving. Failure to achieve this results in an extended calving interval and a loss of tightness in the calving pattern of the herd. This often leads to sub-optimal management and represents a loss of profit to the herd. There is an unfavourable relationship between calving interval and condition score, and also between fertility and condition score.

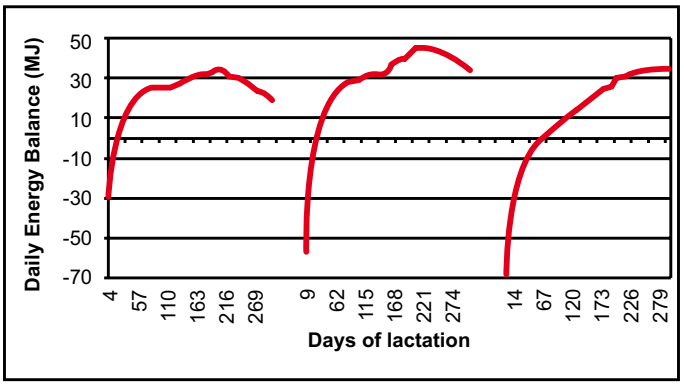


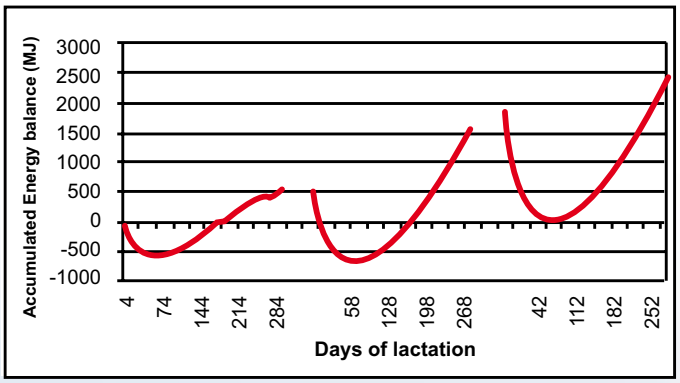

Results from analysis of HUK data, using the 1-9 visual condition scoring system, shown in the figure above, highlights the increase in calving interval with poor condition.

## Condition score and energy balance

Changes in Condition Score (CS) are the outcome of a positive or negative energy balance. If the cow takes in more energy than is expended, then she is in positive energy balance and accumulates body fat. If she expends more energy than is available from feed intake then she contributes body fat to make up the deficit. This is termed negative energy balance. This can be calculated as an accumulated energy balance by adding up each day's energy balance throughout lactation. Negative energy balance is undesirable in dairy cows once it passes some lower level. There is a relationship between the lowest point of negative energy balance and the onset of reproductive activity. The figure below shows energy balance profiles of cows at Langhill over the first three lactations.

## Energy balance and accumulated energy balance calculated from energy intake and expenditure for Langhill cows over three lactations

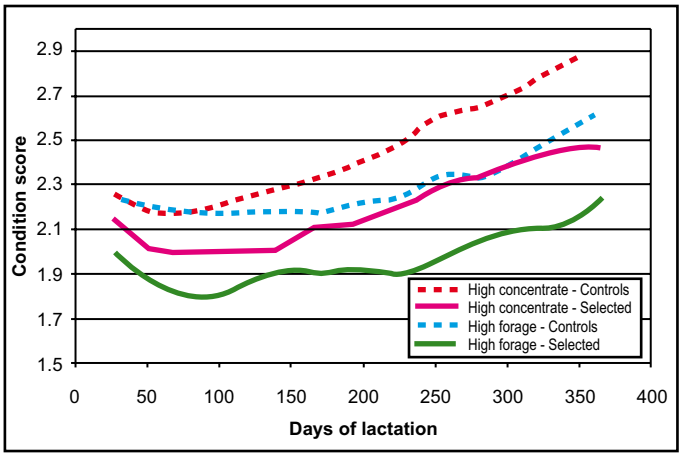



This shows clearly that cows at Langhill lose body energy in early lactation and spend much of the remainder trying to recover that energy. However, negative energy balance is greater in the early part of subsequent lactations and the recovery of lost body tissue is not complete since cows start successive lactations in lower body condition.

## Genetic link between condition score, negative energy balance and survival

SAC research has demonstrated the genetic links between condition score and other characteristics of the dairy cow using both data from its own dairy herd and from nationally recorded data.




The SAC Langhill dairy herd (now at Crichton Royal, Dumfries) contains cows both highly selected for fat plus protein and a non-selected control group. Each group is split between a high concentrate diet and a low concentrate diet. The selected group has a lower body condition score and a lower accumulated energy balance throughout lactation compared to the control group. They also have poorer fertility in traits such as calving interval, days to first service and days open.

Using nationally recorded data SAC research has confirmed the results from its own dairy herd. Body condition score, recorded by HUK, was shown to have a negative genetic correlation with £PIN of about –0.3. This means that animals with a higher £PIN value have the genetic tendency to be in lower body condition. The same result is seen for energy balance too. The genetic correlation between body condition score and calving interval was –0.2 and with days to first service –0.63. This implies that cows with a genetic tendency to lower body condition score have higher calving intervals and take longer to come into heat. A link between condition score and length of productive life was also found, thinner cows having shorter lives.

## Conclusion

Losing body energy is normal for lactating animals but continued selection, primarily for high yields, has led to cows with lower average energy content. This has also contributed to a reduction in health and fertility. Future selection indices should look to balance the benefit of losing some body energy in early lactation but not so much that it impacts upon other economically important traits.

Condition score information is being used to design new selection indexes which will balance the improvement in production with the loss in condition, fertility and length of productive life.

Author:

**Dr Geoff Pollott**
Senior Researcher
SAC
Sir Stephen Watson Building
Bush Estate
Penicuik
EH26 0PH
Phone 0131 535 3299
geoff.pollott@sac.ac.uk

**SAC receives funding from the Scottish Executive Environment and Rural Affairs Department (SEERAD)**