

DAIRY MANAGEMENT

COLOPHON:

Veepro Dairy Management is a supplement to the Veepro Magazine. It contains articles, tips and advice aimed at the management of dairy farms worldwide.

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Score the cows regularly on body condition. It is a perfect tool to monitor the nutrition of the cows and, if necessary, to change the ration in time. If implemented well in the management of the farm it will contribute to an improvement of the gross margin per cow.

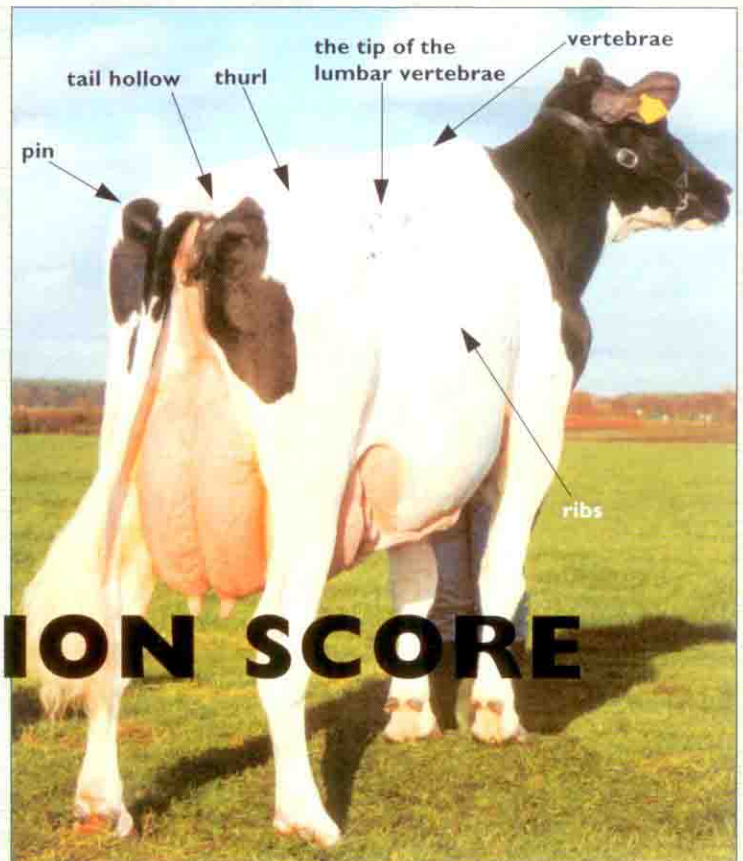
BODY CONDITION SCORE

Body condition scoring is a subjective method for estimating the quantity of fat on a live animal. The muscularity of a cow is rather a matter of genetic potential. The quantity of fat tissue is more a result of feeding practices.

Every dairy farmer should meticulously evaluate the body condition of his cows every four weeks. Farmers doing that will find they are drying off their cows with the right body condition.

Those who closely monitor body condition during the dry period and at the beginning of lactation will find that they can make changes to the ration in time. This will result in a cow that is more resistant to health disorders and has improved fertility. In addition, having a cow not rely on body reserves at the beginning of lactation as intensively, means the milk yield will not drop as fast throughout the remainder of lactation.

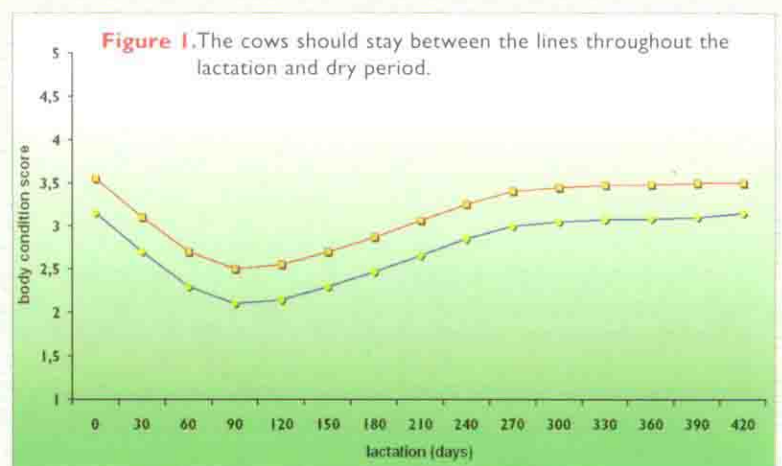
On the next page you will read how to perform a body condition score. It is a matter of getting used to, but once you start doing it, you will reap the benefits.



Body condition is scored on a scale of 1 – 5. A score of 1 indicates severe underconditioning and a score of 5 is assigned to very obese cows. For every whole loss in body condition scores, about 50 kg of body tissue are lost in a mature Holstein cow. To get more variation in the scores it might be desirable to make subclasses of half a point, if one is more experienced it can be done in steps of a quarter point.

Body score curve throughout the lactation

Normally speaking the body condition of a cow decreases after calving (figure 1). This is the result of a negative energy balance. The cow uses energy from body reserves in order to reach her peak in production at around 50 days post-partum. As a result of genetic progress, cows peak higher and higher nowadays and that's why nutrition requires more and more attention.



If after calving, a cow doesn't lose much body condition, she most probably is not producing enough milk. However, it is also possible for the milk production peak to be high while the cow is not losing body reserves. In this case, you have got a great cow. If this is a quite common phenomenon throughout the herd, this can be attributed to outstanding management practices.

Cows losing too much body condition after calving will have high fat and low protein at the beginning of lactation. In the second month into lactation the fat percentage will then drop steeply. That's when the body reserves have been depleted and the cow will need to take up all the energy from the ration. In this period, the protein percentage will also be depressed. At the end of lactation, these cows often exhibit bad persistence causing the milk production to drop quickly. The components do increase due to the effect of the milk becoming more concentrated, but in reality you will not be producing enough milk. In many herds, these cows often receive rations that are too rich or rations with too much corn silage (starch). This causes them to gain too much body fat.

MAIZE SILAGE

Maize silage is fed more and more to dairy cows in dairy husbandry. The very high energy content of maize silage has a great benefit during the first months of lactation. When feeding a lot of starch at the end of the lactation, it will result in too fat cows, specially those animals that show poor persistence or those that make a long lactation due to fertility problems.

Optimum body scores

The ideal situation would be for cows to stay between the lines of figure 1 throughout lactation and the dry period. These two lines portray the optimum body scores. Both during the depletion of body reserves at the beginning of lactation and growth at the end of lactation, about 20% to 25% of the energy is lost.

At drying off the cows should have a body condition score of 3.0 – 3.5. During the dry period this body condition score should be maintained. After calving down the score on body condition should not decrease more than 1 point.

Fat cows

Generally speaking fat cows (with a BCS – body condition score – over 3.8) will have more health problems during the transition period. Fat cows generally have lower dry matter intakes (energy) 7 to 14 days before calving. If this is not compensated with a higher energy ration, the cow will start using her own

body reserves. In other words, she starts losing body condition.

Fatty liver syndrome

When fats are broken down, free fatty acids (NEFAs) are released that have to be converted in the liver. If too much fat is broken down, the liver cannot keep pace. The resulting effects are quite undesirable with the liver becoming too fat. This in turn can lead to the following health disorders:

- Milk fever
- Ketosis
- Displaced abomasum
- Mastitis
- Late ovulation
- Cystic ovaries
- Retained placenta
- Depressed production

The fatty liver syndrome will also occur after calving. Generally speaking a fat cow will peak earlier in terms of milk production but her dry matter intake will be lower. And then the same story applies. The cow will start using body reserves with the resulting fatty liver syndrome. A cow that loses too much body condition during the transition period will also be less resistant to health disorders.

Metabolic diseases

Caution should be taken in increasing the amount of concentrates fed to a cow that is too fat in the first three weeks of lactation. In practice dairy farmers tend to increase the amount of concentrates due to the high level of production. The effects are contra-productive though. A cow that is too fat will have a decreased dry matter intake (1.5 to 2 kgs of DM) after calving. Less forage in combination with more concentrates will lead to rumen acidosis, which in turn could lead to displaced abomasums, sore feet, and a lower absorption level of the rumen tissue. Additional negative effects of a cow that doesn't have enough body condition after calving are:

- Lower milk production
- Inactive ovaries
- Decreased resistance

Why Body condition scoring?

Ration calculation is one of the methods to be used in animal nutrition, but is based on an estimated dry matter intake for the herd. The dry matter intake per day varies greatly among cows in the herd, due to variation in milk production, age, stage of lactation, body capacity, body condition and metabolic diseases. Metabolic diseases, like fatty liver syndrome, milk fever and ketosis, will influence the peak production and the dry matter intake per day. A larger gap in energy in the first two months of lactation might result in poorer persistence during the lactation. Regular scoring of body condition enables of making this lack in energy clear through the decrease in BCS.

Scoring body condition

Scoring the body condition means that you allot every cow a numerical score, with 5 being the highest score and 1 the lowest. It is preferable to line up the animals in the feedlocks when scoring them:

1. Stand behind the animal when scoring her.



2. Give a score for the amount of fat in the tail-hollows and the amount of fat and muscle on the pins, and use these amounts as basis.



3. Next, score the amount of fat and muscle covering the rump area.



If this matches the amount in the tail-hollows, the score is fixed.



If the amount of fat and muscle covering is smaller compared to the amount in the tail-hollows, the score needs to be decreased by a half to a quarter point. If the amount is larger, the score should be increased by a half to a quarter point.

4. Always use the same hand when making evaluations.
5. Enter the score into a data log or write it down.

Remarks

- The size, dairyness, stage of lactation, production level, and general well-being of the animal are not taken into consideration when scoring an animal.
- For young stock you can use the same method.

Figure 2. Form for body condition score.

Cow #	Calving date	Score											
		Scoring date =>											
145													
214													
305													
342													
417													
434													

Registration of scores

The individual scores can be written down with the calving dates on a body condition form (figure 2). This form can then be used for tracking the body condition score of the individual cow.

In order to obtain an overview of the entire herd, the scores can be plotted against the number of lactation days in the condition score figure (figure 1). This scatter plot shows a clear overview of the condition scores over the lactation and any variation within.

PERSISTENCE

Persistence is an important factor to determine the optimum body condition. Persistence means that a cow doesn't drop more than 0.05 to 0.07 kgs of milk per day after reaching her optimal peak. A two-year-old shouldn't drop more than 0.03 to 0.05 kgs per day. Due to a quickly increasing production level, fat cows will take in too little dry matter and therefore experience a larger energy deficiency. Her body condition score will drop more than one point. Somewhat less conditioned cows will often peak somewhat later and not as high, but do show better persistence. These cows shouldn't be bred too early. If these cows are allowed to make a longer lactation, they will gain enough body weight to reach the desired body condition upon entering the dry period. For optimum feed conversion, persistence is the most important factor. Remember, both during the depletion of body reserves at the beginning of lactation and growth at the end of lactation, about 20% to 25% of the energy is lost.

Persistence graph and table

The persistence is easy to read from the graph in figure 3. The graph shows the milk production curve over lactation with good and bad persistence.

Figure 3. Milk production curve over lactation with good and bad persistence

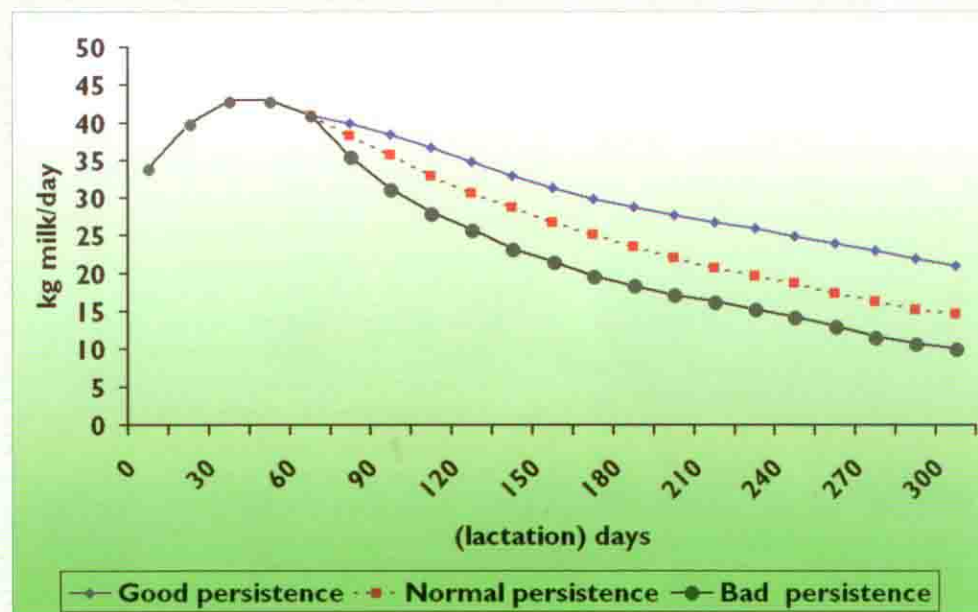


Table 1 shows another way to determine the influence of peak production and persistence on the final production over lactation.

Table 1. Estimated lactation production¹ for a 320-day lactation for different peak and persistence levels.

PEAK	PERSISTENCE (kgs / day)					
	0.03	0.04	0.05	0.06	0.07	0.08
	Kgs / lactation					
22	5878	5545	5214	4882	4550	4219
26	7148	6809	6472	6132	5794	5456
30	8390	8048	7706	7363	7021	6679
34	9705	9367	9030	8693	8355	8018
38	10972	10631	10290	9949	9607	9265
42	12226	11882	11500	11193	10850	10506
46	13506	13159	12812	12465	12118	11771
50	14662	14286	13910	13533	13156	12780

¹) Based on a mathematical relationship where the peak occurs at 50 days, and the lactation curve is modelled as two trapezoids

The table and graph demonstrate that the production per lactation depends on peak production and persistence throughout the lactation and to a lesser degree on the moment a cow peaks shortly after calving. In other words, the production per lactation is largely dependent on the surface area under the lactation curve.

Well-conditioned

A cow that is too fat around calving, will not show the right persistence, and at the end of lactation she will start growing to become too fat again at the end of lactation. This also happens often to cows that make a very long lactation if they are not bred back in time. With these kind of cows it is important to ensure that as soon as production starts dropping and the cow starts to gain fat, the amount of starch from corn silage or other high-starch ingredients in the ration is decreased.

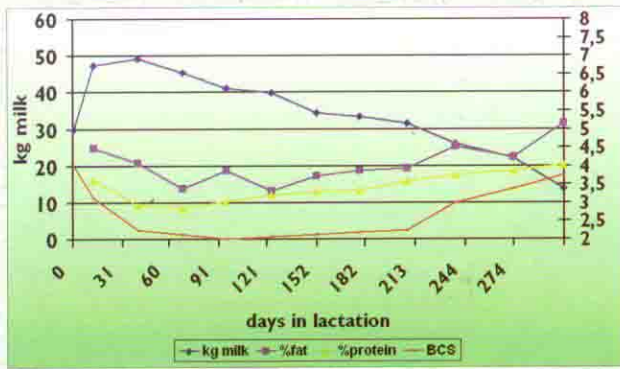
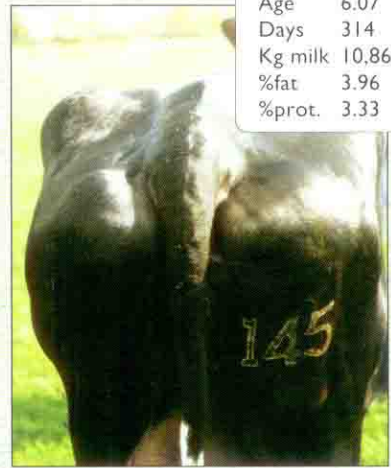
THREE EXAMPLES

The following information from three cows can be used to explain the relation between production and body condition.

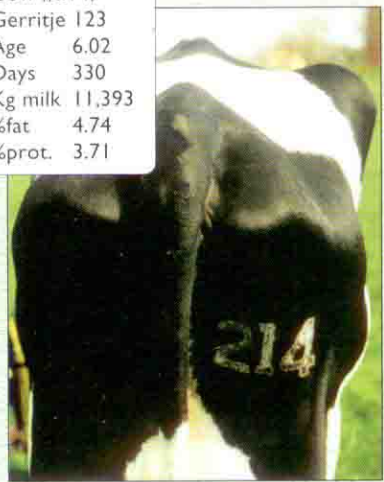
Cow #145, Zwartje 59, had a body condition score of 4 around calving and was hit by ketosis right after calving. She peaked at 49.2 kgs of milk per day with 4.07% fat and 2.93% protein. At the beginning of lactation, she used her body reserves and the second and third milk test show that the cow is using part of the protein ration as an energy source. At 50 days her condition score had dropped to 2.3 and then continued to drop to 2.0 at 100 days into lactation.

Fertility wasn't as desired either and her reproductive cycle had to be induced with prostaglandin. After peak production, milk production dropped quite quickly, by more than 0.1 kgs per day at times. On the basis of her second test, she was projected to a lactation value of 109 (9% above herd average), but eventually she finished at 93. As a result of her quickly dropping production, Zwartje started quickly adding body condition after 200 days into lactation. By placing her in the low production string with less starch in the ration, over-conditioning (= too fat) at the end of lactation was avoided. As a result, she was dried off with a body condition score of 3.8.

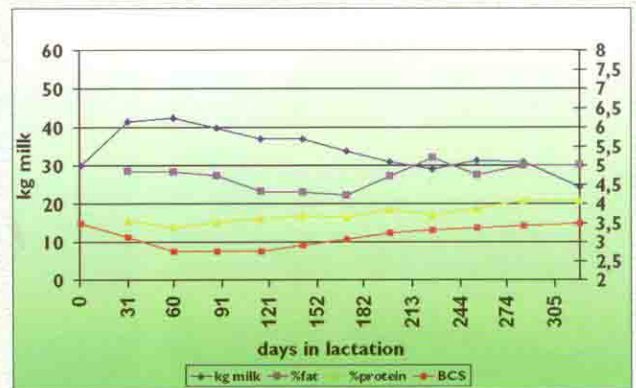
Cow #145,
Zwartje 59
Age 6.07
Days 314
Kg milk 10,862
%fat 3.96
%prot. 3.33



Cow #214,
Gerritje 123
Age 6.02
Days 330
Kg milk 11,393
%fat 4.74
%prot. 3.71



Cow #214, Gerritje 123, calved out with a body condition score of 3.5 and peaked at a lower production level, at 42.5 kgs per day with 4.83% fat and 3.39% protein. The cow suffered from ketosis right after calving, which might slightly have influenced her peak production. The ratio between fat and protein during the first two tests shows that she only made limited use of her body reserves. During the first 50 days her body score dropped 0.75 points. Between 50 and 100 days in lactation, her body condition score remained unchanged and amounted to 3 at 200 days in lactation, while she ended her lactation with a score of 3.5. Because of persistence throughout lactation and her high components, she finished her lactation with the highest lactation value of the three cows in this example, with a value of 111.



Cow #417, Ankje 29, calved out with a body condition score of 2.3 and already peaked during her first milk test of 46.7 kgs of milk with 3.64% fat and 2.89% protein at 25 post-partum. The low fat percentage during the first four milk tests shows that the cow has no body reserves left. The low protein percentages during the first four milk tests indicate that the cow was in a negative energy balance for a long time. This resulted in using part of the protein in the ration as a source of energy. Her second test was quite disappointing in terms of milk due to a slight lameness. Trimming her feet and supplementing her with propylene glycol ensured a quick

recovery by the time she had her third test and throughout the rest of her lactation she was very persistent. Her body condition score dropped from 2.3 to 1.8 at day #50. After stabilizing at 100 days, her body condition score slowly continued to rise to 2.3 by the time she was dried off. Because the cow had been bred 77 days after calving – which resulted in a pregnancy straight away in spite of her energy deficiency – she completed a short lactation of 298 days and didn't get the chance to gain enough body condition by the end of lactation. Because of her higher peak production she made a better milk record than cow #214 but because of her low components her lactation value remained limited to 98.

Cow #417,
Ankje 29
Age 4.03
Days 298
Kg milk 11,136
%fat 3.81
%prot. 3.17

