

CORRELATION BETWEEN BODY CONDITION AND ANIMAL HEALTH PROBLEMS OF HOLSTEIN FRIESIAN COWS

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Abstract: *The Holstein-Friesian cow is the first among milking cows in the world nowadays. The milk production of this type is very high, but the breeders have to face many problems beyond the outstanding milk production. In recent decades the useful lifetime decreased, reproductive disorders and common metabolic disorders appeared, so infertility is common and, re-conception is delayed etc. We analysed the relationship between the animal health status and the BCS, we tried to find the correlation between mastitis, feeding status and hoof health status. In our work we tried to find the answer to the following questions: Which body condition can be associated with foot diseases and mastitis causing considerable economic damage in stocks?*

Key words: *body condition score, milk production, mastitis, foot diseases*

INTRODUCTION

The Holstein-Friesian cow is the first among milking cows in the world nowadays. These cattle are very sensitive to changes in their environment, which is particularly true for feeding. The cows have different needs compared to the feed consumed at the different stages of lactation. Care should be taken at the beginning of lactation, because it is difficult to satisfy the nutrition needs of the high production dairy cows, therefore the cows lose from their body reserves due to the high milk production. In most cases the excellently producing cows with ideal appearance get out of the production earlier than the others.

The breeders have to face many problems beyond the outstanding milk production. In recent decades the useful lifetime decreased, reproductive disorders and common metabolic disorders appeared, so infertility is common and, re-conception is delayed etc. (Berta, 2010).

According to Morris et al. (2009) the stress of various production ‘diseases’ has an adverse effect on dairy cow fertility with clinical mastitis, low body condition score and lameness being especially deleterious. Lameness in dairy cattle is considered to be an important health problem in dairy herds. It has a negative impact on feed intake, milk production, reproduction, and udder and body health (Alban, 1995). Lameness causes financial losses to the farmer and considerably reduces the welfare of a cow because it is associated with painful conditions in the locomotory apparatus (Dippel et al., 2009). Mastitis is one of the most costly diseases in the dairy industry, and the cost is likely to increase as a result of selection for milk yield (Haile-Mariam, 2001).

The body condition examination can show the cow’s responses for the changed environmental conditions (Gergác et al., 2004). This is an important task to improve the milk production efficiency, to optimize the nutrition, and important in the health care of the stock. (Brydl, 1994; Györkös et al. 2002, Roche et al. 2004, Chittapriya et al., 2004).

According to Hoedemaker et al. (2008) cows with BCS <3.0 at calving and during early lactation were more likely to be lame. Cows in the lowest body condition quartile (1.25–2.50 for Holstein Friesian and 2.50–3.50 for Fleckvieh) had the highest risk of being lame (Dippel et al., 2009).

MATERIALS AND METHODS

We carried out experiments on a dairy farm with 600 cows, where up-to-date nutrition and keeping technology is used. The cows are kept free, in a loose housing stable with cubicles. The nutrition is monodietic; the main forage base is corn silage and alfalfa senage. The cow groups get feed supplement in accordance with their milk production.

The experiments started in January of 2009 and ended in December of 2009. We are going on with it continuously, we determined the condition points from 0.5 to 5.0 (with 0.5 point increase) by feeling the various parts of the body. We recorded these data together with the milk quality (SCC) and foot diseases data.

During the examination of the relationship between animal health and body condition we analysed the correlation between mastitis, and body condition. The examinations were carried out on a Holstein-Friesian farm. 4491 data of 862 cows were analysed.

During the analysis we investigated what common effect the body condition and the foot health condition have on the milk production and the udder health condition of the cows. In our study the data of the cows were grouped according to BCS, SCC and foot health condition (Table 1).

Table 1

The groups according to BCS, SCC and foot health condition

Body condition score			Somatic cell count (cells/ml)				Foot health condition	
≥ 4	2.5-4	<2.5	<200000	200001-400000	400001-1000000	>1000000	lame	not lame

The biometric calculations and notations required for data procession were used according the guidelines set by Antal et al. (1978), Sváb (1981) and Huzsvai, (2004-2010).

RESEARCH RESULTS

In the examined period no lameness occurred in 328 cows. 208 animals got lame once, while 148 had some foot disease twice. Out of the 862 cows 178 were lame more than twice.

Considering all the observations the frequency of lameness was 27%, while the proportion of high somatic cell number was 36%. The extreme values of body condition were 36.25% (KP \leq 2.5) and 6.44%. Out of the lame cows it was 47% that did not exceed a BCS of 2.5, while this value was 32.4 % in case of the not-lame group. With these non-lame cows the high cell number content (>400000 db/cm³) changed with the different BCS 29% (KP<2.5) and 55% (KP>4). In the group of the lame cows the two values changed between 38% (KP<2.5) and 65% (KP>4).

The appearances of the three parameters (body condition, foot and udder health condition) are demonstrated in Figure 1.

There were 1343 cows that proved to be healthy considering udder and foot health and their body condition also fell into the ideal interval.

During our examinations there were 655 cases when the high somatic cell number could not be associated with lameness or abnormal condition. The number of the cases was higher (953) where the high somatic cell number entailed lameness, thinness or perhaps fatness as well.

In the case of the groups made according to the condition there were 1628 cows the body condition of which did not exceed 2.5; out of these cows there was 54% (872) where the thinness was associated with other illnesses. In 215 animals both the lameness and the high somatic cell number were present.

The proportion of cows with high BCS (289) was lower on the dairy farm. In this group the ratio of the high somatic cell number was more in number than the ratio of lameness. Lameness usually was associated with lower body condition; 47% of the lame cows did not reach a body condition score of 3.0 while fatness occurred only in 5% of this group.

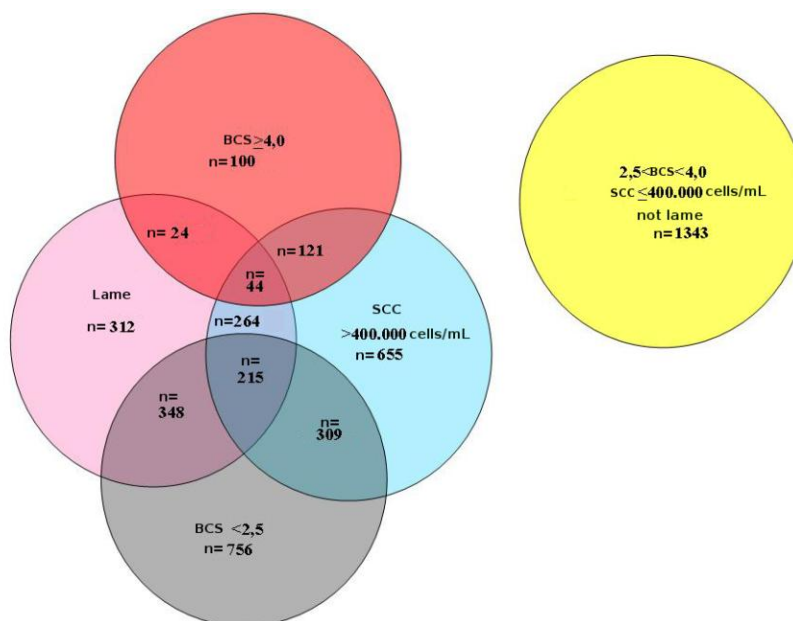


Figure 1 Foot health condition, somatic cell number and body condition rates

The high somatic cell number is also common in the milk of the lame cows, however that cannot be explained with an increased body condition and a decreased milk yield, since BCS improvement is not characteristic in this group. There were 215 cows where lameness, poor condition and high somatic cell number were present at the same time.

We examined the relationship between foot health condition and the instantaneous body condition and the milk yield and somatic cell content. The data are presented in Figures 2 and 3.

Figure 2 shows the somatic cell number in the milk of lame and healthy cows with various body conditions at the different stages of the lactation.

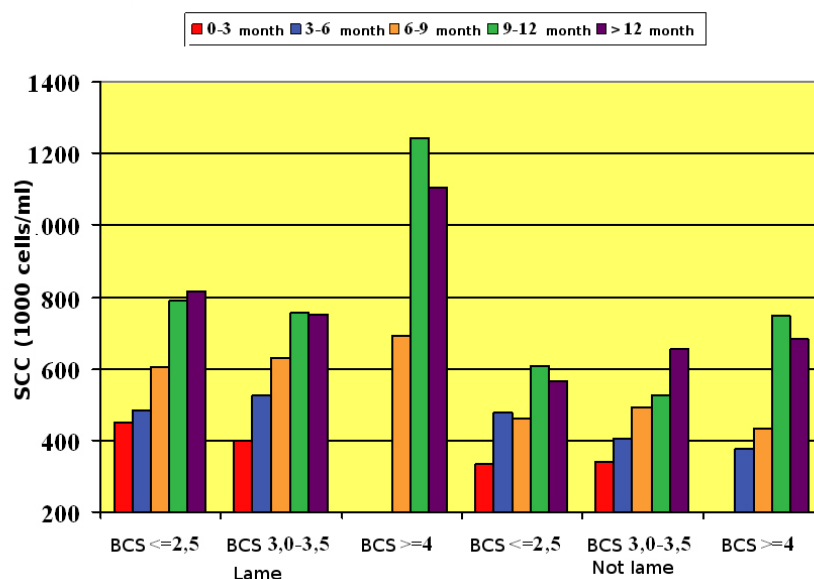


Figure 2 The effect of foot health condition and body condition on the somatic cell number at different stages of lactation

It can be observed that with the increasing production time the somatic cell number is also increasing regardless of the body condition and the foot health condition. The foot health condition has a definite effect on udder health. The somatic cell number of lame cows is higher than that of the cows with healthy feet, having the same body condition at the same stage of lactation.

The effect on milk production is shown in Figure 3. As the lactation proceeds, the production of the cows is decreasing. When examining the effect of the body condition it can be observed that the production of the groups with BCS $KP < 2.5$ and a BCS = 3.0-3.5 do not differ significantly. The excessive body condition increase, however, is associated with the decrease of the milk yield, regardless of the foot health condition.

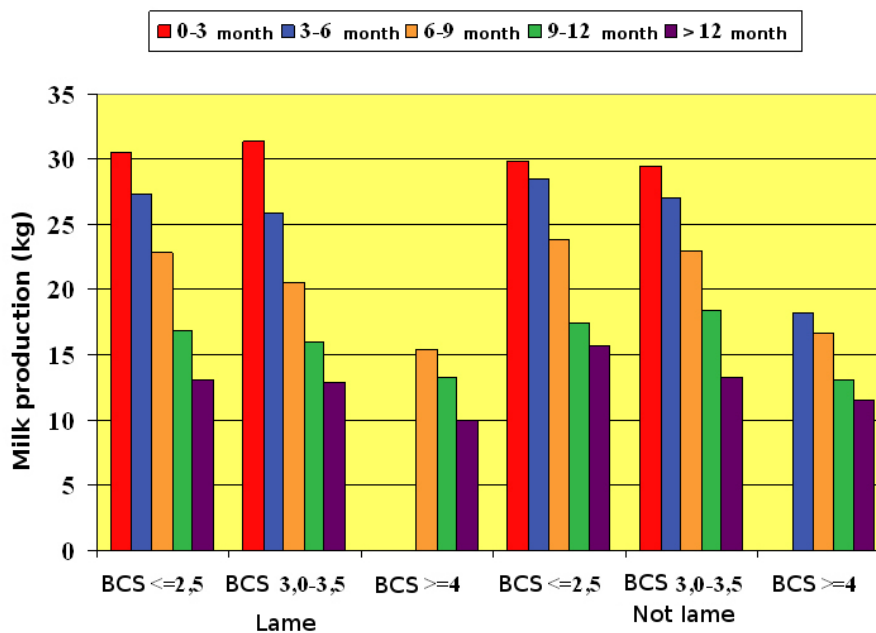


Figure 3 The effect of foot health condition and body condition on the milk yield at different stages of lactation

The production (milk yield) of the cows (in the same period and with the same body condition) do not show significant difference.

Overall we can conclude that a negative correlation can be observed between the milk yield and the body condition, while a decreasing milk production goes together with an increasing body condition. The somatic cell number in the milk is greatly dependent on the length of the production time and the milk yield. The relationship/correlation between foot health condition and udder health condition was confirmed; the somatic cell number in the milk of lame cows was higher in every case than that of the groups with healthy legs (beside the same body conditions).

CONCLUSIONS

When examining the foot health and the body condition we observed that lameness has an unfavourable effect on the udder health condition of the cows. In each case the somatic cell number of the lame cows (beside the same body condition) was higher than that of the groups with healthy legs.

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