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THE INFLUENCE OF LAMENESS OF HOLSTEIN BREED MILK COWS ON THEIR DAIRY YIELD

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Abstract

In this project we were occupied with the influence of lameness on dairy yield of Holstein breed milk cows. Experiment was carried out in Farma Papůvka in Pňovice. 59 cows were diagnosed as having lameness. For comparison, there were 59 milk cows without limping symptoms chosen by random sampling and joined to previous milk cows. As monitored parameter the actual milk yield, the fat content, content of protein and lactose were evaluated. We have found out that milk cows without lameness had average actual milk yield 14,90 kg of milk, average protein content 3,12% and average lactose content 4,67%. Unlike these, milk cows with lameness had actual milk yield 11,48 kg of milk, the protein content 3,31% and lactose content 4,92%. These differences were evaluated as highly statistically significant (P<0,01) in every cases. Only the average fat content (with healthy milk cows 4,22% and with affected milk cows 4,48%) was not statistically significant. Based on these results, we can pronounce that the lameness of cattle decreases the yield about 23% in our case. The content of compounds in milk has not changed in largely.

Key words: milk cows, limping, lameness, milk yield, Holstein cattle

Introduction

The abolition of binding stabling has become a turning point in milk cow breeding. Changeover to loose stabling brought many advantages but during the time also negatives occurred. One of the problems which arose after yield increasing, changes in feeding system and stabling, was increasing a number of limping cows due to cloven hooves disease.

Structure extremity of cattle was evolutionarily adapted for walking on pastures i.e. soft surface. Concrete or grid floors of loose stabling do not respond to physiological needs of cattle extremities and together with even hardly perceptible influences the development of cloven hooves disease occurred. Some breeders do not realize the impact of cloven hooves disease on the rentability of breeding, not even in economically inauspicious present.

Good health condition of extremities and cloven hooves is an important prerequisite for successful milk cows breeding. Because milk cow which suffers with extremities pains spends more time by lying and therefore it takes less feed in, produces less milk, loses weight and becomes to have reproduction problems. In dairy cattle breeding the limping is classified together with mastitis and reproduction disorders as one of the most spread production disorders. So that it is convenient to pay attention to prevention since heifer age. This can keep cloven hooves disease on acceptable limits.

Material and methods

Sampling of milk was carried out from November 2011 to May 2012 on Farma Papůvka with Holstein breed milk cows. 118 samples were analysed, actually 59 from limping milk cows and 59 from healthy milk cows. Before each sampling, walk of milk cows was assessed when walking through milking parlour. According to this milk cows were sorted into groups. Two groups were created with each breed. The first group – limping milk cows with visual walking or extremities disorders have lightened during milking. Second group – healthy, without visual marks of limping and extremity lightening during milking. Milk cows from first to third lactation were put on experiment from 45 to 260 day lactation.

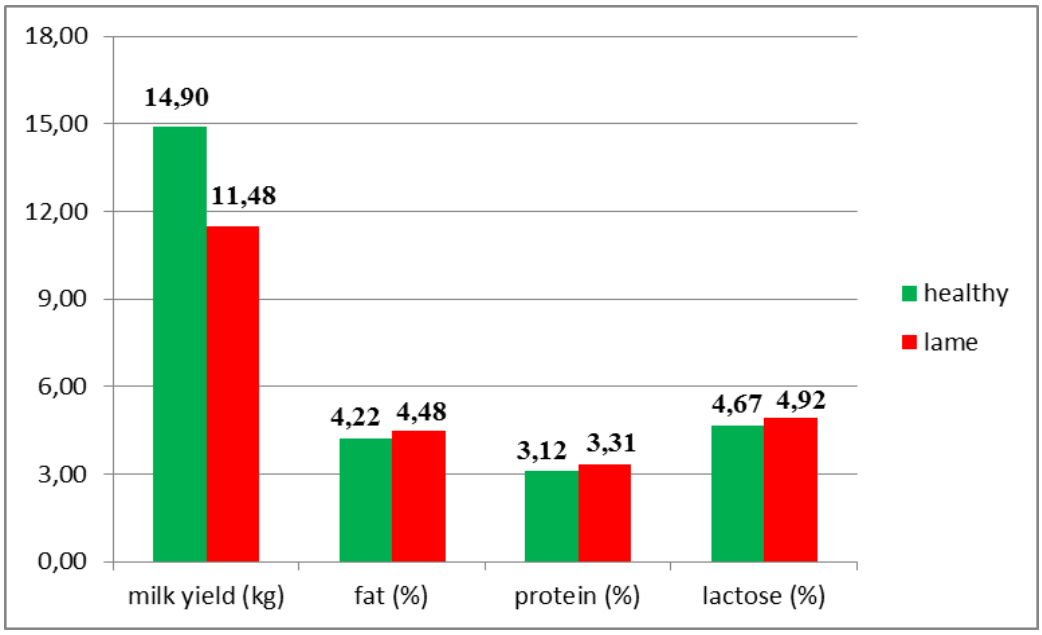
Milk cows which were limping because of irregular extremity stance, with chronic limping and treated milk cows were not included into experiment. Milk was sampled always during the evening milking. After dripping the milk off into vessel, 120 ml of milk was taken into sample container and after ending of milking all the taken samples were cooled down. With chosen milk cows actual amount of drawn milk was recorded. Samples were transported into laboratory of Department of Animal Breeding in Mendel University in Brno the following day where the analyses were carried out. Content of fat (%), proteins (%), lactose (%) were established at each sample using the Julie C5 Scope Elektric apparatus.

Cloven hooves disease diagnostic was carried out according to symptoms which are described in professional literature. After consultation with experts disease diagnosis were made and adjustments of cloven hooves was realized. In the case of need a chirurgical elimination of problem and following treatment was carried out by authorized person.

Results and discussion

Figure 1 shows average values of chosen dairy yield indices comparing healthy and limping milk cows. With milk cows without lameness an average milk yield was 14,90 kg of milk (min. 11 kg and max. 22,30 kg). With limping cows an average milk yield was only 11,48 kg of milk (min. 7,30 kg and max. 17,70 kg). Difference between groups was statistically highly significant ($P<0,01$). An average fat content was with group of healthy milk cows 4,22% (min. 2,93% and max. 5,72%) and with group of limping milk cows 4,48% (min. 2,41% and max. 6,60%). There was no statistically significant difference between healthy and limping milk cows found out. An average protein content was with group of healthy milk cows 3,12% (min. 2,63% and max. 3,52%) and with limping milk cows 3,31% (min. 2,96% and max. 4,10%). There was highly statistically significant difference ($P<0,01$) between healthy and limping milk cows found out. Also content of lactose was analysed. With group of healthy milk cows it was 4,67% in average (min.4,11% and max. 5,25%). Slightly increased was lactose content with limping milk cows 4,92% (min. 4,33% and max. 6,12%). Difference between both groups was also highly statistically significant ($P<0,01$).

Figure 1. **An average values of chosen dairy yield indices**



According to results, with cloven hooves disease of milk cows a yield decreasing occurs. This affirms *Amory et al.* (2008), *Bečvář et al*. (2002), *Hernandez* et al. (2002) and *Nehasilová* (2007), who states a year milk lost due to cloven hooves disease up to 1000 kg. Also *Warnick et al*. (2001) found out that milk production decreased in average about 0,8 kg per milk yield with limping milk cows. Significant relation of milk yield decreasing at walking disorders is then stated by *Hernandez et al*. (2005), *Bicalho et al.* (2008) and *Novák* (2010), who states that limping milk cows have lower food intake and this causes a decrease of milk yield. *Kocak and Ekiz* (2006) monitored changes in milk amount from one milk yield with Holstein cows and found out that mostly decreased milk yield was with limping milk cows in the first week after diagnose in extent of 3 kg of milk. This is also supported by our results which show decreasing of milk amount with healthy milk cows comparing to limping milk cows about 3,42 kg of milk.

Also a slight increase of fat, protein and lactose content with limping milk cows comparing to healthy milk cows was obvious. However, *Juarez et al*. (2003) states that content of fat and proteins in milk is decreased due to worsening moving score of milk cows caused by cloven hooves disease. While in our project we have gained opposite results. Increasing of compounds content in milk could be caused by total milk amount. *Gajdůšek and Klíčník* (1991) state that decreasing of milk amount result an amount of compound content in milk. *Bouška* et al. (2006) than states that stress influences a milk yield negatively. The content of lactose in milk was in physiological range comparing to studies of *Gajdůška* (2003) and *Doležala et al*. (2000). They state a lactose content in milk from 4,55 to 5,30 %. The state of lactose is influenced by phase and order of lactation, higher milk yield and state of health of mammary gland (*Gajdůšek*, 2003).

Conclusion

Rentability of milk cows breeding is decided by many influences. Largely, cloven hooves disease participates on it. Many professionals in our country and many others are focused on this topic because only healthy milk cows with healthy extremities are able to produce such amount of milk which is predicted by its genetic potential.

With the aim to assess the influence of walking disorders i.e. cloven hooves disease on the milk yield of Holstein cows, the experiment with milk cows on Farma Popůvka was carried out. The influence of cloven hooves disease on drawn milk amount, fat content, protein content and lactose content was monitored.

We found out that milk cows without lameness had average actual milk yield 14,90 kg of milk, average protein content was 3,12 % and average lactose content was 4,67 %. To the contrary, milk cows with lameness had actual milk yield 11,48 kg of milk, protein content 3,31 % and lactose content 4,92 %. These differences were assessed as highly statistically significant ($P<0,01$) in every cases. Only the average content of fat (with healthy milk cows 4,22 % and with milk cows with lameness 4,48 %) was not statistically significant.

According to gained results, we can state that cattle lameness decreases in our case dairy yield about 23%, while the content of compounds did not changed largely. So, it is important to pay attention to cattle lameness because it is reflected in breeding economy and last but not least in welfare of milk cows.

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