The effect of calf suckling and machine milking on bovine teats

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Summary

The aim was to test hypotheses that the suckling of calves is more stressful for teats than machine milking and that the injurious impact of suckling is depended on the age of calves and time of their suckling. The effect of machine milking and calf suckling on teats was observed by means of thermographic method. Generally, machine milking and calf suckling evoked an increase ($P<0.05$) of teat temperature (TT). The highest increase of TT was caused by suckling of calves in milk period, the lowest teat stress ($P<0.05$) was find out by after suckling of calves in colostrum period. The shortest time of suckling was recorded in the oldest calves. On the basis of results it is concluded that teat stress depends on age of calves and time of suckling. Machine milking with vacuum 42.6 kPa cannot be considered as significantly injurious.

Key words: *teats, calf suckling, machine milking, thermography*

Introduction

The teats are the most stressed part of the udder. Repeated teat compressions may cause mechanical and circulatory changes in teat tissue and hyperaemia in the teat wall (Isaksson and Lind, 1992; Burmeister *et al*., 1998; Zecconi *et al*., 2000). There are a number of factors in machine milking that may influence the teat condition but calf suckling is regarded as more "friendly" to the teats (Kubíicek, Novak, 1995).

The aim was to test hypotheses that the suckling of calves is more stressful for teats than machine milking and that the injurious impact of suckling is depended on the age of calves and time of their suckling.

Material and methods

Four groups of animals were used in the experiment: the group A (machine milking, 42.6 kPa) – 10 dairy cows; the group B (calves, colostrum period, age 5 days) – 6 dairy cows + 6 calves; the group C (calves, milk period, age 20 days) – 4 dairy cows + 12 calves; the group D (calves, weaning, age 60 days) – 3 dairy cows + 7 calves. The teat stress was evaluated by means of the changes of teat temperature (TT). The TT was measured by thermographic method (camera AGA 570) at the following intervals: immediately before suckling (milking), immediately after suckling (milking), 1 – 5 minutes after suckling (milking) for 2 days in every group. The time of suckling (milking) was recorded. The thermograms of the teats were evaluated by program Irwin 5.3.1., the obtained values by ANOVA.

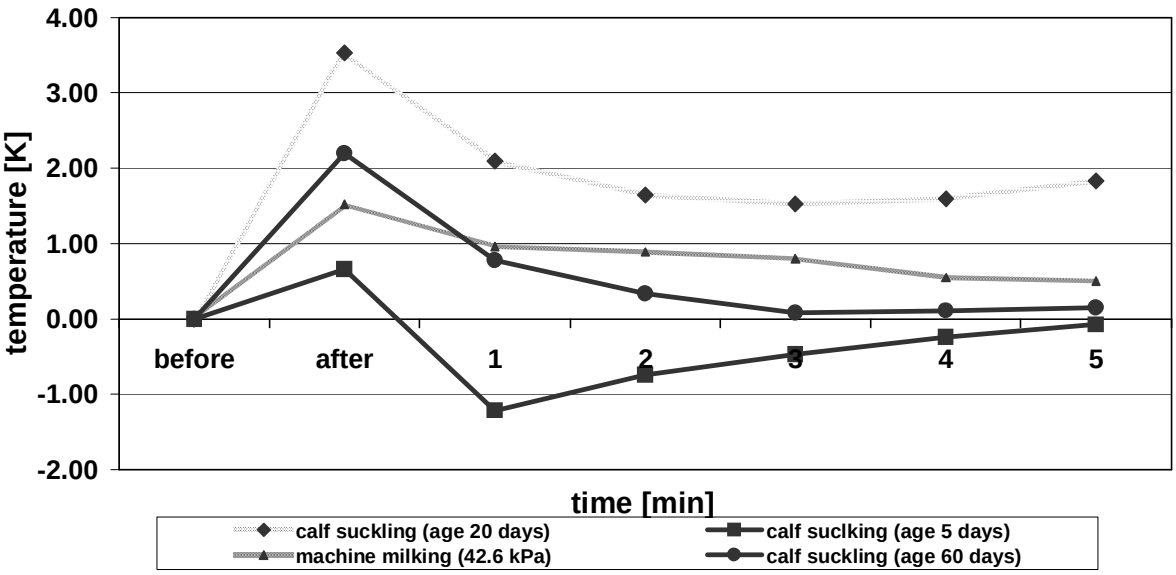

Figure 1. The course of temperature changes in teats depending on calf suckling and machine milking.

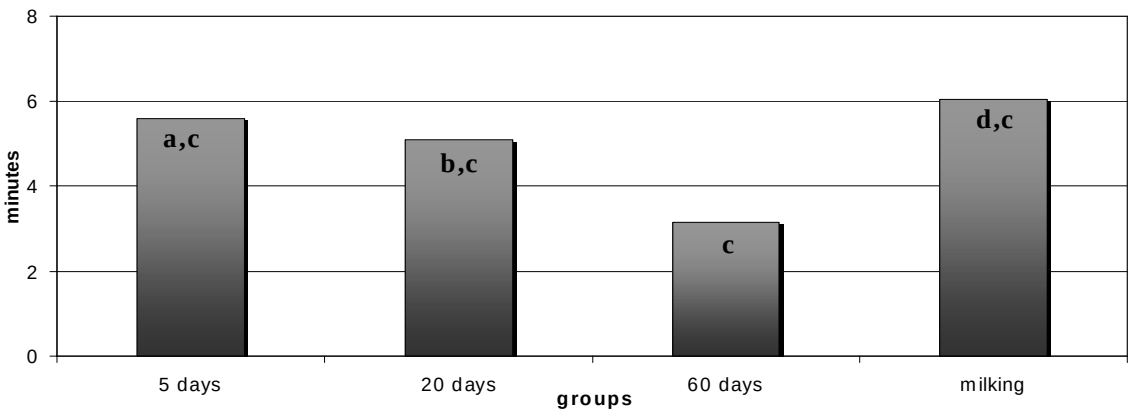

Figure 2. The average time of suckling and machine milking.

Results and discussion

Results are showed in Figure 1 and Figure 2.

Generally, machine milking and calf suckling evoked an increase (P<0.05) of TT. The highest increase of TT was caused by suckling of calves in milk period (group C; difference 3.53 K) compared with groups A (1.52 K), B (0.66 K), D (2.19 K) (P<0.05). The lowest teat stress (P<0.05) was find out by after suckling of calves in colostrum period (B). The shortest time of suckling (3.14 min) was recorded in D compared with B, C and A (P<0.05). After 5 minutes the TT did not reinstate to the initial values in groups A and C.

The effect of suckling on the teats has not been explored as the effect of machine milking, and thermographic measurements have not been published. Our results show that the suckling of calves in the milk period induces the significantly highest temperature in teats. On the basis of results it is concluded that teat stress depends on age of calves and time of suckling. This supports the findings of Krohn (2001). This author recommended only short-term suckling. Flower and Wear (2001) reported similar results. Machine milking with vacuum 42.6 kPa cannot be considered as significantly injurious.

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