EFFECT OF SANITATION AGENTS FROM THE ACQUASTEL® PROGRAMME ON UDDER HYGIENE

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Introduction

The way of milk cows housing inevitably results in the contact of udder skin with the surface of lying place and furthermore with impurities full of all kinds of microorganisms. Consequently up to $1x10^{10}$ of total amount of microorganisms can be found in one gram of impurities on the surface of udder (Reinemann et al., 2000). At inappropriate udder hygiene the present microorganisms on teat skin can reach the milked milk. Besides, raised concentration of microorganisms on udder increases the risk of their penetration from tip of teats to the teat canal, and that causes suitable factors for milk gland inflammation (Pavičic et al., 2003a). Therefore, to keep the udder of milk herds clean and healthy, it is important to carry out hygiene-prophylactic measures prior to and after milking (Gedek, 1994). Nowadays there are different disinfectants for udder hygiene available, but the ecologically acceptable agents with a high degree of bio degradability and not skin aggressive ones are preferred. For this reason we have been examining the application of these agents in order to determinate the efficiency degree of microorganisms on teat skin prior to milking.

Materials and methods

The research included 15 cows from the same breeding lot, which were kept tethered on concrete floor extended to a slatted floor. Milking of cows was performed at milking place and the common milk preparation procedure before the experiment was based on washing the udder with warm water and drying them with wash-cloth or disposable paper napkins. Teats were disinfected only after milking by using a composite disinfectant based on iodine and surface active agents. The first samples of swabs were taken in condition found after the arrival of cows to the milking place. The second samples were taken after washing the udder with Redol® disinfecting agent, and the third samples were taken after the treatment with

Oxyl® (Aquaste®, Croatia) disinfecting agent. The both agents were used diluted 1:20 according to producers' instructions. Before the samples were taken, the disinfected teats had been dried with disposable paper napkins. The samples were taken from the surface of right teat of each cow by means of a 1 cm pattern. The total number of aerobic mesophilic bacteria was determined in a standard way by culturing them on nutritious agar and by incubation at 34ºC within 24 hours. The results were statistically processed and registered as the total number of aerobic mesophilic bacteria cfu/cm^2 of a teat.

The experiment results

Table 1 shows the basic statistic results for the total number of aerobic mesophilic bacteria (cfu/cm^2) on teats prior to and after disinfection. According to indicators of approximate value there is an evident decrease of the total number of bacteria ($P<0.05$) after washing the udder with Redol® disinfecting agent from 769.6 down to 81.2 cfu/cm^2. After immersing the teats into Oxyl® disinfecting solution the number of bacteria decreased even more – from 81.2 to 14.5 cfu/cm^2.

Table 1. Results of total number of aerobic mesophilic bacteria cfu/cm^2 of a teat prior to and after disinfection with Redol® and Oxyl®

Indicator	Number of animals	Mean ± SE Cfu/cm^2	SD	Max.	Min.
Control*	15	769,6^a ± 41,664	161,37	1016	497
Test 1**	15	81,2^b ± 5,924	22,94	118	32
Test 2***	15	14,5^b ± 2,063	7,99	26	2

* sample taking prior to preparation of udder for milking
** sample taking after Redol® disinfection of udder
*** sample taking after Oxyl® disinfection of udder
$^{a,b=}$ arithmetical means which are not marked with the same letter in superscription statistically differ at level $p<0.05$

Discussion

As far back as the end of last century most of the members of international milk society considered the udder preparation for milking was to wash udder with water and to dry them with wash-cloth (Saran, 1995). Still it has been proved that such a way does not reduce enough postsecretory milk contamination; moreover it does not adequately impact the milk gland state of health (Lam et al., 1996). Thus the disinfection should be done prior to milking, since it reduces the total number of bacteria from skin of teats significantly (Pavičic et al., 2003a) and improves the hygienic quality of milk (Pavičic et al., 2003b). In the same time the frequency of intramammary infections caused by environment infective agents is reduced by

disinfecting the teats after milking (Winter, 1999; Schreiner and Ruegg, 2003). Modern sanitisation measures in udder hygiene demands the high quality degree agents at low application concentration. These agents should not represent threat as regards the chemical residuum in milk. Besides, their price should be acceptable for farmers and their use is to be simple at minimal time consumption. Therefore we have been examining the products made from the natural base, on premise that they could be successfully used in hygiene of milking because of their typical content of ions obtained with electrochemical activation. According to results, a significantly lower total amount of aerobic mesophilic bacteria ($p<0.05$) is recorded on the teats skin surface after washing for 89.5 per cent, and the additional teats disinfection decreased the rest of bacteria for further 8.6 per cent. Accordingly, the described disinfection procedure can remove almost 100 per cent of bacteria from the teat skin prior to milking, what came only up to 89.5 per cent in past experiments with other sorts of disinfectants (Pavičic et al., 2003).

Conclusion

The use of Redol® in udder washing and Oxyl® disinfection solution in disinfection of teats prior to milking indicated the great effect on decrease of total amount of aerobic bacteria on teats for 98.1 per cent. Therefore the both of procedures present a probable alternative in udder hygiene care, which especially suits ecological production purpose.

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