
Teatcup hardness after ageing in laboratory and plant usage

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A crucial hygienic measure in primary milk production is the elimination of microbiological contamination. The most stringent requirements are therefore imposed on the quality of liners, which as the only ones come into the contact with the living organism (teats) and with milk.

The liners made by two different manufacturers (L1, L2) were used in two rotary milking parlour Melotte 9 employing milking machines with milking units BDS-378.3 made by Agrostroj Pelhrimov, a.s. Cleaning and disinfection were made by automated washers AMA 227.1 (Agrostroj Pelhrimov, a.s.). The changes of liner rubber hardness were evaluated using various disinfectants and detergents (S1, S2). The releasing of carbon blacks from rubber parts into milk and the CPM (count of coliform bacteria) for lifetime determination were used. A time schedule was set up for observation and sampling of liners and milk tubes in order to verify the capacity of liners and milk tubes to be cleaned. Each sampling contained 4 liners of each type. The samples were then analyzed in accredited laboratories and obtained results subjected to a further statistic evaluation by UNISTAT 5.1 program.

It is possible to conclude on the basis of the correlations that hardness would be increasing with the increasing usage time in the application of L2 and the cleaning and disinfection system S2. In other combinations of liners and cleaning/disinfection systems the hardness of liners decreases with the increasing time of their usage (see Figure 1).

It was evidenced that the hardness of liners is highly significantly influenced only by the cleaning agent ($P < 0.01$). No significant influence on the value of hardness was evidenced in other factors or their interactions. The highest hardness values were reached in L2 combined with the cleaning/disinfection system S1 (average 55.43° Sh A).

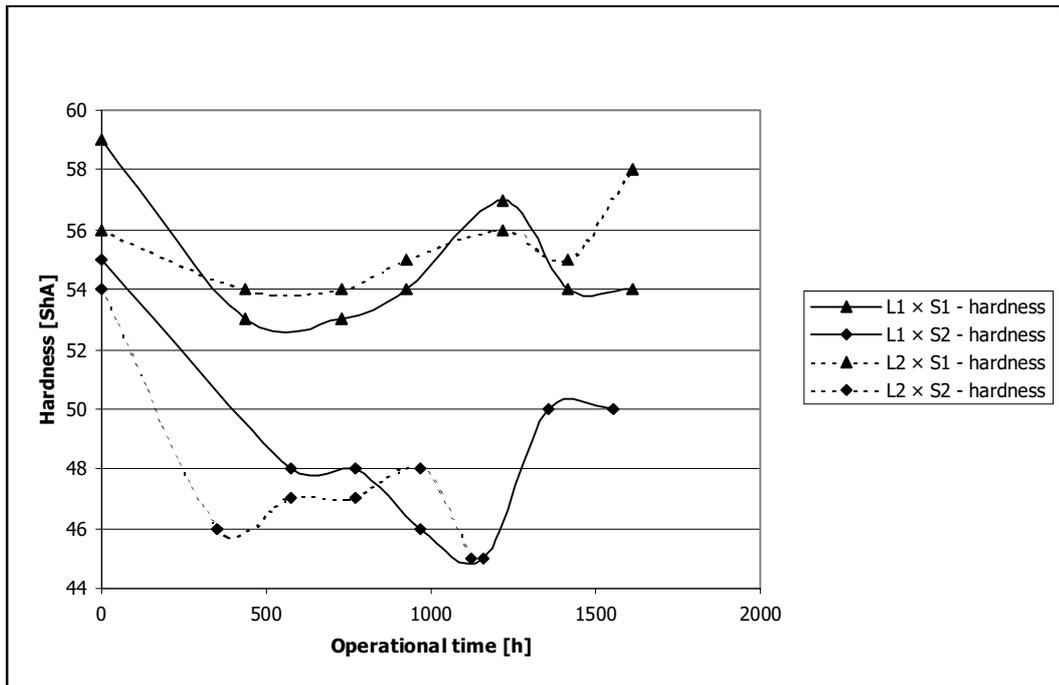


Figure 1. Liners hardness changes in various cleansing agents.

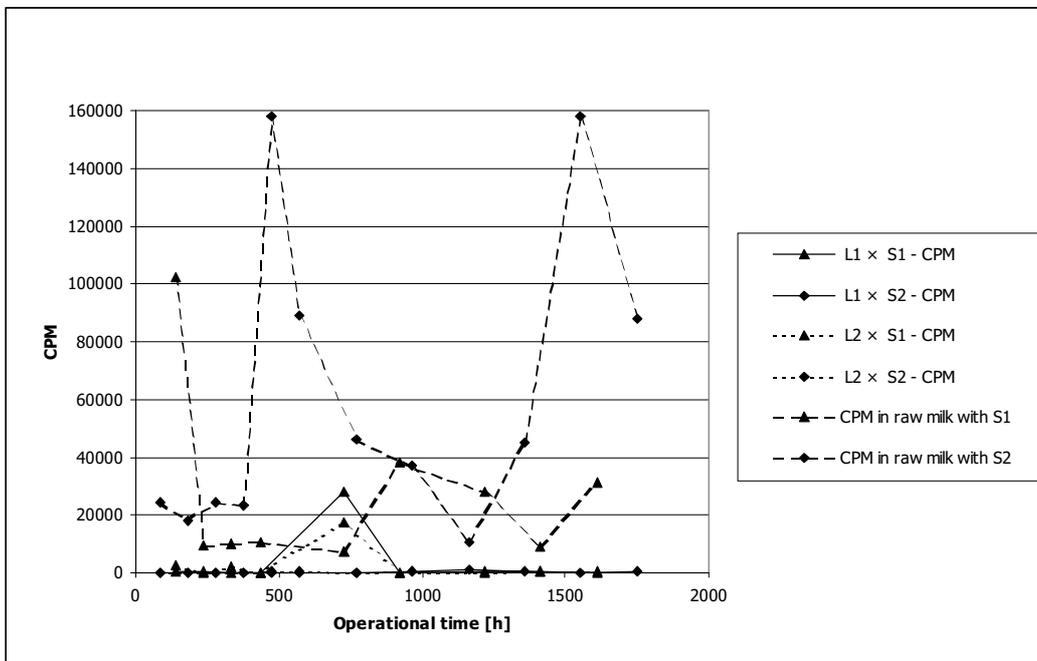


Figure 2. Count of coliform bacteria in raw milk and on liner inner surface.

It follows from the above analyses and their results that the studied mechanical properties were most affected by the type of the cleaning agent and considerably less by the type of the liner. The values of liner hardness after swelling in given detergents and disinfectants in laboratory and in milking parlour were compared, and its values don't corresponding to the milking plant usage.

The number of CPM after main cleaning is very good in both cases, and the number of CPM in raw milk rise over 100000 in two cases, therefore the water quality were really bad (see Figure 2).

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