
Effect of ultrasound in circular disinfection of milking equipment

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The effects of circular cleaning of the pipeline milking equipment ZD 2-020 by means of ultrasound and its influence on the cleanness of milking units were evaluated.

Aim, material and methods

The results were compared with the effects of the traditional way of sanitation. An ultrasonic cleaning equipment with a small trough was constructed for this purpose (Figure 1).

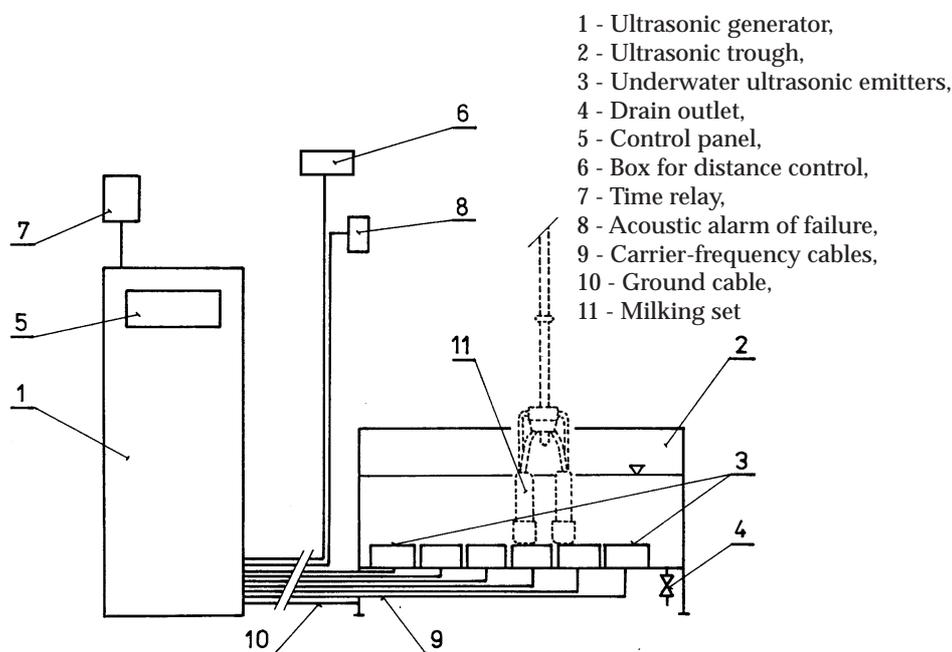


Figure 1. Design of ultrasonic trough equipment for circular cleaning of the pipeline milking equipment.

The cleanness of the milking sets was evaluated on the basis of results of the microbiological control of the inner surface of teat cups (mouth of liner and liner wall), claw-piece, long milk tube, milk-flow indicator and jointing cock. The samples were wiped off and the total number of microorganisms (TNM) expressed in number of colony creating units per dm² area (CCU/dm²) was determined.

Results

All parts of the milking set cleaned by the ultrasonic circular disinfection were better cleaned than with the traditional way of sanitation (Table 1). The share of satisfactory degree of cleanness was higher by 23.2 % (TNM to 500 dm⁻²). The determined values of the microbial contamination in the parts of milking units were the highest in the teat cups, and jointing cock. The share of conditioned satisfactory degree of cleanness (TNM 500 to 2 500 dm⁻²) was lower by 15.7 %.

Table 1. Total number of microorganisms in milking set parts within the individual degrees of microbiological cleanness at various ways of sanitation in CCU/dm².

| Way of sanitation | Traditional | | | With ultrasound | | |
|-------------------------------|-------------|-------|-------|-----------------|-----|-------|
| Degree of microbial cleanness | I. | II. | III. | I. | II. | III. |
| Teat cup - mouth of liner | 41 | 1 194 | 5 640 | 78 | 813 | 0 |
| - liner wall | 33 | 1 138 | 4 418 | 86 | 940 | 0 |
| Claw-piece | 75 | 1 043 | 3 992 | 252 | 709 | 0 |
| Milk tube | 255 | 1 062 | 2 804 | 220 | 845 | 0 |
| Indicator of milk flow | 178 | 1 020 | 3 890 | 162 | 631 | 0 |
| Jointing cock | 175 | 1 004 | 2 512 | 291 | 986 | 2 757 |

Note:

I. Satisfactory degree of cleanness (TNM to 500 CCU/dm²)

II. Conditioned satisfactory degree of cleanness (TNM 500 to 2 500 CCU/dm²)

III. Unsatisfactory degree of cleanness (TNM over 2500 CCU/dm²)

The values of contamination of all parts of milking sets were also lower at the same time. The inconvenient degree of cleanness decreased by 80 %. The teat cup - its liner wall - was contaminated at least when cleaned traditionally as well as with the ultrasound. The highest contamination was noticed in the long milk tube after the traditional sanitation and in the jointing cock after the ultrasonic sanitation.

Conclusion

Better cleanness of all parts of the milking sets was achieved by the ultrasonic circular cleaning of the pipeline milking equipment then with the traditional sanitation.