

MEASUREMENT OF TEAT STRUCTURES OF DAIRY COWS THROUGH ULTRASONOGRAPHY AND EXAMINATION OF MORPHOLOGICAL CHANGES IN TEATS CAUSED BY MACHINE MILKING

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Abstract. The aim of this study was to measure different characteristics of the cow teats and teat canals using ultrasonographic scanning, discover morphological changes in cow teats and recovery time of the teat tissue caused by machine milking. Overall 148 dairy cows of the Holstein (n = 100) and Simmental (n = 48) breed were investigated. Recovery of the teat internal parameters after milking was observed by ultrasonographic scanning. Teat canal length (TCL), teat canal diameter (TCD) and teat wall thickness (TWT) of 296 right front and rear teat were evaluated from 1776 measurements before (t0) and 0, 30, 60, 90 and 120 minutes after milking (t1 - t5). Maximum significant differences for the selected teat characteristics were found between t0 and t1 measurements. The highest restorations of the initial length 103.52% and 114.23% were detected 120 minutes after milking for front and rear teat canals in Holstein breed. Similar process of restoration was found in Simmental breed. All measured internal traits (TCL, TCD, TWT) showed decrease of values indicating the regeneration process of the teat and udder structures after the milking. However, teat canal length a teat wall thickness remained extended until the examination, what proved that 120 minutes period is not enough time for teat structures full recovery after milking. Significant relationships before milking between front teat canal diameter and daily milk yield ($r = 0.348$) and milk flow rate ($r = 0.257$) were confirmed. Negative correlations were found between teat canal length (front and rear) and milk production and milk flow rate before milking and immediately after milking. Significant effect of breed and recovery time was found in all internal traits, whereas cross factors daily milk production, recovery time and milk flow rate recovery time were significantly influenced only in relation to teat canal diameter.

Keywords: ultrasonography, teat, udder, milking traits