

**Relationship between in-line recorded milk flow rate and longevity in Estonian Holstein cows***T. Kaart, A. Tänavots, M. Liiva and H. Viinalass**Institute of Veterinary Medicine and Animal Sciences, Estonian University of Life Sciences, Department of Animal Genetics and Breeding, Kreutzwaldi 62, 51014 Tartu, Estonia; alo.tanavots@emu.ee*

In nowadays industrial world, the homogeneity of cows-related farm procedures (incl. milking process) has become an essential economic factor. Another aspect, which has a major impact on the profitability of the dairy industry, is cows' functional longevity. The relationships between in-line recorded average milk flow rate (AFR, kg/min) expressing the efficiency of the milking process, and survival rate and culling reasons (CR) characterising the longevity, in Estonian Holstein (EHF) cows were investigated. AFR was recorded in-line from 2010 to 2015 in total of 20,484 first parity EHF cows belonging to 58 owners. The number of culled cows at the end of 2015 was 5,190 (25.3%). The Cox proportional-hazards regression model was built and regression tree with package 'partykit' in R was constructed to study the effect of AFR on censored longevity. The correspondence analysis (CA) was used to discover the common patterns among final nodes of regression tree and culling reasons. The overall AFR was 2.16 kg/min (SD=0.79) and the AFR of culled cows was 2.08 kg/min (SD=0.77). The survival rate was the highest on cows with AFR>3.16 kg/min and the lowest on cows with AFR<1.24 kg/min, indicating that the cows with faster AFR survive longer than cows with moderate or slower AFR. This tendency follows also the Cox model. According to the CA the slower AFR ( $\leq 1.66$  kg/min) was mainly related with culling due to the low milk yield and various udder and teat defects, and especially with poor milkability. However, the culling due to mastitis was associated mostly with moderate and culling due to the metabolic and reproductive disorders with faster AFR. The results reveal that faster milking EHF cows have longer productive life and the culling rate due to mastitis does not increase.

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