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Effect of age at first calving on longevity and fertility traits for Holstein cattle

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Effects of age at first calving (AFC) on functional longevity of Czech Holstein cows and their reproduction traits in the first lactation were analyzed using the first lactation data of 605 538 Holstein cows first calved from 1993 to 2008. Three classes were formed for AFC: low age class (16–24 months), average age class (25–30 months), and high age class (33–46 months). Effects of AFC on length of productive life (LPL), days open (DO), days between calving and first service (CTFS), and days between first service and conception in the first lactation (FSTC) were estimated by survival and linear model analyses. It was found that LPL was on average slightly shorter for cows with higher AFC who showed also a lower proportion of higher lactations and tended to longer DO and longer CTFS in the first parity. The results of survival analysis indicate that cows with higher AFC had a tendency to shorter LPL (risk of culling 1.118) and to longer DO (risk of conception 0.758), CTFS (risk of conception 0.757), and FSTC (risk of conception 0.754) in comparison with cows with lower AFC. When the effect of fertility traits on LPL was analyzed, it was found that longer DO, CTFS, and FSTC were connected with a lower risk of culling (0.132, 0.183, 0.206) regardless of the particular AFC group. In linear model analysis, the effects of AFC group were estimated from two datasets, where the second dataset included also the missing values of fertility traits. It was found that the cows group with the highest AFC showed worse values of fertility traits (16.75, 19.69, 20.46 days) than the cows groups with lower AFC. Results of all analyses showed that a high AFC is connected with worse cow's fertility at the first lactation and with lower cow's LPL.

Keywords:

functional traits; survival analysis; linear model; cattle

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