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Effect of calving ease on the subsequent performance of cow and calf in UK Holstein-Friesian cattle

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Introduction Being one of the most economically significant non-production traits, calving ease has a large impact on the dairy industry (Dekkers, 1994). In addition, calving difficulty is ranked an extremely painful condition of cattle (Huxley and Way, 2006), which suggests that the impact of this trait also greatly affects animal welfare. It is therefore plausible that there will be a detrimental effect of a difficult calving on the subsequent performance of the animals involved. The objective of this study was to use UK Holstein-Friesian cattle data to phenotypically analyse the effect of calving ease on fertility and milk production, of both cow and calf, in their subsequent lactation.

Material and methods This study was restricted to first parity calving ease records only, provided by the Cattle Information Service (CIS) and National Milk Records (NMR) and recorded on a 4 -grade and 5 -grade scale respectively. Categories were defined by CIS as: 1-ease, 2-assisted, 3-difficult, 4 -vet assisted, and by NMR as: 1- normal (not assisted), 2- moderate assistance (farmer), 3- moderate assistance (vet called as precaution) 4 - difficult (extraction by farm staff), 5- very difficult calving (vet assisted). To harmonise scales, category 2 and 3 of the NMR scale were merged; both referring to 'moderate assistance required'. Merging the calving ease and fertility data led to a total of 32,483 and 8,184 records of cow and calf, respectively, originating from 2,486 and 1,410 herds. Fertility data consisted of the calving interval (CI), number of inseminations (NINS), non-return at 56 days (NR) and days to first service (DFS), of the first lactation following the recorded calving. CI was restricted between 300-600 days. Merged calving ease data and production data led to a total of 348,648 and 81,885 records of cow and calf, originating from 2,148 and 1,153 herds, respectively. Production data consisted of the milk yield (kg) recorded at multiple test days in the lactation. The production trait analysed in this study equals the cumulative milk yield of the first three test days, when animals were on average up to 90 days in milk. In all datasets, age of cow was restricted between 18-40 months, to be certain that data included only first parity records. Data were analysed using linear regression and Restricted Maximum Likelihood in ASREML (version 2.00, 2006) fitting fixed effects of calving ease score, month of calving, year of calving, age of cow, data source, days in milk and condition score and a random effect of herd for the fertility traits and herd-testdate for the production trait.

Results There was a significant difference in the fertility of cows for different categories of calving ease. Between an easy calving (1) and vet assisted calving (4), there was an increase of 28 days (s.e.d. = 8.04) in CI, 0.7 services (s.e.d. = 0.090) in NINS, and 7 days (s.e.d.= 2.15) in DFS (Figure 1). NR showed a decrease of 9% between an easy and vet assisted calving, though this was not significant. Analyses of the fertility of calves, in their first lactation, did not show significant differences between the easy and vet assisted calving ease categories. The effect of calving ease on the cumulative milk yield of the first three test days is presented in Figure 2 which shows a significant difference between all calving ease categories in the cow analysis. Between an easy and vet assisted calving, milk yield decreased by, on average, 1.67 kg per test day (s.e.d. = 0.85), or 6.1%. The analysis of the calves shows a tendency to decrease in milk yield between a farmer assisted and vet assisted calving of 2.20 kg (s.e.d.= 3.4) on average per test day, or 7.9% (P=0.057).

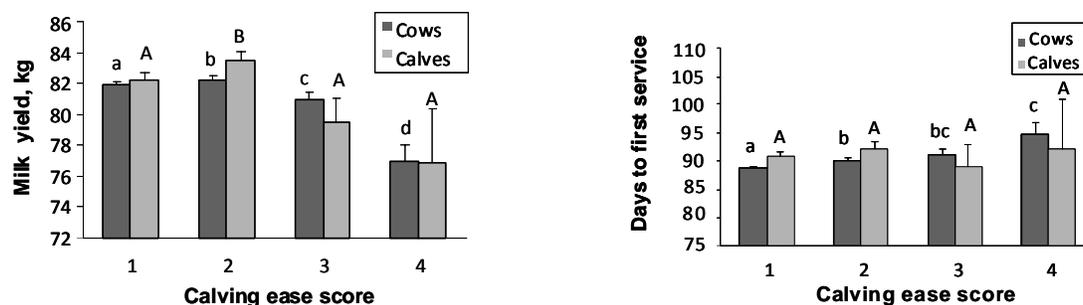


Figure 1 Days to first service per category of calving difficulty **Figure 2** Accumulated milk yield per category of calving difficulty

Conclusions The results of the study indicate that there is a detrimental effect of a bad calving on the subsequent fertility and production of the cow, thereby supporting the findings of De Maturana *et al.*, 2007. When calving difficulty increases, fertility declines and milk yield in the first stage of lactation decreases. A significant effect of calving ease on the subsequent production and fertility of the calves was not found. Though, calves which were delivered with veterinary assistance showed a tendency to decrease in milk yield in the first stage of their lactation as heifers, in comparison to calves delivered with moderate farmer assistance. Further study is needed to analyse the effect of calving ease on the full subsequent lactation.

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