

Retrospective cohort study investigating the relationship between diarrhoea during the preweaning period and subsequent survival, health, and production in dairy cows

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Rearing replacement calves is an important part of dairy farming and diarrhoea is a very common cause of morbidity and mortality in calves. The primary objective of this study was to evaluate the association between preweaning diarrhoea and subsequent survival, health, and production outcomes in dairy cattle. The secondary objective was to assess whether these associations varied with age of onset of diarrhoea. Outcomes of interest included survival (precalving mortality, herd removal), health (retained foetal membranes, metritis, mastitis, somatic cell count [SCC]), and production (305d mature-equivalent milk yield, age at first calving).

Using herd records from a Southern Australian farm, a retrospective cohort study was conducted. Calves with diarrhoea were enrolled at first diagnosis and matched with two unaffected calves by age (± 3 d) and birth date (± 15 d), yielding 9,833 calves. Survival analysis assessed mortality over short (0–20d), medium (21–100d), and long term (101d–first calving) periods following enrolment. Incidence rate ratios, Kaplan-Meier curves, and Cox regression hazard ratios (HR) were calculated, while multivariable linear models were applied to continuous outcomes.

Calves with diarrhoea had higher mortality in the short (HR = 2.48, 95% CI: 1.87–3.29) and medium term (HR = 1.89, 95% CI: 1.41–2.55), but not in the long term (HR = 0.98, 95% CI: 0.79–1.22). A delay in age at first calving was observed, with affected calves calving 4 days later on average (HR = 0.95, 95% CI: 0.91–1.00). Following calving, calves with a diarrhoea history showed higher herd removal rates (HR = 1.13, 95% CI: 1.01–1.26) and elevated peak lactation log SCC (+0.08, 95% CI: 0.02–0.14). No substantial associations were detected for other outcomes.

These findings reinforce the role of preweaning diarrhoea as a major cause of calf mortality and suggest possible long-term implications for herd health and productivity. Further research is needed to confirm exploratory associations observed during lactation.

Keywords: dairy calves, diarrhoea, mortality, production, fertility