

Implementing biosecurity practices to control Johne's disease also reduces calf mortality on IJCP farms

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Summary

- Calf mortality rates (1-100d) in Irish dairy herds nationally declined significantly between 2016 and 2020 and were low (4% calf mortality rate) by international standards.
- Herds in the Irish Johne's Control Programme (IJCP) had a significantly greater reduction in calf mortality than non-IJCP herds.
- Implementation of recommended biocontainment practices to control Johne's disease was associated with a reduction in calf mortality.

Introduction

Postnatal mortality (excluding stillbirths) among replacement stock has a detrimental impact on the social, economic, and environmental sustainability of dairy production. Calf mortality rates vary between countries and show differences in temporal trends. Most calf mortality rates however, are characterised by high levels of between-farm variability. Explaining this variation can be difficult since herd-level information on management practices relevant to calf health is often not available.

Irish Johne's Control Programme (IJCP)

The Irish Johne's Control Programme (IJCP) was launched in 2013, by Animal Health Ireland (AHI) for the control of Johne's disease on Irish dairy farms. Improved calf health through enhanced farm biosecurity is a stated objective of the IJCP. A key component of this programme is a requirement for IJCP-registered herds to complete an annual herd-level Veterinary Risk Assessment and Management Plan (VRAMP), undertaken by an approved veterinary practitioner. The VRAMP provides the framework for a systematic review of factors associated with bioexclusion and biocontainment risks of Johne's disease, including consideration of 'calf protective' measures that are considered to be beneficial for improving calf health generally. Briefly, a series of questions and observations relevant to Johne's disease transmission are assigned risk assessment scores in four areas: pre-weaned calves; weaned calf; adult cow; and calving area. A lower VRAMP score reflects lower assessed biosecurity risk. Whilst this risk assessment is largely focused on factors relevant to the transmission of Johne's disease, many of its principles are good practice biocontainment policies that are also advocated for the protection of calf health.

Research study

In order to determine if this theoretical connection between IJCP/VRAMP and reduced calf mortality exists, a nation-wide study was conducted. Data on the national calf population (sex, breed, herd size, etc.) and calf mortality were extracted from the Animal Identification and Movement (AIM) system for all calves born between 2016 and 2020 in dairy herds (16,154) either registered in or not in the IJCP. The results of the VRAMP scores for the IJCP herds (1,696) were retrieved.

Results

Male calves were 1.45-times more likely to die than females. Jersey or Jersey crosses were 1.26-times more likely to die than Holstein-Friesian while Norwegian Reds were 0.94-times less likely to die. Beef-sired calves were 1.19-times more likely to die than dairy-sired calves. Calf mortality rates were higher in larger herds (>135 cattle) and on farms of birth that contract-reared out their heifers. Calf mortality was 0.83-times less likely in 2020 than in 2016. Farms in the IJCP had a 6% higher risk of calf mortality but also a greater reduction in calf mortality than non-IJCP herds. There was an interaction between IJCP and year of birth; IJCP herds registered farmers reduced their calf mortality to a greater extent than non-IJCP herds registered farmers between 2016 and 2020. In IJCP herds, higher VRAMP scores (higher biosecurity risk) were positively associated with higher calf mortality.

Discussion

While Irish calf mortality rates are relatively low, comparisons between countries is difficult due to differences in data gathering methods and definitions of 'calf mortality'. The decline in postnatal calf mortality detected here is encouraging, but with only five years' data it is not possible to determine if this is a long-term trend. The higher mortality in male calves and Jersey calves may reflect their lower economic value. This may also apply to beef cross calves though they may also be born later into a more challenging rearing environment. Greater calf mortality in large herds may reflect lower labour units:calf ratios with attendant limitations in individual calf health care.

The higher calf mortality in IJCP herds may reflect larger herd size and common biosecurity risk factors between Johnes' disease and higher calf mortality as reasons for entering the programme. However, IJCP herds had a greater reduction in calf mortality over time than non-IJCP herds and IJCP herds that reduced their VRAMP scores over time had lower calf mortality, independent of herd status. This suggests that implementation of recommended biocontainment practices to control Johnes' disease in IJCP herds was associated with a reduction in calf mortality.

These findings were based on a large animal dataset comprising over 6.5 million calves in 16,154 dairy herds over five years; hence, the findings reliably represent the relationships between dairy calf demographics, herd IJCP and VRAMP status and calf mortality.

Conclusions

Membership of the Irish Johnes' Control Programme and reduction in biosecurity risks over time were associated with a significant reduction in postnatal calf mortality in Irish dairy herds.

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