University of Prince Edward Island

Faculty of Veterinary Medicine
Summary of Dissertation

Submitted in Partial Fulfilment
of the Requirements for the

DEGREE OF DOCTOR OF PHILOSOPHY

Dr. Megan Jewell
Department of Health Management

Supervisory Committee
Dr. Shawn McKenna, Chair
Dr. Greg Keefe, Co-supervisor
Dr. Javier Sanchez, Co-supervisor
Dr. Marguerite Cameron
Dr. Michael Cockram
Dr. Jonathan Spears

Examination Committee
Dr. Dan Weary, External Examiner
Dr. Dan Hurnik, Chair
Dr. Shawn McKenna
Dr. Katy Proudfoot
Dr. Jonathan Spears

Prevalence of and risk factors associated with skin lesions and lameness in dairy cattle in the Maritime Provinces of Canada and the use of benchmarking to motivate reductions in the herd-level prevalence of these conditions

Animal-based measurements, such as skin lesions and lameness, are often included in on-farm assessments for welfare and quality assurance programs, for example proAction® in Canada. Using an assessment protocol that was the basis for proAction®, 79 herds housed in both tie-stall (n=33) and free-stall (n=46) barns within the Maritime provinces were evaluated twice, approximately one year apart. During these assessments numerous animal-, environmental-, and management-based measurements were collected and used to provide results and feedback to the study participants. Results were provided in both paper form and through a benchmarking website created using the data from this study, allowing for comparison of results to herds of similar size and facility type.

We found that the prevalence of hock lesions, knee lesions, neck lesions, and lameness were 39%, 14%, 1% and 21%, respectively for all free-stall cows. For the tie-stall cows assessed the prevalence of hock lesions, knee lesions, neck lesions and lameness were 39%, 17%, 5% and 15%, respectively. Using multivariable logistic regression, numerous risk factors for these animal-based measurements were identified.

Re-evaluations of the herds after providing producers with their herd-level prevalence of skin lesions and lameness as benchmarks, we found that the average herd level prevalence of hock lesions and lameness were significantly reduced from 42%-37% and 19%-16%, respectively. Changes that producers made that were associated with the reduction of within herd prevalence included: addition of partitions at the feedbunk, changing the type of milking parlour, and increasing the number of times cows are fed a day. Making producers aware of the prevalence within their herds is an important first step in helping in the reduction of these welfare concerns in dairy cattle. Showing producers that simple changes can be associated with a reduction in the within herd prevalence could also help motivate them to make improvements

Publications

Jewell et al. 2019. Prevalence of hock, knee and neck lesions and associated risk factors in dairy herds in the Maritime Provinces of Canada. Journal of Dairy Science.https://doi.org/10.3168/jds.2018-15080

Jewell et al. 2019. Prevalence of lameness and associated risk factors in dairy herds in the Maritime Provinces of Canada. Journal of Dairy Science. https://doi.org/10.3168/jds.2018-15349.

Jewell et al. 2021. Relationship between types of hoof lesions and behavioural signs of lameness in Holstein cows housed in tie-stall facilities. Journal of Dairy Science. https://doi.org/10.3138/jds.2019-17296.

Oral Presentations

"Relationships between types of hoof lesions and behavioural signs of lameness in Holstein cows housed in tie-stall facilities". Congress of the International Society of Applied Ethology. Charlottetown, PE. 2018.

"Relationships between types of hoof lesions and behavioural signs of lameness in Holstein cows housed in tie-stall facilities". American Association of Bovine Practitioners Conference. Phoenix, AZ. 2018.

"A shorter on-farm dairy welfare assessment protocol that can provide useful feedback to producers". American Association of Bovine Practitioners Conference. Phoenix, AZ. 2018.

"Relationships between types of hoof lesions and behavioural signs of lameness in Holstein cows housed in tie-stall facilities". International Symposium of Epidemiology and Economics. Chiang Mai, Thailand. 2018.

Poster Presentations

"On-line benchmarking of welfare assessments on dairy farms to provide a tool for producers to improve welfare". 7th International Conference on the Assessment of Animal Welfare at the Farm and Group Level. Ede, Netherlands. 2017

"Prevalence of lameness based on scoring system assessing weight bearing & foot positioning of tie-stall housed dairy cattle." Congress of the International Society of Applied Ethology. Charlottetown, PE. 2018.

Biographical Data

Born in Antigonish, Nova Scotia

Awards

Dr Ian Dohoo Travel Award (2018)