



Evidence-based strategies for drying off dairy cows

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Key words

Dry cow therapy, antimicrobial usage, meta-analysis, knowledge synthesis

Aim of the study

This study aimed to 1) evaluate and rank dry off strategies to prevent new intramammary infections (IMI) and cure existing IMI in dairy cows using a network meta-analysis and 2) identify subgroups of infected cows that are likely to benefit from certain dry off strategies using an individual participant data meta-analysis.

Material and methods

Supported by information obtained from systematic reviews recently conducted in Canada, a literature search was performed to identify randomized clinical trials evaluating interventions to prevent or cure IMI during the dry period of dairy cows. For the first research objective, data was extracted from identified studies and offered to one of two Bayesian network meta-analyses: 1) prevention of new IMI and 2) cure of IMI. For the second research objective, authors of dry cow therapy papers published since 1990 were contacted with a request to submit the original data of their publication. The original data was (re-)analyzed using an individual participant data meta-analysis to identify subgroups of cows having the best prevention of new IMI or cure of existing IMI.

Results and significance

Based on the literature search, 58 studies and 18 dry off strategies were identified for inclusion in the two network meta-analyses. Most conducted studies concerned the evaluation of blanket dry cow therapy and negative control. Blanket dry cow therapy in combination with internal teat sealant and α -tocophorol was the highest ranking strategy for prevention of IMI but was evaluated in only one small study. Antimicrobial strategies (ie, blanket dry cow therapy or selective dry cow therapy) in combination with internal teat sealant ranked all high for preventing new IMI. Furthermore, internal teat sealant alone was as successful in preventing new IMI as antimicrobial strategies. Not applying any dry-off strategy (negative control), quarter level selective dry cow therapy, and teat dip were the lowest ranked strategies. Cow level selective dry cow treatment was the highest ranking strategy when cure of IMI was evaluated. Also, all antimicrobial dry off strategies ranked higher than non-antimicrobial dry off strategies, including negative control and teat sealants (when being applied alone). No significant differences in cure of IMI between the different antimicrobial dry off strategies were observed.

For the individual patient data meta-analysis, the second research objective, 27 authors were contacted regarding 49 publications. Fourteen authors of 31 studies agreed to collaborate in the project. Data from 15 studies have been received as of March 28, 2022. Unfortunately, no formal statistical analysis has been conducted for this part of the project yet. The project has experienced another delay due to an unexpectedly high number of authors collaborating in the project, resulting in an even longer waiting period for authors to submit their data. The data collection will close mid-April and we aim to finalize this subproject in the 3 months thereafter.

This study aids to evidence-based decision making when drying off dairy cows. Non-antimicrobial dry off strategies have been ranked together with their antimicrobial counterparts. Furthermore, groups of cows that benefit

most from (non-)antimicrobial strategies will be identified. This is assumed to result in improved guidelines when drying off dairy cows in Switzerland.

Publications, posters and presentations

B. van den Borne, M. Bodmer, S. Dufour, N. Hommels, M. Nielen, and N. Schipper. 2022. Network meta-analysis provides a ranking of preventive dry off strategies. Poster presentation at the 2022 annual conference of the Society for Veterinary Epidemiology and Preventive Medicine, March 23-25 2022, Belfast, Northern Ireland.

N. Schipper, M. Bodmer, S. Dufour, N. Hommels, M. Nielen, and B.H.P. van den Borne. 2022. Network meta-analyses ranking dry-off strategies to cure and prevent intramammary infections in dairy cows. Manuscript in preparation for submission to Journal of Dairy Science.

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