



Network meta-analysis provides a ranking of preventive dry off strategies

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Background

- Dairy cows often acquire new intramammary infections (IMI) during the dry period.
- Several strategies, both antimicrobial and non-antimicrobial, exist to prevent new IMI during dry off.
- Blanket dry cow therapy (BDCT) is commonly applied but results in higher antimicrobial use.
- Many randomized clinical trials have been conducted but not all dry off strategies are pairwise evaluated. Hence, no ranking can be made.

Objective

This study synthesized and ranked different preventive dry-off strategies using a network meta-analysis.

Materials and methods

- A systematic literature review was conducted.
- RCTs evaluating prevention of new IMI during the dry period were included.
- Ranking of strategies made at quarter level (while treatment randomization was mostly at cow level).
- A Bayesian network meta-analysis was performed in R.

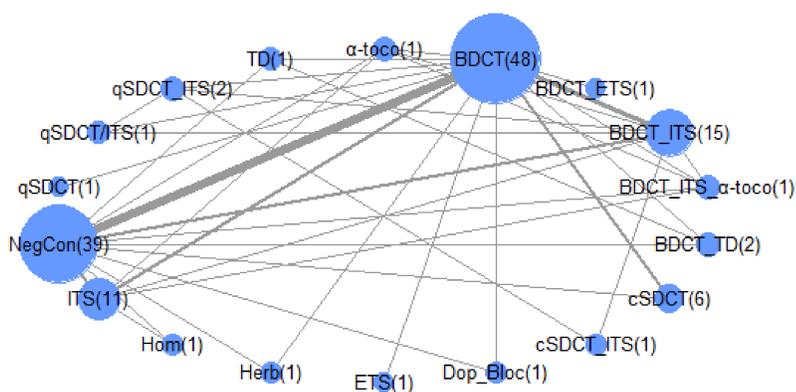


Figure 1. Network plot of preventive dry off strategies. Nodes and lines are weighted according to the number of trials (in brackets) and quarters included

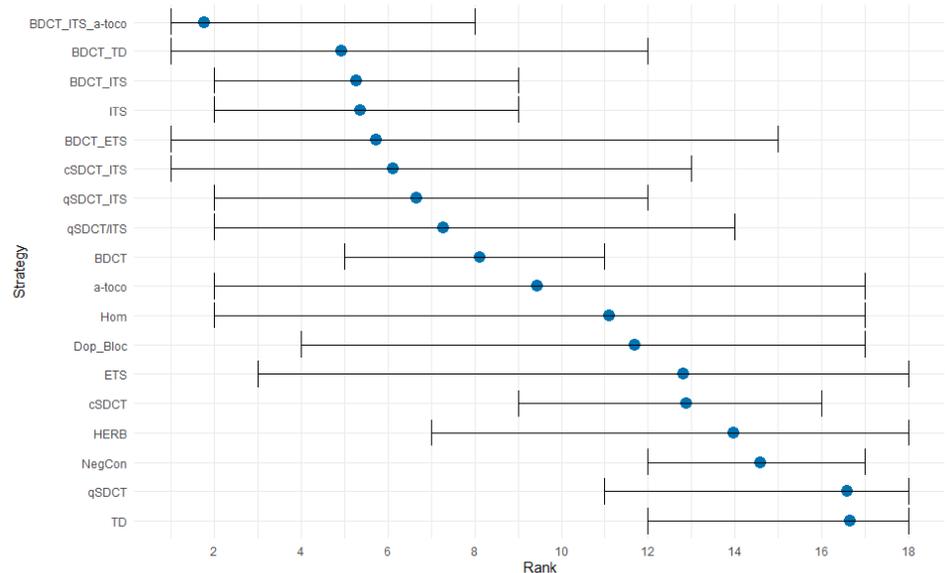


Figure 2. Mean rank (and 95% credibility interval) of preventive dry off strategies

Results

- 54 RCTs, 18 dry off strategies, and 88,598 quarters were included. 14% of quarters experienced a new IMI.
- Strategies contributing to the network (*Fig. 1*) most were BDCT and negative control (NegCon). Internal teat sealants (ITS) were evaluated alone or in combination with antimicrobials.
- BDCT was the highest ranking strategy when applied together with ITS and α -tocopherol (BDCT_ITS_ α -toco; *Fig. 2*) but was evaluated in only 1 small study (*Fig. 1*).
- Antimicrobial strategies (BDCT or selective dry cow therapy (SDCT)) in combination with ITS ranked all high (*Fig. 2*). ITS alone was as successful in preventing new IMI as antimicrobial strategies.
- Strategies combining antimicrobials and teat sealants were more effective than when used alone.
- Homeopathy (Hom), dopamine blocker (Dop_Bloc), external teat sealant (ETS), herbal treatment (Herb) and teat dip (TD), did not perform better than NegCon.

Conclusions

- This network meta-analysis synthesized knowledge from literature and ranked preventive dry off strategies. This helps decision makers when drying off dairy cows.
- ITS is an effective preventive dry off strategy, resulting in a more prudent antimicrobial usage.

Acknowledgments

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