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Published in:
National Mastitis Council 54th Annual Meeting Proceedings

Publication date:
2015

Document version
Early version, also known as pre-print

Citation for published version (APA):
Svennesen, L., Enevoldsen, C., & Klaas, I. C. (2015). From mastitis symptoms to recordings of medical treatments in a central database. In *National Mastitis Council 54th Annual Meeting Proceedings* (pp. 203-204)

From Mastitis Symptoms to Recordings of Medical Treatments in a Central Database

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Introduction

Recorded cases of mastitis treatments are often used for welfare assessment and mastitis control in herd health management and research. However, treatment data available in central databases may be incomplete, and the decision whether to treat mastitis with antibiotics or not is highly dependent on management strategies and the farmer's treatment threshold. To our knowledge, the complete path from mastitis detection to registration in a central database, including the interaction between several actors in larger herds, has not been investigated previously. The aim of this case study was to describe the path from detection to registration of mastitis cases with medical treatments and understand what is behind mastitis treatment registrations available in a central database.

Materials and Methods

We did a four months qualitative case study in a Danish organic farm milking approximately 600 cows. Due to the organic legislation, the herd veterinarian carried out all antibiotic treatments and took milk samples for bacteriological culturing from all affected quarters prior to treatment. We interviewed and observed all actors involved in the detection and treatment of mastitis during their daily routines. The milking personnel was asked to register and grade mastitis symptoms observed at milking as mild, moderate and severe according to Oliveira (2014). We evaluated the registrations of observed cases of mastitis in the milking parlor together with the herd veterinarian's treatment records and culture results, and the registrations in the national cattle database. Multiparous cows having a dry quarter or discarded milk due to antibiotic treatments were registered at four monthly milkings.

Results and Discussion

The study confirmed that the selection of cows for antibiotic treatment is complex. Three levels of involved actors were identified: milking personnel, herd manager and herd veterinarian. Mastitis symptoms were mainly discovered by the milking personnel, but the herd manager was the primary decision-maker in relation to selection of cows for treatment. Cows selected by the herd manager were presented to the herd veterinarian who, according to himself, treated 90 % of the presented mastitis cases. If the herd manager was off duty, the milking personnel selected cows for treatment. In contrast to the herd manager, who considered the cow's history (SCC from previous milk recordings) and the herd specific situation (milk quota, feeding of calves), they only based the decision to treat on clinical symptoms. The milkers perceived that they had a lower threshold for treatment than the herd manager, which may lead to a higher number of cows being treated in the absence of the herd manager. The herd manager and the herd veterinarian

perceived that they had similar treatment thresholds, but the treatment data showed a large variation in selection of cows according to weekday (e.g. no treatments were performed on Sundays). The herd veterinarian registered treatments in his billing system, from where the data was transferred automatically to the national database.

Within the study period, 48 cows were treated with antibiotics and registered in the herd veterinarian's treatment records. Culture results were available from all treated cows with *Streptococcus uberis* being the most frequently cultured pathogen. All treated cases were registered in the national cattle database, indicating complete data transmission from the herd veterinarian to the national database. Only 44 % of the treated cases were registered by the milking personnel. Among the remaining 27 treated cases (unregistered by the milking personnel) information from the national database showed that only two cases were treated because of high somatic cell count at the previous test day. Treatment records indicated severe clinical mastitis in four cases, which the personnel either did not detect or forgot to register. However, we cannot explain how all of the remaining treated cases were selected. There could be more missing registrations of mastitis cows observed in the milking parlor than those 27 treated cows mentioned above. Of the 85 cases observed and registered by the milking personnel, 85 % were cases with mild symptoms. Only 25 % of the observed cases were treated by the veterinarian, with a tendency that moderate to severe cases were more likely to be treated than mild cases ($p = 0.06$). Also, the time-span from observation to treatment was shorter for the moderate to severe cases compared to the mild cases (medians 0 vs. 2 days, respectively).

Drying off individual quarters and discarding abnormal milk until the milk appeared normal were practiced as alternatives to antibiotic treatment especially in mild and chronic mastitis cases. On average 19 % of the multiparous cows had a dry quarter; four to nine new cases were observed every month. At a single observed milking, milk was discarded from 5 % of the multiparous cows, which had untreated mastitis symptoms. Such findings are relevant when estimating the true mastitis incidence or prevalence in the herd and should be included in, for example, comparisons of mastitis incidence or prevalence between herds, and assessments of the impact of mastitis on profitability, productivity and welfare in a herd.

Conclusion

Recordings of medical treatments for clinical mastitis in a central database can give incomplete estimates of the true incidence or prevalence of clinical mastitis. Every fourth observed case was presented to the herd veterinarian for treatment. Drying off single quarters was commonly practiced as an alternative to antibiotic treatment. The major losses of information were caused by missing recordings in the milking parlor and different thresholds for recording and treatment between milking personnel and herd manager. The study demonstrates that thorough knowledge about daily routines, strategies and treatment thresholds of all actors is mandatory to assess the impact of mastitis on profitability, productivity, and welfare in a herd.

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A global organization for mastitis control and milk quality

National Mastitis Council 54th Annual Meeting

Proceedings

February 1-3, 2015
Memphis, Tennessee

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