Mastitis risk indicators assessed through a germ specific epidemiological model in southern Belgium

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Introduction

Udder health is usually considered as the main economic problem for dairy farmers. We now consider that mastitis is the result of many factors related to the environment, the pathogen and the host. Nowadays, the main interface with mastitis is the farmer, and their knowledge about mastitis is very heterogeneous. We tried to show a group of dairy farmers that mastitis could take several different forms from one farm to another, in term of incidence, pathogens and clinical forms. One common observation is that most common preventive practices are not implemented in all farms. This study tries to understand the specific impact of mastitis epidemiology on identified risk factors in previous studies in Wallonia.

Material and Methods

- Epidemiological survey
  25 farmers / 12 veterinarians during 3 months
  Questionnaire about their main practices (25 points) mastitis knowledge (15points), personality and satisfaction
- Bacteriological survey
  Clinical questionnaire and bacteriology at day 0 and day 21
  1630 cows at risk during 3 months (Mean 67; SD 18)
- Germ-specific epidemiology
  Assessment in 3 categories of the bacteria isolated: Mammary, Environmental, Mix related to respectively presence of Staphylococcus aureus, with or without CNS; Environmental pathogens such as Streptococcus uberis or Escherichia coli, with or without CNS; and CNS only or both Streptococcus and Staphylococcus.

We used univariate and multivariate analysis to identify a risk ratio for each variable. Then we used Germ-model as a stratification to analyse each factor with WinEiscope®.

Mammipack®, our sampling agreement with the participants. It contains:
- A pedagogical file upon main aspects of udder health
- Small laminated sheets for quick access on Milking sampling and teat lesions
- Sterile sampling tubes
- A mastitis clinical record pad
- Book Udder Health®

Results

We collected 124 intramammary infection (IMI) events, 244 bacteriology. Only 1265 cows and 118 mastitis were able to be included regarding data collection and bacteriology. Incidence of clinical mastitis over the 1265 cow at risk was 9,41%. Out of the 25 management points, only 12 were able to be compared statistically (Tab. 1).

The germ-specific model was evaluated by farm, the most prevalent being environmental 53%, then mammary 26%, then mix 21%. According to literature, known preventive measures appear associated with increased IMI, such as post-dipping.

Stratified cohort analysis

If there was no interaction between stratum variable was not considered.
Post-dipping : RR Mammary : 0,3 CI95% (0,13-0,70)
RR Environmental : 3,95 CI95% (1,62-9,63)
RR Mix : NS
Q(Breslow-Day) 21,4 (p<0,0001)
Means that Post-dipping is biased by the nature of infections occurring at the farm. It is associated with low IMI incidence regarding Mammary models and high IMI in environmental models

Cubicles :
RR Mammary : NS
RR Environmental : 0,27 CI95% (0,14-0,52)
RR Mix : NS
Q(Breslow-Day) 9,5 (p<0,01)
Means Cubicles has truly association with low IMI only regarding environmental pathogens.

Discussion

As Schukken et al. (1991) and Barnouin et al. (2005) underlined contradiction between risk factor study regarding somatic cell count and clinical mastitis data, we found out significant bias under key management practices. That should help understanding why some measures just won’t help in some farms, due to the type of infection in the herd. Nevertheless we can ask ourselves why post-dipping seems associated with elevated IMI rate. Could it be because of a teat apex modification of the flora?