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Publication date:
2017

Document Version
Publisher's PDF, also known as Version of record

Link back to DTU Orbit

Citation (APA):
Treatment Patterns for Mastitis in Danish Dairy Cattle Farms

Maya Gussmann¹, Kaare Græsbøll¹, Carsten Kirkeby¹, Søren Saxmose Nielsen², Nils Toft¹, Michael Farre³, Tariq Halasa¹
¹DTU National Veterinary Institute, ²University of Copenhagen, ³SEGES, Denmark

Introduction
Regular cow level registrations in the Danish Cattle Database include registrations about e.g. milk yield, SCC and calvings, but also about diseases and treatments for individual cows. These data could potentially be a useful source of information for the development of herd-specific udder health management programs tailored to the farmer’s preferences. With tailored programs farmers will possibly be more motivated to adopt a proposed management program.

Data
518 Danish dairy farms with recordings for treatment, calvings, and lactation stage from 2009 to 2015.

Statistical analyses
• Farm-wise logistic regressions to predict treatment
For 458 farms without extreme coefficients:
• AUC: prediction capability of the model
• Principal component analysis (PCA) for 429 farms: transformation of regression coefficients to explain as much variance as possible
• Clustering of farms

Results
Multivariate logistic regression showed significance for all predictors, though not on all farms. On 77 farms all predictors were significant.

Fitting the regression models on 90% of the cows and testing on the remaining 10% yielded a mean AUC of 0.78, indicating a good predictive capability of the model (see histogram).

The first two principal components explain more than 50% of the Variance. PCA and clustering show three clusters, one around parity, one around lactation stage and average milk yield and one around clinical registrations, PCR and SCC (see Figure 1).

Summary
The results indicate that farmers have different reasons for mastitis treatments; some focus on age, or production, while others focus on disease indicators such as positive PCR or SCC.