

**Animal health in organic dairy farming – Health state as well as development,
application and evaluation of a preventive herd health planning concept**

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The prevention of animal health problems is crucial in organic livestock farming: this may be achieved by choosing appropriate animal housing conditions as well as suitable breeds and, offering high quality feedstuffs, allowing grazing or outdoor-running, and considering proper stocking densities. To date, relatively little is known about the specific dairy health situation under the conditions of organic husbandry and specific preventive concepts are hardly known to most organic milk producers. The objectives of the present thesis were, first, to assess the status quo of the animal health situation in organic dairy farming through a survey in a representative sample of farms; secondly, to develop a concept for farm-individual herd health plans; and, thirdly, to apply such health plans in the course of intervention studies on organic dairy farms. Additionally, studies of inter-observer agreement regarding locomotion scoring and a survey, which evaluated the acceptance of herd health plans by the farmers, were carried out.

The thesis consists of an introduction to the topic followed by five chapters and a concluding summary. The first chapter contains results from an investigation which analysed the status quo of the animal health situation of organic dairy farming in Germany. On-farm surveys with regard to cow health, medicine use and milk recording data in 50 (year 2002/ 2003) and 43 (2004/ 2005) representative farms revealed that production diseases such as clinical mastitis, lameness and metabolic disorders seriously affect organic dairy farming. Prevalences and incidences (e.g. mastitis) were similar in range to those found in conventional dairy farming and specific concepts for prevention were hardly known.

A lameness intervention study in organic dairy farming is in the focus of the second chapter. The aim of this study was to develop and validate a preventive animal health concept, taking lameness as an example, and to demonstrate that it can successfully be implemented into practice. Farm-individual catalogues of measures were developed in cooperation with the farm manager and implemented on 21 intervention farms. The lameness situation was then recorded during regular farm visits over a period of four years (2005 - 2009) and compared with the situation on 19 control farms, where no measures were in effect. Results showed that lameness prevalence was significantly and consistently reduced on the intervention farms by more than 50%. This was also the case, when the baseline situation was considered in the statistical model. The prevalence of limb injuries (here: swelling of the carpal joint) was also reduced by introducing specific measures to improve cow comfort of the lying surface.

In our studies, animal related parameters were recorded using subjective assessment protocols, e.g. locomotion scoring, which can be easily applied on-farm and do not require technical equipment. These assessments are suitable for on-farm surveys provided that an acceptable level of inter-observer reliability can be assured. In the third chapter we therefore evaluated the training effect for an observer in using a five-point locomotion scoring system. The agreement between an experienced and a naïve observer during an initial training time and subsequent farm visits was investigated using a set of coefficients. The level of inter-observer reliability was already acceptable after a short theoretical and practical introduction to the scoring system and substantially improved with increasing experience.

The fourth chapter describes the results of a pilot study on the implementation of herd health plans in organic dairy farming (2006 - 2009). The study aimed at applying the concept of individual farm visits, which had been successfully adopted during the lameness intervention study, to other aspects of herd health. In a first step, we defined specific indicators for dairy health (udder and metabolic health; fertility) and defined target values. This formed the basis of a concept for herd health plans (HHP), including an initial weak points analysis, for individual farms. Whether this concept could be successfully implemented and whether the process was sufficiently effective was tested on 27 dairy farms; 13 farms served as a control. Udder health was significantly improved on the farms that had implemented herd health plans compared to the control farms. Also the treatment incidence of puerperal infections was significantly lower after measures were introduced for improving the fertility situation. Herd health plans also helped to significantly improve the average body condition of the herd. In the course of the study, the average age of cows in the herd and the average milk yield remained unchanged.

Chapter five deals with the acceptance of herd health plans by organic dairy farmers. Before the start of the pilot study on implementing herd health plans on individual farms, the farmers involved were asked about their expectations and ideas regarding the proposed health plans and animal health in general. After finishing the pilot study, the same farmers were interviewed again to assess whether their expectations had been met and to evaluate the general acceptance of the applied measures. Organic dairy farmers had a positive attitude towards herd health plans before the start of the study and felt the same afterwards. They highly valued the systematic and strategic approach of herd health plans as it demonstrably helped them to identify causes and effects in the complex field of dairy cows' disorders and to take adequate measures. The practicability and feasibility of the health plans were extremely important for the farmers and this finding calls for a strictly individual approach towards each farm.

The results demonstrate the need for preventive health concepts and the respective benefits of herd health plans: dairy farmers who implemented herd health plans successfully reduced lameness in their herds and improved udder health and other health parameters of their cows.

Another focus of the thesis was on the evaluation of the practicability/ feasibility of the developed health concepts. Our findings confirm the effectiveness of herd health plans and showed that - within the framework of applied research projects - the implementation of this management tool is feasible on individual farms and well accepted by the milk producers. We therefore expect our findings to strongly encourage the implementation of herd health plan oriented preventive concepts in organic dairy farming.

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