



Economic figures in herd health programmes as motivation factors for farmers



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ABSTRACT

Veterinarians often express frustrations when farmers do not implement their advice, and farmers sometimes shake their heads when they receive veterinary advice which is practically unfeasible. This is the background for the development of a focused 3 page economic report created in cooperation between veterinarians, farmers, advisers and researchers. Based on herd specific key-figures for management, the report presents the short- and long-term economic effects of changes in 15 management areas. Simulations are performed by the dairy herd simulation model "SimHerd". The aim is to assist the veterinarian in identifying the economically most favorable and feasible management improvements and thereby provide more relevant and prioritised advice to the farmer.

In the developing process, a prototype of the advisory tool was tested by 15 veterinarians on 55 farms. After the test period, a selection of farmers were asked to take part in a qualitative evaluation questioning them whether they had implemented the action plans suggested on basis of the advisory tool and making them explain what made them agree or disagree on the results from this new advisory tool. The aim of this process was to evaluate the farmers' receptiveness to advice based on these economic analyses. We found that the analysed advisory tool (the report) can be seen as a valuable help and support for some farmers when deciding whether to implement the action plans. However, certain reservations were recognised. The trustworthiness of the tool depends on whether the veterinarians are able to suggest to the farmer which specific management changes are needed to obtain the estimated effects and what the related expenses might be (costs). Without transparency of expenses, time-limits, work hours and so on, farmers may not be convinced by the tool.

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1. Introduction

Today, veterinarians are not only important advisers for farmers in relation to the health of the farm animals. They have also become important partners in the development of action plans leading to changes on the dairy farms with the aim of improving production, while focus of dairy management has changed from curative to preventive (da Silva et al., 2006). Still, research has shown that farmers do not always follow the advice from the veterinarians (Huijps et al., 2010). This may partly be due to a lack of communication skills among veterinarians, for instance due to a lack of taking the different learning styles of farmers into account or of understanding and accepting that farmers do not behave irrationally, but have differ-

ent values and perceptions of risk than veterinarians (Kristensen and Jakobsen, 2011; Lam et al., 2011).

Another important aspect is that farmers' management and ability to make decisions are influenced by many other factors such as personality, available time and labor and background knowledge (Olson, 2011).

In Denmark and in other European countries, herd health programmes are mandatory in herds with more than 100 cows or 200 young stocks (Lind et al., 2012; Anon., 2015). Every quarter, the veterinarian has to deliver a herd health report to the farmer, including advice or action plans on how to improve herd health and production. Different support tools can be used in this process. An example is SimHerd, a decision support tool presenting both technical and economic consequences of simulated scenarios (www.simherd.com). Another example is Interherd (<https://www.nmr.co.uk/reporting-analytics/interherd-plus>) which provides the farmers with Key Performance Indicators (KPI) presenting the current performance of the herd. SimHerd and a programme like Interherd

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supplement each other, since SimHerd relies on the KPIs as input parameters for simulating the scenarios.

However, the farmer does not always follow the advice from the veterinarian, and both parties may end up being frustrated.

The current project assumes that the farmer often regard the economic consequences of these action plans to be too uncertain and therefore is unwilling to spend time and money on implementing the different recommendations. Therefore, the project is based on the hypothesis that the inclusion of estimated economic consequences in action plans will be a valuable help and support for the farmer when deciding whether to implement the action plans.

Hence, the aim of this project was 1) to develop an advisory tool providing a report presenting the herd-specific economic estimates for the action plans suggested by the veterinarian and 2) to evaluate the farmers' receptiveness to guidance based on these economic reports presented by the veterinarian.

2. The advisory tool: materials and methods

The advisory tool developed in this project is called Analysis of Animal Health Economics (AAHE). The AAHE tool is based on the simulation model SimHerd which is a stochastic, dynamic and mechanistic model simulating individual animals in a dairy herd in weekly time-steps. The model mimics the production related and economic effects of management changes in a herd based on the individual herd's own data (Østergaard et al., 2005). SimHerd has been used for scientific purposes the last 25 years and since 2010 also as an advisory tool targeting veterinarians and other cattle advisers in a special web based version.

Danish veterinarians have asked for a quick push-and-go version of the tool presenting the effects of a series of different standard management changes of production and economy. The aim was to help farmers prioritise where to focus their efforts. The resulting AAHE tool developed during the project provided a 3 page report presenting the simulated economic and production related effects of implementing improvements in a selection of management areas. The selection of relevant management areas was based on the results of two workshops – one with farmers and one with their respective veterinarians who made suggestions of the most relevant management areas to include in the tool. That process resulted in the choice of 15 changes in management areas to be simulated in all herds. These changes are presented in Table 1. For the first eight management areas, two levels are simulated, both the improvement of the management area described in Table 1 and – for the purpose of external benchmarking – one scenario representing the level of the 25% best performing herds for this particular parameter. All 23 scenarios in the 15 management areas were compared to a scenario which represents the current management performance and herd status. All of these are simulated for the specific farm based on herd specific data where the veterinarian previously has validated and adjusted the data input (if necessary).

A report is produced automatically by the AAHE tool. The same scenarios are simulated in all herds; the results from a scenario will, however, differ between herds due to the fact that farm specific data are used to define the current management and herd status scenario.

In the report presented to the farmer by the veterinarian, results are shown in three ways: Bar charts of the economic consequences: Figs. 1 and 2 show changes in annual gross margin compared to current management after the effects of the management changes have stabilised (average of years 5–10). Tables present the effects on the production (Tables 2 and 3) and curves present economic effects over years of some specific management changes (Figs. 3 and 4).

In Fig. 1, a blue bar shows the total increase in gross margin, if the occurrence of a disease is e.g. reduced by 50 percentages

(reflecting the first 8 management areas of Table 1). The grey bars relate to external benchmarking and show the economic potential if the farm improves to the level of the 25 percentile best herds in the country for each specific management area. Likewise, in Fig. 2, red bars show the increase in income if more complex health measures like calf mortality are reduced or if cow longevity is improved (reflecting the last 7 management areas of Table 1).

Tables 2 and 3 present the expected changes in production results of the simulated improvements of 15 management areas: Change in milk yield, number of calving's per year, size of different age groups, labour hours and production of methane. Some management changes, e.g. improved reproduction, only have a minor immediate effect, but a marked long-term effect. These changes in gross margin/year are shown as curves over 10 years in Figs. 3 and 4.

The last page in the report presents an overview of the farm specific key figures describing the current management and Important parameters to discuss parameters which were used as input for the analysis (not presented here).

A main aim of the report was to keep the presentation of the effects of the potential management changes as clear and simple as possible and thus to make a report of maximum three pages for the farmer with the primary focus on bar charts showing economic effects of management improvements. The veterinarian will facilitate feeding the model with the needed data from the farm and then personally present the report to the farmer and discuss with him/her how to prioritise different management improvements. The management area best suited for improvement may not be applicable on the farm or may conflict with other restraints or principles. The report is developed as a tool to support herd health advisory programmes, and it is therefore developed as a tool for dialogue, not a tool for the farmer alone. Important parameters to discuss are e.g. the farmers' own estimate of costs related to the implementation and labour hours saved/needed when the change have been implemented. Based on these discussions and the report, the veterinarian can then specify the action plans for the farmer.

In the developing process, a prototype of the advisory tool was tested by 15 veterinarians on 55 farms. After the test period, a selection of farmers were asked to take part in a qualitative evaluation questioning them whether they had followed the action plans suggested on basis of the advisory tool and making them explain what made them agree or disagree with the results of this new advisory tool. The aim of this process was to evaluate the product and make final adjustments of both the report and the course material for the veterinarians who were going to use the tool.

2.1. The qualitative evaluation – material and methods

A mix of quantitative and qualitative methodologies was used to evaluate the farmers' perception of the advisory tool. Questions in the structured interview guide focused on the relationship between effect and cause: Did the advisory tool and the way it was presented result in farmers following and implementing the suggested action plan?

Qualitative methodologies in an evaluation process are recommended especially to identify unintended consequences (Tilley and Alan, 2006) and for investigations of causal relationships when the relationship between cause and effect can be unpredictable, complex, influenced by the context and depends on human interpretations and actions. Some qualitative evaluators assert that qualitative methods are best suited for allowing a multiplicity of views and interests to be expressed in an evaluation process (Dahler-Larsen, 2012:115).

A selection of 38 farmers in total representing all participating veterinarians was asked and accepted to take part in a phone interview (in Danish) following a structured interview guide. The selection of 38 among the 55 farmers was done randomly aiming

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