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Improving bovine udder health: A national mastitis control program in the Netherlands

T. J. G. M. Lam,*†‡[1] B. H. P. van den Borne,†§ J. Jansen,# K. Huijps,‖ J. C. L. van Veersen,*† G. van Schaik,† and H. Hogeveen‡¶
*UGCN, Dutch Udder Health Centre, PO Box 2030, 7420 AA Deventer, the Netherlands
†GD Animal Health Service, PO Box 9, 7400 AA Deventer, the Netherlands
‡Utrecht University, Department Farm Animal Health, PO Box 80151, 3508 TD Utrecht, the Netherlands
§Veterinary Public Health Institute, Vetsuisse Faculty, University of Bern, Schwarzenburgstrasse 155, 3097 Bern, Switzerland
#Wageningen UR, Livestock Research, PO Box 65, 8200 AB Lelystad, the Netherlands
‖CRV, PO Box 454, 6800 AA Arnhem, the Netherlands
¶Wageningen University, Chair Group Business Economics, PO Box 8130, 6700 EW Wageningen, the Netherlands

ABSTRACT

Because of increasing bulk milk somatic cell counts and continuous clinical mastitis problems in a substantial number of herds, a national mastitis control program was started in 2005 to improve udder health in the Netherlands. The program started with founding the Dutch Udder Health Centre (UGCN), which had the task to coordinate the program. The program consisted of 2 parts: a research part and a knowledge-transfer part, which were integrated as much as possible. The knowledge-transfer part comprised 2 communication strategies: a central and a peripheral approach. The central approach was based on educating farmers using comprehensive science-based and rational argumentation about mastitis prevention and included on-farm study group meetings. Comprehensive education materials were developed for farmers that were internally motivated to improve udder health. In the peripheral approach it was tried to motivate farmers to implement certain management measures using nontechnical arguments. Mass media campaigns were used that focused on one single aspect of mastitis prevention. These communication strategies, as well as an integrated approach between various stakeholders and different scientific disciplines were used to reach as many farmers as possible. It should be noted that, because this intervention took place at a national level, no control group was available, as it would be impossible to isolate farmers from all forms of communication for 5 years. Based on several studies executed during and after the program, however, the results suggest that udder health seemed to have improved on a national level during the course of the program from 2005 to 2010. Within a cohort of dairy herds monitored during the program, the prevalence of subclinical mastitis did not change significantly (23.0 in 2004 vs. 22.2 in 2009). The incidence rate of clinical mastitis, however, decreased significantly, from 33.5 to 28.1 quarter cases per 100 cow years at risk. The most important elements of the farmers' mindset toward mastitis control also changed favorably. The simulated costs of mastitis per farm were reduced compared with a situation in which the mastitis would not have changed, with €400 per year. When this amount is extrapolated to all Dutch farms, the sector as a whole reduced the total costs of mastitis by €8 million per year. It is difficult to assign the improved udder health completely to the efforts of the program due to the lack of a control group. Nevertheless, investing €8 million by the Dutch dairy industry in a 5-yr national mastitis control program likely improved udder health and seemed to pay for itself financially.
Key words: national program, communication, extension, economics

INTRODUCTION

Mastitis impairs milk quality (Barbano et al., 2006), cow welfare (Kemp et al., 2008), leads to an increased risk of antibiotic residues (van Schaik et al., 2002), is very annoying for farmers whose working routine is disturbed (Jansen, 2010), may have a negative effect on the image of the dairy industry, and has monetary effects (Hogeveen et al., 2011). Recent estimates of the average economic losses caused by mastitis in different countries range from €61 to €97 per average cow in the herd (Hogeveen et al., 2011). However, large differences exist between farms within a country. In the Netherlands, the estimated total failure costs of mastitis varied from €17 to €198 per cow per year (Huijps et al., 2008). From the 1970s to 2000, bulk milk SCC (**BMSCC**) in the Netherlands steadily decreased (Sol,

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[1]Corresponding author: t.lam@gddeventer.com

2002). This improvement stagnated in the beginning of this century, with increasing BMSCC levels and higher peaks in the summer periods. Additionally, field reports indicated that a substantial number of herds were experiencing problems with clinical mastitis (**CM**).

With that background, the Dutch dairy industry decided in 2004 to invest approximately €8 million levy money in a 5-yr national mastitis control program, with the ambitious goal of decreasing the incidence rate of clinical mastitis (**IRCM**) by 10 percentage points (van der Zwaag et al., 2005). The national mastitis control program was run by the Dutch Udder Health Centre (**UGCN**), which was especially founded to implement this control program. The UGCN served as an independent source of information on udder health for farmers and others, and initiated and coordinated research in a wide range of Dutch research institutes.

To prevent mastitis, one should consistently put effort in optimizing nutrition, host resistance, environmental conditions, milking equipment, milking technique, and hygiene (Bradley, 2002; LeBlanc et al., 2006). Additionally, proper data handling and goal setting are crucial to evaluate the measures taken. Many quantitative studies have demonstrated the effect of farm management practices on mastitis (e.g., Barkema et al., 1999; Barnouin et al., 2004; Green et al., 2007). Nevertheless, quantifiable management factors cannot explain the variance in mastitis incidence on farms completely. Differences in productivity between dairies have been described in spite of these farms having the same facilities, feed, genetic base, and environmental circumstances, the main difference between them being the herd manager (Seabrook, 1984). The same is likely the case for mastitis. Therefore, in the Dutch mastitis control program, besides knowledge transfer on optimal farm management practices, much attention was paid to change the attitude and behavior of farmers and veterinarians.

In many countries national mastitis control programs exist, varying from very applied such as the Australian Countdown Downunder project (Brightling et al., 2009) to more research oriented such as the Canadian Bovine Mastitis Research Network (Reyher et al., 2011). Several states in the United States have or had their programs (i.e., Reneau, 2007; Ruegg and Rodrigues, 2007) and especially Nordic countries have a long background in an organized approach of udder health (Østerås and Sølverød, 2009). Apparent differences in udder health in different countries exist (IDF Standing Committee on Animal Health, 2001). Although the dairy industry in these countries differs in aspects such as production systems, market circumstances, climate, and legislation, it shows that room for improvement exists in many countries and that one can learn from others' experiences. The experience and results generated by the Dutch mastitis control program can help others in the dairy industry worldwide improve or design their own mastitis control programs. The objective of this paper was to describe and evaluate the Dutch national mastitis control program with respect to mastitis occurrence, farmers' mindset and behavior, and farm economics.

MATERIALS AND METHODS

The Dutch National Mastitis Control Program

The national mastitis control program consisted of 2 parts: (1) initiating applied research and (2) transferring existing and new knowledge to the field. By having these 2 parts, research and practice were integrated. Approximately half of the available financial resources were invested in research projects that contributed to a substantial number of scientific publications and 9 PhD theses (Melchior, 2007; Hettinga, 2009; Halasa, 2009; Huijps, 2009; Sampimon, 2009; Bouwstra, 2010; Jansen, 2010; Ploegaert, 2010; van den Borne, 2010). All research activities were directed toward implementation into the field because they were paid by the dairy industry and, directly or indirectly, dairy farmers had to profit from the results. The other half of the resources was invested in knowledge transfer to dairy farmers and their advisors. Although the power of policy instruments such as regulations, BMSCC threshold levels, and bonuses on milk quality is known (e.g., Leeuwis, 2004; Nightingale et al., 2008), changing regulations was beyond the reach of the UGCN, who could not enforce changes in milk quality regulations. Thus, other strategies such as communication campaigns were used to enhance farmers' behavior to improve udder health in the Netherlands. The theoretical background of that approach has been described before (Jansen et al., 2010a; Lam et al., 2011; Jansen and Lam, 2012) and comprised 2 main communication strategies.

The first strategy, called the central approach (Jansen et al., 2010a), included on-farm study group meetings and the development of comprehensive education materials for farmers who were interested in participating in a program to improve udder health management. This strategy focused on improving udder health by educating farmers using comprehensive science-based and rational argumentation about mastitis prevention and treatment. In a survey conducted before the start of the program, farmers identified their veterinarian as the first person to approach when having udder health problems (Jansen et al., 2009). Therefore, the backbone of this type of knowledge transfer was formed by veterinary practitioners acting as intermediaries between the UGCN and farmers. In 2005, the approach and the