



J. Dairy Sci. 99:1–11  
<http://dx.doi.org/10.3168/jds.2015-10816>  
 © American Dairy Science Association®, 2016.

## Dutch dairy farmers' need for microbiological mastitis diagnostics

Karien Griffioen,<sup>\*1</sup> Geralda E. Hop,<sup>†</sup> Manon M. C. Holstege,<sup>†</sup> Annet G. J. Velthuis,<sup>†</sup> Theo J. G. M. Lam,<sup>\*†</sup> and 1Health4Food–Dutch Mastitis Diagnostics Consortium<sup>2</sup>

<sup>\*</sup>Department of Farm Animal Health, Faculty of Veterinary Medicine, Utrecht University, PO Box 80151, 3508 TD Utrecht, the Netherlands

<sup>†</sup>GD Animal Health, PO Box 9, 7400 AA Deventer, the Netherlands

### ABSTRACT

Although several microbiological mastitis diagnostic tools are currently available, dairy farmers rarely use them to base treatment decisions on. In this study, we conducted a telephone interview among 195 randomly selected Dutch dairy farmers to determine their current use of and their need for microbiological diagnostics for clinical mastitis (CM), subclinical mastitis (SCM), and dry-cow treatment (DCT), followed by the test characteristics they consider important. A structured questionnaire was used, based on face-to-face interviews previously held with other farmers. The answers were registered in a database and analyzed using descriptive statistics and univariable and multivariable models. Antimicrobial treatment decisions for CM, SCM, and DCT were mainly based on clinical signs and somatic cell count. In case of CM, 34% of farmers indicated that they currently submit milk samples for bacteriological culture (BC). This would increase to 71% if an on-farm test resulting in treatment advice within 12 h were available. For SCM, use would increase from 22 to 55%, and for DCT, from 7 to 34%, if the same 12-h test were available. For CM and DCT, the preferred test outcome was advice on which antibiotic to use, according to 58 and 15% of the farmers, respectively. For SCM, the preferred test outcome was the causative bacterium for 38% of the farmers. Farmers who currently submit CM milk samples for BC were 13.1 times more likely to indicate, as the preferred test outcome, advice on which antibiotic to use, compared with farmers who do not currently submit CM milk samples for BC. Fourteen percent of the farmers indicated not being interested at all in microbiological mastitis diagnostics for CM.

For SCM and DCT, 27 and 55%, respectively, were not interested in microbiological mastitis diagnostics. Regarding test characteristics that farmers considered important, reliability was most often indicated (44–51% of the farmers). Additionally, a preferred time-to-result of  $\leq 8$  h for CM and  $\leq 20$  to 24 h for SCM and DCT and  $\leq 7\%$  false test outcomes were indicated as desired characteristics of microbiological mastitis diagnostics. Overall, a need seems to exist for microbiological mastitis diagnostic tests among Dutch dairy farmers, specifically for CM, and resulting in a treatment advice. The availability of a reliable diagnostic test, with a suitable time-to-result, will likely increase the use of microbiological mastitis diagnostics and eventually optimize antibiotic usage.

**Key words:** mastitis, microbiological diagnostics, test characteristics, reliability

### INTRODUCTION

The main indications for using antimicrobial agents on dairy farms are the treatment and prevention of clinical mastitis (CM) and subclinical mastitis (SCM; Pol and Ruegg, 2007). Because the use of antimicrobial agents may lead to antimicrobial resistance (Levy and Marshall, 2004), limiting antibiotic usage based on microbiological diagnosis is advisable (Roberson, 2003). Additionally, the benefit of applying antimicrobial agents is debatable in some situations. For example, the cure rates of mild gram-negative coliform CM did not differ between groups of dairy cows that were treated with or without antimicrobial agents (Guterbock et al., 1993; Suojala et al., 2010). The same is true for SCM where the benefit of antibiotic treatment depends on the severity and duration of the infection (Barlow et al., 2009; van den Borne et al., 2010). Additionally, the preventive use of antimicrobial agents in dry-cow treatment (DCT) is under discussion in some countries (Scherpenzeel et al., 2014). Hence, for both treatment and prevention of IMI, a decision has to be made whether or not to use antimicrobial agents. Dependent on the legislation in a country, the decision

Received December 24, 2015.

Accepted March 9, 2016.

<sup>1</sup>Corresponding author: k.griffioen@uu.nl

<sup>2</sup>This consortium also includes Fimme J. van der Wal, René P. Achterberg, Jan B. W. J. Cornelissen, and Dik Mevius (Central Veterinary Institute, Lelystad, the Netherlands); Annet E. Heuvelink, Inge M. G. A. Santman-Berends, Remco Dijkman, and Christian G. M. Scherpenzeel (GD Animal Health, Deventer, the Netherlands).

to use antimicrobial agents is made by the veterinarian or the farmer. For prudent use of antimicrobial agents related to mastitis, determining whether susceptible bacteria are present through microbiological diagnosis of milk samples is critical (Lago et al., 2011a). The discussion on antibiotic usage, as well as the changing legislation, social pressure, and economic incentives of limited antibiotic usage, are factors likely to increase the role of microbiological mastitis diagnostics in the coming years.

Although several laboratory tools for microbiological diagnosis of IMI for dairy farmers and their veterinarians are available currently, these are rarely used to support treatment decisions (Owens et al., 1997; Lago et al., 2011a). The small number of milk samples submitted to bacteriological laboratories can be explained by the related costs, by the required effort of the farmer involved (Royster et al., 2014), and by the time-to-result (Neeser et al., 2006; Lago et al., 2011a). The current laboratory microbiological diagnostic methods are not considered suitable to base targeted treatment of CM in practice on, because of a time lag of >24 h between sampling and result (Viora et al., 2014). Consequently, mastitis treatment decisions are usually made empirically or based on historic bacteriological culture and susceptibility results (Owens et al., 1997). To overcome the delay due to the long time-to-result, the use of on-farm mastitis diagnostics has expanded in countries such as the United States and Canada (Roberson, 2003; Cameron et al., 2013). With on-farm mastitis diagnostics, different categories of mastitis pathogens may be identified (Viora et al., 2014), leading to faster treatment decisions (Lago et al., 2011a,b; Royster et al., 2014) and selective use of antimicrobial agents in CM (Pinzón-Sánchez et al., 2011). In many countries in Europe, however, it is still common practice to treat all cases of CM with antimicrobial agents (Viora et al., 2014), which may be due to the lack of microbiological mastitis diagnostic tests considered suitable by farmers for making treatment decisions. To our knowledge, the needs of dairy farmers with respect to this type of tests have never been described. The aim of this study was to determine the Dutch dairy farmers' current use of, and their need for, microbiological mastitis diagnostics of CM, SCM, and DCT and to determine which test characteristics they consider important.

## MATERIALS AND METHODS

### Study Design

A telephone interview was conducted among randomly selected Dutch dairy farmers using a structured questionnaire. The questionnaire was based on face-to-

face interviews that were previously held with other farmers and are briefly discussed below. Based on that experience, the questions for the telephone interview were chosen from those used in the face-to-face interviews. These questions focused on subjects that came up as potentially important from the face-to-face interviews. The results of the telephone interviews were analyzed and are discussed in this paper.

### Semi-Structured Face-to-Face Interviews

The individual face-to-face interviews were held by the first author with nonrandomly selected Dutch dairy farmers between October and December 2014, using a qualitative semi-structured questionnaire with open-ended questions. The first author is a veterinarian, which was not known by the farmers at the time of interview. The questionnaire was previously discussed with a communications expert and 2 mastitis experts. The goal of the face-to-face interviews was to gather a broad range of attitudes regarding mastitis and mastitis diagnostics, forming the base of the subsequent telephone questionnaire. The participants were selected with the goal of including farms with differences in characteristics such as herd size, milking system, farmers' focus on udder health, management style, and mastitis incidence. After interviewing 20 farmers, no new information was obtained and the interviews were stopped.

### Structured Telephone Interviews

**Selection of Farmers.** In December 2014 and January 2015, 660 dairy farmers were randomly selected from a list of all 17,563 Dutch dairy farmers. The goal was to gather 200 participants. The farmers received a letter by mail with a short description of the study and the announcement that they might be approached by telephone for participation in a 30-min questionnaire on mastitis and microbiological mastitis diagnostics. The farmers were asked to look up their most recent bulk milk SCC, the number of CM cases in 2014, antibiotic usage in 2014 (animal daily dose, based on the national monitoring system; Speksnijder et al., 2015), and the prevalence of high-SCC cows (heifers >150,000 cells/mL, older cows >250,000 cells/mL; de Haas et al., 2008) at the last milk recording. Within 2 wk after the letters were sent, farmers were approached by telephone to ask whether they were willing to participate. If positive, either the interview was held directly or an appointment was made. If negative, the reason for being unwilling to participate was asked as well as 2 additional questions on the current herd size and perceived mastitis problems at their farm. Farmers

Download English Version:

<https://daneshyari.com/en/article/10973652>

Download Persian Version:

<https://daneshyari.com/article/10973652>

[Daneshyari.com](https://daneshyari.com)