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Economic losses due to bovine mastitis in Dutch dairy herds

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Abstract

Current annual losses due to mastitis in Dutch dairy herds were calculated to average Dfl. 136 per cow per year, which equals about 12 % of net return on labour and management per cow on a typical farm. Reduction in milk and fat yield accounts for 70 % of these losses. Streptococcal infections were found to have the highest economic impact, causing almost 40 % of total losses. More information should become available to estimate differences in losses between farms.

Keywords: mastitis, economic losses, dairy cattle

Introduction

Mastitis is commonly recognized as a major economic disease in dairy cattle. For Dutch conditions, losses were previously quantified on Dfl. 125 per cow per year, which equaled about 15 % of net return on labour and management per cow on a typical farm (Dijkhuizen & Renkema, 1977). Since then various prices and production circumstances have changed, and more literature became available on the incidence and effects of mastitis.

In most economic calculations the number of somatic cells in the milk was used as a major criterion for the presence and seriousness of mastitis. In the literature, however, there is a discussion going on whether this criterion is still appropriate. The number of cells was found to be influenced by several other factors, such as production level, age and breed (Brolund, 1985).

In this paper, current economic losses in Dutch dairy cattle of both infections with and without clinical signs are estimated, using pathogens in the milk as the major diagnostic criterion. Four different types of pathogens are being considered: coliform, streptococcal, staphylococcal, and *Corynebacterium pyogenes*. Clinical cases in which no pathogens could be detected are defined as bacteriologically negative.

Economic framework and input data

The economic effects of mastitis can be divided into three major categories: (1) reduced milk receipts, (2) costs for treatment, and (3) premature culling. Input data were derived from various references, reliable for Dutch conditions, and summarized in Table 1.

As shown in Table 1, total frequency of clinical mastitis is estimated to average 28 cow cases per 100 cows per year, with 28 × 1.3 = 36 quarters being involved. Streptococcal infections appear to be the most frequent. The estimated decrease in total milk production is taken to be 23 %, ranging from 17 % for coliform to 48 % for *Corynebacterium pyogenes*. Fat contents of the milk is assumed to be reduced by over 4 % (Hoare, 1982). For each kg of milk not produced, a saving of 0.5 kg of concentrates is taken into account. Treatment costs are considered to include veterinary fees, drug expenses, and farmer's labour. Milk from cows treated with

Table 1. Major input data for clinical mastitis.

Type of pathogen	Frequency [1]	Infected quarters per case	Annual milk decrease per quarter (%)	Culling rate (%)
Coliform	7.0	1.1	17	14
Streptococcal	10.8	1.3	22	10
Staphylococcal	3.0	1.4	26	14
C. pyogenes	1.6	1.1	48[2]	80
Bact. negative	5.6	1.3	21	12
Total/Average	28.0	1.3	23	14

[1] Percentage cow cases per year.
[2] Next lactation.

Table 2. Calculated annual losses due to mastitis (Dfl.)

Type of pathogen	Calculated annual loss per infected cow		Total calculated annual loss per 100-cow herd
	with clinical signs	without clinical signs	
Coliform	355	-	2440 (18 %)
Streptococcal	446	66	5300 (39 %)
Staphylococcal	504	79	2070 (15 %)
C. pyogenes	886	-	1420 (17 %)
Bact. negative	424	-	2360 (11 %)
Total/Average	450	71	13600 (100 %)

anti-biotics is not delivered to the factory for 5 days, but fed to young calves. This reduces the losses from otherwise discarded milk.

On an average 14 % of the cows with clinical mastitis are culled, as shown in Table 1. *C. pyogenes* ranks by far the highest with a culling rate of 80 %. The loss of culling is the difference of (1) the income that a particular cow could earn during her remaining expected life, had the reason for replacement not presented itself — given normal probabilities of disposal due to other reasons — and (2) the expected average income of replacement animals. Van Arendonk (1985) calculated the costs of premature disposal to average Dfl. 430 per culled cow.

Per year, 11 cows (and 15 quarters) per 100 cows have infections without any clinical signs, of which 60 % is caused by streptococcal and 40 % by staphylococcal bacteria. Losses are restricted to milk reduction (4.6 % per lactation) and fat decline (1.9 % per lactation). Mastitis without clinical signs is difficult to detect. Therefore, treatment costs nor premature culling are being included in the calculations.

Results

Calculated annual losses due to mastitis are summarized in Table 2. Per clinically infected cow the *C. pyogenes* pathogen causes by far the highest losses, especially because of its extreme culling rate. Staphylococcal infections rank secondly, due to a combination of a relatively high number of infected quarters per case and a considerable loss in production. Infections without any clinical signs are far less important from an economic point of view.

At farm level, streptococcal infections have the highest economic impact, causing almost 40 % of total losses, while *C. pyogenes* now ranks the lowest. Their differences in costs per case are outranged by differences in incidence rates.

Total losses per farm are found to average Dfl. 136 per cow per year, which equals about 12 % of net return on labour and management per cow on a typical farm. Reduction in milk and fat yield accounts for 70 % of these losses, 18 % is due to treatment and 12 % is caused by premature culling.

Final remarks

A quantitative insight into the economic impact of diseases is not only important for a description of the actual situation, but can help to estimate the extent of the losses to be avoided. In particular this is the case if differences between farms are indicated. With respect to mastitis, more farm specific information on the incidence rate and effect on cow performance should become available to estimate these differences. Additional research is also of interest to determine the actual costs and benefits of mastitis control measures.

References

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