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DYNAMICS OF SUBCLINICAL MASTITIS IN HOLSTEIN COWS FROM BRAZILIAN DAIRY HERDS WITH LOW AND HIGH BULK TANK SOMATIC CELL COUNTS

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Introduction

Controlling subclinical mastitis is a challenge to be met by the Brazilian dairy sector due to the high prevalence of this disease in dairy herds (1). Mastitis requires constant monitoring mainly due to the contagious pattern presented by certain pathogens. The success in controling mastitis is assessed by measuring the prevalence or level of infection. The level of infection can be a function of the new infection rate, cure infection rate, and chronic infection rate at a particular time (2). These data allow a better understanding of the dynamics of subclinical mastitis in herds and support strategies for control and prevention. Somatic cell counts (SCC) are usually measured in composite cow milk and are used for monitoring udder health and milk quality (3). This study investigated the dynamics of subclinical mastitis in Brazilian dairy herds with bulk tank somatic cell count (BTSCC) lower than 250,000 cells/mL (low prevalence of subclinical mastitis) and higher than 750,000 cells/mL (high prevalence of subclinical mastitis).

Material and Methods

Data of 20 Holstein dairy herds located in Minas Gerais State, Brazil, were used in this study. Herds were selected according to the geometric mean of bulk tank somatic cell count (BTSCC). They were classified into two groups with 10 herds each. Group 1 had BTSCC lower than 250,000 cells/mL and Group 2 BTSCC higher than 750,000 cells/mL throughout a one year period (from August/2009 to July/2010). The number of cows in groups 1 and 2 was 530 (388,52 cows.year) and 525 (324,50 cows.year), respectivelly. The value of 100,000 cells/mL was used as a threshold for classification of cows according to udder health status. The prevalence of subclinical mastitis was calculated by dividing the number of cows with a geometric mean of SCC higher than 100,000 cells/mL by the total number of cows in the group. Udder health status for each cow per month was determined according to the SCC value of the previous month (PM) and current month (CM), considering three categories, as follows: PM<100,000 and CM<100,000 (healthy); PM<100,000 and CM>100,000 (new infection); PM>100,00 and CM>100,000 (chronic infection). Differences between prevalence of subclinical mastitis and BTSCC groups and between udder health status with BTSCC groups were evaluated using the chi-square test.

SP 5375 P. 170

Result and Discussion

Prevalence of subclinical mastitis was different (P<0.001) between herds with BTSCC lower than 250,000 cells/mL (54.2%) when compared with herds with BTSCC higher than 750,000 cells/mL (84.4%). The results showed that the new infection and chronic infection rates per cow.year were statistically higher (P<0,001) in Group 2 than in Group 1 (Table 1). The prevalence of subclinical mastitis influenced the udder health status classification. The infection pressure on cows from herds with BTSCC above 750,000 cells/mL probably contributed for higher new and chronic infection rates when compared with cows with BTSCC below 250,000 cells/mL. The results showed that the probability of a new infection becoming a chronic infection is higher in herds with high prevalence of subclinical mastitis. Measuring the udder health status at a particular time and monitoring through the time with individual cows can assist in decision making at farm level in relation to control measures and prevention of mastitis. This scheme of monitoring udder health status for lactating cows can increase the awareness of the farmer, provide information that can be used for culling, clinical mastitis therapy and dry cow therapy earlier. However, understanding subclinical mastitis dynamics in a specific herd requires precise longitudinal data and constant assessement of udder health status.

Table 1. Udder health status (cow.year) according to herds with bulk tank somatic cell count (BTSCC) lower than 250,000 cells/mL and higher than 750,000 cells/mL

Udder health status	BTSCC (cells/mL)		P	RR	CI 95%
	<250,000	>750,000			
Healthy	5,83	0,99	-	-	-
New infection	3,05	7,81	<0.001	5.51	4.19 - 7.25
Chronic infection	6,17	11,01	<0.001	10.53	8.45 - 13.13

P - signficance level; RR - relative risk; CI - confidence interval

Conclusion

The data obtained in the study showed that the likelihood of apperaring a new subclinical infection and this infection becomes a chronic infection changes according to prevalence of subclinical mastitis.

References

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