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The use of the somatic cell count of composite milk samples to predict the infection status of the udder in cows from New Zealand dairy herds.

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INTRODUCTION

Over the past 12 to 15 years, the somatic cell count of composite milk samples has become the accepted method for assessing the state of health of the bovine udder, both in New Zealand, and in other dairying countries. Little information is available with respect to the relationship between the somatic cell count and the infection status of the individual udder quarters or of the whole udder.

MATERIALS AND METHODS

The ability of the somatic cell count of composite (whole udder) milk samples to predict the presence or absence of subclinical udder infection was assessed in 120 dairy cows from three herds within the Manawatu region of New Zealand, during the 1986 to 1987 and 1987 to 1988 dairy seasons. Bacteriological analyses were carried out on quarter foremilk samples which were taken, using aseptic precautions, at monthly intervals during the dairy season. At the same milking, a composite sample was taken, using a milk meter and the somatic cell count was measured by fluoro-optical counting.

RESULTS

The critical threshold is defined as "the level of a parameter at which the percentage of false positive results, as a proportion of the uninfected cows, and the percentage of false negative results, as a proportion of the infected cows are equal. The critical threshold and the accuracy of diagnosis for each herd, and for the three herds combined are given in Table 1. The accuracy of diagnosis showed little variation between herds, although the critical threshold varied widely, being greatest in the herd with the highest incidence of udder

infection. Table 2 shows the outcome of applying the fixed 250,000 cell per ml threshold level to each of the three herds. Within herd A, use of a fixed 250,000 cell per ml threshold caused many of the infected cows to be misdiagnosed as being uninfected, while within herd C, many of the uninfected cows were classified as being infected.

TABLE 1 Critical threshold of somatic cell counts of composite milk and the accuracy of diagnosis of udder infection for 3 herds of dairy cows.

Herd	Critical Threshold	Accuracy
A	73,000	80.4 %
B	142,000	79.4 %
C	344,000	76.5 %
Combined	185,000	75.1 %

TABLE 2 Results of applying the fixed somatic cell count of milk threshold level to each of 3 dairy herds.

Herd	Threshold	Accuracy Negatives	False Positives	False
A	250,000	77 %	63 %	3 %
B	250,000	89 %	29 %	5 %
C	250,000	72 %	18 %	36 %

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DISCUSSION

The results show that the somatic cell count is able to predict the infection status of the cow, in herds with different levels of udder infection. However, the critical threshold varies between herds. The threshold level which is chosen for use within a herd will depend upon the consequences of misdiagnosing infected cows

as being uninfected and vice versa. It is clear that a higher threshold will be required for herds with a greater incidence of udder infection, while a lower threshold will suffice for herds with fewer infected cows.

The assistance of the New Zealand Dairy Board Livestock Improvement Corporation is gratefully acknowledged.