Mastitis in New Zealand Dairy Herds:

I. Management, diagnosis, and treatment of subclinical mastitis

II. Phenotypic and genotypic characterisation of Streptococcus uberis isolates

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Abstract

Four scientific trials were undertaken to extend the scientific research on mastitis in New Zealand dairy herds, producing milk seasonally from grazed pastures.

Trial 1:

Aim. To compare the effect of drying-off techniques on the prevalence of new intramammary infections.

Conclusions. A 48-hour intermittent drying-off technique increased the quarter prevalence of mastitis caused by major and minor pathogens or major pathogens alone, at dry-off. There was no significant difference in the prevalence of mastitis in quarters dried-off with a 24-hour or 48-hour intermittent milking technique, during the first 12 days of the subsequent lactation. This may have resulted from higher culling (due to apparently unrelated causes) of infected cows from the 48 hour group.

Trial 2:

Aims. To assess the economic value of treating subclinical mastitis based on electrical conductance and/or rapid mastitis test results and to determine the cure rates and economic outcome to the dairy farmer.

Conclusions. The Rapid Mastitis Test or electrical conductance diagnosed 66% of the quarters infected by major pathogens. Cure rates were 58% in infected untreated quarters and 61% in infected quarters treated with a course of intramammary antibiotics. An assessment of costs and benefits from treating infected quarters, plus the inevitable cost of treatment of uninfected quarters, resulted in an overall net loss of approximately $9.18 per quarter treated.

Trial 3:

Aims. To determine the antibiotic sensitivity patterns of 150 and 180 *Streptococcus uberis* isolates cultured from subclinical and clinical cases of mastitis respectively, in New Zealand dairy cattle from 15 different regions, using a disk diffusion assay. To assess the suitability of antibiograms for subtyping of *Streptococcus uberis* isolates for epidemiological studies.

Conclusions. The 330 isolates fit into 17 different antibiogram patterns. Ninety-five percent of the isolates followed one of five common antibiogram patterns. Eighty percent of the isolates were of

antibiogram pattern C. The only significant difference between the subclinical and clinical *Streptococcus uberis* isolates tested in this study was the clinical isolates were more sensitive to cloxacillin. Similarities in antibiograms between the study isolates and the isolates from the United States (McDonald *et al.*, 1976) were noted for cloxacillin, cephalothin, erythromycin, lincomycin, penicillin G, and streptomycin. The relatively low number of antibiogram patterns resolved from the 330 *Streptococcus uberis*, limits the usefulness of the technique as a solitary tool for epidemiological studies in New Zealand dairy herds.

Trial 4:

Aims. To determine and compare the restriction endonuclease fragment pattern of *Streptococcus uberis* isolates from subclinical and clinical cases of mastitis in New Zealand dairy cows, from 15 different farming regions in New Zealand. To compare the pulsed-field genotyping technique with antibiogram typing of *Streptococcus uberis* isolates within 8 different farms.

Conclusions. The 343 *Streptococcus uberis* isolates exhibited 330 different restriction endonuclease fragment patterns, indicating at least several hundred genetically different strains of *Streptococcus uberis* isolates in New Zealand capable of causing mastitis in dairy cattle. Genetically different and similar strains were identified within the same quarter of an individual cow, different quarters from the same cow, different cows within the same farm, and from different cows from the same or different districts, farming regions or islands. The high degree of dissimilarity among the isolates tested is an indication that *Streptococcus uberis* infections in New Zealand dairy cattle are largely due to the opportunistic nature of the organism in the cow's environment. Prevention and treatment of *Streptococcus uberis* mastitis will therefore need to be directed at a multitude of different strains present throughout the country as well as in individual herds.

Fewer antibiogram patterns were defined on each individual farm compared to the number of pulsed-field gel electrophoresis patterns on those farms. The pulsed-field gel electrophoresis typing technique appears to be a more discriminatory test for typing *Streptococcus uberis* isolates on 8 New Zealand dairy herds than antibiograms.

The information gained from these trials provides scientific research to strengthen the recommendations made in the Seasonal Approach to Managing Mastitis (SAMM) Plan, a mastitis prevention programme designed for seasonal dairy farmers in New Zealand.

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I am sure there is more, but let's get on with the thesis...

Many thanks to all

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