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**EVALUATION OF ALTERNATIVE DAIRY FARM
MANAGEMENT PRACTICES USING A
SIMULATION MODEL**

A thesis presented in partial fulfilment of the requirements for the
degree of Masters in **Agricultural Science in Farm Management** at
Massey University.

Diego Escallón Robá

1994

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ABSTRACT

New Zealand dairy farming is known worldwide for its on-farm efficiency, particularly for being one of the world's most cost-effective milk producers. New Zealand farmers' attempts to minimize costs by aiming to match the pattern of pasture growth with animal requirements. However, a more even production through the year may lower factory operating costs, would reverse the tendency to increase peak milk production during spring, and allow fresh products and products with a higher added value to be supplied all year round. For this reason a differential payment for the peak production periods will be introduced locally by Tui Milk Products Ltd.

On-farm efficiency is likely to be affected by changes to the payment system. In this study practices under the new payment system were evaluated. From among the large number of practices affecting dairy farm productivity, calving and drying off dates, stocking rate, supplementary feeding and nitrogen fertiliser, were identified as important variables in the design of alternative management systems. The variables were manipulated within a whole farm system, giving production and financial responses.

A computer simulation model, (UDDER), was used in a case-study approach to evaluate management alternatives for farms which supply the local dairy company. The effects of changes in those variables on the system's physical and financial parameters were monitored. Improvements in gross margins were achieved in the model by changing calving and drying off dates, improving the match of animal requirements with pasture production. As stocking rate was increased, so did gross margin improve, giving better feed utilization and hence lower herbage losses. The above changes have also been combined with changes in supplementary feeding and nitrogen fertiliser.

The manipulation of calving and drying off dates, stocking rate, supplements fed, and nitrogen fertiliser applied, increase total milk production within the range 4% to 12%, and gross margins were increased within the range 6% to 22%, while peak production was affected by only 1% to 3% for the "improved" strategies for all farms. Hence, the potential to shift a proportion of total milk production into shoulder months, profitably, is small.

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