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THE EFFECT ON FOOD INTAKE AND MILK PRODUCTION
OF ADDING CONCENTRATE TO THE
RATION OF COWS FED PASTURE

A THESIS PRESENTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS
FOR THE DEGREE OF MASTER OF AGRICULTURAL SCIENCE
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INTRODUCTION

It has long been appreciated that well managed leafy pasture will provide sufficient energy and protein for high milk production. However, because of seasonality of pasture production there are periods in the year when the supply of pasture is deficient. Hay and silage are used to supplement pasture during these periods of shortages on New Zealand dairy farms, but are limited in their ability to maintain high levels of milk production, particularly early in lactation. Thus recourse may have to be made to the use of concentrates to maintain milk production during periods of pasture shortage. The limited amount of experimental work conducted in New Zealand on the use of concentrates (Hancock, 1953; Wallace, 1957) indicates that their use may be worthwhile. However, information on the effects of supplementing pasture with concentrates under controlled (indoor) experimental conditions is non-existent under New Zealand conditions.

Results obtained by overseas workers on the effect of concentrate feeding on milk production suggest that responses have been most erratic, especially when concentrates have been fed with pasture. In general these responses were less than would have been expected on the basis of feeding standards.

Reports on supplementary feeding of dairy cows by Corbett and Boyne (1958), MacLusky (1955) and Seath et.al. (1962) suggest that the concentrates fed acted as a substitute for pasture. In all of these experiments, however, the intake of pasture was measured by indirect methods.

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Taking the above points into consideration two experiments were conducted. The first one was a small grazing experiment with the object of studying the effects of concentrates on milk yield and composition and to obtain experience in the problems of experimentation in a simple continuous trial using 16 Friesian cows. The other experiment involved nine Jersey cows and was mainly designed to study the effect of feeding concentrates on voluntary intake of pasture. This experiment consisted of a 3 x 3 Latin square replicated three times, with squares being run concurrently. Measurements of milk yield and milk composition were also carried out. Additional information was obtained on the rate of passage of feedstuffs with some of the cows, on digestibility of feeds with six wethers, and rumen fermentation studies with four (extra) fistulated cows.