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THE MEASUREMENT OF THE FEED CONSUMPTION OF INDIVIDUAL ANIMALS

INTRODUCTION

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During the last three years a very considerable amount of work has been done at Ruakura with the object of developing a satisfactory method of measuring the level of intake of dairy cattle grazing at pasture. There is probably little need for me to emphasise the importance that we at Ruakura attach to the successful development of such a technique. It is certainly my own firm conviction that a number of problems of fundamental importance to the dairy industry cannot be elucidated until such a technique is in the hands of the animal husbandman. Among the problems that await the application of such a technique is investigation of the relative efficiency with which large as compared with small cows, high producing as compared with low producing cows, and high testing as compared with low testing cows, convert N.Z. pasture and its products into milk and butterfat. Another problem is that raised by Mitchell at the Conference last year—namely, at what level of intake should herds of different dairying merit be fed if maximum B.F. per acre is to be achieved? A further question which needs critical examination is whether, from a national point of view, the dairy industry is sound in its present system of herd recording, whereby the production of all cows, the immature and the aged, are brought for comparative purposes to the common denominator of the mature equivalent. Surely it must be true that the relative merit of dairy cows in New Zealand depends not only upon how much they produce, but also upon how much feed they need to consume in order to sustain their production. In view of this, it is possible relative merit might better be assessed upon some such basis as the volume of production per unit of live weight—or if this is impracticable, per unit of some readily taken external body measurement. The answer to this probably depends upon whether the level of consumption of dairy cows is at all accurately related to such characters as live weight or external body dimensions.

I think it is true to say that during recent times very great improvements have been effected in respect to experimental designs. Many of these improved designs have been rendered possible only by the development of special techniques. The application of the individual feeding techniques to many problems of pig nutrition affords a pertinent example. As a result of the introduction of this particular technique, group feeding comparisons now appear as rather old fashioned in precise experimentation in this field.

This brings me to a point which I really wish to make—that is, the very grave disadvantage at which the New Zealand worker in dairy cow nutrition has been placed, as compared with workers overseas or even the New Zealand worker in the field of pig nutrition. Certainly both groups of workers have certain things in common—both are in a position to accurately evaluate not only the volume but also the quality of the products that their chosen animals produce. Milk recording and testing has long been practised; systems of litter recording were introduced many years ago and methods of evaluating carcase quality although of rather more recent introduction are now in quite common usage.

The production side is covered in both fields of work but the consumption side presents a very different picture. Up until this very present the nutrition man working with dairy cows in New Zealand has usually been in a position to speak only in rather general terms of the quantity and quality of pasture that he offered to his groups of cows; he has seldom been in a position to say what were the actual quantities that his groups consumed and to the best of my knowledge never has he been able to supply information as to the level of intake of his individual animals—not unless he has been prepared to take a really desperate plunge and seek the answer to his outdoor problem under artificial indoor conditions.

I have mentioned that workers at Ruakura have devoted considerable time toward developing a satisfactory method of measuring intakes. The word satisfactory needs elucidation. In the first place, if a method is to be satisfactory it must not interfere with the normal grazing behaviour of dairy cows. That is, we wish to avoid having to harness our cows or loading them with other impedimenta. Secondly, we would much prefer a method which does not involve the need to sample the pasture for the accuracy of any such method must depend upon the ability of the operator to simulate the foraging habit of cows.

The method about which you are to hear this morning does not involve either of these undesirable features. It is a method depending upon two quite separate estimates—an estimate of the amount of faeces voided by a cow, and an estimate of the digestibility of the pasture consumed by that cow. Obviously, if both these things are known, the level of intake may be calculated without difficulty.

Mr. Coup will deal with the chromium method now being employed at Ruakura to estimate the amount of faeces voided by a cow—a method which allows of a cow grazing naturally at pasture between milkings. Mr. Lancaster will deal with the problem of estimating the digestibility of the pasture that the cow consumed while grazing freely between milkings, and of the method he has developed whereby the digestibility is estimated from the concentration of nitrogen in her faeces.

The two estimates, although fundamentally quite separate, have this much in common—they may both be obtained by analysis of the same sample of faeces. Interference with the cows is limited simply to the administration of one capsule containing chromic oxide, and the collection of one small sample of faeces at the normal milking times. These are both operations which may be performed with great alacrity by a practised technician.

I think that perhaps the greatest disservice I could render this meeting would be to take up more of its time than I have already done. I am sure that what you really wish to hear are the papers by the three people—Mr. Coup, Mr. Lancaster and Mr. Percival—who have together been mainly responsible for developing the technique for measuring individual intakes to a really useful stage where it may be applied to measuring the separate consumptions of the cows comprising a normal-sized dairy herd throughout the whole of the milking season.