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# The Relationship Between Level of Nutrition During the Dry Period and Subsequent Performance of Dairy Cattle

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## Summary Only

This work was carried out in the Manawatu concurrently with that reported above by Lees et al for the Waikato, and the conditions under which stock were managed and fed were, as far as possible, kept similar at the two stations.

Over a period of three years two similar groups of cows, chiefly grade Jerseys, were used. Cows were kept in the same groups from year to year, replacements being brought in as necessary. In all, 70 cows were involved, and data from 102 completed lactations were used in the final analyses. During the last 10 weeks of pregnancy when the cows were dry, the animals in one group were in heavily stocked, bare pastures and received up to 7lb. of hay per animal per day. Over the same period the cows in the second group were rotationally grazed over lightly stocked pastures and given all the hay and silage they could eat. After calving, cows of both groups were run together and well fed.

The following results were obtained:—

- (1) In each of the three years the cows on the low plane of nutrition lost a considerable amount of condition—estimated at approximately 90lb. per cow after allowing for changes in the weight of the gravid uterus and the contents of the digestive tract. The animals in the second group gained in body condition considerably in the last two years, and maintained their condition in the first year of the experiment.
- (2) During the early part of the lactation when all animals were on the same feed, the cows which had been better fed prior to calving lost more weight than those previously poorly fed.
- (3) The differences in the average butterfat production of the two groups were 23, 28 and 25lb. per cow in the first, second and third years of the experiment respectively in favour of the better fed animals. Most of the difference in production occurred in the first three months of lactation. Both milk yield and fat percentage contributed to the observed differences in butterfat production—the former being slightly more important.
- (4) For the first two months in each year the solids-not-fat percentage was slightly higher in the milk from the better fed cows, but for the greater part of the lactation the percentage was similar in both groups.
- (5) The difference in treatment of the dams made no significant difference to the birth weight of their calves.
- (6) There was no significant difference in the reproductive performance of the two groups of cows. The only significant differences in health were in the numbers of cows with retained placentae and post-calving discharges, which were higher in the poorly fed animals.

Although an attempt was made to maintain a similar experimental feeding procedure at both stations, the condition of the cows was greatly influenced by climatic factors which varied markedly between the stations in any one year. For example the Waikato cattle were subjected to severe drought conditions in the summer and autumn of 1946, when those in the Manawatu were enjoying unusually good conditions. Differences in results are probably largely due to such uncontrolled factors.

# Discussion on Papers by Dr. C. P. McMeekan, Dr. Wallace, Mr. Lees, Dr. Campbell and Mr. Flux

Mr. LAWRY: I noticed that the difference in production between the low and the high planes at Ruakura was much less in the first year than in subsequent years. In the first year's feeding during the dry spell was less winter-saved pasture used than in the subsequent years? Does Dr. McMeekan think that some of the difference can be attributed to the quality of the feed during the dry period?

Dr. McMEEKAN: Less autumn-saved pasture was provided in the first year. The fundamental weakness in both pieces of work is that we do not know how much feed the cattle had before or after calving, or what the quality of the feed really was. As I tried to point out, this deficiency is a very real one. The problem of measuring intake of a grazing cow is a limiting factor to any nutritional work on pasture and we must solve it as soon as possible.

Mr. RANSTEAD: I should like to know if the cost of the feed will be compensated for by the extra pounds of butterfat. Would it pay a dairy farmer to feed the cows on bought hay, and in the event of his having no ensilage, would it pay to buy concentrates?

Dr. McMEEKAN: At normal prices the feed supplied to the Ruakura high plane cows costs about £2 and that to the low plane cows about £1. The extra butterfat produced was worth £6/5/- so that there is a net profit of over £5 per cow.

Mr. RANSTEAD: After the dry summer we had, we were getting hay from all over New Zealand and it was costing 8/- a bale.

Dr. McMEEKAN: I believe that despite summers like that of 1945-46 which occasionally turn up it is possible under good grassland management conditions for the dairy farmers of New Zealand to carry sufficient hay and ensilage to feed their cows, at all times, the way these cows have been fed, because that is the way we have fed them under normal conditions at Ruakura.

PROF. CAMPBELL: As an example of the differences in feeding of the two grades at the Institute, in one season the difference amounted to an acre of winter grazing—not winter-saved grass—and a ton and a half of silage per cow. We did not have as much autumn-saved grass for the dairy cows as did Dr. McMeekan, so we had to feed more silage. The price we got for our extra 26lb. butterfat had to be weighed against a ton and a half of silage, plus the occupancy of an acre of grassland over the 70 days. I think we should stress that, in our case, the low plane animals in each year went into the period of under-feeding in good condition.

Mr. MONTGOMERY: I know there was 60lb. fat between low and high plane in the last two years on average cows producing about 350lb. I was wondering whether there was a marked difference between cows of 400lb. fat as against those of 300lb. fat. Whether that 60lb. fat was a percentage or whether there was a greater figure at the higher levels.

Dr. McMEEKAN: The numbers of pairs involved in the work were insufficient to answer that question, but we did happen to take into the experiment a pair of identical twins that were of about a 250lb. fat productive level. These also showed a difference of 60lb. fat.

Mr. LEVY: I would like to know whether the added weight was put on with that winter-saved grass or the hay or the ensilage. The amount of hay fed would indicate to me that most of it was put on with winter-saved grass.

Dr. McMEEKAN: I think, in general terms, if I made a guess at it, I would attribute most of the added weight to the autumn-saved pasture.

PROF. CAMPBELL: I would agree that it is easiest to put condition on dry stock when plenty of autumn-saved grass is available, but it is interesting to note that at the Institute in 1946, when the greatest amount of silage was fed out to the high plane group, the best gains in condition were recorded.