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## DISCUSSION

Q: *How much would Mr McKenzie recommend that calving dates should be retarded under his system?*

S. A. MCKENZIE: In districts not subject to frequent dry autumns, I feel there is a place for delayed calving as stock numbers increase, the extent of this delay being about 10 to 14 days behind the district average on highly stocked farms.

DR W. M. HAMILTON: *Dairy Board surveys have shown that early calving has an important effect on production. This is at variance with Mr McKenzie's opinion. Likewise A. H. Ward's survey showed practically no relationship between rates of topdressing and production. How would Mr McKenzie reconcile these findings with his own beliefs?*

MR MCKENZIE: My views on delayed calving relate to districts where dry autumns are infrequent and where stocking rates are high. These are not average conditions for New Zealand and this may explain why I hold the opinion I do. Regarding topdressing, I am not aware of any farms in the South Taranaki area that are achieving high production without the use of relatively high rates of topdressing. There are, however, farms using high rates of topdressing but which, possibly owing to faulty management, are not getting high production, and these may be confusing the survey mentioned.

Q: *In the multiple mob system of wintering, are the dry stock rationed grass at a rate related to grass growth?*

MR MCKENZIE: Yes. When these stock go into their set stocked paddocks there will be little fresh grass on them. Once this is eaten they presumably get a daily grass ration equivalent to daily grass growth. On mild days there will be more growth than on cold days, and some of the difference is made up by feeding out more supplement on the colder day.

Q: *Mr McKenzie's opinions are at variance with those of Dr Wallace concerning the use of autumn feeding. When the cows are spread out over the farm, are the pastures not damaged by the movement of the tractor and trailer from paddock to paddock when conditions are wet?*

MR MCKENZIE: Not on our relatively free draining soil where dense swards have developed.

Q: *Under the system of feeding grass in the winter, is it correct that the period of feeding out conserved fodder is extended?*

MR MCKENZIE: For South Taranaki, yes. Feeding out silage and hay starts earlier to give the grass time to accumulate and I do not know of any farmer who is able to build up sufficient grass to rely entirely on this for the winter. For this reason farmers supplement the winter grass ration with either silage or hay.

DR A. H. CARTER: Mr Campbell's Figure 1 shows a very close association between dry matter yield per acre and digestible organic matter yield per acre. Is this not what one would expect since digestibility varies much less than pasture dry matter yield? D.O.M. does not measure the portion utilized by the animal. It is the utilized portion of the D.O.M. that is really important. An approach such as that of Crampton and Lloyd, who measure Nutritive Feed Value might be useful here. Again,

the aggregate pasture production over the whole year is probably of less importance than an average production weighted according to the needs of the animal.

A. G. CAMPBELL: My object in presenting Figure 1 was to suggest that there is perhaps more validity than is generally thought in measuring pasture yields in terms of dry matter rather than in more complex terms. The linearity of the relationship is assisted by a decrease in percentage ash, and hence an increase in percentage organic matter, with advancing age up to a certain stage of maturity at least.

The Nutritive Value Index method of assessing forage value is no doubt very useful, but there are great difficulties in measuring the necessary parameters of "maximum voluntary intake" and "digestibility of the feed energy" under free-grazing conditions.

Certainly it would be more valuable to increase pasture production at some seasons than at others—*e.g.*, in July and August rather than in October and November. But it may still be valuable to increase production in October and November, if winter carrying capacity is governed partly by the amount of conserved fodder available.

F. J. SOUTHCOMBE: In interpreting grazing management studies for the farmer I usually advise that from calving onwards grazing should become less intensive. This is achieved by speeding up the rotation for roughly seven months so that stocking intensity falls progressively from 50 or 60 cows per acre immediately after calving down to 10, or even to a set stocking situation in mid summer. Thereafter, for the next five months I think the speed of rotation should be slowed down and intensity of grazing thereby increased, as autumn-saved pasture is built up ahead of the herd for calving. Would Mr Brougham agree with this interpretation?

R. W. BROUGHAM: Yes, although the system of grazing over the summer should aim at preserving a cover of herbage. Depending on location and climate this can be achieved in various ways.

Q: *Were the two-year average pasture production yields quoted by Dr McMeekan from Mr Campbell's work not a combination of results which showed a difference in favour of uncontrolled grazing in one year and in favour of controlled grazing in the other?*

DR C. P. McMEEKAN: All animal production differences were in favour of controlled grazing. The grass yield data did combine the two years' yields, but there was no real difference in total amounts, through differences in seasonal yields.

Q: *What were the sampling intervals used in Mr Campbell's work quoted by Dr McMeekan to estimate the pasture production under the two grazing systems?*

MR CAMPBELL: Samples were taken inside and outside enclosure cages on the set stocked treatments at fortnightly intervals—*i.e.*, 26 times per year. This technique is, of course, subject to the very valid criticism that what is being measured is the production from a set stocked paddock when spelled for a fortnight. Pre- and post-grazing samples were cut on the control grazed treatments immediately before and after each grazing. The intervals between sampling dates in this case are irregular, but these treatments are usually sampled 25 to 28 times per year.

DR L. R. WALLACE: *Assuming that there were no differences in pasture produced by the controlled and uncontrolled heavy stocking rate systems,*

*and further assuming that the utilization of pasture under set stocking was less than under controlled grazing owing to (a) lower liveweight, hence lower maintenance requirement, (b) lower losses in conservation, and (c) an expected greater efficiency of conversion of feed at lower levels of intake, what happened to the pasture not utilized by the set stocked cows?*

MR CAMPBELL: It most probably decayed. Botanical separation of pasture samples from the set stocked treatments in January and February particularly, show that anything between 50 and 65% of the large amount of available pasture dry matter is dead and decaying. Other data which we have suggest that cows avoid eating this dead material.

*Q: What, in Dr McMeekan's view, are the reasons for the differences in butterfat production between the herds at No. 2 dairy if pasture production is virtually the same in all cases?*

DR McMEEKAN: They could be due largely to the transfer of nutrients by conservation techniques, such that the level of nutrition of the control grazed cows is more in line with production needs. They are also materially influenced by stocking rate differences which affect the situation through the impact of body weight and percentage efficiency of harvesting available feed.

*Q: Why are yields of dry matter at Ruakura only 10,000 to 11,000 lb per acre, when estimates on highly productive pastures elsewhere are in excess of 20,000 lb.*

MR CAMPBELL: The philosophy adopted at Ruakura is that we should attempt to achieve high per cow and per acre production through the use of good animal management techniques, rather than rely on highly productive pastures. The annual fertilizer application for the pastures on which the production of 10,000 to 11,000 lb of dry matter was measured is only 2 cwt of serpentine superphosphate per acre.

*Q: Have there been differences between the No. 2 dairy herds in body-weights, and could more stock have been carried on any of the treatments?*

DR McMEEKAN: Yes, and Yes.

*Q: Dr McMeekan has acknowledged the limitations of unreplicated grazing management experiments but he has nevertheless drawn conclusions from his No. 2 experiment. Can he then indicate the differences in per acre production that he would regard as being real.*

DR McMEEKAN: No, not on the data available. At the same time, replication in years with all differences substantially showing the same trends justify the general conclusions reached.

*Q: Dr McMeekan observes that simulated grazing experiments carried out with lawnmowers may not give pasture yield estimates relatively in line with pasture production obtained under animal grazing and concludes that we need more experiments taking the cow into account. Should we not rather do more experiments taking the plant into account?*

DR McMEEKAN: We must do more of both, together and in combination.

*Q: Could Dr McMeekan say something of the heights of stubble left after grazing in the various treatments at No. 2 dairy in view of Mr Campbell's theory of residues?*

DR McMEEKAN: Very variable, as must be expected from seasonal and conservation effects in an environment where pasture growth is variable and stocking rates are static.