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Summary

TWO EXPERIMENTS ON THE EFFECT OF SHORT PERIODS OF UNDERFEEDING ON THE YIELD AND COMPOSITION OF COWS MILK

M. R. PATCHELL* and D. S. FLUX†

IN THE FIRST EXPERIMENT, carried out with 12 pairs of monozygous twin cows in one year and 15 pairs in the second, it was found that underfeeding after calving had more severe adverse effects on milk yield and the S.N.F. content of the milk when it followed a period of underfeeding before calving than when it followed normal feeding.

The cows which were underfed after calving lost no more weight in early lactation than the normally fed controls, but put on more weight in the later stages of lactation. Milk composition returned to normal quite rapidly after normal feeding was resumed.

In the second experiment, carried out with 15 pairs of monozygous twin cows, it was found that severe underfeeding for five days after calving had little or no effect on production during the subsequent lactation. Underfeeding for ten days caused the peak milk yield to be reached earlier than in control cows, and there was a strong suggestion of a reduction in peak milk yield. Initiation of lactation did not appear to be affected by the underfeeding. Milk composition returned to normal within three weeks of the resumption of normal feeding.

DISCUSSION

Q.: *What were the ages of the experimental animals?*

A.: They ranged from two to eight years of age.

Q.: *Did under-feeding have any effect on the incidence of metabolic diseases?*

A.: The incidence of metabolic diseases was very low and there was no evidence of an effect of any of the feeding treatments on it.

Q.: *For the farmer facing a difficult feed situation in the spring, would it be better to underfeed his herd severely for a short period than to underfeed slightly for a longer time?*

A.: The results of these experiments and those of Dr. Wallace, reported by Dr. McMeekan, all suggest that it would be dangerous to underfeed

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severely for even a fairly short time soon after calving because milk and butterfat yields would not recover fully after normal feeding was started. However, there is not sufficient experimental evidence on the relative effects of different levels and durations of underfeeding to answer the question satisfactorily.

Q: : Do you consider that feeding is more important than breeding in causing low solids-not-fat?

A: : Both are important. There are definite and quite large breed differences in the solids-not-fat content of the milk. (Jerseys average about 9.3 per cent. and Friesians about 8.6 to 8.7 per cent. for whole lactations). Underfeeding can lower the solids-not-fat content of milk by 0.2 to 0.5 per cent.

Q: : As most nutritional experiments do not show a much greater drop in solids-not-fat than you have experienced, can you explain the much more severe drops which do occur in practice?

A: : There is seldom sufficient accurate information to enable one to be very certain about the real extent of drops in the solids-not-fat content of milk on farms. In experimental work they have been up to about 0.5 per cent. and I do not know of any greater. Perhaps Professor Campbell would add something to this answer.

PROFESSOR CAMPBELL: : Genetic factors in a herd set the general level of the per cent. solids-not-fat in the milk. An all-Jersey herd could experience a considerable drop and still be well above the legal minimum, but in the average Friesian herd, where the long term average solids-not-fat level is normally about 8.6 to 8.7 per cent., a drop of only 0.3 per cent. would put it below the legal minimum (8.5). Sudden drops as referred to by Dr. McMeekan in commercial samples are difficult to check because of the possibility of errors due to sampling, testing and contamination with water; these errors can be quite large in field data, and we should be very careful in making comparisons between the results of carefully conducted experiments and figures obtained in commercial work. However, in the extensive field data I have seen, I have found no good evidence of solids-not-fat percentage drops of a greater order than those mentioned by Dr. Flux.

Q: : Have weather conditions any effect on solids-not-fat?

A: : They can affect solids-not-fat by reducing food intake and hence causing the usual "underfeeding" fall as seen in European cattle in the tropics. Whether there is any additional effect acting in another way is not certain. If hot weather has an effect, it might be expected to act by causing reduced thyroid activity, but in some experiments by Professor Campbell, feeding iodinated casein to cows in the summer, when the solids-not-fat content of their milk was low, did not result in any increase.