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A STUDY OF SOME ENDEMIC VIRUSES OF CATTLE, WITH
PARTICULAR REFERENCE TO ENTERIC VIRUSES.

A thesis presented in partial fulfilment of the
requirements for the degree of Master of
Veterinary Science at Massey University,
New Zealand.

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May, 1975.

ABSTRACT

This investigation was undertaken to isolate and characterise a number of viruses from diarrhoeic cattle faeces, as a preliminary step in the systematic investigation of viruses as possible causes of diarrhoea in cattle, and more particularly calves. A further and important aim was to gain further experience in a number of virological procedures.

Using 3 passages of inocula in each of secondary foetal bovine kidney and lung cells, and monkey kidney (Vero) cells, 7 viruses were isolated from 56 faeces, 2 intestinal samples, and 1 spleen, all from scouring animals. Five of the isolates were found to produce a rapid and complete cytopathic effect in a variety of cell cultures, and their biological and physicochemical properties were subsequently studied in some depth. One of these isolates was also studied with the immunofluorescent technique, and its buoyant density was determined in a caesium chloride gradient. These isolates were concluded to be bovine enteroviruses, and were found in further studies to be separable into 2 types on the basis of cross-neutralisation tests, fluorescent antibody tests, and behaviour in the presence of low concentrations of hydroxybenzyl benzimidazole. These 2 serotypes on further cross-neutralisation tests were found to be serologically distinct from the 7 U.S. standard serotypes that were available.

Another of the isolates was found to cause a slow growing and relatively nonprogressive type of cytopathic effect in only Vero cells, and was consequently harder to study. On the basis of limited studies of this isolate, it was concluded to be probably a member of the diplomavirus group, possibly having some affinity with the "reo-like" viruses. Further more precise studies will be needed to confirm or refute this relationship.

The remaining virus, which was isolated from the spleen, was identified as being bovine viral diarrhoea (BVD) virus on the basis of its cytopathic effect and neutralisation by standard BVD antiserum.

A limited survey for neutralising antibodies to infectious bovine rhinotracheitis and BVD viruses, and haemagglutinating-inhibiting antibodies to parainfluenza 3 virus and reoviruses 1, 2, and 3 was undertaken. It showed that antibody to all the viruses was present in a considerable proportion of the North Island cattle population.

This work can only be regarded as a preliminary study, as it is probable on the basis of overseas work that a number of other viruses remain to be isolated from diarrhoeic cattle faeces. It is hoped to continue this investigation and to eventually establish a better understanding of the relationships between viruses and bovine gastrointestinal disease, and more particularly to establish their possible economic significance.

ACKNOWLEDGEMENTS

The work for this thesis was carried out whilst in receipt of a bursary from the New Zealand Ministry of Agriculture and Fisheries, whose assistance is gratefully acknowledged.

Particular thanks must go to Dr. G.W. Burgess for the helpful advice and encouragement that he gave during the course of this project.

I would also like to thank Prof. B.W. Manktelow, head of the department, and Dr. J.K. Clarke, for their interest and encouragement. The able and willing technical assistance that was given by Miss L. Fray is very much appreciated, as is the advice and assistance given by Mr. A. Craig and other members of the staff of the electron microscope unit of the Applied Biochemical Division of the DSIR.

Further thanks are due to Mr. T.W. Law for technical assistance with photography, to Dr. R. Marshall and Dr. K. Moriarty for their advice and interest, and to Mrs. D. Steffert for typing the thesis.

Finally, I would like to acknowledge my indebtedness to the late Dr. H.W. Dunne for his generous action in supplying 7 U.S. serotypes of bovine enteroviruses and their corresponding antisera.

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