GENETIC STUDIES OF A DARKENING OF THE DORSAL COAT IN AGOUTI MICE.

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A Thesis presented to the University of New Zealand in partial fulfilment of the requirements for the degree of Master of Agricultural Science.

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ACKNOWLEDGEMENTS

The candidate wishes to record his indebtedness to Dr. F. Cockrem (Sheep Husbandry Department) whose continued guidance and interest made this study possible.

He also wishes to acknowledge the advice and assistance of Professor A.L. Rae of the Sheep Husbandry Department in which this study was carried out.

Special thanks are also extended to Mr. T.S. Chang (Sheep Husbandry Department) for assistance with statistical problems, and Mr. B. Reynolds (Veterinary Science Department) for advice on histological techniques.

Finally, thanks are due to Miss M.G. Campbell (Librarian) and her staff for assistance in obtaining references.

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INTRODUCTION

It is the candidate's contention that an understanding of the mechanisms of gene action and interaction at the physiological level, is a necessary basis for a fuller understanding of the principles and problems of animal breeding. On this point, Rae (1958) states ... "population genetics deals essentially with genes and final phenotypes, but has little to say about the vast developmental gap between the two". However, opportunities for physiological studies of simple Mendelian traits in farm livestock are few and far between, while the expense of such studies is normally prohibitive.

Consequently, physiological genetic studies are normally carried out on small animals, especially the mouse. Gruneburg (1952) has reviewed the use that has been made of this mammal for genetic studies of all types.

The steadily increasing number of reported mutants affecting hair growth and pigmentation in the mouse provide excellent experimental material for studies on gene action, while their pleiotropic effects provide material for studies on the physiology and development of hair growth. As Chase (1954) has pointed out, in the one hair follicle can be seen all aspects of cell development, growth, division, and death at different stages of the hair cycle. The hair itself provides a permanent record along its length of the changes that have occurred in the hair follicle during the period of hair growth (Russell, E.S. 1946).

The studies to be described concern attempts to investigate yet another of these mouse hair mutants.