STUDIES OF THE FLOCK MATING PERFORMANCE

OF

BOOROOLA MERINO CROSSBRED RAM LAMBS,

AND THE

FOOT "CONDITIONS" IN BOOROOLA MERINO CROSSBREDS

AND

PERENDALE SHEEP

GRAZED ON HILL COUNTRY

A THESIS PRESENTED IN PARTIAL
FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE
OF MASTER OF AGRICULTURAL SCIENCE
IN ANIMAL SCIENCE AT
MASSEY UNIVERSITY

MOHAMMED TAHA ALWAN

1983

MASSEY UNIVERSITY
PALMERSTON NORTH, NEW ZEALAND

MASSEY UNIVERSITY

1.* (a) I give permission for my thesis, entitled
"STUDIES OF THE FLOCK MATING PERFORMANCE OF BOOROOLA MERINO CROSSBRED RAM LAMBS, AND THE FOOT "CONDITIONS" IN BOOROOLA MERINO CROSSBREDS AND PERENDALE SHEEP GRAZED ON HILL COUNTRY"
to be made available to readers in the Library under the conditions determined by the Librarian.

(b) I agree to my thesis, if asked for by another institution, being sent away on temporary loan under conditions determined by the Librarian.

(c) I also agree that my thesis may be copied for Library use.

2. * ~~I do not wish my thesis, entitled~~
.....
.....
.....
to be ~~made~~ available to readers or to be sent to other institutions ~~without my written consent within the next two years.~~

Signed .....

Date 11-2-1982

* Strike out the sentence or phrase which does not apply.

The Library
Massey University
Palmerston North, N.Z.

Name and Address Date

.....
.....
.....
.....
.....

ABSTRACT

Two studies using the Booroola Merino crossbred animals were conducted. In the first, the flock mating performance of Booroola Merino-Romney crossbred ram lambs mated to Perendale ewes was examined. The second study comprised observations on the incidence of foot "conditions" in young Booroola Merino crossbreds and Perendale sheep grazed on hill country.

MATING PERFORMANCE

Eighteen Booroola Merino x Romney ram lambs (6 control, 12 mating group) were selected according to weaning weight, fleece characteristics and general body condition. Nine ram lambs were exposed to ewes prior to mating for two weeks (trained) and nine kept separate from any ewes (untrained). The ram lambs of the mating group (6 trained, 6 untrained) were allocated to six groups of ewes which were "single-sire" mated. Groups 1, 2, 3, 4 comprised 140 ewes each and Groups 5 and 6 comprised 100 ewes each. The ram lambs were changed after eight, eight, seven and seven days of mating, Periods P_1, P_2, P_3 and P_4 respectively, and a total of 12 "single-sire" mating groups generated. All ram lambs produced a satisfactory semen sample before joining with the flocks. Mating commenced on 30 March 1981.

The flock mating performance of each ram lamb was assessed by recording the percentage of ewes raddled, percentage of ewes returning to service, percentage of pregnant ewes, percentage of ewes lambing, docking rate and weaning rate. Differences among each of these parameters were attributed to various factors. Trained and un-

trained ram lambs were similar in most of the observed parameters of flock mating performance. There were no differences between individual ram lambs within each sire-group (trained or untrained) in mating performance. There were differences in the percentage of ewes raddled between first and second oestrous cycle of mating ($P<0.001$).

Live weights of the ram lambs were measured from weaning (December 1980) until the end of the trial (December 1981), at weekly intervals during the mating periods and at monthly intervals during the post-mating and post-shearing periods. There was little loss in the mean live weight of the mating group ram lambs after P_1. Overall the live weights of both groups increased consistently throughout the trial.

Semen samples (collected by electro-ejaculation) from the ram lambs of the mating group were microscopically examined for general motility after each mating period at least for three days. Recovery from mating exhaustion occurred four and six days after P_1 and P_2 respectively, while three and two days were required after P_3 and P_4 respectively.

Semen samples were also collected on two occasions from the rams (only 15) as two-tooths and examined for general motility, sperm concentration and percentage of live sperm. There were no differences in semen characteristics between rams of the mated and control groups.

The two-tooth rams were also subjected individually and randomly

on three occasions to pen-libido tests, each with two oestrous ewes. Mating ability was assessed by recording the number of mounts attempted on the oestrous ewes, the number of services, the reaction time to mount (in seconds) and the reaction time to service. There were no differences between the mating and control groups in the number of mounts and number of services performed on each occasion of the libido test. Significant differences were found between both groups in reaction time to mount ($P<0.01$) and in reaction time to service ($P<0.05$) but only at the first libido test.

It was concluded that the Booroola Merino x Romney ram lambs had achieved satisfactory levels of flock mating performance under the conditions of the trial. No adverse effects of mating on the post-mating body development of the ram lamb could be detected. Semen quality from the ram lambs deteriorated during mating but recovered shortly after mating. The use of ram lambs as sires had no adverse effects on their semen characteristics and libido performance at the two-tooth age.

FOOT "CONDITIONS"

The incidence of abnormal foot shape, foot scald and footrot was observed in Perendale and Booroola Merino crossbreds. The animals were generated in 1980 and 1981. Observations on foot "conditions" were made at the lamb, hogget and two-tooth ages for animals born in 1980, and at the lamb and hogget ages for those born in 1981. A scoring system was used to rank the various foot "conditions" (shape; scald; footrot) which were assessed separately.

Booroola Merino crossbreds showed significantly a higher incidence of abnormal foot shape, foot scald and footrot than did Perendale sheep. Significant differences in foot "conditions" were also found between (Booroola x Romney) x Perendale and Booroola x Romney sheep. Sires of the progeny generated in 1980 and 1981 provided a major source for the variation in the incidence of these foot "conditions".

Estimates of heritability of each of the observed foot "conditions" were calculated at different ages (lamb, hogget and two-tooth).

Sex of the lamb caused significant effects on the incidence of abnormal foot shape ($P<0.05$) and foot scald ($P<0.001$) between ram lambs and ewe lambs, but not on the incidence of footrot.

Differences in the incidence of abnormal foot shape and foot scald occurred between 1980- and 1981-born sheep. These differences were attributed partly to the particular climatic conditions in each year (notably the annual rainfall).

It was concluded that under environmental conditions similar to that of the present trial, long-term selection programmes could be applied to enhance the natural resistance of sheep against foot diseases.

ACKNOWLEDGEMENTS

I would like to acknowledge my gratitude to my supervisor Dr M.F. McDonald, Animal Science Department, Massey University, who suggested some of the aspects included in this study and offered guidance and criticism during the course of the study and writing of the manuscript.

Special thanks are due to staff of the Animal Science Department, particularly Dr G.A. Wickham for his valuable advice and discussion.

I am indebted to my fellow graduate student Mr A.R. Gilmour, who offered very useful assistance for the statistical analyses.

Acknowledgement is made also to Messrs M.G. Divehall, M. Wycherley, B. Thatcher and W.R. Fairhall for their skilled technical assistance, and to Mr A.L. Harwood (Tuapaka Sheep Farm) for his co-operation.

I am grateful to the Government of IRAQ for financial assistance and support.

Finally, I would like to thank Mrs E.V. Oram for her skilful and careful typing of this manuscript.

MOHAMMED TAHA ALWAN

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTD)

TABLE OF CONTENTS (CONTD)

TABLE OF CONTENTS (CONTD)

TABLE OF CONTENTS (CONTD)

TABLE OF CONTENTS (CONTD)

TABLE OF CONTENTS (CONTD)

LIST OF TABLES

LIST OF TABLES (CONTD)

LIST OF TABLES (CONTD)

LIST OF FIGURES

LIST OF FIGURES (CONTD)

LIST OF PLATES

LIST OF APPENDICES

LIST OF APPENDICES (CONTD)