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TRANSCERVICAL ARTIFICIAL INSEMINATION
OF ROMNEY EWES

A thesis presented in partial fulfilment of the
requirements for the degree of Master of Agricultural Science
in Animal Science at Massey University

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ABSTRACT


Transcervical AI was attempted in 178 mixed age Romney ewes. AI was performed between 48 and 52 h after synchronisation of oestrus with progesterone impregnated CIDRs. Fresh or frozen-thawed semen was used and each insemination dose contained approximately 100 million spermatozoa. Half of these ewes were treated prior to AI with clenbuterol hydrochloride (Panipart™) in an attempt to cause cervical softening to allow insertion of an inseminating pipette through the cervix. Reproductive tracts were recovered from 32 ewes in which transcervical insemination was achieved. After flushing each tract the spermatozoa were counted from the cervix and from the left uterine segment.

94% of ewes showed oestrus within 48 h of CIDR withdrawal. Variation in time of onset of oestrus prior to AI did not affect conception rate (P>0.05). The conception rate based on non-return to oestrus was 34%. A greater percentage of ewes conceived to insemination with fresh semen (42%) than that for frozen-thawed (24%) (P<0.05). Clenbuterol did not affect depth of cervical penetration but it did reduce bleeding at the cervical os observed at AI (P<0.01). Parity/age of ewe significantly affected depth of cervical penetration (P<0.001) and the time taken to inseminate (P<0.01), with few two tooth ewes successfully transcervically inseminated (76% were vaginally inseminated). Sperm numbers were significantly higher in the cervix of ewes that were inseminated with fresh rather than frozen-thawed semen (P<0.05). Numbers of spermatozoa recovered were low in comparison to similar studies and were related to the extent of cervical damage (recorded at dissection of reproductive tracts). Uterine sperm counts were significantly lower (P<0.05) for those ewes where cervical damage was observed.

The depth of insemination was estimated at the time of AI, and full cervical penetration was recorded in 68% of the mature ewes. However examination of the ewe cervices at dissection suggested that this figure was misleading. Anatomical evidence suggested
that the inseminating needle had frequently lodged in the cervical wall and successful passage had not been achieved. Therefore it was likely that semen was deposited frequently in areas of damaged cervical tissue which would have been detrimental to survival of spermatozoa. This was probably the main reason for the low sperm numbers in the reproductive tracts and consequently the low conception rate. For those ewes where full cervical penetration was recorded at AI, only 28% conceived.
Dedication:

I dedicate this work to my two sons,

Jeremy and John Paul.
I am grateful for the direction given by my supervisors, Associate Professor Maurice McDonald and Mr Tim Harvey in the planning and conduct of this experimental work and in the preparation of this manuscript. Their expertise, perspective and enthusiasm was most valuable.

Special thanks to Dr Patrick Morel for the time he contributed to the statistical analyses.

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Mr Ronald Poos made a significant contribution to the running of the experiment. He was responsible for ram training and semen collection. He also assisted with data recording and the AI programme. I thank Dr John Campbell and Mr Tim Harcombe for help with the AI programme.

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LIST OF ABBREVIATIONS

The following abbreviations have been used in the text without prior definition:

Units:

- °C    degree Celsius
- h     hour(s)
- iu    international units
- USP   United States Pharmacopoeia
- kg    kilogram(s)
- mg    milligram(s)
- µg    microgram(s)
- ml    millilitre(s)
- %     per cent

Others:

- CIDR(S)    Controlled internal drug release device(s)
- SE         Standard error