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A STUDY OF TRANSCERVICAL ARTIFICIAL INSEMINATION IN SHEEP

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1995

ABSTRACT

Usboko, Y. (1995) *A study of transcervical artificial insemination in sheep*. MAgrSc. thesis, Massey University, Palmerston North, New Zealand.

The study describes two trials on artificial insemination in Romney ewes. Trial 1 was conducted to examine the anatomical site in the reproductive tract of the inseminating needle after transcervical insemination, and to evaluate the effect of the needle in causing cervical tissue damage based on the microscopic assessment of cervical slides. Trial 2 was undertaken to compare the effect of intrauterine, cervical or transcervical methods of insemination with fresh semen on fertility.

Two hundred and five mixed-aged ewes (3-8 years old) were hormonally treated with CIDR-G for 12 days and these were removed after this period. Forty-eight hours later, to monitor the onset of oestrus, they were joined with 10 harnessed vasectomised rams. Oestrous detection was undertaken twice daily, at 1.00 am and 1.00 pm. Most ewes were synchronised in oestrus over 2 days after CIDR withdrawal but there was an extended period of 'second' oestrus when the inseminations were conducted. In Trial 1, transcervical insemination with Indian ink was performed in 29 ewes at the second oestrus, and then they were euthanased with Sodium Pentobarbitone. Position of the inseminating needle ***in situ*** was determined at

dissection. The genital tract was removed and the uterus opened to determine whether Indian ink had penetrated. The cervix was then split into three similar sized portions, fixed in Bouins solution, and sections histologically processed and stained for slides. The slides were microscopically examined by two evaluators to determine damage scores.

In trial 2, semen samples (concentration at least 3 x 10^9 spermatozoa ml^{-1}, motility minimal 4) were collected per artificial vagina from 5 Romney rams, pooled and freshly diluted with UHT-milk to 8 x 10^8 spermatozoa ml^{-1}. One hundred and seventy-five cyclic ewes were randomly assigned to either of three AI techniques (intrauterine, cervical and transcervical), and were inseminated with freshly diluted semen at a mean interval of 6.1 0.26 h after second oestrus was detected.

In slaughtered ewes, penetration of the modified needle through the lumen of the cervix and even into the uterus occurred more that with the unmodified needle (90% vs 68%; $0.05<P<0.1$). Both types of needle used caused damage in the genital tract, and even caused rupture through the wall of the cervix. This was less frequent with the modified needle and therefore it was used for transcervical insemination in Trial 2. The predicted location of the needle in the tract and its actual location were highly correlated.

In Trial 2, the overall mean for the conception rate to AI was 82%, but no differences were noted between methods of inseminations. With lambing rate,

transcervical inseminations gave the best results, but there were no differences in the litter size between methods.

For transcervical insemination depth of penetration of the needle had an effect on conception rate and lambing rate ($P<0.05$) and thus the method should aim to place the semen well into and even through the cervix. The results for transcervical insemination were not affected by the interval from oestrous detection to insemination, or the age of the ewes or whether the inseminations were conducted in the morning or afternoon. The technique was more difficult to accomplish in maiden than older ewes.

It was concluded that while transcervical insemination with freshly diluted semen gave a satisfactory result, it is not always suitable for maiden ewes and others, where difficulty is encountered in penetrating through the cervix. Further work to evaluate the technique with larger numbers of ewes is required.

DEDICATION

To THE BLESSED VIRGIN MARY

for her unfathomably maternal love, guidance and care.

ACKNOWLEDGEMENTS

A proverb,'No man is an island', is greatly applicable to this thesis. This small work is a resultant of the constructive involvement of several animal scientists at Department of Animal Science, which were dedicative to share their knowledge and skills, and therefore they are deserved to be named personally.

I wish to cordially express my deepest gratitude and appreciation to my supervisor, Assoc. Prof. Maurice F. McDonald for his guidance, supervision and encouragement during my study.

My sincere thanks to Dr. John W. Campbell and to Mr. Timothy G. Harvey for their skilful assistance and constructive suggestion in my trial.

My sincere gratitude is extended to Assoc. Prof. George A. Wickham and to Dr. P.C.H. Morell for a valuable discussion on statistical analysis and SAS advice. The same gratitude is extended to Dr. John F. Smith for his fruitful advise.

I wish to express my sincere thanks to the Head of Department of Animal Science, Prof. Hugh T. Blair, and the rest of staff for their help during my study.

Acknowledgements are made to Ministry of Foreign Affairs and Trade (MFAT) for funding my masterate study in New Zealand.

My deep gratitude for Fr.Jose Vattaparambil, SDB and St. John Bosco Parish in Fuiloro, Lospalos, East Timor for offering the opportunity to continue this study. Thanks to Mrs. Barbara J. Purchas, Nicolas Vilalobos, and Filipe J.A. Mesquita for their help. Thanks to my host-family: Terry & Jenny McGrath, John and Leslie Ayers for their sincere hospitality.

Warm thanks are extended to all Indonesian students in N.Z., friends at Manako Tertiary Chaplaincy, St. Patrick, Our Lady of Lourdes parishes, friends at the Young Adult Ministry, Navigators, Sisters of St. Joseph for their friendship, encouragement and prayers.

Finally, my sincerest gratitude to my parents Habel and Theresia Klaran Usboko and to my brother and sisters: Hendrikus, Yovita, Frida, Imelda, Elisabeth, Jasintha and Gutriana Usboko for their prayers and support. May God bless you all.

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