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**INVESTIGATIONS INTO PROCEDURES FOR THE IMPLEMENTATION OF A  
MULTIPLE OVULATION AND EMBRYO TRANSFER SCHEME  
USING EWE LAMBS**

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the requirements for the degree of  
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## ABSTRACT

Three trials using 6-7 month-old Romney ewe lambs and adult ewes were conducted to evaluate the feasibility of implementing a juvenile MOET scheme. Older lambs were used to evaluate ways of improving the ovulation rates in 3 additional trials, one of them involved Booroola-cross lambs. Studies were also carried out to develop and evaluate a technique for splitting sheep embryos, and these were transferred to recipient ewes.

In the three trials involving superovulation and transfer a range of gonadotrophin treatments were used. The more highly purified preparations (FSH-P, Ovagen) gave lower responses compared with PMSG (1.78, 1.06 vs 4.18 respectively in Trial 3,  $P < 0.01$ ). Ovulation rate of ewe lambs relative to adult ewes in the 3 trials were respectively 1.20 vs 2.00 ( $P < 0.01$ ), 4.18 vs 6.35 and 1.61 vs 3.15. Overall, administration of GnRH did not significantly increase the ovulation rates, although lambs treated with PMSG + GnRH tended to give higher responses.

Egg recovery was higher in most cases in adults than in lambs (91% vs 55%,  $P < 0.01$ ; 72% vs 47%,  $P < 0.01$ ; 34% vs 43%, for trials 1, 2 and 3 respectively). Fertilization rate in trial 1 was lower in lambs than in adults (50% vs 82%,  $P < 0.05$ ) but not different in trials 3 and 5, probably due to the use of intrauterine insemination.

Ovulation rate was not improved by treating lambs at 8-9 months of age or by administering PMSG 2 or 4 days before sponge removal. Ovulation rates following gonadotrophin stimulation were higher in androstenedione-immunized ewe lambs than in non-immunized ewe lambs (2.22 vs 1.59,  $P < 0.05$ ). Booroola-cross lambs treated at 6-7 months of age gave considerably higher ovulation rates compared to those recorded in Romney lambs from another experiment conducted at the same time (3.79 vs 1.61).

Lower embryo survival and incidence of twins were found for demi-embryos generated from 9-10 month-old lambs compared to those obtained from 24 months or older animals. Higher pregnancy rate and demi-embryo survival were found when bisecting blastocysts rather than morulae harvested in the same flush.

A deterministic model incorporating parameters provided by the study showed that the limited number of lambs generated from lamb donors restricted the improvement in genetic progress.

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## TABLE OF CONTENTS

<b>ABSTRACT</b> .....		ii
<b>ACKNOWLEDGEMENTS</b> .....		iii
<b>LIST OF TABLES.</b> .....		viii
<b>LIST OF FIGURES.</b> .....		xiii
<b>LIST OF APPENDICES.</b> .....		xiv
<b>I</b>	<b>INTRODUCTION.</b> .....	1
<b>II</b>	<b>REVIEW OF FACTORS AFFECTING PUBERTY AND EMBRYO TRANSFER SUCCESS IN SHEEP.</b> .....	6
2.1	Puberty. ....	6
2.2	Embryo transplantation procedures. ....	10
	2.2.1 Oestrous synchronization. ....	10
	2.2.2 Superovulation. ....	11
	2.2.3 Factors affecting the response to the superovulatory treatment. ....	12
	2.2.3.1 Gonadotrophin used .....	12
	2.2.3.2 Dose-level of gonadotrophin. ....	15
	2.2.3.3 Breed .....	15
	2.2.3.4 Age. ....	16
	2.2.3.5 Immunization against steroids .....	17
	2.2.4 Service of donors .....	19
	2.2.5 Embryo recovery from donors .....	19
	2.2.6 Embryo searching and evaluation .....	20
	2.2.7 Embryo transfer .....	21
	2.2.8 Factors affecting the success of embryo transfer. ....	22
	2.2.8.1 Degree of synchronization of oestrus in donor and recipient ewes .....	22
	2.2.8.2 Quality of the embryos transplanted. ....	23
	2.2.8.3 Number of embryos transplanted. ....	23
	2.2.8.4 Site of transfer. ....	24
	2.2.9 Embryo splitting. ....	25

<b>III</b>	<b>MOET STUDIES USING EWE LAMBS.</b>	<b>31</b>
3.1	Materials and methods	31
3.1.1	Experimental animals and their management	31
3.1.2	Synchronization of oestrus.	32
3.1.3	Superovulation	33
3.1.3.1	Gonadotrophins and ovulatory responses.	34
	Trial 1.	34
	Trial 2.	37
	Trial 3.	38
	Trial 5.	40
3.1.3.2	Trial 4 (Immunization against androstenedione and superovulation	42
3.1.3.3	Trial 6 (Booroola gene effects and superovulation	44
3.1.4	Service of donors.	45
3.1.4.1	Natural mating.	45
3.1.4.2	Intrauterine A.I.	45
3.1.5	Embryo recovery from donors.	45
3.1.6	Embryo searching and evaluation.	46
3.1.7	Transfer of embryos.	46
3.1.8	Analysis of data.	47
3.2	Results	53
3.2.1	Incidence and distribution of onset of oestrus following progestagen sponge treatment.	53
	Trial 1	53
	Trial 2.	55
	Trial 3.	60
	Trial 4.	64
	Trial 5.	67
	Trial 6.	70
3.2.2	Factors affecting the ovulatory responses.	72
	Trial 1.	72
	Trial 2.	75

	Trial 3. ....	76
	Trial 4. ....	83
	Trial 5. ....	86
	Trial 6. ....	90
3.2.3	Factors affecting egg recovery, fertilization rate and percentage of transferable embryos. ....	94
	Trial 1. ....	94
	Trial 2. ....	99
	Trial 3. ....	102
	Trial 4. ....	107
	Trial 5. ....	110
3.2.4	Factors affecting the survival of transplanted embryos. ...	114
	Trial 1. ....	114
	Trial 3. ....	114
	Trial 5. ....	117
3.3	Discussion. ....	120
<b>IV</b>	<b>EMBRYO SPLITTING. ....</b>	<b>141</b>
4.1	Materials and methods. ....	141
	4.1.1 General management. ....	141
	4.1.2 Experimental procedures ....	141
	Study 1.. ....	144
	Study 2.. ....	145
	Study 3.. ....	145
	Study 4.. ....	147
	Study 5.. ....	147
	Study 6.. ....	148
4.2	Results. ....	149
	4.2.1 Factors affecting the survival of demi-embryos. ....	149
	Study 1. ....	149
	Study 2. ....	149
	Study 3. ....	149
	Study 4. ....	151
	Study 5. ....	153

Study 6. . . . .	155
4.3 Discussion. . . . .	160
<b>V ANALYSIS OF THE POSSIBLE USE OF A JUVENILE MOET SCHEME TO INCREASE THE RATE OF ANNUAL GENETIC PROGRESS IN A SHEEP FLOCK. . . . .</b>	<b>165</b>
<b>VI GENERAL DISCUSSION AND CONCLUSIONS. . . . .</b>	<b>176</b>
<b>APPENDICES . . . . .</b>	<b>182</b>
<b>REFERENCES. . . . .</b>	<b>207</b>



LIST OF TABLES

<u>Table</u>		<u>Page</u>
<b><u>Chapter I.</u></b>		
Table 1.1	Chronological sequence of the trials: Number of trial or study (Trial or Study), Time when conducted (Time), Flocks used (Flock) and experimental site (Site). . . . .	5
<b><u>Chapter III.</u></b>		
Table 3.1	Distribution of animals of group 1 to their respective treatments and subgroups (Trial 1). . . . .	36
Table 3.2	Distribution of animals of group 2 to their respective treatments and subgroups (Trial 1). . . . .	36
Table 3.3	Distribution of animals of group 3 to their respective treatments (Trial 1). . . . .	36
Table 3.4	Distribution of animals to the treatments (Trial 2). . . . .	37
Table 3.5	Distribution of animals to their respective treatments and groups (Trial 3). . . . .	39
Table 3.6	Distribution of animals to their respective treatments and groups (Trial 5). . . . .	41
Table 3.7	Distribution of animals to their respective treatments and groups (Trial 4). . . . .	43
Table 3.8	Distribution of animals to their respective treatments and groups (Trial 6). . . . .	44
Table 3.9	Effect of group of treatment on the incidence of oestrus following sponge removal (Trial 1). . . . .	53
Table 3.10	Percentage of animals showing heat by treatment (Trial 2). . . . .	56
Table 3.11	Effect of group of treatment on the incidence of oestrus following sponge removal (Trial 3). . . . .	61
Table 3.12	Effect of immunization on the incidence of oestrus following sponge removal (Trial 4). . . . .	65
Table 3.13	Effect of source of PMSG on the incidence of oestrus following sponge removal (Trial 4). . . . .	65
Table 3.14	Effect of group of treatment on the incidence of oestrus following sponge removal (Trial 4). . . . .	65

<u>Table</u>	<u>Page</u>
Table 3.15	Effect of group of treatment on the incidence of oestrus following sponge removal (Trial 5). . . . . 67
Table 3.16	Effect of age of treatment on the incidence of oestrus following sponge removal (Trial 6). . . . . 70
Table 3.17	Effect of Dose of PMSG, Time of PMSG injection and Genotype on the ovulatory responses in Romney ewe lambs (Mean $\pm$ s.e.m.) (Trial 1). . . . . 74
Table 3.18	Effect of age on the ovulatory responses (Mean $\pm$ s.e.m.) (Trial 1). . . . . 74
Table 3.19	Effect of gonadotrophin treatment (Trt.) on the ovulatory responses (Mean $\pm$ s.e.m.) (Trial 2). . . . . 75
Table 3.20	Ovulatory responses (Mean $\pm$ s.e.m.) from ewe lambs by Treatment, GnRH, Genotype and Group (Trial 3). . . . . 80
Table 3.21	Effect of the interactions Treatment by GnRH (Trt x GnRH), Treatment by Group (Trt x Group) and Treatment by Genotype (Trt x Gen.) on the ovulatory responses (Mean $\pm$ s.e.m.) (Trial 3). . . . . 81
Table 3.22	Ovulatory responses (Mean $\pm$ s.e.m.) to PMSG (Folligon) administration in lambs and adults treated in groups 1 and 2 (Trial 3). . . . . 82
Table 3.23	Ovulatory responses (Mean $\pm$ s.e.m.) to PMSG (Folligon) administration in lambs and adults for groups 1 and 2 combined (Trial 3). . . . . 82
Table 3.24	Effect of source of PMSG, Immunization, GnRH, and PMSG by GnRH interaction on the ovulatory responses (Mean $\pm$ s.e.m.) (Trial 4). . . . . 85
Table 3.25	Effect of Treatment, Genotype and Group on the ovulatory responses in ewe lambs (Mean $\pm$ s.e.m.) (Trial 5). . . . . 88
Table 3.26	Effect of the interaction of Treatment by Genotype (Trt x Geno) on the ovulatory responses in ewe lambs (Mean $\pm$ s.e.m.) (Trial 5). . . . . 89
Table 3.27	Effect of age on the ovulatory responses (Mean $\pm$ s.e.m.) (Trial 5). . . . . 89

<u>Table</u>		<u>Page</u>
Table 3.28	Effect of gonadotrophin treatment, age and their interaction on the ovulatory responses (Mean $\pm$ s.e.m.) of Booroola cross ewe lambs (Trial 6). . . . .	92
Table 3.29	Average ovulatory responses following gonadotrophin treatment according to natural ovulation rate in Booroola cross lambs (Mean $\pm$ s.e.m.) (Trial 6). . . . .	93
Table 3.30	Effect of dose and time of PMSG injection on the recovery rate of eggs (Trial 1). . . . .	95
Table 3.31	Effect of age on the recovery rate of eggs, fertilization rate and the percentage of embryos transferable (Trial 1). . . . .	96
Table 3.32	Effect of dose and time of PMSG injection on fertilization rate (Trial 1). . . . .	97
Table 3.33	Effect of dose and time of PMSG injection on the percentage of embryos transferable (Trial 1). . . . .	98
Table 3.34	Effect of source of PMSG, time of PMSG injection and their interaction on the recovery rate of eggs (Trial 2). . . . .	99
Table 3.35	Effect of source of PMSG, time of PMSG injection and their interaction on fertilization rate (Trial 2). . . . .	100
Table 3.36	Effect of source of PMSG and time of its injection on the percentage of embryos transferable (Trial 2). . . . .	101
Table 3.37	Effect of gonadotrophin treatment, GnRH and group on the recovery rate of eggs (Trial 3). . . . .	102
Table 3.38	Effect of age on the recovery rate of eggs, fertilization rate and the percentage of embryos transferable (Trial 3). . . . .	103
Table 3.39	Effect of gonadotrophin treatment, GnRH and group on fertilization rate (Trial 3). . . . .	104
Table 3.40	Effect of gonadotrophin treatment, GnRH and group on the percentage of embryos transferable (Trial 3). . . . .	106
Table 3.41	Effect of source of PMSG, immunization and GnRH on the recovery rate of eggs (Trial 4). . . . .	107
Table 3.42	Effect of source of PMSG, immunization, GnRH and the source of PMSG x GnRH interaction on fertilization rate (Trial 4). . . . .	108
Table 3.43	Effect of source of PMSG, immunization and GnRH on the percentage of embryos transferable (Trial 4). . . . .	109

<u>Table</u>	<u>Page</u>
Table 3.44	Effect of gonadotrophin treatment on the recovery rate of eggs (Trial 5). . . . . 110
Table 3.45	Effect of age on the recovery rate of eggs, fertilization rate and the percentage of embryos transferable (Trial 5). . . . . 111
Table 3.46	Effect of gonadotrophin treatment, inseminator and ram on fertilization rate (Trial 5). . . . . 112
Table 3.47	Effect of gonadotrophin treatment, inseminator and ram on the percentage of embryos transferable (Trial 5). . . . . 113
Table 3.48	Effect of embryo quality, number of embryos implanted and ovulation rate of the recipient ewe on pregnancy rate following the transfer of embryos from ewe lambs (Trial 3). . . . . 115
Table 3.49	Effect of embryo quality, number of embryos implanted and ovulation rate of the recipient ewe on pregnancy rate following the transfer of embryos from adult ewes (Trial 3). . . . . 116
Table 3.50	Effect of age of the donor on pregnancy rate (Trial 3). . . . . 116
Table 3.51	Effect of embryo quality on pregnancy rate (Trial 5). . . . . 117
Table 3.52	Effect of age of the donor on pregnancy rate (Trial 5). . . . . 118

#### Chapter IV.

Table 4.1	Distribution of animals to their respective treatments and groups (Splitting; Study 1). . . . .
Table 4.2	Effect of breed of the donor on demi-embryo survival (Study 3). . . . . 150
Table 4.3	Effect of technician on demi-embryo survival (Study 3). . . . . 151
Table 4.4	Effect of embryo quality on demi-embryo survival (Study 4). . . . . 152
Table 4.5	Effect of stage of embryo development on demi-embryo survival (Study 4). . . . . 153
Table 4.6	Effect of embryo quality on demi-embryo survival (Study 5). . . . . 154
Table 4.7	Effect of stage of embryo development on demi-embryo survival (Study 5). . . . . 154
Table 4.8	Effect of embryo quality on demi-embryo survival (Study 6). . . . . 155
Table 4.9	Effect of stage of embryo development on demi-embryo survival (Study 6). . . . . 156

<u>Table</u>	<u>Page</u>
Table 4.10	Effect of age of the donor (months) on demi-embryo survival (Study 6). . . . . 157
Table 4.11	Effect of breed of the donor on demi-embryo survival (Study 6). . . . . 158
Table 4.12	Effect of technician on demi-embryo survival (Study 6). . . . . 159

### Chapter V.

Table 5.1	Structure of the flock using normal reproduction. . . . . 165
Table 5.2	Efficiency of the juvenile MOET scheme. . . . . 165
Table 5.3	Effect of implementing a MOET scheme in ewe lambs when extra outside ewes are used as recipients when there are not sufficient 5-year olds within the selected flock. . . . . 170
Table 5.4	Effect of implementing a MOET scheme in ewe lambs when all the recipients are obtained from the selected flock. . . . . 171
Table 5.5	Effect of decreasing the percentage of ewe lambs selected on the annual genetic gain ( $\Delta Ga$ ) considering three ovulation rate responses (4, 7 and 10 CL). . . . . 172
Table 5.6	Effect of increasing the degree of accuracy of selection ( $r_{TI}$ ) when different proportions of ewe lambs are selected on the annual genetic gain ( $\Delta Ga$ ). . . . . 173
Table 5.7	Effect of change in the age of the rams on the annual genetic gain ( $\Delta Ga$ ) when different percentages of ewe lambs are selected. . . . . 174
Table 5.8	Effect of increasing the degree of accuracy of selection ( $r_{TI}$ ) of the ram lambs used for breeding on the annual genetic gain ( $\Delta Ga$ ) considering different percentages of ewe lambs selected. . . . . 174

LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
Figure 3.1	Percentage of animals showing oestrus at different times following sponge removal for groups 1, 2 and 3 (Trial 1). . . . . 54
Figure 3.2	Percentage of animals showing oestrus at different times following sponge removal for animals used as donors or recipients (Trial 1). . . . . 57
Figure 3.3	Percentage of animals showing oestrus at different times following sponge removal for animals treated with PMSG and without PMSG (Trial 2). . . . . 58
Figure 3.4	Percentage of animals showing oestrus at different times following sponge removal for animals used as donors or recipients (Trial 2). . . . . 59
Figure 3.5	Percentage of animals showing oestrus at different times following sponge removal for groups 1, 2 and 3 (Trial 3). . . . . 62
Figure 3.6	Percentage of animals showing oestrus at different times following sponge removal for animals used as donors or recipients (Trial 3). . . . . 63
Figure 3.7	Percentage of animals showing oestrus at different times following sponge removal in immunized and non-immunized ewe lambs (Trial 4). . . . . 66
Figure 3.8	Percentage of animals showing oestrus at different times following sponge removal for groups 1, 2 and 3 (Trial 5). . . . . 68
Figure 3.9	Percentage of animals showing oestrus at different times following sponge removal for animals used as donors or recipients (Trial 5). . . . . 69
Figure 3.10	Percentage of animals showing oestrus at different times following sponge removal for animals treated at age 1 (6-7 months) and age 2 (9-10 months) (Trial 6). . . . . 71

**LIST OF APPENDICES**

<b><u>Appendix</u></b>	<b><u>Page</u></b>
<b><u>Chapter III.</u></b>	
Appendix 3.1	Factors affecting the ovulation rate of PMSG (Consept45) treated ewe lambs: Analysis of variance (Trial 1). . . . . 182
Appendix 3.2	Factors affecting the number of large follicles of PMSG (Consept45) treated ewe lambs: Analysis of variance (Trial 1). . . . . 182
Appendix 3.3	Factors affecting the total ovarian response of PMSG (Consept45) treated ewe lambs: Analysis of variance (Trial 1). . . . . 182
Appendix 3.4	Effect of age on the ovulatory responses of PMSG (Consept45) treated animals: Analyses of variance (Trial 1). . . . . 183
Appendix 3.5	Effect of gonadotrophin treatment on ovulation rate of ewe lambs: Analysis of variance (Trial 2). . . . . 183
Appendix 3.6	Effect of gonadotrophin treatment on the number of large follicles of ewe lambs: Analysis of variance (Trial 2). . . . . 183
Appendix 3.7	Effect of gonadotrophin treatment on the total ovarian response of ewe lambs: Analysis of variance (Trial 2). . . . 184
Appendix 3.8	Effect of age on ovulation rate: Analysis of variance (Trial 2). . . . . 184
Appendix 3.9	Factors affecting the ovulation rate of gonadotrophin treated ewe lambs: Analysis of variance (Trial 3). . . . . 184
Appendix 3.10	Factors affecting the number of large follicles of gonadotrophin treated ewe lambs: Analysis of variance (Trial 3). . . . . 185
Appendix 3.11	Factors affecting the total ovarian response of gonadotrophin treated ewe lambs: Analysis of variance (Trial 3). . . . . 185
Appendix 3.12	Effect of Treatment, Group and their interaction on the ovulatory responses of gonadotrophin treated ewe lambs:Analyses of variance (Trial 3). . . . . 186

<u>Appendix</u>	<u>Page</u>
Appendix 3.13	Effect of Treatment, Group and their interaction on the ovulatory responses of gonadotrophin treated adult ewes: Analyses of variance (Trial 3). . . . . 187
Appendix 3.14	Effect of age on the ovulatory responses of gonadotrophin treated animals; Group 1: Analyses of variance (Trial 3). . . . . 188
Appendix 3.15	Effect of age on the ovulatory responses of gonadotrophin treated animals; Group 2: Analyses of variance (Trial 3). . . . . 188
Appendix 3.16	Effect of age on the ovulatory responses of gonadotrophin treated animals: Analyses of variance (Trial 3). . . . . 189
Appendix 3.17	Effect of PMSG source, Immunization and GnRH on ovulation rate of ewe lambs: Analysis of variance (Trial 4). . . . . 189
Appendix 3.18	Effect of PMSG source, Immunization and GnRH on the number of large follicles of ewe lambs: Analysis of variance (Trial 4). . . . . 190
Appendix 3.19	Effect of PMSG source, Immunization and GnRH on the total ovarian response of ewe lambs: Analysis of variance (Trial 4). . . . . 190
Appendix 3.20	Factors affecting the ovulation rate of gonadotrophin treated ewe lambs: Analysis of variance (Trial 5). . . . . 190
Appendix 3.21	Factors affecting the number of large follicles of gonadotrophin treated ewe lambs: Analysis of variance (Trial 5). . . . . 191
Appendix 3.22	Factors affecting the total ovarian response of gonadotrophin treated ewe lambs: Analysis of variance (Trial 5). . . . . 191
Appendix 3.23	Effect of age on the ovulatory responses of gonadotrophin treated animals: Analyses of variance (Trial 5). . . . . 192



<u>Appendix</u>	<u>Page</u>
Appendix 3.24	Factors affecting the ovulation rate of gonadotrophin treated ewe lambs: Analysis of variance (Trial 6). . . . . 192
Appendix 3.25	Factors affecting the number of large follicles of gonadotrophin treated ewe lambs: Analysis of variance (Trial 6). . . . . 192
Appendix 3.26	Factors affecting the total ovarian response of gonadotrophin treated ewe lambs: Analysis of variance (Trial 6). . . . . 193
Appendix 3.27	Factors affecting the recovery rate of eggs: Analysis of variance (Trial 1). . . . . 193
Appendix 3.28	Effect of age on the recovery rate of eggs, fertilization rate and the percentage of embryos transferable. Analyses of variance (Trial 1). . . . . 193
Appendix 3.29	Factors affecting fertilization rate: Analysis of variance (Trial 1). . . . . 194
Appendix 3.30	Factors affecting the percentage of embryos transferable: Analysis of variance (Trial 1). . . . . 194
Appendix 3.31	Factors affecting the recovery rate of eggs: Analysis of variance (Trial 2). . . . . 194
Appendix 3.32	Factors affecting fertilization rate: Analysis of variance (Trial 2). . . . . 194
Appendix 3.33	Factors affecting the percentage of transferable embryos: Analysis of variance (Trial 2). . . . . 195
Appendix 3.34	Factors affecting the recovery rate of eggs: Analysis of variance (Trial 3). . . . . 195
Appendix 3.35	Effect of age on the recovery rate of eggs, fertilization rate and the percentage of embryos transferable. Analyses of variance (Trial 3). . . . . 195
Appendix 3.36	Factors affecting fertilization rate: Analysis of variance (Trial 3). . . . . 196
Appendix 3.37	Factors affecting the percentage of embryos transferable: Analysis of variance (Trial 3). . . . . 196

Appendix 3.38	Factors affecting the recovery rate of eggs: Analysis of variance (Trial 4). . . . .	196
Appendix 3.39	Factors affecting fertilization rate: Analysis of variance (Trial 4). . . . .	197
Appendix 3.40	Factors affecting the percentage of embryos transferable: Analysis of variance (Trial 4). . . . .	197
Appendix 3.41	Effect of gonadotrophin treatment on the recovery rate of eggs: Analysis of variance (Trial 5). . . . .	197

**Appendix****Page**

Appendix 3.42	Effect of age on the recovery rate of eggs, fertilization rate and the percentage of embryos transferable. Analyses of variance (Trial 5). . . . .	198
Appendix 3.43	Factors affecting fertilization rate: Analysis of variance (Trial 5). . . . .	198
Appendix 3.44	Factors affecting the percentage of embryos transferable: Analysis of variance (Trial 5). . . . .	198
Appendix 3.45	Ovulatory responses of mature treated with different sources of Massey-PMSG (Splitting; Study 1). . . . .	199
Appendix 3.45a	Ovulatory responses (Mean $\pm$ s.e.m.) from adult ewes by Dose of PMSG, Time of injection and Mare. . . . .	203
Appendix 3.45b	Effect of the interactions Dose of PMSG by Time of injection (Dose x Time), and Time of injection by Mare (Time x Mare) on the ovulatory responses (Mean $\pm$ s.e.m.). . . . .	204
Appendix 3.45c	Factors affecting the ovulation rate of PMSG treated (Massey-PMSG) adult ewes: Analysis of variance. . . . .	205
Appendix 3.45d	Factors affecting the number of large follicles of PMSG treated (Massey-PMSG) adult ewes: Analysis of variance. . . . .	205
Appendix 3.45e	Factors affecting the total ovarian response of PMSG treated (Massey-PMSG) adult ewes: Analysis of variance. . . . .	206