A STUDY OF COMMERCIAL EMBRYO TRANSFER PROGRAMMES CONDUCTED WITH TEXEL AND AWASSI SHEEP

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Abstract

The results of two commercial embryo transfer (ET) programmes conducted in Central Hawkes Bay, comprising 93 Texel and 78 Awassi donor ewes, were analysed to identify variables that affect the success of commercial ET programmes. The production of high quality embryos for export was the primary objective in the Texel programme, while the rapid multiplication of the Awassi was the sole purpose of the Awassi programme. Reproductive parameters such as; ovarian response to exogenous gonadotrophins, recovery and fertilisation rate of ova, yield of good quality embryos and embryo survival rate to scanning and birth were evaluated. The influence of age, ovulatory response, repeated flushing, the number of corpora lutea in recipient ewes and donor surgeon, on the reproductive parameters, were assessed.

The Texel ewes were all purebred consisting of two-tooth and four-tooth animals. The Awassi ewes were either three-quarter or purebred, and included both ewe hoggets and mixed age ewes.

Synchronisation of oestrus was attempted using a double CIDR-G™ regime. The super ovulatory programme differed in each breed but consisted of a series of FSHp injections in combination with PMSG. The ewes were inseminated *intra-uterine* with fresh diluted semen from a ram of the same breed after detection of oestrus. Embryo recovery was attempted 6-6.5 days after insemination using a standard flushing technique in which the oviducts and uterus were exposed by mid-ventral laparotomy. Two or three embryos were transferred into each recipient ewe within 1.5 hours (Texel) and 4 hours (Awassi) of recovery.

Ovarian response to superovulatory treatments was not significantly affected by any of the variables recorded in this study, although the Texel programme provided a higher ovulatory response than the Awassi programme (8.89 CL vs 7.08 CL). The embryo recovery rates were 71.8% for the Texel and 78.1% for the Awassi sheep. Age of the donor ewes significantly affected ($p=0.006$) recovery rate of ova in the Awassi sheep, adult ewes and ewe hoggets recorded recovery rates of 90.7% and 65.2%. Fertilisation

rate was not affected by any of the factors studied with 94.6% and 77.6%, of the Texel and Awassi ova, being fertilised. The overall yield of good quality embryos was 91.6% for the Texel and 80.1% for the Awassi. The yield of good quality embryos was significantly affected (p=0.03) by age in the Awassi, 87.5% of adult embryos and 64.4% of ewe hogget embryos were of good quality. Survival rates in the Awassi data set were significantly affected by the lower scanning and birth rates of the Awassi ewe hoggets than Awassi ewes (43.8% vs 65.9%: p=0.02) and (39.3% vs 59.4%: p=0.03) respectively. Each Texel donor ewe produced, on average, 3.89 embryos that were of sufficient quality to be preserved and therefore not transferred, resulting in 0.70 lambs being born per donor ewe in the Texel programme. The Awassi programme produced 2.10 lambs donor per ewe, however, this was significantly affected (p=0.03) by the age of the donor ewes, with adult ewes produced an average of 2.7 lambs per donor, and ewe hoggets, 1.2 lambs per donor.

This work demonstrated the variable nature of embryo transfer programmes as well as the difficulty in achieving acceptable results from ewe hoggets. The Texel and adult Awassi results compared favourably to the other published reports and illustrate that on-farm commercial embryo transfer can provide acceptable results.

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ACP	Acetylpromazine
AI	Artificial insemination
BSA	Bovine serum albumin
°C	Degrees Celsius
CIDR	Controlled internal drug release
CL	Corpus luteum
CO_2	Carbon dioxide
DMSO	Dimethyl sulpoxide
FGA	Flurogestone acetate
FSH	Follicle stimulating hormone
GnRH	Gonadotrophin releasing hormone
HAP	Horse anterior pituitary extract
hMG	Human menopausal gonadotrophin
i.u	International units
LH	Luteinizing hormone
MAP	Medroxyprogesterone acetate
mg	Milligrams
ml	Millilitres
MOET	Multiple ovulation embryo transfer
No.	Number of
pFSH	Porcine follicle stimulating hormone
PMSG	Pregnant mares' serum gonadotrophin
PBS	Phosphate buffered saline
SE	Standard error