# Location and status of embryos flushed from portions of the reproductive tract of superovulated fallow deer (*Dama dama*) does

**D.K. Berg, J.G. Thompson, P.A. Pugh, H.R. Tervit and G.W. Asher[1]**

*AgResearch, Ruakura Agricultural Centre, Hamilton, New Zealand and [1]AgResearch, Invermay Agricultural Centre, Mosgiel, New Zealand*

The overall efficiency of multiple ovulation embryo transfer (MOET) programmes for fallow deer (*Dama dama*) have been low compared to those for red deer with 1.0-1.5 surrogate pregnancies per donor. The most common cause of failure has been attributed to poor fertilisation rates and low embryo recovery (Fennessy *et al.*, 1994). Fertilisation has been improved by the use of laparoscopic intrauterine insemination with fresh semen (Morrow *et al.*, 1994; Jabbour *et al.*, 1995). However, embryo recovery rates remain low. The present study describes the location and stage of development of embryos within the reproductive tract of superovulated fallow does in order to improve embryo recovery rates.

One hundred cycling fallow does were separated into five groups, synchronized and superovulated, and artificially inseminated as described by Morrow *et al.* (1994). Does were slaughtered on days 1, 3, 5, 7 and 9 (day of insemination = day 0). Reproductive tracts were collected at slaughter, trimmed and ovarian morphology was recorded. Portions of the tract were divided and flushed separately as follows: 1) oviduct, 2) uterotubal junction (UTJ) plus 1-1.5 cm of the uterine tip, 3) upper portion of the remaining horn and 4) lower horn and body of the uterus. The flushing medium was HEPES TCM 199 supplemented with 0.4% BSA. Recovered ova were inspected by stereomicroscopy and classified according to the development stage.

Twenty does failed to ovulated, but nine of these were from the D1 group. Fifteen of the remaining 80 does exhibited one ovulation and were not flushed. At least one ovum/embryo was recovered from 58 of the remaining 65 does that had 2 ovulations. No differences were observed in number of corpora lutea, large follicles or total stimulation among the groups with an overall mean (s.e.) of 10.6 (0.8), 4.8 (0.4) and 15.4 (0.9) respectively.

Distribution analysis showed the mean (s.e.) number of days required for 50% of the embryos to reach 2-cell, 8-cell, 16-cell, morulae and blastocyst stages were 3.6 (0.3), 4.7 (0.3), 5.8 (0.2), 5.9 (0.2) and 8.2 (0.3). The percentage of embryos recovered (s.e.) for each group were low, day 1 = 38 (8), day 3 = 36 (6), day 5 = 37 (5), day 7 = 42 (6), day 9 = 15 (4), with recovery rate on day 9 significantly lower ($P<0.05$) than the others. The majority (87%) of the recovered embryos were found in the oviduct and UTJ region.

Embryos recovered from superovulated fallow deer developed at a slower rate and transport through the tract was delayed compared to embryo development and transport rates of superovulated sheep and cattle. The optimum day for recovery of embryos appeared to be day 7 which maximizes recovery rate and when the majority of embryos are morula/blastocysts.

## REFERENCES

Fennessy, P.F., Asher, G.W., Beatson, N.S., Dixon, T.E., Hunter, J.W. & Bringans, M.J. 1994. Embryo transfer in deer. *Theriogenology* **41**:133-138.

Jabbour, H.N., Marshall, V.S., Argo, C.McG., Hooton, J. & Loudon, A.S.I. 1995. Successful embryo transfer following artificial insemination of superovulated fallow deer (*Dama dama*). *Reproduction, Fertility and Development* **6**:181-185.

Morrow, C.J., Asher, G.W., Berg, D.K., Tervit, H.R., Pugh, P.A., McMillan, W.H., Beaumont, S., Hall, D.R.H. & Bell, A.C.S. 1994. Embryo transfer in fallow deer (*Dama dama*): Superovulation, embryo recovery and laparoscopic transfer of fresh and cryopreserved embryos. *Theriogenology* **42**:579-590.