

An 11 year study of factors associated with the reproductive performance of 11493 ewes inseminated laparoscopically – Michael John Glover

Abstract

Background: Satisfactory reproductive performance in ewes involved in genetic improvement programmes and undergoing laparoscopic insemination (LapAI) is important.

Objective: To describe pregnancy rates in purebred and pedigree ewes inseminated laparoscopically and to investigate factors associated with variation in outcomes in commercial settings in the UK.

Design: Breeders using LapAI services provided by one artificial sheep breeding company (SWSBS) based in the south west of the UK were surveyed annually from 1995-2005.

Setting: Inseminations were carried out on farms of origin, or after transporting ewes to other farms or to an AI centre.

Participants: All 117 breeders who used the LapAI service during the study period were surveyed; 83% responded and provided data on 80.4% of 14299 ewes in 82.1% of 1093 Sire Groups and in 17 of 18 breeds. Breeds were grouped into: Charollais, Hampshire, Rouge de l'Ouest, Suffolk, Texel, and 'Other'.

Measurements: The outcome of interest was the pregnancy rate i.e. the proportion of ewes in a Sire Group (ewes from one flock inseminated on one day with semen from one ram) which lambled following LapAI. Data on exposures were sourced from breeders and SWSBS' records.

Results: The mean pregnancy rate was 71% (range: 0-100%, IQR: 61.0-83.0%); it was significantly higher for fresh (77%; range: 0-100%, IQR: 71.4-85.4%) than frozen semen (68%; range: 0-100%, IQR: 56.3-80.0%). Mean pregnancy rate varied by year.

For fresh semen: factors associated with higher pregnancy rates were: Charollais compared to Texel breeds; and >1 compared to 1 AI programme completed on a day. Factors associated with lower pregnancy rates were: inseminations in July compared to August; PMSG dose, <500iu compared to ≥500iu; and maximum ambient temperature on the day (MAT), ≥25°C compared to <25°C.

For frozen semen: breed was the only factor significantly associated with higher pregnancy rates; Charollais, Hampshire, 'Other, and Suffolk ewes had higher rates than Texel. Factors associated with lower pregnancy rates were: inseminations in November and December compared to August; PMSG dose, <500iu compared to ≥500iu; total number of ewes inseminated on the day, ≥65 compared to <65 ewes; and MAT, ≥25°C compared to <25°C.

Non-significant associations: occurred between pregnancy rate and introduction of teaser rams at sponge removal, time of insemination, use of pellet or straw frozen semen, use of reference sire semen, size of AI programmes (≥56 or <56 ewes), and transport of ewes for insemination.

Strengths and limitations: This is the largest study on pregnancy rates following LapAI in the UK to date. The results are of use to stakeholders involved with AI in ewes. The results may not be generalizable to breeds not in the study, nor to breeds where only a small number Sire Groups were included, e.g. Bluefaced Leicester, Lleyn, and Polled Dorset/Dorset Horn breeds.

Conclusions: Pregnancy rates following LapAI are satisfactory but vary widely. Frozen semen is less fertile than fresh. The study provides new evidence for factors that can be used to improve the reproductive performance of ewes in future LapAI programmes. Opportunities for further research have been identified.