



Influence of prostaglandin F2 α dosage and semen storage time on cervical artificial insemination of ewes

Isabela M. L. de Paula^{1,2}, Amanda G. L. de Moraes^{*2}, Liliana M. S. dos Santos¹, Hélder M. P. Quintas¹, Ramiro C. Valentim¹, Daiane M. Silva²

¹Bragança Polytechnic University, Bragança/Trás-os-Montes, Portugal; ²Federal Institute of Education, Science and Technology of South of Minas Gerais (IFSULDEMINAS), Machado/Minas Gerais, Brazil.

*Graduate student – amanda.gabriele@alunos.ifsuldeminas.edu.br

Fixed-time artificial insemination (FTAI) is one of the main tools to achieve genetic improvement in sheep production and its implementation is facilitated by methods of estrus synchronization and ovulation' stimulation. For vaginal or cervical artificial insemination, fresh or cooled semen is the most used, resulting in acceptable pregnancy rates. The main purposes of this research were to evaluate the effectiveness of a reduced dose of prostaglandin F2 α (PGF2 α) in the estrus synchronization protocol and to verify the influence of semen storage time at 5°C on the sheep conception rates. This study was conducted at Bragança Polytechnic University between April and June 2023. Sixty-six Churra Galega Bragançana Branca breed ewes were used. The short progestogen protocol involved the use of a vaginal device containing 0.35 g of progesterone for seven days. Simultaneously with the device insertion, half of the ewes received an intramuscular (IM) injection of 75 μ g of PGF2 α , while the other half received 100 μ g. Upon the removal of the device, all ewes received a 500 IU IM injection of equine chorionic gonadotropin (eCG). Semen was collected from two ram donors through electroejaculation and seminal analyzes were performed using a computer assisted semen analysis (CASA). Semen was diluted in INRA 96 extender and 0.25 mL straws containing 250 x 10⁶ sperm each were produced. The straws' temperature was reduced until 5°C in a refrigerated water bath (-0.27°C/min). Semen was stored at 5°C, 0-day, 1 day or 2 days after cooling. Fifty-six hours after the eCG injection, all ewes were cervical inseminated by the FTAI method. After 41 days, rectal ultrasound was used to detect pregnancy rate. In order to identify statistically significant variations, variance analyses were conducted. The comparison between means was performed using the Bonferroni/Dunn test at 95% of probability. The Chi-square test was done to compare frequencies. It was determined that the use of 100 μ g of PGF2 α was more effective ($P \leq 0.05$) than 75 μ g, with conception rates of 85% and 73%, respectively. PGF2 α is a hormone with high cost, then to reduce the dosage/animal/cycle is interesting for the sheep producers, but unfortunately the reduction of 25% compromises the pregnancy rate. The storage time (0-day, 1 day and 2 days) did not significantly impact the conception results ($P \geq 0.05$), with rates of 81%, 83% and 73%, respectively. Therefore, it was concluded that the 100 μ g of PGF2 α protocol generates a higher pregnancy rate than the 75 μ g of PGF2 α protocol and it is possible to use ram semen until two days after cooling at 5°C without any negative impact on the conception rate of Churra Galega Bragançana ewes.

Keywords: Churra Galega Bragançana, cooled semen, estrus synchronization, hormone, reproduction, sheep

Acknowledgment: IFSULDEMINAS and Bragança Polytechnic University.