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Abstract

The performance of MOET (multiple-ovulation embryo transfer) programs in sheep is limited, mainly due to variable ovarian responses to FSH superovulation treatments. In several mammalian species, anti-Müllerian hormone (AMH) has been demonstrated to be a good predictor of the ovarian follicle population able to respond to gonadotropins. Therefore, we aimed to evaluate its usefulness in ovine MOET programs. With this goal, two MOET trials involving 24 adult ewes in total were performed. Each ewe received a fluorogestone acetate sponge (Sincropart 30 mg, CEVA Animal Health SA, Barcelona, Spain) which was replaced by a new one after 6 days (T-4). Four days later (T0), the first FSH injection (Follitropin-V, Minitub Ibérica SL, Tarragona, Spain) of a superovulation treatment consisting in 280 IU of FSH administered in 8 decreasing doses was applied. Blood samples were taken at T-4 and T0 using lithium heparin tubes for AMH measurement. Ewes were inseminated 51 h after sponge removal. Eight days after sponge removal, ovulation rate was recorded and embryo recovery was carried out under general anaesthesia. After morphological evaluation, 2 embryos were transferred to each recipient previously synchronized. The plasma concentrations of AMH were determined using the AMH equine ELISA kit (AnshLab, Webster, TX, USA). The sensibility of the assay was 27.8 pg mL⁻¹, and the intra-assay coefficient of variation was 4.8%. Relationships between the AMH concentration of each animal and the number of corpora lutea (CL), embryo recovered and lambs born per donor ewe were tested using the Pearson correlation coefficient. Normality of the variables was assessed by Kolmogorov-Smirnov test. The plasma AMH concentrations at T-4 were highly correlated with those at T0 ($r = 0.95$; $P < 0.01$), so both sampling times could be used indistinctly. The plasma AMH concentration at T0 was highly variable between animals, ranging from 0 to 309.1 pg mL⁻¹ (mean \pm s.e.m.: 98.4 \pm 18.4 pg mL⁻¹). Similarly, the number of CL ranged from 2 to 29 (12.2 \pm 1.5), recovered embryos from 0 to 17 (7.6 \pm 1.2), and lambs born per donor and session from 0 to 13 (4.5 \pm 0.9). The AMH concentration at the beginning of the FSH treatment (T0) was highly correlated with the total number of CL ($r = 0.70$; $P < 0.01$), but significance was not attained for AMH with the other variables. The number of CL was also correlated with the number of recovered embryos ($r = 0.69$; $P < 0.01$) and lambs born ($r = 0.58$; $P < 0.01$). In conclusion, AMH concentrations measured in blood plasma before the FSH treatment could be used to predict the number of CL per donor ewe, and so to improve the efficiency of MOET programs. Further studies are necessary to assess the individual repeatability of a given ewe from session to session as well as the relationship of AMH with other embryo-related variables.

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