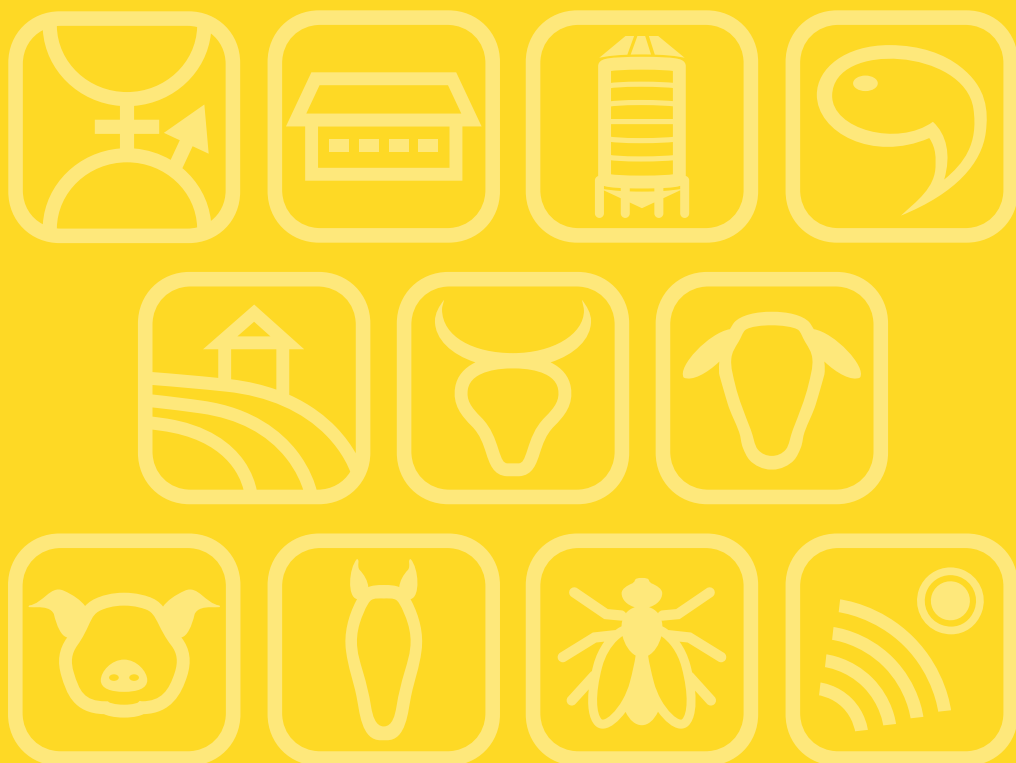


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The male effect as an alternative to eCG in oestrus induction and synchronization treatment in ewes

N. Debus¹, G. Besche¹, S. Fréret², A. Hardy³, M.T. Pellicer-Rubio², A. Tesniere¹ and J.-B. Menassol¹
¹UMR SELMET, Place Viala, 34000 Montpellier, France, ²UMR PRC, INRAE, 37380 Nouzilly, France, ³EPL La Cazotte, Route de Bournac, 12400 Saint-Affrique, France; *nathalie.debus@inrae.fr*

We tested if the male effect (ME) can be an alternative to eCG in oestrus induction treatment used prior to artificial insemination (AI) in ewes. Two groups of 50 Arles Merino (M) (2021) or Lacaune dairy (L) (2022) ewes were monitored during anoestrus season: (1) FGA group: ewes were treated with intra-vaginal sponges impregnated with progestagen for 14 days prior to ME; (2) C group: ewes received no hormonal treatment before ME. First, ME was performed for 14 days with 4 vasectomized rams equipped with the electronic oestrus detectors to monitor oestrus kinetics and introduced with the ewes on the day of sponge removal (D0). Then, the ewes were mated with 4 entire rams for 17 days. Progesterone was measured before FGA treatment to determine the cyclic status of the ewes prior to ME and for 11 days from D0 to characterise the ovulatory response to ME. We observed a high percentage of cyclic ewes before ME (from 46 to 74%). Most cyclic and non-cyclic ewes ovulated after ME in FGA and C groups (respectively 98 and 68% for M ewes; 98 and 63% for L ewes). The FGA treatment suppressed short cycles in response to ME (0 vs 12% for M ewes; 0 vs 6,1% for L ewes, $P<0.01$). The percentage of ewes in oestrus from D0 to D14 was higher in the FGA group than in the C group (96 vs 44% for M ewes; 96 vs 68% for L ewes; $P<0.001$). The onset of oestrus after D0 was earlier and better grouped in the FGA group (Median=34.34 h [Q1=31.08 h, Q3=43.25 h] for M ewes; 42.16 h [33.73 h, 56.85 h] for L ewes) compared to the C group (137.83 h [71.61 h, 246.74] for M ewes; 147.14 h [51.02 h, 232.35 h] for L ewes) ($P<0.001$). Our previous results showed a higher fertility rate for ewes inseminated between 0 and 35 h after the onset of oestrus. In the present study, 90% of M ewes and 68% of L ewes in the FGA group came into oestrus within a time window compatible with AI performed 53 h (M ewes) or 60 h (L ewes) after sponge removal, compared to 4% (M) and 10% (L) in the C group ($P<0.001$). The combination of ME and FGA pre-treatment is an alternative method to the use of eCG in AI protocols with a unique and fixed timing of insemination.

Circulating anti-Müllerian hormone from 5-month old Merino ewe lambs predicts first birthing rates

J. Daly, J. Kelly, K. Kind and W. Van Wettere

University of Adelaide, School of Animal and Veterinary Sciences, Roseworthy, 5371, Australia; william.vanwettere@adelaide.edu.au

Anti-Müllerian hormone (AMH) is an accurate phenotypic marker of antral follicle numbers and responsiveness to stimulation protocols in cattle and sheep. However, the relationship between pre-pubertal AMH and fertility of mature breeding females is poorly understood. Fertility at first mating and AMH has been correlated in Rasa Aragonesa and Sarda ewe lambs. The relationship between pre-pubertal AMH and the fertility of Australian Merino ewes has not yet been investigated. This study determined whether pregnancy and birthing rates of Australian Merinos following their first mating was related to plasma AMH concentration at 5 months old. At 5 months of age, a single blood sample was collected from 86 Merino ewe lambs managed under routine husbandry at a Research Centre in South Australia. At 18 months of age, ewes were housed with harnessed Merino rams for 35 days (24 hours / day). Ultrasound was used to determine pregnancy status, at an average of day 60 pregnancy. AMH levels in plasma were measured using an ovine specific AMH ELISA kit (Ansh laboratories, Texas, USA). Differences in AMH between groups of ewes that became pregnant and lambed and those that did not were determined using an ANOVA, unbalanced design (Genstat 19th Edition; VSC International). Data presented as mean \pm SEM. Ewes scanned pregnant (n=70) had higher AMH at 5 months of age than those scanned not-pregnant (n=16) (2.74 \pm 0.22 vs 1.64 \pm 0.48 ng/ml; $P<0.05$). AMH was higher ($P<0.05$) for ewes which birthed (n=71) a lamb compared with those which did not (n=15) (2.83 \pm 0.21 vs 1.26 \pm 0.48 ng/ml). AMH concentrations at 5 months of age were higher ($P<0.05$) for singleton and twin-bearing ewes compared with non-lambing ewes (2.74 \pm 0.23 and 3.34 \pm 0.81 vs 1.26 \pm 0.48 ng/ml, respectively), but similar for singleton and twin-bearing ewes. These are the first data in the Merino to demonstrate that circulating AMH concentrations at 5 months of age are higher for hoggets which produce a lamb following their first mating. This finding is consistent with previous evidence that AMH can predict fertility in Rasa Aragonesa and Sarda ewes. Ongoing studies by our group will determine the relationship between AMH at weaning and lifetime fertility and productivity of Merino ewes.