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Color Doppler ultrasound as a substitute to laparoscopy for the CL count in superovulated sheep

P.H.N. Pinto[1], G.M. Bragança[1], C.R. Leite[1], G.B. Santos[1], R.M. Rosa[1], V.A.P. Alfradique[1], L.H.S. Gonçalves[1], M.F.A. Balaro[1], J.F. Fonseca[2], F.Z. Brandao[1]

[1]UFF, Niterói; [2]EMBRAPA, Coronel Pacheco.

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This study aimed to evaluate the Color Doppler ultrasound as a substitute for laparoscopy for couting of corpora lutea (CL) in superovulated sheep. Twenty-five nulliparous Santa Ines ewes (11.9 ± 1.1 months old, BCS: 2.8 ± 0.3) were superovulated using the Day 0 protocol concept. For previous wave synchonization, intravaginal progestagen sponges (Progespon®, Zoetis, Campinas-SP, Brazil) were kept for 6 days and on Day 5, 300 IU eCG (Novormon®, Schering Plough, São Paulo, Brazil) and 0.24mg cloprostenol (Estron®, Tecnopec, Sao Paulo, Brazil) were given intramuscularly (IM). Thirty-six hours after sponge removal, 25 µg licerelin was administered IM. The superovulation started 80 hours after sponge removal by the use of 200 mg of FSH/ per ewe (Folltropin-V ®, Bioniche Animal Health, Ontario, Canada) in six declining doses, every 12 hours (50/50, 30/30, 20/20 mg), IM. At the first FSH dose, a new sponge (Progespon®, Zoetis, Campinas-SP, Brazil) was inserted and removed at the time of the fifth dose. At the last FSH dose, 0.24 mg of cloprostenol (Estron®, Agener Union, Sao Paulo, Brazil) and, 24 hours later, 25 µg of lecirelin (Gestran Plus®, Tecnopec, Sao Paulo-SP, Brazil) were administered IM. Ewes were mated every twelve hours from the last FSH dose to the end of estrus. Twelve hours before embryo collection, Color Doppler ultrasound exams were performed using Sonoscape S6® equipment (Sonoscape, Yizhe Building, Yuquan Road, Shenzhen, China), coupled to a 7.5 MHz linear transducer (transrectal) to predict the number of corpora lutea (CL-DOPPLER). Previous to embryos collection, the number of CLs was determined again by laparoscopy (CL-LAPARO). The CL-DOPPLER and CL-LAPARO were compared through the Pearson's correlation coefficient, Simple Linear Regression Analysis and Intraclass Correlation Coefficient (ICC). For all tests, $P < 0.01$ was considered as statistically significant. A high correlation between the number of CL-DOPPLER and CL-LAPARO ($r = 0.92$; $r2 = 0.85$; $P < 0.01$) and an excellent ICC (0.93; $P < 0.01$) were obtained. In conclusion, the Color Doppler ultrasonography is highly efficient to estimate the number of CLs in superovulated ewes. This represents an important advance because it replaces invasive laparoscopic procedure, avoids fasting, drugs use and unnecessary handling in animals that did not respond to the treatment. Therefore, the Color Doppler ultrasound can replace the laparoscopy for the assessment of superovulated sheep.