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Luteal vascularization as a tool for early pregnancy diagnosis in sheep is more efficient from day 17 post-insemination

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The objective of the present study was to determine the efficiency of luteal vascularization assessment using color Doppler ultrasonography (US) as a tool for predictive pregnancy diagnosis and at which moment post-insemination this evaluation is more efficient. Adult Santa Inês ewes (n=28) with an average age, body weight, and body condition score of 3.0±1.2 years, 44.6±5.4Kg, and 3.0±0.2, respectively, were used. The animals were submitted to a FTAI protocol as previously described by Balaro et al. (Domest Anim Endocrinol, v.54, p.10, 2016). The AI (D0) was performed 56h alter sponge withdrawal using commercial frozen-thawed semen. Luteal vascularization was assessed by color Doppler US (PRF: 1.0 KHz, WF: 75 KHz) from D12 to D20 using a portable device equipped with a 7.5 MHz transducer. Luteal vascularization was classified using a subjective scale ranging from 1 to 4 (Bragança et al. Animal Reproduction, v.13, p.587, 2016). Females bearing a CL with vascularization graded as 2 or superior was presumably considered as pregnant. Pregnancy was confirmed at D30 by visualization of embryonic vesicle using B-Mode US and data was compared with predictive diagnoses performed from D12 to D20. The efficiency of color Doppler US was evaluated by calculating the percentage of false negative (FN) and false positive (FP) results and also sensitivity (SENS), specificity (SPEC), negative (NPV) and positive (PPV) predictive values, and accuracy (AC) of the technique. At D30, 11 females were confirmed as pregnant and 17 as non-pregnant. As expected, use of color Doppler from D12 to D14 was unfeasible to predict non-pregnant animals because all animals still had vascularized CL (pre-luteolysis period), and thus they were all considered as pregnant. From D15 to D17 the number of FP results progressively decreased, increasing the values observed for SPEC, PPV, and AC (SPEC=18%; PPV=44%; AC=50%; FP=50% for D15; SPEC=47%; PPV=55%; AC=68%; FP=32% for D16; SPEC=76%; PPV=73%; AC=86%; FP=14% for D17). Results did not change from D17 to D20. In The present study, four FP results remained until D20. However, CL in these 4 animals kept a vascularization grade equal or superior than 2 until D20, suggesting that failure to predict non-pregnant animals was due to early embryo lost from D20 to D30 and not due to technique limitation. It was not observed FN results, thus SENS and NPV remained constant from D15 to D20 (SENS=1, NPV=1). The present results demonstrated the efficiency of color Doppler US as a tool for early identification of non-pregnant animals from D15. However, due to occurrence of FP results, best results was observed were observed from D17. Acknowledgments: FAPERJ for financially support the project and provide scholarship for EKNA and FZB.