



A052 Folliculogenesis, Oogenesis and Superovulation

Evaluation of the luteal function in sheep using color doppler ultrasonography

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The aim of the present study was to evaluate the use of color Doppler ultrasonography in the study of luteal function in sheep. Estrus was synchronized in nulliparous Santa Ines ewes (n=18) with short-term protocol of 6 days (Cavalcanti, R. Bras. Zootec., v. 41, p.1412-1418, 2012). After estrus detection, ovulation (D0) and subsequent corpus luteum (CL) development was assessed every 24 hours by ultrasonographic exams using a portable ultrasound device with color Doppler (Sonoscape[®] S6, Shenzhen, China), equipped with a 7.5 MHz linear transducer. Ultrasonography exams were performed until detection of a subsequent ovulation. In each sonogram, the ovaries were scanned with both B and color flow Doppler modes and a video was recorded. Luteal tissue and vascularization areas were also measured in a single 2D image (at CL largest diameter). Blood samples were collected daily for plasma progesterone (P4) determination by radioimmunoassay. Results were evaluated by ANOVA and differences between means were determined by Tukey's test. Correlations were analyzed using Pearson's correlation method. Results are shown as means±SD. Color Doppler ultrasonography allowed an early examination of the developing CL, which was first visualized at day 0.77±0.62 with an average area of 29.68±13.21 mm². As expected, luteal dynamics was characterized by a luteogenesis period, in which a progressive increase of the luteal tissue area and plasma P4 concentration was observed (maximum 124.0±38.0 mm² and 11.23±4.89 ng/mL, respectively), a plateau phase in which no significant increase was detected, and a luteolysis period in which plasma P4 concentration decreased abruptly while luteal tissue area decreased gradually. Similarly, vascularization area progressively increased during luteogenesis (maximum 52.78±24.08 mm²) and gradually decreased during luteolysis. These results demonstrate the importance of a functional vascular structure for CL development. Also, variations observed with color Doppler ultrasonography were directly related to luteal function. A positive correlation between CL vascularization area and plasma P4 concentration during luteogenesis (r=0.22, P<0.05) and luteolysis (r=0.48, P<0.05) was observed. The low correlation value observed during luteogenesis period was likely due to high vascularization of the early CL (corpus hemorrhagicum). When CL was first visualized, mean vascularization area was 12.26±6.9 mm², which represented 44.3% of the luteal tissue area. In conclusion, luteal dynamics in Santa Ines sheep was similar to the patterns observed in other sheep breeds and domestic ruminant species (cows and goats). Color Doppler ultrasonography allowed an early visualization of the CL, but its use to quantitatively assess luteal function remains a challenge.