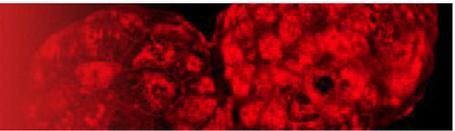


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312 LUTEAL MORPHOMETRIC PARAMETERS AND SONOGRAPHIC ECHOTEXTURE DURING LUTEOGENESIS PERIOD IN PREGNANT GOATS

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Abstract

Sonographic echotexture is an important parameter for corpora lutea (CL) evaluation, since it is related to variations on vascularization and histological features of CL and, consequently, to steroidogenesis. The aim of this study was to evaluate the luteal dynamics and pixel value during the early luteogenic period in goats. Nuliparous Toggenburg females ($n = 18$) with an average age of 8 months, weight of 33.52 ± 5.58 kg, and body condition score of 3.5 ± 0.33 (1 to 5 scale) were used. Ovarian sonographic evaluations were performed daily for 21 days after natural estrus, using a portable ultrasound device (Aloka SSD 500, Aloka Co., Ltd., Tokyo, Japan) equipped with an adapted linear rectal 5-MHz probe. CL and cavity areas were measured at their largest diameter. CL area minus the cavity area was considered luteal tissue. Images were digitalized in .TIFF format, at a 1500×1125 resolution, using a video capture board (Pinnacle DC10, Pinnacle Systems, Mountain View, CA, USA). Images recovered on Days 6, 8, 10, and 12 of the estrous cycle were analyzed using a custom software (Quantpro®). Each image dot (pixel) received a numeric value ranging from 0 (black) to 255 (white). Representative elementary area (REA) of 5625 pixels (0.31 cm^2) was defined in the luteal tissue (proposed by Van den Bygaarty *et al.* 1999 *Can. J. Soil Sci.* **7**, 149–160). Due to the possibility of early luteal regression, only data from pregnant animals (14/18, 77.8%) were used. Follicle diameter, CL area, and cavity were analyzed by ANOVA, and differences among means were evaluated by Tukey's test. Correlations were established by Pearson's correlation method. Results are presented as means \pm SEM. Mean diameter of ovulatory follicle was 0.75 ± 0.01 cm. There was no significant correlation ($P > 0.05$) between ovulatory follicle diameter and CL area. CL were first visualized on Day 5.68 ± 0.37 after the estrus, with a mean area of $0.56 \pm 0.05 \text{ cm}^2$, and progressively increased in size ($P < 0.001$) until Day 12, reaching a maximum area of $1.18 \pm 0.06 \text{ cm}^2$. A significant ($P < 0.05$) pixel value increase was observed from Days 6 to 12 of the cycle (42.79 ± 5.06^a ; 47.90 ± 4.51^{ab} ; 48.33 ± 4.21^b ; and 52.95 ± 4.65^b , respectively, values with the same superscript not being significantly different). There was a significant positive correlation ($R = 0.54$, $P < 0.0001$) between luteal tissue area and pixel value during the luteogenesis period. In single ovulating goats (10/14; 71.42%), the mean time for the first CL visualization was lower (4.71 ± 0.15 v. 6.78 ± 0.89 days; $P < 0.01$) and the area of the CL on Day 12 was larger (1.32 ± 0.04 v. $1.03 \pm 0.15 \text{ cm}^2$; $P < 0.01$) than in goats with two or more ovulations, but there was no difference in luteal pixel value (52.32 ± 3.19 v. 53.75 ± 3.90 ; $P > 0.05$). The presence of luteal cavities was observed in 89.47% (17/19) of the CLs on the first day of visualization, with a mean size of $0.30 \pm 0.05 \text{ cm}^2$, representing 45.31% of the total CL area and difficult echotexture analysis. These cavities progressively regressed ($P < 0.01$) until Day 11 of the cycle, with an area less than 0.1 cm^2 . These results show that pixel values are correlated to CL development in goats, suggesting an association between CL echotexture and steroidogenic function.

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