LUTEAL ECHOGENICITY EVALUATION USING DIFFERENT ULTRASOUND PROBES

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The advent of ultrasonography has made possible to monitor corpus luteum (CL) development sequentially, by identification and measurement of it size and density. The luteal density is an important evaluation parameter, since it reflects luteal blood flow and, indirectly, progesterone production. Density evaluation performed visually is subjective and not sensitive enough to identify discrete variations of tonality. Computer-assisted image analysis is based on identification of picture elements (pixels) intensity, reflected in the gray scale displayed in the screen, and can be applied in corpora lutea echo-texture evaluation. However, there is still no standard methodology for image recovery, digitalization and processing. The aim of this study was to compare two methods of image generation for luteal texture analysis. The estrous cycle of Holstein-Zebu crossbred heifers (n=10) aging 20 to 27 months was synchronized with an intravaginal progesterone release device (CIDR®) associated with administration of a PGF analog. Sonographic evaluations of the ovaries were performed daily after estrus, using a portable ultrasound device (Aloka SSD 500, Aloka Co.) equipped with a linear rectal 5MHz probe (RP), and with a sector transvaginal 5MHz probe (VP). Corpora lutea images were recorded in VHS tapes and digitalized with a video capture board (Pinnacle DC10, Pinnacle Systems) in .TIFF format. Acquired images of days 3 (metaestrus), 6 (early diestrus) and 10 (mid diestrus) were analyzed with a specific software, using a 256 shades of gray scale (0 to 255). There was a positive correlation between values obtained with RP and VP (r = 0.5408; P<0.01), with a linear increase in echogenicity according to day (Y=6.01x + 58.50; R²=0.96). The use of VP resulted in higher mean echogenicity values, but difference (P<0.05) was observed only in day 6 (D3: 59.97±12.73[a] vs. 67.56±10.96[a]; D6: 65.35±13.50[a] vs. 81.34±14.11[b]; D10: 71.08±15.83[a] vs. 80.48±13.20[a] for RP and VP, respectively). The higher echo-texture obtained with VP may be associated with ultrasound wave attenuation during RP evaluation, due to the lower proximity between the probe and the corpus luteum. In conclusion, the ultrasound image generation system shall be considered when luteal echo-texture analysis is performed.