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Abstract

Comparative evaluation of ovarian structures in cattle by palpation per rectum, ultrasonography and plasma progesterone concentration

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The aims of this study were to determine the relationship between the ultrasonographic determination of corpora lutea and the plasma progesterone profile of cyclic cows during an oestrous cycle, and to compare the accuracy of detection of normal and abnormal ovarian structures by ultrasonography and palpation per rectum, based on the plasma progesterone profile. The ovaries of six lactating cyclic dairy cows were scanned and blood samples were obtained three times a week for one month. There was a high correlation (r=0·85) between the diameter of the corpus luteum and the plasma progesterone concentration, but on days -3 and -2 (oestrus=day 0) the diameter was the same as mid-luteal values but it was functionally inactive (plasma progesterone <0·5 ng/ml). The accuracy of palpation per rectum and ultrasonography for determining the presence and age of the corpora lutea was investigated in 34 cows by using the plasma progesterone concentration and the dissection of ovaries post mortem as standards. The sensitivity, specificity and positive predictive value of palpation for identifying mid-cyclic corpora lutea were 85 per cent, 95·7 per cent and 89·5 per cent, respectively.

Ultrasonography had a sensitivity of 95 per cent, a specificity of 100 per cent and a positive predictive value of 100 per cent. Twenty-nine cows were diagnosed by palpation per rectum as having either follicular or luteal cysts. During ultrasonography, an ovarian cyst was defined as a non-echogenic structure at least 5 mm in diameter. Cysts were further classified into follicular cysts, with a uniformly non-echogenic antrum and a wall 3 mm or less thick, or luteal cysts, with non-echogenic antrum with grey patches within the antrum or along the inner cyst wall and a wall more than 3 mm thick. The ultrasound diagnosis was independent of the diagnosis by palpation. A correct ultrasound diagnosis was based on the plasma progesterone concentration: less than 0·9 ng/ml for follicular cysts and more than 0·9 ng/ml for luteal cysts. Palpation correctly diagnosed ovarian follicular and luteal cysts in 15 of the 29 cows. Ultrasonography correctly determined the presence of ovarian cysts in 15 of the cows, large follicles (diameter 12 to 14 mm) in three cows and corpora lutea (with or without cavities) in the remaining 11 cows.