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Evaluation of ultrasonography as a method for diagnosing subclinical endometritis in postpartum dairy cows

The common methods in diagnosing chronic endometritis, such as visual inspection, rectal palpation and vaginoscopy, are not accurate and fail to detect all affected cows. There is disagreement in the international literature about the effect of chronic endometritis on reproductive performance. The objectives of this study were to evaluate signs of endometritis, such as oedema or scars of the endometrium and accumulations of fluid in the uterine cavity detected by ultrasonography. It was investigated, if these ultrasonographic findings were associated with a reduced reproductive performance.

The uteri of 324 cows (126 first lactating cows, 198 older cows), that were diagnosed as healthy by rectal examination, were examined ultrasonographically. The diameter of each horn, the thickness of the uterine wall and the width of the uterine cavity were measured at two locations. Of approximately one third of the cows the echostructure of the endometrium and the echogenicity of accumulations of fluids were assessed. In addition, the ovaries were examined ultrasonographically for the presence of a follicle or a corpus luteum. The cows were examined 21 – 27 days postpartum (PK 1) and again 35 – 41 days post partum (PK 2). From a total of 151 cows endometrial cells were collected by Cytobrush®, to determine the percentage of PMN (Polymorphonuclear Neutrophiles). Subclinical endometritis was diagnosed by the width of the uterine cavity and the presence of fluids. A second criteria was the echostructure of the endometrium and the echogenicity of the fluid. To define a threshold value for the width of the uterine cavity, the sensitivity and specificity were calculated. The percentage of PMN was used as “gold standard”. To achieve a high sensitivity a threshold value of 0,2 cm was chosen. Cows with a width less than 0,2 cm were regarded as healthy. Cows with more than 0,2 cm were regarded as diseased. For a high specificity, a width of the uterine cavity more than 0,8 cm was chosen. With a threshold value of 0,5 cm the sensitivity and specificity were comparable. The reproductive performance was compared between healthy and diseased cows, for each of the three threshold values. Cows with subclinical endometritis had a significantly reduced first service conception rate, proportion of pregnant cows and conception rate. The number of services per conception was significantly higher for cows with subclinical endometritis. These significant differences were only found for the threshold value of 0,2 cm, when measured 21 – 27 days postpartum.

Cows, for which the echogenicity and echostructure of the fluid and the endometrium was assessed, were classified in three categories: healthy (category 0), intermediate (category 1) and diseased (category 2). Between the healthy and the diseased group of cows a significant difference in the proportion of cows pregnant was found. The results of this study demonstrated, that chronic, subclinical endometritis can be diagnosed by means of a width of the uterine cavity more than 0,2 cm. In addition it can be diagnosed by means of the echogenicity of accumulated fluids and the echostructure of the endometrium. These diagnostic criteria were associated with a reduced reproductive performance.