

The effect of serum catalase and superoxide dismutase activity on subclinical ketosis and conception rate at first service in Holstein dairy cows

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Received:12.02.2020

Accepted:23.06.2020

Abstract

Today, the most important factor in the occurrence of metabolic and reproductive diseases in dairy cattle is the disturbance of natural process in the body's cellular-molecular events that occurs after increasing of oxidants and the formation of oxidative stress. Ketosis is one of the most important metabolic abnormalities caused by disruption of energy metabolism early in lactation. This study was carried out on 45 Holstein dairy cows (between 3 and 5) and high-yielding dairy farms of Isfahan province. Blood samples of each cow were taken 21-27 days after Parturition and serum samples were obtained. BHBA, catalase and superoxide dismutase, were measured. Ovulation synchronization protocol was performed for all cows after the Clean Test and confirmation of genital health by B-mode ultrasound. The first Artificial Insemination was performed at 45-50 days postpartum and at the same time, follicular diameter, ovarian status, and uterine tonicity were assessed by using rectal ultrasonography. Also, the presence or absence of estrus was recorded in all cows. At 32 days after artificial insemination, the cows were pregnancy diagnosed by rectal ultrasound. The results of the present study showed that the concentration of superoxide dismutase ($P=0.04$) and catalase ($P=0.08$) decreased in subclinical ketosis dairy cows compared to healthy cows, Also, BHBA concentration was lower significantly in pregnant cows than nonpregnant ($P = 0.008$). Finally, the results of this study confirm that oxidative stress biomarkers can be promising biomarkers for the prediction of subclinical ketosis in postpartum dairy cows.

Keyword: Ketosis, Dairy cow, Antioxidant, Oxidative Stress

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