JOURNAL OF ANIMAL AND BEHAVIOURAL SCIENCE: VOL: 5, ISS: 2

Early warning for ovarian diseases disease in dairy cows

Yuxi Song, Cheng Xia

Heilongjiang Bayi Agriculture University, China

Abstract:

Statement of the Problem: Inactive ovaries (IO) and ovarian cysts (OC) are two common ovarian diseases (OD) leading to infertility in dairy cattle. The cysts can be subdivided into follicular cysts (FC) or corpus luteum cysts (LC). Both disorders are associated with altered metabolites and hormones. There are currently no known effective biomarkers that can be used for OD early diagnosis. The purpose of this study was to identify the plasma biomarkers of the OD in Holstein dairy cows that facilitate an early diagnosis of the diseases and control its progression. Methodology & Theoretical Orientation: The experiment was performed from 21 days postpartum and last for 4 weeks. Forty Holstein cows were divided into healthy control group (HC, n=22), IO group (n= 6), FC group (n= 6) and LC group (n=6) by rectal palpation or ultrasonography during this four-week period. Blood was collected via tail vein for measurement of plasma metabolites, minerals, and hormones on days 21 and 50 postpartum. Data were analyzed by Mann-Whitney U, Kruskal-Wallis, Spearman correlation, binary logistic regression analysis and Receiver operating characteristic (ROC) analysis, where applicable. Findings: OD compared with HC cows had greater ($P<0.05$) concentrations of plasma nonesterified fatty acids (NEFA), and lesser ($P<0.05$) concentrations of plasma alanine aminotransferase (ALT), calcium (Ca), phosphorus (P) and insulin-like growth factor 1 (IGF-1) on 21 d than OD cows. OD were positively correlated with plasma NEFA, and negatively correlated with plasma ALT, Ca, P and IGF-1. Early warning values for OD cows were plasma NEFA concentrations > 0.50 mmol/L, or Ca concentrations < 2.02 mmol/L on 21 days postpartum. Conclusion & Significance: Plasma NEFA and Ca could be used as early-warning indicators for OD in dairy cows. The present findings provide a new strategy for prevention and control of OD in the future.

Image

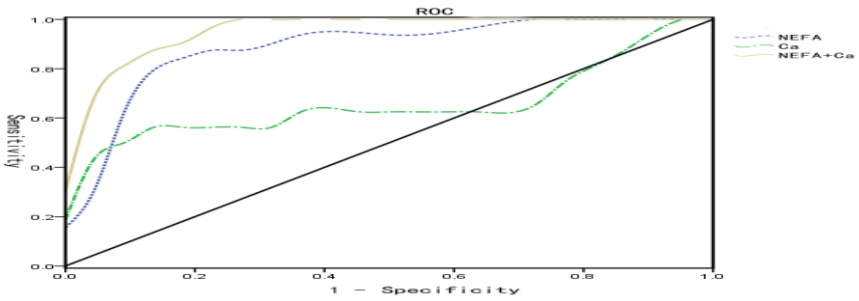

Figure 1: ROC area under the curve of NEFA and Ca in dairy cows with ovarian disease.

Biography:

Yuxi Song specializes in animal nutritional and metabolic disorders. His major is clinical veterinary medicine. He has been committed to improving nutritional and metabolic diseases of dairy cows for many years.

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Abstract citation: Yuxi Song, Early warning for ovarian diseases disease in dairy cows, Veterinary Medicine 2021, 2nd World Congress on Veterinary Medicine, May 26-27, 2021. Conference Url: http://veterinarymedicine.pulsusconference.com/