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Early warning for inactive ovaries based on liver function index, serum MDA, IL-6, FGF21 and ANGPTL8 in dairy cows

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Postpartum inactive ovaries (IOs) in dairy cows reduce the economic returns of the dairy industry. It is related to energy metabolism disorder, inflammatory response and oxidative stress. The objective of this study was to investigate the association of liver function index (LFI) and serum cytokines at 21 days postpartum with IO and to predict the risk of IO in dairy cows. The blood of 60 parturient cows was collected through caudal root vein at 3, 21, 28 and 55 days postpartum. Ultrasonography was performed at 50 and 55 days postpartum to determine follicular development. With the median LFI as the standard, it was divided into high LFI (n = 30) and low LFI group (n = 30). A cohort study was used to analyse the risk of LFI to IO and t-test was used to compare the blood biochemical indicators of different LFI groups. Then, 12 cows (oestrus = 6 and IO = 6) were slaughtered 55 days postpartum. The differences of LFI, cytokines and biochemical indexes were compared and data were analysed by t-test, Spearman's correlation analysis, binary logistic regression analysis and receiver operating characteristic analysis. The results show that growth and development of follicles of low LFI dairy cows were impaired, the risk of IO increased by 2.67 times. Cows with lower LFI had energy metabolism disorders, increased inflammation and oxidative stress and decreased ability to resist oxidative stress at 21 days postpartum. LFI and serum MDA, IL-6, FGF21 and ANGPTL8 at 21 days postpartum can predict IO in dairy cows. (Figure 1)

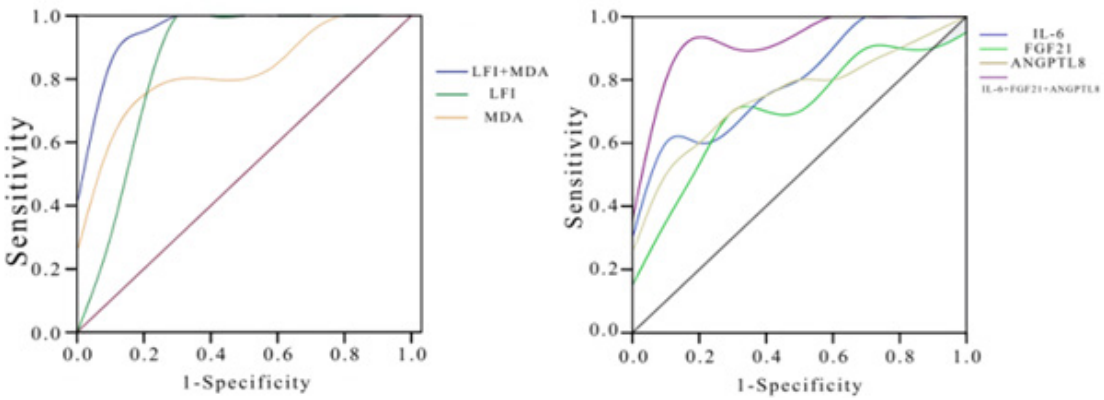

Figure 1: ROC area under the curve of LFI, MDA, IL-6, FGF21 and ANGPTL8 in dairy cows with IO

Recent Publications

1. Bertoni G, Minuti A, Trevisi E (2015) Immune system, inflammation and nutrition in dairy cattle. Animal Production Science 55:943.

2. Butler W (2003) Energy balance relationships with follicular development, ovulation and fertility in postpartum dairy cows. Livestock Production Science 83:211-218.

3. Li Y, Teng C (2014) Angiopoietin-like proteins 3, 4 and 8: regulating lipid metabolism and providing new hope for metabolic syndrome. Journal of Drug Targeting 22:679-687.

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. This work is supported by The Key Project of Natural Science Foundation of Heilongjiang Province of China (ZD2021C006).

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