

Identification of Blood Predictive Biomarkers of Lameness in Transition Dairy Cows

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Lameness is considered the 3rd most economically important health issue in dairy herds after fertility and mastitis. The incidence of lameness is highly varied between farms from 7% to 69%. Early diagnosis and prompt treatment of the disease can reduce animal suffering, improve recovery rate, increase longevity and minimize cow loss. However, there are no indications of disease until it shows up clinically and at this point the only way to deal with the sick cow is intensive treatment or culling. The objective of this study was to identify predictive biomarkers of lameness in transition dairy cows. Blood samples were collected from 100 multiparous Holstein dairy cows and 6 healthy control and 6 cows with clinical signs of lameness at -8, -4, disease and +4 wks relative to parturition were selected. Multiple analyses were conducted including serum metabolites as well as acute phase proteins and cytokines. Results of this study showed that cows affected by lameness had pronounced greater concentrations of lactate, interleukin (IL)-6, serum amyloid A (SAA), and lipopolysaccharide-binding protein (LBP) in the serum versus healthy cows. Most interestingly, enhanced serum concentrations of lactate, IL-6, SAA, and LBP started to appear at 8 and 4 wks before parturition as compared with healthy cows. More research is being conducted to identify predictive biomarkers of lameness in urine so that dairy producers themselves can identify them under farm conditions.

Implications:

By taking one drop of blood or urine dairy producers in the near future can identify 4-8 wks before appearance of lameness all cows that might be affected by the disease and take preventive measurements to avoid the disease and all the related economic and welfare issues. An ounce of prevention is worth a pound of cure.