

## **The association between lipomobilisation syndrome and paraoxonase-1 activity in periparturient dairy cows**

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Late pregnancy and early lactation is a critical period for health and productivity of dairy cows due to the energy deficit with a high incidence of metabolic diseases and reduced fertility. The objective of this study was to investigate the relationship between parameters of lipid mobilisation and paraoxonase-1 (PON1) activity during the transition period. The study was conducted on 24 Holstein-Friesian dairy cows aged 2-7 years. Blood samples were taken on days -30, -10, -2, 0, 5, 12, 19, 26 and 60 relative to parturition. Serum triglycerides (TG), total cholesterol (TC), HDL-cholesterol (HDL-C), nonesterified fatty acids (NEFA) and  $\beta$ -hydroxybutyrate (BHB) concentrations were assayed by the standard commercial kits. The PON1 activity was measured spectrometrically by the method of hydrolysis of paraoxon. Serum NEFA concentration was significantly elevated at calving and stayed at the highest values up to day 19 after calving ( $P < 0.05$ ). As a consequence, BHB concentration increased significantly ( $P < 0.05$ ) on days 12 and 19 after calving. In addition, significant correlation between BHB and NEFA has been found ( $r = 0.38$ ;  $P < 0.0001$ ). Serum TG concentration significantly declined at calving and stayed at the lower values until day 60 of lactation ( $P < 0.05$ ). Both TC and HDL-C significantly decreased at calving with an increase during lactation. Significant positive correlation between TC and HDL-C concentrations ( $r = 0.95$ ;  $P < 0.0001$ ) was observed. Serum PON1 activity was decreased at calving and increased significantly on days 26 and 60 postpartum, suggesting a lower antioxidant status in the postpartal period. Additionally, PON1 significantly positively correlated with TC and HDL-C ( $r = 0.42$ ;  $P < 0.001$  and  $r = 0.49$ ;  $P < 0.0001$ , respectively) and inversely correlated with NEFA ( $r = -0.33$ ;  $P < 0.0001$ ) indicating the relationship of PON1 with lipid metabolism and lipomobilisation syndrome. These results indicated a lipomobilisation syndrome and lower antioxidant activity in periparturient dairy cows and also suggested that PON1 is related to lipomobilisation syndrome being influenced by negative energy balance during the transition period.

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