

## THE CORRELATION BETWEEN ENZYMES ACTIVITY, MINERALS PROFILE, PRODUCTIVITY AND MILK COMPOSITION IN COWS

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**Summary.** The objective of this study was to determine the correlation between enzymes activity, minerals profile, productivity and milk composition. Fifty six Lithuanian Black-and-White clinically healthy high productive cows were selected. Cows were from  $3.2 \pm 0.24$  lactation and duration of lactation were  $102 \pm 4.9$  days. Milk-yield of cow was  $26.2 \pm 0.7$  kg/ day, an average of milk fat was  $4.10 \pm 0.09$  %, protein content  $3.06 \pm 0.04$  % and urea–  $23.80 \pm 1.35$  mg %. The concentration of enzymes–alanine aminotransferase (ALT), aspartate aminotransferase (AST), lactate dehydrogenase (LDH), creatine kinase (CK), alkaline phosphatase (ALP) activities and minerals content- calcium (Ca), magnesium (Mg), phosphorus (P), potassium (K), sodium (Na), chlorine (Cl) and iron (Fe) in serum were determined. It was determined positive significant correlation in enzymes activities ( $P < 0.05-0.01$ ). It was estimated positive, strong, significant correlation between serum levels of Ca and Mg, P, Fe; of P and Mg; of Fe and Ca, Mg, P; of Cl and K ( $P < 0.01$ ), Ca, Mg, P ( $P < 0.05$ ). Negative significant correlation was between serum levels of Cl and Ca, Mg, P and Fe ( $P < 0.01$ ). Highly significant positive correlation was estimated between serum levels of Ca, Mg, P, Fe level and enzymes ALT, AST, LDH, CK ALP activity ( $P < 0.001$ ). Furthermore, positive correlation was detected between serum levels of Ca, Mg, P, Fe and enzymes. Highly significant positive correlation between serum levels of K and AST activity ( $P < 0.001$ ) and K and LDH ( $P < 0.01$ ) was determined. Positive and statistical significant correlation was between Na value and AST activity and Cl level and ALT activity ( $P < 0.01$ ). The significant strong and positive correlation was observed among ALP activity and Ca, P level in blood serum of cows ( $P < 0.001$ ). Correlation among productivity and enzymes activity, minerals level was negative and low ( $P < 0.05$ ) except chlorine ( $r = 0.03$ ).

The correlation between milk fat content and blood enzymes activity was statistically insignificant ( $P > 0.05$ ). However, positive correlation between milk fat and Cl level ( $P < 0.05$ ), , between milk protein content and enzyme CK activity ( $r = 0.23$ ,  $P < 0.05$ ) and between milk urea and, Cl ( $r = 0.41$ ;  $P < 0.01$ ) were estimated. Statistically significant negative correlation between level of milk urea and blood enzymes AST ( $r = -0.25$ ; ( $P < 0.05$ ), ALT ( $r = -0.45$ ;  $P < 0.01$ ), milk urea and Ca ( $r = -0.63$ ;  $P < 0.01$ ), P ( $r = -0.54$ ;  $P < 0.01$ ), Mg ( $r = -0.57$ ;  $P < 0.01$ ) and Fe ( $r = -0.51$ ;  $P < 0.01$ ) were detected.

**Keywords:** dairy cow, blood, enzymes, mineral profile, correlation.