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±0.24 lactation and duration of lactation were 102±4.9 days. Milk-yield of cow was 26.2±0.7 kg/ day, an average of milk fat was 4.10±0.09 %, protein content 3.06±0.04 % and urea–23.80±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 and 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 unsignificant (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.