

THE RELATIONSHIP BETWEEN THE NUMBER OF SOMATIC CELLS (SCC) IN THE MILK AND THE CONCENTRATION OF VITAMIN A, E AND β -CAROTENE IN THE BLOOD SERUM OF DAIRY COWS

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The aim of this study was to compare SCC in the milk and the concentration of vitamin A, E, and β -carotene in the blood serum of dairy cows during the first month of lactation.

Samples of milk from 50 selected dairy cows were examined from 10th to 30th day of lactation in the Holstein dairy cows with average yield of 10,500 kg of milk for standard lactation. The number of somatic cells (SCC) and serum concentrations of vitamin A, E and β -carotene were determined in the milk. Selected dairy cows were categorized into 5 groups of 10 pieces according to number of somatic cells. Group no. 1 consisted of 10 dairy cows with SCC to 100,000 in 1 ml, group no. 2 consisted of 10 dairy cows with SCC 100,000–200,000, group no. 3 consisted of 10 dairy cows with SCC 200,000–400,000, group no. 4 consisted of 10 dairy cows with SCC 400,000–800,000, and group no. 5 consisted of 10 dairy cows with the number of somatic cells above 800,000. Somatic cells were determined on Fossomatic instrument, the vitamins concentrations were determined by the HPCL method. The statistical evaluation of the results was carried out using the ANOVA method.

Concentrations of vitamin A, E and beta-carotene were significantly different among the groups of dairy cows. In the group no. 1, the vitamin A concentration was 1.13 $\mu\text{mol/l}$, vitamin E concentration was 6.31 $\mu\text{mol/l}$ and β -carotene 4.81 $\mu\text{mol/l}$. With the increasing number of SCC in milk, concentration of these micronutrients decreased, and in the group no. 5 concentrations were very low. Level of vitamin A was 0.69 $\mu\text{mol/l}$, vitamin E 4.22 $\mu\text{mol/l}$ and β -carotene 1.59 $\mu\text{mol/l}$. The differences between group no. 1 and no. 5 were statistically significant. In the vitamin A, group no. 1 vs. no. 5 $P < 0.001$, group no. 1 vs. no. 4 $P < 0.001$, group no. 2 vs. no. 5 $P < 0.001$. In vitamin E, group no. 1 vs. no. 5 $P < 0.01$, group no. 2 vs. no. 5 $P < 0.001$. And in β -carotene, group no. 1 vs. no. 5 $P < 0.05$, and group no. 1 vs. no. 4 $P < 0.05$.

On the 1st month of lactation in dairy cows, a significant difference in vitamin A, E and β -carotene was found out according to SCC in the milk. In the group with SCC up to 100,000 in 1 ml of milk were the statistically higher concentrations of vitamin A, E and β -carotene than in the group of cows with number of somatic cells greater than 800,000.

Keywords: DAIRY COW, SCC, VITAMIN A, VITAMIN E, β -CAROTENE