

## HAPTOGLOBIN AND SERUM AMYLOID IN SERUM OF DAIRY COWS WITH CLINICAL AND SUBCLINICAL MASTITIS

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The aim of the study was to compare serum levels of acute phase proteins (haptoglobin and serum amyloid A) between healthy dairy cows and those with subclinical or clinical mastitis at 3 weeks *post-partum* under field conditions. Also the relationship between milk somatic cell count (SCC) and hematological parameters was evaluated.

The study included 107 Holstein-cross, primi- and multiparous dairy cows from a 600 head herd. The cows with clinical metritis and lameness were excluded. The cows were evaluated for clinical signs of mastitis at the milking parlour. Milk SCC was measured at 7 and 21 days postpartum. Blood samples were collected at 1 week prepartum (T1) and 21 days postpartum (T2) from the coccygeal vein into serum separation tubes. Serum was frozen at  $-20^{\circ}\text{C}$ . Serum haptoglobin was analyzed by colorimetry (*Konelab 20XT*), SAA by *Sandwich ELISA (BIOTEK Instruments Inc., USA)*. Hematology was performed with the analyser *BC-2800 Vet (Mindray, China)*. Based on milk SCC values at 21 days postpartum, the cows were divided into 4 groups: group 1 — healthy cows, 0–100 thous. cells/mL (n=70); group 2 — SCC 101–200 thous. cells/mL (n=9); group 3 — SCC 201–800 thous. cells/mL (n=10); group 4 — high SCC and clinical cases, SCC >801 thous. cells/mL (n=18). Differences between the groups in serum SAA, haptoglobin levels, hematological parameters (white blood cells, lymphocytes, monocytes, granulocytes, etc.) and leucogram (band cells) were evaluated. The data were processed by one-way non-parametric ANOVA.

At T1 serum levels of SAA and haptoglobin were generally low. An increase in serum SAA and haptoglobin between T1 and T2 was statistically significant only for the clinical mastitis group 4 ( $P<0.001$ ), averaging 0.483 mg/L and 0.998 mg/mL at T2, respectively. For the healthy group 1, no increase between T1 and T2 was noted. At T2, serum levels of SAA and haptoglobin were significantly higher in group 4 than in the other groups ( $P<0.01$ ), exceeding markedly the reference haptoglobin values reported for healthy cows. Also the haptoglobin level was significantly higher in group 3 than in group 1 at T2. The healthy group 1 had average SAA and haptoglobin levels at T2 of 0.097 and 0.117 mg/mL, respectively. SAA and haptoglobin were highly correlated in groups 4 and 3 at T2 ( $r=0.61$  and  $0.79$ , resp.,  $P<0.001$ ). No significant differences in hematological parameters and band cell percentages were found between the groups.

Clinical mastitis/high SCC significantly increased serum haptoglobin and SAA as compared both with the healthy udder cows (SCC <100 thous.) and the cows with elevated SCC (200–800 thous.). We did not find any differences in serum SAA between the healthy udder cows (SCC <100 thous.) and the cows with elevated SCC (200–800 thous.), whereas serum haptoglobin was significantly increased with elevated SCC. Hematological parameters and leucogram were not significantly influenced by increasing milk somatic cell counts, not even by clinical mastitis.

**Keywords:** COWS, MASTITIS, MILK SOMATIC CELLS, ACUTE PHASE PROTEINS