

HAPTOGLOBIN IN SERUM OF COWS: RELATIONS TO METABOLIC PARAMETERS DURING EARLY LACTATION

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Introduction: Haptoglobin (Hp), one of the most sensitive acute phase proteins (APP) in cattle, is synthesized in response to infection, inflammation or fatty liver (1). The elevation of non-esterified fatty acids (NEFA) observed in the conditions of negative energy balance is characteristic for high yielding dairy cows in early lactation. To clarify whether a negative energy status increases serum Hp, Hp was determined in cows without abnormalities in differential haemogram during that time. The data for β -hydroxybutyrate (β -OH-B), non-esterified fatty acids (NEFA) and of NEFA/ β -OH-B ratio presented here were tested for potential relationships with serum Hp concentrations.

Methods: Blood samples were collected weekly by jugular venipuncture, during the first 12 weeks post partum, from 28 multiparous Holstein Friesian cows, average age 4.64 ± 1.23 years of two different feeding intensities. Group I received 154 ± 13 MJ NEL/d, group II was fed with 145 ± 19 MJ NEL/d. Serum β -OH-B concentrations were determined by a veterinary diagnostic laboratory (VLK, Cologne). NEFA concentrations were analysed with a commercial testkit (Roche Diagnostics, Mannheim). Serum Hp concentrations were determined using an ELISA (2). The NEFA/ β -OH-B ratios were calculated (3). The metabolic parameters in blood samples (n=14 animals of each group) were compared using analysis of variance (SPSS 12.0).

Results: Serum concentrations of Hp as well as the metabolic parameters were affected by time ($p < 0.05$). For Hp and the NEFA/ β -OH-B ratio maximal concentrations were observed during the first two weeks after delivery, while NEFA and β -OH-B were elevated for the first half of the experimental time. In serum, Hp and NEFA were related ($r = 0.4$; $p < 0.001$). Differences between the two feeding-groups could be found between the metabolic parameters NEFA and the NEFA/ β -OH-B ratio ($p < 0.01$).

Conclusions: Higher NEFA concentrations as well as higher NEFA/ β -OH-B ratios according to (3), demonstrate the negative energy status of the animals in group II. Although no differences of Hp concentrations could be established between the two feeding-groups, there seems to be an interrelation between conditions of negative energy balance and increasing Hp levels.

References

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