

HAPTOGLOBIN IN SERUM AND MILK OF COWS AND ITS RELATION TO UDDER HEALTH AND METABOLIC DISORDERS

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Introduction

The relationship between experimentally induced bovine mastitis and increased Haptoglobin (Hp) levels in milk is already known (1). To clarify if Hp in milk is a reflector for metabolic disorders as well, Hp was determined in milk and β -hydroxybutyrate (β -OH-B), non esterified free fatty acid (NEFA) and Hp were analysed in serum in early lactation.

Methods

Quarter milk samples (n=1940) and blood samples (n=490) were collected weekly during week 3 to 12 post partum from 49 Holstein Friesian cows, being in their first to eighth lactation., β -OH-B concentrations were determined by a veterinary diagnostic laboratory (VLK, Koeln). Serum and milk Hp concentrations were determined using an ELISA (1). NEFA concentrations were analysed by a commercial test kit (Roche Diagnostics, Mannheim). Quarter milk samples were diagnosed healthy or diseased on the basis of the Hp value (3,4 μ g/mL) for udder health (2). To evaluate the relationship between Hp concentrations in milk and metabolic blood parameters, five Hp groups were composed (see table 1).

Results

Table.1: Results of Serum Hp and metabolic parameters (Mean \pm SD)

Serum	number of quarters per cow above cut-off value [$>3,4 \mu$ g/mL]				
	four n=13	three n=26	two n=71	one n=102	none n=273
Hp [mg/mL]	2.4 \pm 1.87 ^a	0.42 \pm 0.60 ^b	0.39 \pm 0.68 ^b	0.24 \pm 0.27 ^b	0.17 \pm 0.27 ^b
NEFA [mmol/L]	0.4 \pm 0.37 ^a	0.17 \pm 0.15 ^b	0.19 \pm 0.17 ^b	0.19 \pm 0.18 ^b	0.20 \pm 0.14 ^b
β -H-B [mg/dL]	17 \pm 12.8 ^a	8.5 \pm 3.6 ^b	7.8 \pm 3.6 ^b	9.2 \pm 5.4 ^b	9.1 \pm 4.8 ^b

a,b Means in the same row with different superscripts differ (p<0.001)

Discussion

Relationships between Hp in milk and metabolic parameters could be established. Hp serum concentrations as well as metabolic parameters were not significantly different in cows having elevated milk Hp in no quarter or even single quarters. Increased Hp levels in all quarters per cow and increased metabolic parameters may indicate that milk Hp also reflects extramammary disorders. These findings underline the importance of quarter milk samples in the assessment of Hp in mastitis.

References

- 1) Hiss, S.; Mielenz, M.; Bruckmaier, RM; Sauerwein, H., 2004: J Dairy Science 87 (11), 3778-3784
- 2) Neu-Zahren, A.; Müller, U.; Hiss, S.; Sauerwein, H., 2004: 7th EAAP/ASAS/COST, Bled, Slovenia