

## BIOCHEMICAL CHANGES IN FOLLICULAR FLUID AND VENOUS BLOOD DURING ACUTE RUMINAL ACIDOSIS IN HEIFERS

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The aim of this study was to evaluate biochemical changes in composition of follicular fluid and blood during acute ruminal and metabolic acidosis in dairy heifers.

Ten Holstein heifers were synchronized by cloprostenol (500 µg i.m. per cow, *Oestrophan*<sup>®</sup>, *Bioveta a.s.*, Ivanovice na Hane, Czech Republic). Seven days later dominant follicles were ablated to start the new follicular wave. Two days later (day 0, D0), stimulation using FSH was initiated. A total dose of 345 µg FSH (*Pluset*<sup>®</sup>, Calier SA, Spain) was administered intramuscularly in eight doses at 12 h intervals (D0–D3) in order to induce production of follicular fluid for the whole experimental period. The first sampling (venous blood, follicular fluid) was performed on D3 (time 0, T0). Then metabolic acidosis was induced by oral administration of sucrose at a dose of 9 g/kg of bodyweight dissolved in 10 L of warm tap water given as a ruminal drench. After this treatment, the heifers were not fed until the last sample was collected on D5. Subsequent samplings were collected after 8, 12, 16, 24, 32, 40 and 48 hours (T8–T48) of each cow. Samples of follicular fluid obtained by transvaginal follicular aspiration (TVFA) and peripheral blood obtained by indwelling jugular catheters were examined for biochemical parameters: urea, glucose (Glu), non-esterified fatty acids (NEFA), β-hydroxybutyrate (BHB), sodium (Na), phosphorus (P) and magnesium (Mg).

During the experiment, changes in acid-base balance variables in blood were determined to monitor acute metabolic acidosis development. Values of pH reached the minimum 16 h after sucrose treatment (ST) — 7.30. The lowest values of HCO<sub>3</sub><sup>-</sup> were observed 24 hours after ST (18.75 mmol/l) as well as the lowest values of BE (-6.61 mmol/l).

Statistically significant decrease (T0 vs. time after ST) were recorded in urea concentration (5.09 vs. 2.33 mmol/l), NEFA (0.90 vs. 0.17 mmol/l), BHB (0.3 vs. 0.08 mmol/l), Mg (1.00 vs. 0.78 mmol/l) and statistically significant increase in P concentration (2.20 vs. 3.18 mmol/l) in blood. Statistically significant decrease were recorded in urea concentration (4.57 vs. 1.99 mmol/l), BHB (0.40 vs. 0.07 mmol/l) and statistically significant increase in glucose (4.19 vs. 6.64 mmol/l), Na (141.5 vs. 165.0 mmol/l), P (2.74 vs. 3.45 mmol/l) in FF.

Ruminal and subsequent metabolic acidosis significantly influenced evaluated blood parameters. The composition of follicular fluid reflected changes of blood composition. We supposed that the affection of follicular fluid by metabolic acidosis can impair fertility in dairy cows.

**Keywords:** FOLLICULAR FLUID, RUMINAL ACIDOSIS, HEIFER, TRANSVAGINAL ASPIRATION