

Ruminal response to Yea-Sacc¹⁰²⁶® during experimentally induced acidosis

J. Illek, V. Kudrna, M. Viček and A. Křivka

University of Veterinary and Pharmaceutical Sciences Brno, Czech Republic, Research Institute of Animal Production, Czech Republic and Alltechnology CZ, Czech Republic

Objective

To investigate the effects of Yea-Sacc¹⁰²⁶ (live cultured *Saccharomyces cerevisiae*) on experimentally induced rumen acidosis in high producing dairy cows.

Materials and methods

Animals

- 8 Holstein cows in the 2nd month of lactation (~ 40 kg/d)
- 2 treatment groups of 4 cows each
- Treatments were fed for 3 wk before inducing rumen acidosis.
- Acidosis induced by a single, 2-kg dose of sucrose via a rumen probe 2 h after a.m. meal.

Treatments

- Control – maize silage, clover-grass silage, high moisture corn, sugar beet pulp, cut straw, concentrate and mineral-vitamin premix (TMR: 52% DM, 17.8% CP, 7.1 MJ NEL/kg DM)
- YS – control + Yea-Sacc¹⁰²⁶ (Alltech Inc.) 20 g/cow/day

Measurements

- Cows were monitored for the health status and TMR intake.
- Rumen fluid was withdrawn at 0 h (before sucrose administration) and 3, 6, 9, 12, 24 and 48 h thereafter. Fluid was analysed for pH, NH₃, VFA, percentages of acetate, propionate, butyrate and lactate.

Data analysis

- Differences between means were evaluated using Student's t-test.

Results

- Appetite to ingest TMR returned 7 h after acidosis was induced in YS cows and 2 h later in controls.
- Ruminal fluid pH decreased gradually. Within 6 h, the pH value dropped under 6 in all cows. The pH drop was greatest (P<0.01) for controls. By the 9th h post administration pH had slightly improved such that mean pH was 6.01 for the YS group, compared with 5.6 for the controls. At 24 and 48 h post administration, pH remained higher (P<0.01) in YS cows compared with the control (Figure 1; Table 1).
- VFA levels dropped rapidly with progressing acidosis in both treatment groups. At 12 and 24 h, VFA concentrations in the YS group were higher (P<0.05) compared with the control (Table 1).
- Lactate levels underwent the most pronounced change. Initial levels were low, but they increased sharply during acidosis (Figure 2; Table 1). In the Yea-Sacc¹⁰²⁶ group, lactate levels remained lower (P<0.05) 48 h post administration.

Conclusion

Yea-Sacc¹⁰²⁶ supplementation in high producing dairy cows favorably affected fermentation processes in the rumen and mitigated experimentally induced acidosis.

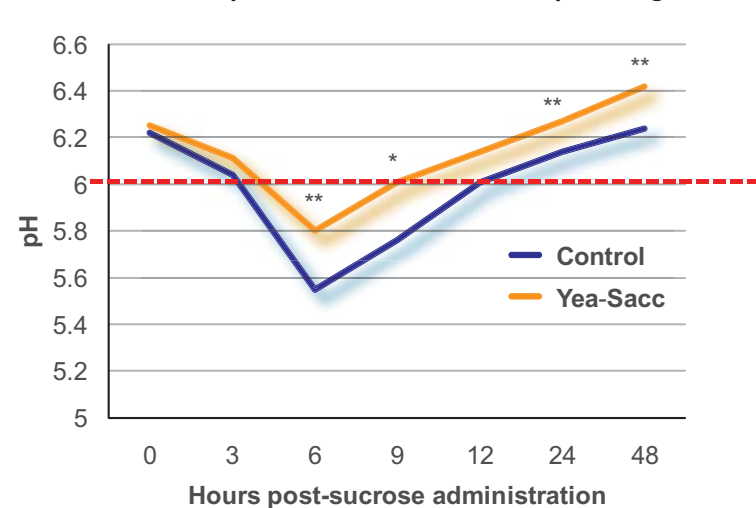
Table 1. Effect of Yea-Sacc¹⁰²⁶ on rumen ammonia and VFAs.

Time (h)	NH ₃ (mmol/L)		VFA (mmol/L)		Acetate (%)		Propionate (%)		Butyrate (%)	
	Control	YS	Control	YS	Control	YS	Control	YS	Control	YS
0	7.38	6.95	103.75	106.50	61.35	62.00	23.80	24.58	14.85	13.43
3	6.40	5.90	117.50	114.25	50.20	53.63	30.15	28.68	19.65	17.70
6	4.53	4.43	100.25	95.50	48.08	49.45	31.98	31.53	19.95	19.03
9	4.23	3.90	76.25	84.75	52.38	54.93	28.38	26.73	19.25	18.35
12	5.73	5.55	88.25	100.25*	56.70	58.03	24.95	24.70	18.43	17.28
24	6.00	5.55	97.25	107.00*	61.68	61.15	23.20	23.58	15.13	15.28
48	6.35	6.43	104.00	111.75	64.08	64.13	21.08	23.58*	14.50	12.75

* Means differ P<0.05

** Means differ P<0.01

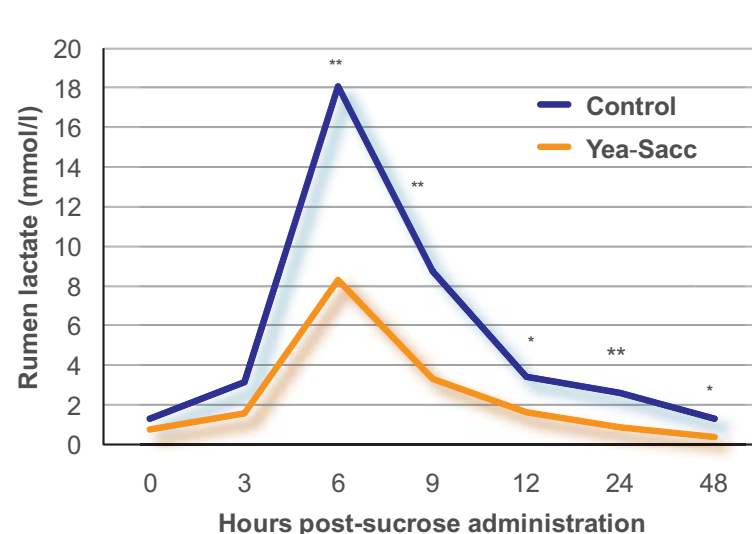
Figure 1. Compared with the control, Yea-Sacc¹⁰²⁶ maintained rumen pH above the critical level of pH 6 longer.



* Means differ P<0.05

** Means differ P<0.01

Figure 2. Compared with the control, Yea-Sacc¹⁰²⁶ better controlled rumen lactate levels.



* Means differ P<0.05

** Means differ P<0.01

