Ann Zootech (1993) 42, 175

The effect of *Saccharomyces cerevesiae* (BIOSAF Sc 47) on ruminal flora and rumen fermentation pattern in dairy cows

B Gedek [1], C Enders [1], F Ahrens [2], C Roques [3]

[1] *Veterinary Faculty, University of Munich;*
[2] *IS-Forschungsgesellschaft, Wahlstedt, Germany;*
[3] *SI. Lesaffre, 59706 Marcq-en-Bareuil Cedex, France*

Four lactating rumenal fistulated cows were fed with or without BIOSAF Sc 47 (10 g yeast culture = 5.10^{10} CFU/cow/d), according to a cross-over design: 2 x 5-wk periods per animal.

The diet was composed of 15% hay, 25% grass silage, 20% maize silage, and 40% concentrate based on barley and soya bean. Yeast was supplied 4 times per d with concentrate. Daily DM intake was between 12–17 kg/d. During the last 3 wk of each period, the following individual measurements were made: 1) in rumen contents: a) microbes (lactobacilli, strictly anaerobic Gram + and Gram – bacteria, coliforms, enterococci, yeast, anaerobic fungi): 3 measurements (at 14.30 h)/wk x 3 wk; b) fermentation pattern (pH, ammonia, volatile fatty acids (VFA)): 4 measurements (at 8.00, 11.00, 13.00, 16.00 h)/d x 3 d/wk x 3 wk; 2) in samples of hay, grass and maize silage enclosed in nylon bags, after 12-h and 24-h immersion in the rumen: acid detergent fiber; 3) in feces: the same microbial determination as for 1 a), at the same frequency.

The overall means showed no difference in rumen fermentation pattern (pH = 6.30, ammonia = 8.7 mmol/l, VFA content = 107 mmol/l, acetic (C_2), propionic (C_3) and *n*-butyric (C_4) acids relative percentages = 65.1, 20.0, and 11.3% respectively). However, in the 2 last wk, 2 h after feeding the first portion of yeast as well as 2 h later, yeast treatment tended to increase VFA content (108.9 *vs* 100.4 mmol/l, and 116.5 *vs* 112.0 mmol/l respectively) without altering the relative proportions of C_2, C_3 and C_4. No clear difference was observed in cell-wall degradation between the 2 treatments. In the rumen of treated animals, the content of living yeast cells was higher than for untreated animals (10^5 *vs* 1.6 x 10^2 CFU/ml; $p < 0.05$) and accurately corresponded to the number of cells fed. BIOSAF Sc47 increased the counts of strictly Gram– bacteria by a factor of 10 ($p < 0.05$), in rumen contents (2.0 x 10^5 *vs* 1.6 x 10^4 CFU/ml) and in faeces (1.1 x 10^4 *vs* 2.6 x 10^3 CFU/ml). It did not significantly alter other microbes counts. The variations in each microbial species measured in the rumen were greatly reduced with the BIOSAF treatment compared to the control.

In conclusion, the results suggest that BIOSAF Sc 47 stimulates the growth of amylotytic bacteria and has stabilizing and bioregulating properties as regards the flora.