Live yeast increased the rate of feed digestion in cattle fed a protein-deficient diet

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In Australia, beef cattle production occurs mainly in extensive areas with low rainfall and seasonal production of pastures. During dry season, the quality of tropical pastures decrease substantially, affecting cattle performance. Supplementation with protein and non-protein nitrogen sources is commonly practiced in an attempt to improve nutrition, with further beneficial effects achieved with the incorporation of feed additives, such as ionophores and antibiotics (McAllister *et al.*, 2020*)*. These additives are added into the supplement to increase feed digestibility, fibre degradation and animal efficiency, but despite their known efficacy, there is a push for reductions in the use of these as growth promoters. This led to an increased demand for alternative products such as live yeast (LY), a natural ingredient that can improve cattle performance by improving ruminal fermentation and digestive health (Ovinge *et al*., 2018). The hypothesis for this study was that the addition of LY in the supplement of young bulls consuming a low-quality hay would result in increase in fibre degradation rate.

To evaluate the effects of LY inclusion on forage utilisation and rumen fermentation of supplemented growing cattle, twelve Droughtmaster bull calves [270 kg ± 7.6 kg liveweight (LW)] were allocated, in a completely randomized block design, individually in pens and fed *ad libitum* Rhodes grass hay (8.8% CP, 72.0% NDF) and 300 g/head/day of supplement (52.1% CP, 31.3% NDF) without (Control) or with LY inclusion [3.6×10^{10} colony-forming units (CFU)/kg in as fed basis]. The specific *Saccharomyces cerevisiae* strain used for this study was CNCM I-1077. The animals were fed the experimental diets for 28 days in their allocated pens, followed by seven days in metabolism crates. Dry matter intake (DMI) and nutrients utilization were determined.

The addition of LY increased the total tract degradation rate of organic matter (OM) (35.72 vs 32.39 g/d) and NDF (28.35 vs 25.94 g/d) and resulted in an increase in total NDF (680 vs 620g) and OM (850 vs 770g) degraded per day, in comparison with control cattle ($P<0.05$). As a consequence of the increment in fibre degradation rate, young-bulls fed LY presented higher DMI (1.79 vs 1.67 kg/100 kg of BW, $P=0.05$) and NDF intake (1.25 vs 1.17 kg/100 kg BW, $P=0.05$). LY did not affect total rumen short chain fatty acids (SCFA) concentration (64.8 vs 71.6 mmol/L, $P=0.32$). Nonetheless, cattle supplemented with LY tended to have greater concentration of propionic acid than their counterparts (14.7 vs 14.0 mmol/100 mmol, $P=0.09$). There were no observed differences on dry matter, OM, NDF or protein total tract digestibility ($P>0.10$).

These results validate the hypothesis that LY utilization enhances fibre degradation in cattle fed low quality diets. The implication is that beef cattle producers would be able to improve performance of animals on low quality tropical forages.

References

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