

## THEME 9 | RUMINANT NUTRITION AND PRODUCTION

**Effects of exogenous amylase on *in vitro* kinetics rumen digestion of corn silage**

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The aim on this study was to evaluate the effects of exogenous amylase on *in vitro* kinetics rumen digestion of corn silage dry mater (DM). The *in vitro* gases production methodology was used to evaluate five repetitions of dent corn hybrid RB9004 ( $31.0 \pm 0.7\%$  of DM;  $8.1 \pm 0.2\%$  of crude protein, CP;  $39.3 \pm 1.1\%$  of non-fiber carbohydrate, NFC;  $43.9 \pm 0.9\%$  of neutral detergent fiber, NDF) and other five repetitions of hard corn (flint corn) hybrid RB9308 ( $25.6 \pm 1.7\%$  of DM;  $7.5 \pm 0.2\%$  of CP;  $33.1 \pm 2.5\%$  of NFC;  $49.7 \pm 2.4\%$  of NDF) with the treatments: amylase or control (without amylase). Rumen fluid were collected of two crossbreed dairy cows (Holstein x Gyr) fed a total diet composed by corn silage, Tifton hay and concentrate composed by ground corn, soybean meal and a mineral vitamin premix with sodium monensin (15.8 mg/kg DM; DSM Produtos Nutricionais Brasil SA, Sao Paulo, Brazil) and the addition or not of amylase (658 mg/kg DM, Ronozyme® RumiStar™, DSM Produtos Nutricionais Brasil SA, Sao Paulo, Brazil). The two cows were changed over between the two treatments and the rumen fluid were collected after 14 days of adaptation period. The experimental design was split plot on random complete blocks, where the blocks were the rounds (2), addition or not of amylase were the plots and the hybrids (2) were the subplots. The digestion parameters were obtained by bicompartimental logistic model. Amylase increases the DM degradation in 3.3% ( $613.5$  vs  $634.0$  g/kg,  $P=0.03$ ) and the cumulative gas production in 7.1% ( $236.1$  vs  $252.8$  mL,  $P=0.02$ ), and these parameters were not affected by the corn hybrid ( $P \geq 0.13$ ). The pH average was 6.2 and was not affected by the amylase or the corn hybrid ( $P > 0.05$ ). The lag time was reduced in 28.5% with the amylase addition (4:09 vs 3:20 h:min,  $P=0.01$ ) and the rate of gas production of the NFC fraction was reduced in 10% with the amylase addition (0.090 vs 0.102 mL/h,  $P < 0.01$ ). Neither the colonization period nor the gases production of NFC was affected by the hybrid ( $P \geq 0.17$ ). The amylase treatment increased ( $P < 0.01$ ) the gas production at the digestion of the fiber carbohydrates fraction in 10.9% ( $137.3$  vs  $152.3$  mL) and the rate of gas production in 9.5% (0.021 vs 0.023 mL/h), and these increases were greater at the corn dent hybrid ( $P=0.02$ ). The exogenous amylase improves the DM corn silage degradation of hard and dent hybrids.

**Keywords:** additives, monensin, hybrids, degradation

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