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Effects of amylase and essential oils in cross-breed dairy cows diets: milk composition and production

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This study was carried out to evaluate the effect of the combination of exogenous amylase and essential oils on cross-breed dairy cows diets. Thirty-nine lactating Holstein x Gyr cows (87±30 days in milk, 500±54 kg ofbody weight) were divided in three treatments and evaluated for 49 days. The treatments were: monensin (15.8 mg/kg of DM;DSM Produtos Nutricionais Brasil SA, Sao Paulo, Brazil); monensin + amylase (15.8 mg/kg DM of monensin and 658 mg/kg DM of Ronozyme® RumiStar™ or 395 KNU/kg DM; DSM Produtos Nutricionais Brasil SA, Sao Paulo, Brazil) and essential oils + amylase (52.7 mg/kg DM of CRINA® Ruminants and 658 mg/kg DM of Ronozyme® RumiStar™; DSM Produtos Nutricionais Brasil SA, Sao Paulo, Brazil). Cows were allocated to a Free Stall. The diet composition was 467 g/kg DM of concentrate (303 g/kg CP; 748 g/kg TDN; 353 g/kg starch), 480 g/kg DM maize silage (680 g/kg TDN; 316 g/kg starch) and 53 g/kg DM Tifton hay. The chemical composition of the total diet presented was 179 g/kg CP, 302 g/kg NDF, 705 g/kg TDN and 317 g/kg starch. Before the experiment beginning, the animals were adapted to the same diet without additives for 21 days. Dry matter intake (DMI), milk yield and composition were measured daily. The data were analyzed using the PROC MIXED model of SAS for a completely randomized design with repeated measures. Means with P<0,05 were considered statistically different. DMI was lower for the monensin treatment in comparison to the others treatments (16.0 vs 17.4 kg/day, P<0.001). Milk yield was higher (P<0.001) for monensin + amylase group (20.71 vs 19.6 kg/day, P<0.001). Fat (FCM) and Energy corrected milk (ECM) was higher for essential oils + amylase compared to monensin + amylase (22.7 vs 22,0 and 20.9 vs 20.3 kg day-1, respectively), whereas FCM and ECM was higher for monensin + amylase compared to Monensin (22.0 vs 21.5 and 20.3 vs 19.8 kg day-1). Regarding the milk components, essential oils + amylase treatment showed higher fat, protein, and total solids contents (%). The fat content (%) for essential oils + amylase was 10.6% higher compared to the other treatments. Milk lactose was higher in monensin treatment when compared to monensin + amylase and essential oils + amylase treatments (4.77% vs 4.67% and 4.71%, respectively, P<0.01). Adding exogenous amylase in a diet with monensin improves milk yield, FCM and ECM, and when monensin is replaced by essential oils the improvements in FCM and ECM are even greater. Essential oils associated with amylase, increases milk components concentration in cross-breed dairy cows.

Keywords: essential oils; fat-corrected milk; milk components