

## Ruminal degradability of starch from corn silage containing different glycerin concentrations

J.C. Carneiro<sup>1</sup>, J.S. Oliveira<sup>1</sup>, J.C.F. Lima<sup>2</sup>, M.T. Ribeiro<sup>2</sup>, A.L.M. Carmo<sup>3</sup>

<sup>1</sup>Researcher – Embrapa/Dairy Cattle Research National Center, Brazil [jailton.carneiro@embrapa.br](mailto:jailton.carneiro@embrapa.br) e [jackson.oliveira@embrapa.br](mailto:jackson.oliveira@embrapa.br), <sup>2</sup>Analyst - Embrapa/Dairy Cattle Research National Center, Brazil, <sup>3</sup>Biologist.

**Introduction** The use of glycerin as energy source for ruminants is a viable option (ÍTAVO et al., 2011), once its energetic value is similar to corn starch (Duque et al., 2011). Gomes et al. (2011) verified that glycerin, purified or not, added to roughages improves the *in vitro* digestibility of organic matter and the total digestible nutrients. Many others researches were carried out to study the effects of glycerin in ruminant feeding and animal production (Duque et al., 2011; Gomes et al., 2011).

**Material and methods** The experiment was carried out at the Embrapa Dairy Cattle, located in Juiz de Fora, MG, Brazil. Four levels of crude glycerin (0, 5, 10 and 15% wet basis) were added to corn silage and evaluated in a completely randomized experimental design with five replications. Twenty experimental silos, made from polyvinyl tubes 50 cm long with 10 cm diameter with Bunsen valve in the upper cap, were used. Sixty days after silos closure, they were opened and sampled for starch analysis using the technique described by (Passos, 1996).

The *in situ* degradability of starch was evaluated using nylon bags and Mehrez and Orskov (1977) methodology. Ruminal degradability parameters were determined using PROC NLIN procedure. Determination of effective degradability (DE) were done according Orskov and McDonald (1979) model, considering 0.0341%/h as the passage rate through the rumen.

Four rumen cannulated Holstein-Zebu cows with 450 kg of average weight were used. Cows were fed a total mixed ration with 60% corn silage and 40% concentrate (dry matter basis). Silages in the diets were prepared with glycerin levels similar to silages incubated in the rumen (0, 5, 10 e 15% of glycerin in wet basis).

**Results and Discussion** Table 1 shows the data from starch degraded in the rumen. Although potential degradable fractions were higher in silages with 5 and 10% of glycerin, the constant degradation rate of degradable fraction and effective degradability were higher in silage with 15% glycerin. Corn silage with 15% glycerin presented higher starch degradability, probably due to the fact of crude glycerin be able to positively affect starch availability. Also, glycerin could have improved rumen environment and the growing of amylolytic bacteria population.

**Conclusions** Starch degradability of corn silage was higher when 15% of glycerin (wet basis) was added during silage making.

**Table 1** Parameters of rumen degradation of starch from corn silage prepared with different glycerin concentrations (as fed basis).

Glycerin (%)	A (%)	B(%)	c (/h)	S(%)	DE (%)
0	77.30	60.82	0.0356	0	31.06445
5	91.23	63.92	0.0267	13.3	41.37013
10	95.75	66.30	0.0225	13	39.35601
15	86.91	47.18	0.0493	40.3	68.18938

\*A = potentially degradable fraction, B = potentially degradable fraction under microbial action, c = constant rate of degradation of the potentially degradable by microbial action, and S = soluble fraction more particles reduced in size that pass through the pores of the nylon (SAMPAIO, 1988).

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