Influence of difference source of the fat on animal performance and methane emission

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Introdcution Methane emissions from ruminant livestock have increased fivefold over the last century (Johnson *et al*., 2000) and now constitute ~15% of global CH4 emissions (McAllister *et al*., 1996). However, improving forage quality (i.e. increasing dietary starch content) through the supplementation of alternative forages, has the potential to reduce CH4 emissions per kg animal product as a result of increased diet digestibility and a shortened duration of feeding (Beauchemin *et al*., 2009). Dietary strategies such as, use of the sources lipids have been successful in manipulating methanogenesis, at least in the short term, through either i) the direct inhibition of methanogens, ii) reducing the production of hydrogen in the rumen or iii) providing alternative sinks for the disposal of hydrogen (Beauchemin *et al*., 2009). This trial aimed to evaluate the effects of lipid supplementation on performance and methane emission of beef cattle grazing *Brachiaria brizantha* cv. Marandu pasture during the summer.

Material and methods The experiment was conducted at Animal Science Department of the São Paulo State University, Campus Jaboticabal, during 84 days in a 6.0 ha area divided in 6 paddocks, using 18 Nellore young bulls in continuous stocking rate grazing system. Lipid sources supplements evaluated were: soybean grain, fat-protected with calcium salts, and control. Animals were supplemented daily, 0.5 g/kg body weight, between 11:00 am to 14:00 pm to minimize the effects of supplement on grazing behavior. All supplements presented the same content of crude protein, and total digestible nutrition (TDN), 260 g/ kg DM, and 980 g/kg DM, respectively. Control treatment consisted of mineral salt. . The experiment was analyzed by a complete randomized design with tree treatments and two replications (paddocks) with six animals in each one. The CH4 emissions were evaluated using the SF6 tracer gas technique. Five consecutive gas samples were collected in 24-h intervals from each animal. Data were analyzed using the GLM procedure of SAS. Characteristics evaluated in the study were CH4 emission expressed in kg of CH4 emitted per year (kg CH4.yr-1), gram of CH4 emitted per day (g CH4.d-1), gram of CH4 emitted per day per kg of metabolic BW (g CH4.d.MBW-1), gram of CH4 emitted per day of weight gain and animal performance.

Results The use of different lipid sources showed no statistical difference (P> 0.01) over the variables analyzed. However, supplementation improved animal performance increasing at ~ 400 g / day. This difference in weight gain of the animal will decrease the residence time the animal of this system, which in turn reflects on positive results in lowering total emissions of greenhouse gases.

Table 1 Effect the sources of the fat methane emission

Trataments	Variable			
	g CH4.d-1	Kg CH4.yr-1	g CH4.d.MBW-1	g WG
Control	89.5a	32.6a	1.2a	631.7b
Protect fat	97.3a	35.5a	1.2a	1008.3a
Soybean grain	96.0a	35.0a	1.2a	963.3a

Conclusions The use of sources of lipid supplementation in Nellore maintained in Brachiaria brizantha did not alter the production of methane but improved animal performance.

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