

Emission Intensities by Holstein and Holstein x Jersey crossbreed lactating Cows in two Brazilian grazing Systems

A. Berndt^a, A.P. Lemes^a, T.C. Alves^a, A.D.F. Pedroso^a, L.S. Sakamoto^a, L.G. Barioni^b and P.A. Oliveira^a

^aEmbrapa Southeast Livestock, Rodovia Washington Luiz, km 234, 13560-970 São Carlos - Sp, Brazil; ^bEmbrapa Agriculture Informatics, Av. André Tosello, 209, Barão G., 13083-886 Campinas - Sp, Brazil
barionilg@gmail.com

In recent years the concern with methane (CH₄) emission by enteric fermentation has become indispensable for dairy production systems. The aim of this study was to evaluate CH₄ emissions from pure Holstein (HOL) and 1/2Jersey 1/2Holstein (JH) high producing lactating cows grazing two different forages.

The experiment was conducted at EMBRAPA's (Brazilian Agricultural Research Corporation) experimental station in the Southeast region of Brazil. Cows were allocated in two grazing conditions systems: extensively grazed pastures with low stocking rate (ELS) or irrigated pastures under intensive management and high stocking rate (IHS). Pastures in the ELS system were composed mainly of *Brachiaria decumbens* and *Cynodon nlenfuensis* (10.5% CP; 49.8% DMD) while the IHS system was composed of 27 paddocks of *Panicum maximum* cv Tanzania (21.0% CP; 62.8% DMD). Forage availability were 22.2 and 37.2 kg DM/AU respectively for ELS and HIS. A total of 24 dairy cows were used (2 breeds x 2 systems x 3 animals per paddock x 2 replicates), grouped according to age, stage of lactation and level of milk production. Cows were kept at pasture and supplemented with minerals and concentrates in accordance with milk yield (1 kg of concentrate/3 kg of milk produced). IHS pasture was rotationally managed and both IHS and ELS were managed under variable stocking rate ("put-and-take"). Forage production and animal performance variables were measured in order to subsidize environmental, technical and economic assessments. Methane emission evaluation took place in January 2013, using the SF₆ tracer technique (Johnson *et al.*, 1994). Samples were collected every 24 hours for five consecutive days. Gases were analyzed on a Shimadzu GC 2014. For statistical analyses we used the MIXED procedure of SAS and results were presented as least square means.

No interactions between grazing system and breed were observed. Milk production and CH₄ emission were similar in both breeds and forages. Methane emissions were higher than the average in this season and milk production lower because cows were in the end of lactation. Consequently methane intensities were higher in this experiment for HOL and JH (average of 30.4±2.3 vs. 27.9±2.6 LCH₄/kg milk). Efficiency of milk production can be a mitigation strategy because less methane is emitted per Litre of milk, but the treatments evaluated in this research in the rainy season could not confirm that.

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