Documentos

ISSN 1983-974X
Outubro, 2016
216

II SIGEE – Second International Symposium on Greenhouse Gases in Agriculture – Proceedings

ISSN 1983-974X
outubro, 2016

Empresa Brasileira de Pesquisa Agropecuária
Embrapa Gado de Corte
Ministério da Agricultura, Pecuária e Abastecimento

Documentos 216

II SIGEE – Second International Symposium on Greenhouse Gases in Agriculture – Proceedings

Organizadores
Roberto Giolo de Almeida (Coordenador)
Patrícia Perondi Anchão Oliveira
Maurício Saito
Cleber Oliveira Soares
Lucas Galvan
Lucimara Chiari
Fabiana Villa Alves
Davi José Bungenstab

Embrapa
Brasília, DF
2016

Exemplares desta publicação podem ser adquiridos na:

Embrapa Gado de Corte
Av. Rádio Maia, 830, Zona Rural, Campo Grande, MS, 79106-550
Fone: (67) 3368 2000
Fax: (67) 3368 2150
http://www.embrapa.br/gado-de-corte
https://www.embrapa.br/fale-conosco/sac

Supervisão editorial: *Rodrigo Carvalho Alva*
Revisão de texto e Editoração Eletrônica: *Rodrigo Carvalho Alva e Adionir Blem*
Foto da capa: Luiz Antônio Dias Leal

1ª edição
Versão online (2016)

Dados Internacionais de Catalogação na Publicação (CIP)
Embrapa Gado de Corte.

Anais - 2º Simpósio Internacional Sobre Gases de Efeito Estufa na Agropecuária [recurso eletrônico] / Roberto Giolo de Almeida et al. - Campo Grande, MS : Embrapa Gado de Corte, 2016.
502 p. ; 21cm. - (Documentos / Embrapa Gado de Corte, ISSN 1983-974X ; 216).

Sistema requerido: Adobe Acrobat Reader, 4 ou superior.
Modo de acesso: <http://www.cnpgc.embrapa.br/publicacoes/doc/DOC216.pdf>
Título da página da Web (acesso em 16 de outubro de 2016).

1. Gases de efeito estufa. 2. Agropecuária. 3. Emissões de GEE. 4. Embrapa Gado de Corte. I. Almeida, Roberto Giolo de. II. Oliveira, Patrícia Perondi Anchão. III. Saito, Maurício. IV. Soares, Cleber Oliveira. V. Galvan, Lucas. VI. Chiari, Lucimara. VII. Alves, Fabiana Villa. Bungenstab, Davi José.

CDD 636.213

Intensive grazing system increases milk productivity of Holstein and Jersey-Holstein crossbred dairy cows

Patrícia Perondi Anchão Oliveira[1], Paulo Henrique Mazza Rodrigues[2], Maria Fernanda Ferreira Menegucci Praes[2], Amanda Prudêncio Lemes[1], André de Faria Pedroso[1], Teresa Cristina Alves[1]*

[1]EMBRAPA Southeast Livestock - Rodovia Washington Luiz, Km 234 s/nº, Fazenda Canchim, Caixa Postal: 339, CEP: 13560-970 - São Carlos, SP – Brazil. [2]University of São Paulo/FMVZ – Dept. of Animal Nutrition and Production, Av. Duque de Caxias, 225 – 13635-900 – Pirassununga, SP – Brazil.

*Corresponding author menegucci2002@yahoo.com.br

Introduction

In Brazil, despite the lack of accurate statistics on the contribution of each type of system in total milk production, it is known that pastures represent the main feed source in most production systems (IBGE, 2010). However, a major concern with respect to this factor is related to the potential environmental impact the degradation of thousands of hectares of these pastures may have.

Improvements in pasture management in the last decades have led to a great advance in animal production systems in the country. Among them are the adoption of cultivated pastures and the improvement of native pastures, leading to increased stocking rates and productivity (Oliveira et al., 2015).

Besides the intensification of pasture management, producers must seek dairy cattle genotypes with better production characteristics. Therefore, there is growing interest in Holstein cross breeding to increase fertility and improve milk production and composition (Xue et al., 2011). Combining good genetics with sustainable grazing systems is essential to improve milk production and preserve the environment. This experiment was designed to examine the effect of different

grazing systems on the productivity of milk and its components by Holstein and Jersey-Holstein crossbred dairy cows.

Material and Methods

Twelve Holstein and twelve Jersey-Holstein crossbred dairy cows were used in a 2 x 2 factorial arrangement, represented by 2 cattle genotypes (Holstein and Jersey-Holstein) and 2 pasture systems (extensive with low stocking rate - EXT - and intensively managed and irrigated with high stocking rate - IIR). Cows were kept on pastures and received a dietary supplement (concentrate) formulated according to the NRC (2001) in the rate of 1 kg of concentrate per 3 kg of milk produced. The extensive pasture system was composed of two paddocks, 3.0 ha each, containing *Brachiaria spp*. and *Cynodon nlemfuensis* Vanderyst, managed as continuous grazing systems, without fertilization. The intensive managed system was irrigated and cultivated with *Panicum maximum* Jacq cv. Tanzânia and overseeded with *Avena byzantina* cv. São Carlos and *Loliun multifloram* Lan. cv. BRS Ponteio, in autumn. The IIR system consisted of two similar 1.6 ha rotational systems, divided in 27 padocks with 600 m^2 each, intermittently grazed, with a day of occupation and 26 days of rest. The intensive managed pastures were limed and fertilized with superphosphate and potassium chloride to achieve respectively, 20 mg $P.dm^{-3}$ and 4% K in soil CTC - cation exchange capacity. Nitrogen was applied at the rate of 600 kg $ha^{-1}year^{-1}$.

Three cows (tracers) of each genotype grazed simultaneously in each replicate of area. All grazing systems were submitted to stocking rate adjustments using the "put and take" technique (Mott and Lucas, 1952) and visual evaluation of forage availability.

Milk yield (MY), 3.5% fat corrected milk (FCM), fat (F), protein (P), lactose (L), total solids (TS) and dry defatted extract (DDE), per area per year (kg $ha^{-1}year^{-1}$) were evaluated. Data were analyzed by the SAS® (SAS Institute, 2002) program, using Mixed Procedure.

Results

Annual average stocking rates were 1.9 and 2.1 animals ha^{-1} in EXT and 6.6 and 7.9 animals ha^{-1}in IIR, for Holstein and Jersey-Holstein breeds, respectively. Consequently, the type of grazing system influenced ($P<0.0001$) productivity of milk and its components (Table 1). The IIR system increased the productivity of milk and its components, independently of the cow genotype used.

Irrigation and intensive management caused an 258% increase in annual production of milk, when compared to the extensively managed system (63,867 vs.17,839 $ha^{-1}year^{-1}$). The cattle genotypes did not have any influence on productivity of milk and its components, estimated using the average production of each breed (Table 1).

Forage production in irrigated rotational grazing systems tends to be high, and can increase stocking rate and productivity. However, gains in extensive systems, that present low carrying capacity, may be minimal despite the use of better cattle genotypes (Mendonça et al., 2010).

Table1. Effects of two genotypes and grazing systems on the productivity (kg ha^{-1} $year^{-1}$) of milk and its components.

	Genotype		Pasture			*P Level*		
Item[1]	Holstein	Jersey-Holstein	Extensive	Intensive Irrigated	SEM[2]	Pasture	Genotype	Past*Gen
MY	40,095.0	41,611.0	17,839.0	63,867.0	6,461.6	<0.0001	NS	NS
FCM	36,915.5	38,231.0	16,228.5	58,918.0	6,007.7	<0.0001	NS	NS
F	1,207.3	1,248.1	525.1	1,930.3	198.9	<0.0001	NS	NS
P	1,300.1	1,366.4	584.6	2,081.9	207.3	<0.0001	NS	NS
L	1,852.3	1,919.1	823.9	2,947.6	300.3	<0.0001	NS	NS
TS	4,740.2	4,934.4	2,108.1	7,566.6	764.4	<0.0001	NS	NS
DDE	3,544.8	3,690.9	1,579.9	5,655.8	569.9	<0.0001	NS	NS

[1]MY: milk yield; FCM: 3.5% fat corrected milk; F: fat; P: protein; L: lactose; TS: total solids; DDE: dry defatted extract; [2]standard error of the means; NS: non- significant ($P>0.05$);

Conclusions

Intensive management of pastures increases the productivity of milk, collaborating to the sustainability of dairy production, especially in small areas.

References

Instituto Brasileiro de Geografia e Estatística [IBGE]. 2010. Confronto dos resultados dos dados estruturais dos Censos Agropecuários –BR.

Mendonça, F.C.; Santos, P.M.; Cavalcante, A.C.R. 2010. Irrigação de pastagens. In: PIRES, A.V. (Ed.). Bovinocultura de corte. Piracicaba: FEALQ, p.473-508.

Mott, G.O.; LUCAS, H.L. 1952. The design conduct and interpretation of grazing trials on cultivated and improved pastures. In: International Grassland Congress. State College Press, Proceedings. Pennsylvania, USA, p.1380.

National Research Council [NRC]. 2001. Nutrient Requirements of Dairy Cattle. National Academy Press, Washington, DC, USA.

Oliveira, P.P.A. 2015. Greenhouse gases in brazilian livestock production systems and the importance of the carbon balance for environmental preservation. Revista Brasileira de Geografia Física, 8:623-634.

Statistical Analyses System Institute [SAS]. 2002. Guide of personal computers. Version 9.2. Inc., Cary, NC.

Xue, B.; Yan, T.; Ferris, C.F.; Mayne, C.S. 2011. Milk production and energy efficiency of Holstein and Jersey-Holstein crossbred dairy cows offered diets containing grass silage. J. Dairy Sci 94:1455–1464

Acknowledgements

CNPq for the financial support to the project 562861/2010-6
EMBRAPA for financing Pecus network (01.10.06.0001.05.00).
CAPES x EMBRAPA (15/2014) for the scholarship and financial support to the project.