



52ª Reunião Anual da Sociedade Brasileira de Zootecnia

Zootecnia: Otimizando Recursos e Potencialidades

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Performance of crossbred cows under grazing supplemented with soybean oil

Francielle Ruana Faria da Silva¹, Edilena Santiago², Giovanna Araújo de Carvalho³, Jessica Halfen⁴, Ana Karina Dias Salman⁵, Henrique Nery Cipriani⁵, Eduardo Schmitt⁶

¹Undergraduate Student – FIMCA, Porto Velho, Rondônia, Brazil. e-mail: franruana@gmail.com

²Graduate Student, Post-graduation Program of Environmental Science – UNIR, Rolim de Moura, Rondônia, Brazil. e-mail: edilenasantiago@globomail.com

³Scholarship of CNPq/Capes. e-mail: giovanna.carvalhozootec@gmail.com

⁴Undergraduate Student – UFPel, Pelotas, Rio Grande do Sul, Brazil. e-mail: halfenzootecnista@gmail.com.

⁵Scientific Researcher, Embrapa Rondônia, Porto Velho, Rondônia, Brazil. e-mail: ana.salman@embrapa.br; henrique.cipriani@embrapa.br

⁶Professor of UFPel, Pelotas, Rio Grande do Sul, Brazil. e-mail: schmitt.edu@gmail.com

Abstract: This work aimed to evaluate effect of soybean oil supplementation on dairy production of crossbred dairy cows under grazing. Twenty $\frac{1}{2}$ and $\frac{3}{4}$ Holstein x Gyr cows with average of 77 days of lactation and 19.8 kg of daily milk yield were used under grazing of palisade grass (*Brachiaria brizantha* cv. Marandu) managed by intermittent stocking. In a 2 x 2 crossover trial, cows were homogeneously distributed between two experimental groups: 1) Control (C) – supplementation with concentrate ration without soybean oil; and 2) Soybean oil (SO) – addition 3% of soybean oil in concentrate ration (dry matter basis). Inclusion of soybean oil did not affect daily milk yield ($P>0.05$) in relation to control group. However, considering cost of oil inclusion and only the milk yield, this feed strategy is not economically viable.

Keywords: dairy cattle, energy source, lipid supplementation

Desempenho de vacas leiteiras mestiças em pastejo suplementadas com óleo de soja

Resumo: Objetivou-se com esse trabalho avaliar o desempenho de vacas leiteiras lactantes, sob pastejo, suplementadas com óleo de soja. Foram utilizados 20 animais $\frac{1}{2}$ e $\frac{3}{4}$ Holandês x Gir com média de 77 dias de lactação e produção média diária de 19,8 kg de leite, as quais foram mantidas em pastagem de capim-marandu (*Brachiaria brizantha* cv. Marandu) manejada com lotação intermitente. Para tanto, realizou-se um ensaio em delineamento *crossover* 2 x 2, em que as vacas foram divididas de forma homogênea em dois grupos experimentais: 1) Controle (C) – suplementação com ração concentrada sem a inclusão de óleo de soja; e 2) Óleo de Soja (OS) – suplementação com ração concentrada com a inclusão de 3% de óleo de soja (base na matéria seca). A inclusão de óleo de soja no concentrado não afetou a produção de leite ($P>0,05$) em relação ao grupo controle. Entretanto, o custo da inclusão ainda inviabiliza esta estratégia alimentar ao avaliarmos apenas a produção leiteira.

Palavras-chave: fonte energética, gado de leite, suplementação com lipídeos

Introduction

According to Ministry of Agriculture, Livestock and Supply (MAPA, 2014), consumption of milk and dairy products in Brazil has been increasing gradually in the last years. However, the average milk consumption of the Brazilian population has still been below to 210 liters.inhabitant⁻¹.year⁻¹, recommended by Ministry of Health and World Health Organization; in addition, Brazilian milk yield is enough to supply only 170 liters.inhabitant⁻¹.year⁻¹. Following this, it has been more common to carry out studies aiming to increase the productivity and the efficiency of using feed resources.

Eifert et al. (2006) reported that in dairy cattle system type and amount of concentrate affect milk yield, as well as the supplementation with soybean oil in enough level reduces voluntary intake and allows to increase the efficiency of milk yield. Diet supplementation with fat sources has been considered an alternative for improving energetic profile in dairy cows (SANTOS et al., 2009), considering that the higher is milk yield, the higher is cow energy requirement.

Thus, this work aimed to evaluate the performance of crossbred dairy cows supplemented with soybean oil under grazing.



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Material e Methods

The trial was carried out at experimental field of Brazilian Corporation of Agricultural Research (EMBRAPA), Porto Velho, Rondônia State, Brazil from January 26th to March 11th, 2015. Twenty ½ and ¾ Holstein x Gyr multiparous lactating cows with average of 77 days in milk and 19.8 kg of milk.day⁻¹ were used. They grazed palisade grass (*Brachiaria brizantha* Stapf cv. Marandu) pasture managed by intermittent stocking with 2 days of grazing and 28 days of resting. All animals had free access to fresh water and a mineral. Trial was in a 2 x 2 crossover design with two sequences of two 10-day periods for adaptation and two 15-day periods for data collection, totalizing an experimental period of 50 days. Animals were allocated in two balanced groups on the basis of genetic group, and milk yield and SCC (Somatic Cell Counting) measured in the week prior to the experiment. Treatments were Control (C), in which cows were fed with non-soybean oil concentrate; and Soybean Oil (SO), in which cows were fed concentrate with 3.0% of soybean oil (in dry matter basis). Ingredients of basal concentrate were corn, soybean meal, urea and mineral, which were balanced for being iso-protein (30% of crude protein), following recommendations of Cornell Net Carbohydrate and Protein System (CNCPS v. 6.1) by software AMTS Cattle Professional 3.4.5 (© Agricultural Modeling and Training Systems, LLC). Soybean oil was homogenously mixed to concentrate of SO treatment just prior cow feeding. Concentrates were offered in two equal portions at milking time. The amount of concentrate offered was adjusted before the beginning of experimental period according to daily milk yield, which means, 1 kg of concentrate for each 3 kg of milk when mean of daily milk yield were above to 8 kg (NRC, 2001). Cows were mechanically milked twice a day: at 7:30 a.m. and at 1:30 p.m. Individual milk yield was recorded once a week by weighing the milk of both daily milking using a 10g -40Kg Digital Portable Weighing. Statistical analysis was done by Minitab 17 software, with means compared at 5% of significance level.

Results and Discussion

In the first experimental period, means of milk yield of control and OS groups were 16.81±5.94 and 17.99±5.41 kg of milk.day⁻¹, respectively. During the second period, the means observed in control and OS groups, respectively, were 15.85±5.72 and 17.34±5.38 kg of milk.day⁻¹. Lipids increase ration energy density and have high metabolic efficiency, justifying the milk yield numerically higher in OS group. However, this difference was not statistically significant ($P>0.05$). Similar results were found by Eifer et al. (2005 and 2006), Santos et al. (2009), Lopes et al. (2012) and Lopes et al. (2014) who also evaluated the effect of feed supplementation with vegetal oil on milk yield of dairy cows. Lower milk yield in the second period was being expected, since experimental cows were in the middle of lactation period (MOREIRA et al., 2014).

Eifer et al. (2005) evaluated diets with different combinations of soybean oil and monensin (1 - non-soybean oil and non-monensin diet; 2 - non-soybean oil + 33 ppm-monensin diet; 3 - 3.9%-soybean oil + non-monensin diet; and 4 - 3.9%-soybean oil + 33 ppm-monensin diet) and observed that DM intake was lower in cows fed diets with soybean oil ($P<0.05$) without affecting milk yield. Similar results were found by Eifer et al. (2006), who evaluated feed supplementation of dairy cows using concentrates balanced with corn or wheat meal or pulp citric associated or not with 2.25% of soybean oil and found that cows supplemented with soybean-oil diets were similar to cows supplemented with non-soybean oil diets in terms of milk yield but had lower intake, which increases feed efficiency. In this study, grazing voluntary intake has still being estimated, as well as economic viability. However, Lopes et al. (2012 and 2014) reported that it is economically unviable to use vegetal oil for supplementation of lactating dairy cows due to the increase in cost for including this ingredient in diet.

Conclusions

The inclusion of 3% of soybean oil in concentrate for lactating crossbred cows under grazing do not negatively affect daily milk yield. However, the cost for inclusion of this ingredient in dairy cattle diet may become this feed strategy economically unviable, especially when only daily milk yield is considered.

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