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Methane emission from a diet high in inclusion of co-products from the ethanol industry consumed by Nellore cattle in the feedlot

Alexandre Berndt[2], Mariana Nunes Vieira de Melo*[1], Alane Samara Souza Azevedo[2], Rolando Pasquini Neto[1], Sérgio Raposo de Medeiros[2], Rodrigo Silva Goulart[1]
[1]University of São Paulo, Pirassununga/SP, Brazil;
[2]Embrapa Southeast Livestock, São Carlos/SP, Brazil.
*MS Graduate student - mariana.nunes97@usp.br

Enteric methane emissions are very important once it is a potent greenhouse gas that contributes do global warming. Our objective was to compare enteric methane emissions of a diet optimized for lower cost per kilogram, with maximum inclusion of co-products from ethanol production (Canapec), with another formulated for the same performance but with conventional ingredients (Conventional). The study lasted 107 days (14 days of adaptation) and was carried out in the experimental feedlot of Embrapa Pecuária Sudeste, São Carlos, SP, whose four pens have Greenfeed equipments (C-Lock, South Dakota, EUA) for individual and daily measurement of methane emission. Forty Nellore cattle, intact males, aged 18 ± 0.4 months and with initial live weight (BW) of 374 ± 37 kg, were distributed in a randomized block design. The blocking criterion was live weight (10 animals/pen; 20 animals/treatment). Animal ethics committee approval: CEUA 06/2023. The Canapec diet had sugarcane bagasse (13.50%), corn grain (52.77%), dry distiller's grains with solubles (DDGS, 30.0%), peanut oil (0.66%), potassium chloride (0.51%), calcite (1.0%), urea (0.56%) and mineral mixture (1.0%). The Conventional diet had corn silage (25.50%), corn grain (32.74%), soybean hulls (35.00%), soybean meal (4.75%), urea (1.00%) and mineral mixture (1.00%). Variables were daily methane emission (g animal^{-1} day^{-1}), and daily methane per kilogram (g kg DMI^{-1} day^{-1}). Data were analyzed considering the treatments as fixed effect and the blocks as random effect using PROC MIXED from SAS (SAS Institute Inc., SAS 9.4). Differences between means were considered significant when P<0.05. Due to equipment malfunction we have methane values for only 27 animals. There was significant difference (P = 0,0410) for daily emission (188 and 147 g animal^{-1} day^{-1}) and (P = 0,0367) per kilogram of gain (98.97 and 75.86 g kilogram of gain^{-1}) but not (P = 0,1591) for daily emission per kilogram of DM intake (17.58 and 14.86 g kg DMI^{-1}) and for the Conventional and Canapec treatments, respectively. The Canapec diet had 22% lower daily emission and per kilogram of DMI than Conventional diet. As for emissions per kilogram of gain, the difference is only 15%, due to lower DMI for Canapec (data not shown). The results indicate that the diet high in ethanol coproducts is a promising option to reduce methane emission.

Keywords: biofuels, coproducts, ethanol, methane.

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