in diets formulated to meet lysine requirement. Finally, the highest supplemented level of encapsulated lysine resulted in greater plasma lysine concentration 8h post-feeding.

Key Words: rumen protected soybean meal, feed efficiency, rumen protected lysine
doi:10.2527/asasann.2017.575

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576 The potential benefit of corn dried distillers' grain (co)products (DDG) fed alone or in combination with ionophore and condensed tannin to mitigate methane emission in cattle.

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The objective with this trial was to evaluate the potential of ionophore (33 mg of monensin/kg DM) and condensed tannins (offered at 3% of DMI) to mitigate enteric methane production by beef steers fed corn dried distiller's grain (DDG) in finishing diets. Eight British-cross steers, 12 ± 2 mo old weighing 212 ± 11.7 kg, were assigned to two replicated Latin rectangle design (LRD, n = 32) to evaluate four treatments: control (no DDG or feed additive), DDG (40% DDG inclusion), DDGI (40% DDG inclusion + ionophore), and DDGCT (40% DDG inclusion + condensed tannins). Animals were randomly assigned to the diets fed at an intake of 2.5% of BW (DM basis). Animals were adapted to the diets for 14 d prior to collection periods. Enteric methane measurements were collected in two open circuit respiration, pull mode chambers in which animals were fed twice daily 0800 and 1600 h. The data acquisition consisted of a 48-h period of measurements (runs). The statistical analysis was performed using random coefficients model methodology in SAS 9.4 (SAS Inst., Cary, NC) assuming fixed effects of treatment (diet) and random effects of animals and runs. An effect of diet was observed ($P < 0.001$) for CH_4 (L/d) production at 12h, 24h and 36h, but not at 48h. The addition of DDG significantly decreased CH_4 (L/d; $P < 0.001$) at 12h, 24h, 36h, and 48h when compared to the control diet. Additionally, the inclusion of ionophore and condensed tannins decreased CH_4 production (L/d; $P < 0.001$) at 12h, 24h and 36h, but only DDGCT decreased CH_4 production (L/d; $P < 0.001$) at 48h when compared to the control diet, suggesting a more prolonged effect of condensed tannins over enteric CH_4 mitigation. At 24h DDG, DDGI, and DDGCT diets were not different for CH_4 production (L/d; $P < 0.001$), but at 36h DDGI and DDGCT had a significant effect on CH_4 mitigation when compared to the control or DDG. Our results indicated that DDGCT was a prominent CH_4 reducer over 48h followed by the DDGI treatment. The inclusion of ionophore and condensed tannins to DDG-based diets significantly affected enteric CH_4 production (L/d; $P < 0.001$).

Key Words: DDG, feed additives, methane production
doi:10.2527/asasann.2017.576

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577 In vitro ruminal fermentation and enteric methane production of tropical forages supplemented with nitrogen or the combination of nitrogen and starch.

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This research was conducted to evaluate in vitro ruminal fermentation parameters (CO_2 emissions, NDF degradability, pH, VFA, and NH_3-N) and enteric methane production of medium quality tropical grass hay (TGH; *Brachiaria decumbens*, 6.8% CP), supplemented with N only (urea:ammonium sulfate), or the combination of N and starch. The 7 treatments evaluated were: control (TGH only, 6.8% CP), N supplementation (TGH + N at 90.1 and TGH + N 130 g/kg), N + starch supplementation (low starch, 10% of forage weight; and high starch, 20% of forage weight). Samples were incubated in serum bottles (50 mL) at 39°C, each run being replicated 4 times. Methane, CO_2, and VFA were evaluated after 24-h incubation. The measurements of NDF degradability, NH_3-N concentration, and pH were performed at 3, 6, 9, 12, 24, 36, 48, 72 and 96 h. Values of pH, NH_3-N, VFA, CH_4, and CO_2 obtained for the different incubation times were evaluated as repeated measures design. Data were analyzed using PROC MIXED of SAS (SAS Inst., Cary, NC) and differences were declared significant at $P \leq 0.05$. Treatment was considered fixed effect whereas treatment within run considered random. When expressed in mL/g DM, no effect was found on CH_4 ($P = 0.498$) and CO_2 ($P = 0.538$) production, potentially degradable fraction of NDF ($P = 0.429$), nondegradable fraction of NDF ($P = 0.429$), and fractional degradation rate of NDF ($P = 0.568$). Yet, compared to control, supplementation did affect total VFA concentration ($P < 0.05$), more specifically, with starch affecting ($P < 0.05$) total acetate production, and decreasing A:P ratio ($P < 0.05$). The pH was found to be higher for supplemented diets ($P < 0.05$). Supplementation also affected NH_3-N, after 36 h, with high starch inclusion being the highest ($P < 0.05$). Overall, the N supplementation alone does not improve TGH fermentation dynamics, and independent of the level of N supplementation, the inclusion of starch onto TGH supplementation strategies is likely to affect only VFA profile rather than total production.

Key Words: supplementation, tropical forage, protein
doi:10.2527/asasann.2017.577