Effects of Precision Feeding the Condensed Tannin *Quebracho* to Feedlot Cattle on Enteric Methane Production, Animal Performance and Carcass Characteristics

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Enteric methane (**CH_4**) is the primary greenhouse gas (**GHG**) emitted from livestock. This study aimed to evaluate the effects of precision feeding a *Quebracho* condensed tannin on enteric CH_4 production when fed to cattle consuming a high concentrate diet. Forty-eight black Angus and black Angus x Herford heifers (body weight (**BW**) = 592 kg ± 11.0) were used in a randomized complete block design (n=24) and blocked based on individual, co-variate enteric CH_4 (111.0 g ± 7.2) emissions collected on d -18 to -15. The two treatments that were used in this study were as follows: Control (**CON**; 48.87 g of ground corn/hd/d + 1.13 g Melengestrol Acetate (**MGA**; g/hd/d; Zoetis, Parsippany, NJ)) and *Quebracho* condensed tannin (**TAN**; 0.15% TAN/kg DM + 48.87 g of ground corn/hd/d + 1.13 g MGA). Heifers were precision fed based on 2.2% BW and % DM of the total mixed ration (**TMR**) being fed. Individual dry matter intake (**DMI**) and water intake (**WI**) were monitored using the Roughage Intake Control System (**RIC System**; Hokofarm Group, Marknesse, The Netherlands). Enteric CH_4, carbon dioxide (**CO_2**), and hydrogen (**H_2**) gas emissions were collected using the Green Feed (**GF**; C-Lock, Inc, Rapid City, SD). Enteric emissions were collected on days (**d**) 10-13, 24-27, 38-41, 52-55, and on d 66-69.

Sixteen, 3-hour sampling windows were stagged across a 90-hour sample period to collect a total of eight emission readings/animal/sampling period to determine the average 24-hour emission production from each individual heifer. Heifers were harvested on d 76, and individual carcass data was collected on d 77. Methane, CO_2, and H_2 production did not differ between TAN vs. CON heifers ($P > 0.05$). Methane and H_2 yield were similar between TAN and CON fed heifers ($P > 0.05$). Carbon dioxide yield had a tendency ($P = 0.075$) to be reduced from heifers fed TAN vs. CON by 7.47% from d 38 to 41 (Table 15). *Quebracho* condensed tannin did not have an effect on enteric CH_4, CO_2, and H_2 intensity in TAN fed heifers vs. CON fed heifers ($P > 0.05$). Body weight and average daily gain (**ADG**) were similar between heifers fed TAN vs. CON ($P > 0.05$). There were no differences between heifers fed TAN and heifers fed CON for gain to feed ratio (**G:F**), DMI and WI ($P > 0.05$). Hot carcass weight (**HCW**), marbling score, preliminary yield grade (**PYG**), ribeye area (**REA**), and dressing % (**DP**) were similar between TAN and CON heifers ($P > 0.05$). All carcasses graded either Prime or Choice. In summary, precision supplementation of TAN at 0.15%/kg DM to feedlot heifers consuming a high concentrate did not affect enteric gas emissions, animal performance, and carcass characteristics and quality.