Supplementation of Angus crossbred steers with avian-derived polyclonal antibody preparations against the ruminal methanogen *Methanobrevibacter ruminantium* M1 does not alter in vivo methane emissions

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Introduction

- Fiber-based cow/calf operations produce 81% of the total greenhouse gases (GHG, in CO_2e) in conventional beef production systems, with cows accounting for 78% of the total enteric CH_4 emissions (Beauchemin et al., 2010)
- In addition, enteric CH_4 production is energetically wasteful

Hypothesis

- Passive immunization against the ruminal methanogen *Methanobrevibacter ruminantium* M1 (M1) will decrease enteric CH_4 emissions of steers fed a high-fiber diet

Objectives

- Evaluation of in vivo CH_4 emissions of Angus crossbred steers consuming a high-fiber diet supplemented with PAP against M1 (PAP-M1)

Materials and Methods

- 20 Angus crossbred steers (BW = 250 ± 33 kg)
- 2 periods of 32 d each
  - 14 d adaptation to feeding regime
  - 18 d treatment
- High-fiber diet:
  - Chopped bermudagrass hay ad libitum (intake recorded using the GrowSafe System)
  - Corn gluten feed at 0.3% of BW/d (0.75 kg)
- Two treatments
  - 3 mL/d PAP-M1
  - 3 mL/d non-immunized egg product (CON)
- Enteric CH_4 emissions measured with SF_6 technique (Johnson et al., 1994)

Statistical Analysis

- Change-over design
- Data analyzed using the MIXED procedure of SAS with fixed effects of order, period and treatment and random effect of steer within order

Results: Intake and CH_4 production

	Treatment		SEM	*P*-value
	CON	PAP-M1		
Intake				
DM, kg/d	5.5	5.7	0.25	0.44
% BW	2.2	2.3	0.12	0.33
CH_4 production				
CH_4, g/d	92	94	6.9	0.86
CH_4 Y_m, % GEI	5.5	5.7	0.46	0.78
CH_4, g/kg DMI	17.0	17.6	1.43	0.78
CH_4, g/kg OMI	19.6	20.1	1.55	0.80

Conclusions

- Supplementation of Angus crossbred steers with PAP-M1 did not alter enteric CH_4 production