

Methane production in warmblood ponies fed either a roughage or a roughage plus concentrate ration

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Atmospheric methane concentrations have increased considerably since the pre-industrial era, mainly caused by anthropogenic contributions¹. For equines, enteric methane emissions are defined by the Tier 1 method and are estimated at 18 kg methane/head/year². Reduction of methane emission from horses may be achieved by dietary interventions, i.e. feeding diets low in roughage and high in concentrates. However, such feeding strategy is undesirable from a welfare point of view and there is limited data quantifying the impact of such feeding strategy on methane production of horses. Therefore, the main objective of this study was to quantify methane production from warmblood ponies fed roughage only (R) or a ration containing roughage plus concentrate (RC). A cross-over design involving 4 mature warmblood pony geldings (BW 230 ± 10.5 kg) was used. The ponies received 5.05 kg DM hay/d on the R ration and 2.52 kg DM hay/d plus 1.11 kg DM concentrate/d on the RC ration. These rations were iso-energetic and ponies were fed at maintenance level³. Ponies were housed in pairs in climate controlled respiration chambers for 3 days, to measure carbon dioxide production, oxygen consumption and methane production. Heat production was estimated by use of indirect calorimetry. Feces were collected quantitatively to determine digestibility.

Dry matter intake differed significantly between rations, but Net Energy (NE) intake was equal for both rations (21.3 MJ NEm/d). Methane production had higher values ($P = 0.014$) on the R ration (29.8 L/pony/d) compared to the RC ration (23.2 L/pony/day). Methane production expressed in L/kg BW^{0.75}/d and as % of DE was decreased for the RC-group by 21% ($P = 0.064$) and 12% ($P = 0.113$) respectively. Heat production, oxygen consumption and carbon dioxide production were not affected by diet. Our results show that iso-energetic addition of concentrate to roughage diets reduces methane production in ponies.

¹Solomon *et al.*, 2007. Climate change, pp. 74.

² IPCC, 2006.

³ CVB, 2004.

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