

**Influence of Addition of Corn on *in vitro* Gas Production of two Legumes Forages**

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Methane is a common by-product of ruminal fermentation of food in the rumen. In recent years many researches have been involved identifying enteric methane mitigation strategies. Many studies show that tannins can reduce methane emissions by ruminants. Alfalfa is widely used in the ruminant and is characterized by containing no tannin while sainfoin has a medium content of tannins. The main objective of this study is to evaluate the *in vitro* gas and methane production at 48 hours of two forage legumes, alfalfa (*Medicago sativa*) and sainfoin (*Onobrychis viciifolia*) and the effect of the addition of corn in two different proportions (20 % and 40 %).

The gas production was determined by the Ankom system (Ankom Technology, Ankom 2011), with 0.5 g of sample and 120 ml of buffer solution (2:1). Methane detection was realized by GC-FID (gas chromatograph with flame ionization detector, Agilent HP-4890).

Gas and methane production was significantly lower in sainfoin than alfalfa ( $P < 0.05$ ). Alfalfa hay had a gas and methane production of 286.90 ml gas/g DM and 38.55 ml methane/g DM whereas sainfoin hay had a production of 187.11 ml gas/g DM and 24.76 ml methane/g DM. The effect of addition of corn depended on the forage species. In alfalfa, the inclusion of corn did not affect the gas production (286 vs 302 ml gas/g DM;  $P > 0.05$ ), but affected the methane production, although significantly only when it was added at higher proportion (38.55 vs 46.74 ml methane/g DM, alfalfa vs alfalfa+40% corn respectively;  $P < 0.05$ ). Regarding to sainfoin, the inclusion of corn increased gas and methane production, regardless of the proportion of corn added (187.11 vs 251.52 ml gas/g DM; 24.7 vs 41.05 ml methane/g DM, sainfoin vs sainfoin+corn, respectively ;  $P < 0.05$ ).

In conclusion, the gas and methane production of the forage depends on the species used. The addition of corn increased the amount of gas and methane production, that increase being more considerable in sainfoin hay.

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