Does replacing grass silage by maize silage in Flemish dairy cattle diets lead to methane reduction?

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It is often stated that replacing grass silage (GS) by maize silage (MS) in dairy rations is a promising nutritional strategy to reduce methane (CH_4) emissions (Van Middelaer et al., 2013; Mills et al., 2001), as MS is rich in starch. In practice, however it is not feasible to simply replace one forage by another without affecting the performance of cows (i.e. the milk production and/or composition). In order to have a sufficiently high starch supply in the total diet (±20%, Grant, 2010), diets rich in GS are accompanied by high starch concentrates (HSC). In this trial we compared a GS/MS diet (65/35 ratio on DM (dry matter) base) with a MS/GS diet (65/35 ratio), to investigate the effect on CH_4 emissions. We used 12 high-producing (31±3 kg milk/day) Holstein Friesian cows, divided in two uniform groups (control and treatment). At the end of a control period of six weeks, in which all cows received the GS/MS diet with HSC, the CH_4 emissions of all cows were measured in open-circuit chambers (OCC). After these measurements, the treatment group switched to the MS/GS diet for a six week period. The control group remained on the GS/MS diet with HSC for that period. In the last week CH_4 emissions of all cows were measured again in the OCC. Replacing GS by MS did not change the absolute CH_4 emissions of the cows (on average 423 and 425 g CH_4/day respectively), nor the CH_4 emissions expressed per kg DM intake (DMI) or per kg of produced milk (MP) (20g CH_4/kg DMI, 16g CH_4/kg MP, respectively). Based on these results we can conclude that in practice the replacement of GS by MS in typical Flemish dairy diets does not lead to CH_4 reduction, because it is more than only the exchange of two forages.