Methane mitigation in dairy cattle with 3-NOP in an on-farm trial

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Nutritional interventions are widely investigated to mitigate methane emissions from ruminants. The methane reducing potential of the feed additive 3-nitrooxypropanol (3-NOP) in dairy cattle was explored. Roughage mixture consisted of 50% maize silage, 40% pre-wilted grass silage and 10% pressed beet pulp on a DM basis. The amount of concentrates (balanced concentrate and (protected) soybean meal), was calculated on an individual basis, to meet the needs of VEM and DPI. Methane emissions of 10 cows (86±31 DIM; on average 21±3 kg DMI/d) were measured with a GreenFeed in the free stall with cubicles at ILVO during a 7 days control period (CP; no treatment) and a 7 days treatment period (TP; from 12 days after first treatment). Treatment involved an additive (1,7g active compound/day) for 8 cows and a placebo for 2 reference cows. Additive or placebo were mixed in soybean meal and administered via a concentrate feeder. Milk production (MP) and dry matter intake (DMI) were monitored. Daily methane emissions decreased for the treated cows from 482±55 to 390±46 g CH_4/day ($p<0.01$), whereas for the reference cows the daily methane emissions where 462±59 in the CP and 446±53 g CH_4/day in the TP ($p=0.94$). Expressed per kilogram of DMI the additive reduced the methane yield from 23±2 to 19±3 g CH_4/kg DMI ($p<0.01$), where the reference cows produced 23±3 in the CP and 21±1 g CH_4/kg DMI in the TP ($p=0.48$). When MP was considered, no significant change was observed. The reference cows displayed values of 13±2 and 14±2g CH_4/kg MP ($p=0.92$), whereas the treated cows produced 15±2 and 14±3 g CH_4/kg MP ($p=0.52$), during CP and TP respectively.