Topic

Environment

Feed additives to reduce rumen methane production

Background

Different feed additives included in dairy cow diets can reduce ruminal methane emissions. Many countries target carbon neutrality, and combatting enteric methane emissions is one way to reach it.

Mechanism of 3-NOP on enteric methane reduction of dairy cows

Methane production	•Methane is produced by ruminal microbes in the rumen •Feeds are digested through a complex fermentation process, from which methane is produced
Feeding	• 3-NOP can be addressed directly into the feed • 3-NOP's targeted amount is 60 mg / kg DM
Effectiviness	• Best effect will be gained when 3-NOP is added into TMR and thus will be affecting constantly in the rumen
Mechanism	• 3-NOP affects the active site of methyl-coenzyme M reductase, in the final stages of methanogenesis in the rumen
Results	• Methane production reduces approximately 30%, when additives are being used in the daily feeding of cows

Several compounds with potential effect

- 3-NOP
- Red algae containing bromoform
- Nitrates
- Calcium peroxidase
- Biochar
- Plant extracts

3-NOP is approved

- 3-NOP (commercial name Bovaer® by DSM) is approved as the first additive to reduce enteric methane in dairy production by European Comission
- 3-NOP has been proven to reduce methane production up to 30%
- Results may depend on the diet composition (fat, fibre) and forage proportion
- No long-term effects have been discovered, meaning, that 3-NOP affects in the rumen only while present

Side effects

3NOP was approved by the EFSA FEEDAPP panel, that assessed feed additives for side effects such as:

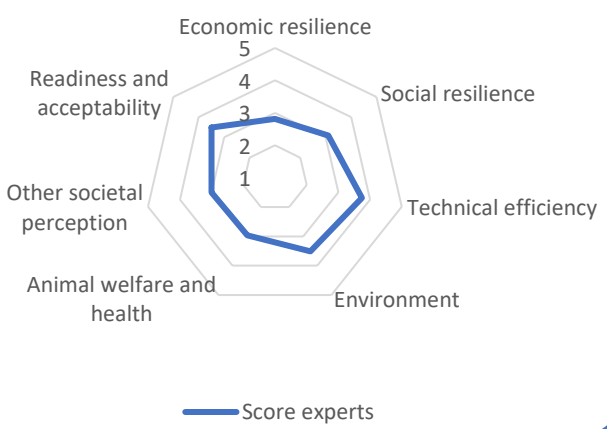
- Reduced feed intake / production
- Reduced animal health
- Residues in milk / meat / environment

3NOP has not been assessed for potential negative animal welfare effects such as discomfort and pain

What will be the reality?

- Consumer attitudes?
- Final price for the products? Will it be transferable into the price paid for the farmers? The cost of 3-NOP is about 1 cent / kg milk.
- Role of methane in mitigating climate change?
  How are the additives taken into account in national greenhouse gas inventories?

Assessment of method



Quote of the farmer:

" Reducing climate impact is important, but farmer's voice should be heard when deciding who pays the costs of methane mitigation"

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101000770.