Use of rapeseed fat (methane emissions)

Last update: 2 June 2023

- **Type of challenge**: Environment.
- **Challenge:** Climate change (enteric methane emissions).
- **Action**: Reduction of enteric methane emission by addition of unsaturated fat as non fermentable highly digestible energy source.
- **Animal category**: Lactating dairy cattle, other dairy ruminants.
- **Technique**: Addition of rapeseed fat via rapeseed expellers meals, whole grains or rapeseed oil into the diet.
- **Mode of action**: Inhibition of methanogenesis by unsaturated (or medium-chain saturated) fatty acids, which are usually abundant in vegetable oils; increased supply of nonfermentable highly digestible energy.
- **Potential efficacy:** Between 4 and 5% abatement in enteric methane emission intensity per percent of fat added to a full diet composed of 60% of forages.
- **Nature of evidence of efficacy**: Peer reviewed scientific publications (meta-analysis); evaluation by certain national authorities in the framework of eco-schemes.
- **Factors impacting on efficacy**: Proportion of forages vs. concentrate; quality of the forage (fat content); period of lactation.
- **Mode of use:** Mixed with concentrate feed at inclusion levels increasing the fat content in the full diet up to 3%.
- **Requirements/limitations**: The rapeseed must be low in glucosinate; limit the amount of fat to avoid excessive fat content in the body that can impact on fertility.
- **Economic consequences**: Higher feeding cost compensated partially by higher milk yield.
- **References**:
  - Arndt *et al.* (2022). *Full adoption of the most effective strategies to mitigate methane emissions by ruminants can help meet the 1.5 °C target by 2030 but not 2050*. PNAS May 10, 2022. https://doi.org/10.1073/pnas.2111294119
  - Brask *et al.* (2013). *Methane production and digestion of different physical forms of rapeseed as fat supplements in dairy cows*. J. Dairy Sci. 96 :2356–2365. http://dx.doi.org/10.3168/jds.2011-5239
  - Brask *et al*. (2013). *Enteric methane production, digestibility and rumen fermentation in dairy cows fed different forages with and without rapeseed fat supplementation*. Anim. Feed Sci. Technol. 184, 67-79 (2013). https://doi.org/10.1016/j.anifeedsci.2013.06.006
  - Covenant Enteric Emissions Cattle Measure 7: Rapeseed fat
  - EIP-AGRI Focus Group (2017). Reducing emissions from cattle farming.
- **Other techniques**: Other unsaturated fat sources (linseed); electron sink (nitrate); methane inhibitors (Asparagopsis taxiformis, 3-NOP, tanniferous forages); shift inrumen fermentation pattern (tannins, high digestible forages, probiotics, organic acids, essential oils, decreasing forage-to-concentrate ratio); lower emission intensity (increasing feeding level, increasing feed efficiency, decreasing grass maturity).

Charter Ambitions: 1, 5