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Effect of diet rich in "fibre" or in "starch and lipid" on environmental impacts of bull-fattening system

Thi Tuyet Hanh Nguyen, Maguy Eugène, Hayo van Der Werf, Gwenola Chesneau, Marie-Madeleine Mialon, Michel Doreau

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receiving a mixed diet of chopped hay, barley, Soya and molasses JavanoI decreased methane emissions by 20% when expressed per unit of live weight gain and increased nitrogen retention by 15%. Sandalwood extract and chemical analogues thereof have the potential to be used as additives to animal foodstuff in order to bring about important and beneficial changes in ruminant digestion.

T95. Effects of diet rich in “fibre” or in “starch and lipid” on environmental impacts of bull-fattening system

T.T.H. Nguyen, M. Eugene*, H.M.G. van der Werf, G. Chesneau, M. M. Malon and M. Doreau

Mitigation strategies for enteric CH₄ emissions should be evaluated through a multicriteria assessment of environmental impacts. Enteric CH₄ from bulls fed a high-concentrate diet based on cereals supplemented with extruded linseed was reduced by 23% (g kg⁻¹ body weight gain) in comparison with a high-concentrate diet based on fibre-rich co-products (Eugène et al., 2010, this symposium). This study aimed at comparing environmental impacts, in particular GHG emissions, of a bull fattening system from the age of 8.5 to 16 months with these two diets using the life cycle assessment method. The fibre-rich diet (F) comprised 13% straw and 87% concentrate including 22% bran, 22% dehydrated alfalfa and 21% dehydrated beet pulp. The starch and lipid-rich diet (SL) comprised 13% straw and 87% concentrate including 46% cereals and 6% extruded linseed. The system included production and transport of feed ingredients and associated upstream processes, emissions from the animals and manure storage. The hypotheses on the farm location were north of France for diet F and southwest of France for diet SL. The functional unit was 1 kg of body weight gain (BWG) then during the fattening period. Enteric CH₄ was either measured by Eugène et al. (2010), or estimated using the IPCC (2006) Tier 2 method, or the equation P of Ellis et al. (2009). Emissions from manure management were calculated according to IPCC. Emissions associated with feeds were calculated based on practices in France, especially for fertilizer application and feed technology. Enteric CH₄ contributed 47 and 44% to climate change (CO₂, CH₄ and N₂O emissions) impact for diets SL and F, respectively, based on the measured data. Climate change impact for diet SL was 27% lower than for diet F. The reduction of 23% of enteric CH₄ (g kg⁻¹ of BWG) observed with the bulls receiving diet SL (Eugène et al., 2010) resulted in a 10% decrease in climate change impact of diet SL compared to diet F. Predicted enteric CH₄ by IPCC and Ellis et al. (2009) was lower (-60 and -33%, respectively) than the measured value for both diets. Therefore, climate change impact based on predicted enteric CH₄ by IPCC and Ellis et al. (2009) was 28 and 15% lower, respectively, than climate change based on measured data. Diet SL was better than diet F in terms of acidification and cumulative energy demand but had higher eutrophication and land occupation impacts than diet F. Terrestrial ecotoxicity potential was the same for both diets.

T96. Effect of lactose ureide on methane emission and ruminal fermentation in vitro

T. Nishida*, S. Hayasaki, K. Kida, T. Matsumoto*, R. Asa-Morikawa and J. Takahashi*

An *in vitro* continuous incubation system was used to evaluate effects of increasing addition of lactose ureide (LU, Japan Dairy Technical Association, Tokyo, Japan) prepared by reaction of whey with urea on ruminal fermentation and methane emission. Four 1000 ml fermentation vessels were used for 24 h incubation and replicated 3 times. The culture media consisted of 400 ml of strained rumen fluid collected from ruminally cannulated non-lactating Holstein cows and 400 ml of McDougall's buffer. The culture media were anaerobically incubated with 10 g of a mixture of ground concentrate and Timothy hay (1:1, w/w) at 39°C for