Upper Lobby Coffee break and poster viewing - Poster session 2

Dietary Fibre in Pig's Diets: Effects on Greenhouse Gas Emissions from Slurry Storage to Field Application

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Pig's slurry is a key source of greenhouse gases (GHG). In Spain, GHG emissions (CH_4 + N_2O) from pig slurry (storage and land application) accounted in 2011 for 18.4% of total GHG emissions (in CO_2- equivalent) of the agriculture sector according to the National Inventory Report (NIR). Slurry composition can be modified through diet manipulation. The aim of this work was to evaluate the effect of different fibre types in fattening pigs' diets on GHG emissions from pig slurry storage and field application.

Thirty fattening pigs (85.4±12.3 kg initial live weight) were fed five diets with similar contents on NDF: a commercial diet (C) based on wheat and barley, two diets with orange pulp (OP) as fermentable fibre source at two inclusion levels (7.5%, OP7.5 and 15%, OP15), and two diets with carob bean (CB) as non- fermentable fibre source at two inclusion levels (7.5%, CB7.5 and 15%, CB15). Slurry was collected from each animal individually during 7 consecutive days. Slurry was chemically analysed for volatile solids content (VS) and CH_4 yield potential (B0). Emission factors for manure storage were calculated for each animal following Intergovernmental Panel on Climate Change (IPCC) and NIR guidelines. Moreover, slurry samples from each treatment were experimentally surface-applied to a grassland (Lollium perenne) soil and CO_2-equivalent (N_2O + CH_4) fluxes were measured during 40 consecutive days.

Average volatile solid excretions (VS, kg/animal and day) were significantly higher in animals fed the highest non-fermentable fibre level (CB15) compared to the other dietary treatments ($P<0.05$). The B0 (ml CH_4/kg VS) were not different among treatments averaging 350 ml/kg VS. The CH_4 EF (kg CO_2- equivalent/animal and year), was not different among treatments ($p>0,05$), resulting in the following values: 132.72 (C), 160.86 (OP7.5), 135.03 (OP15), 152.67 (CB7.5) and 165.27 (CB15). If considering total slurry produced from animals in each treatment, greenhouse gas fluxes from soil expressed as mg CO_2- eq/animal and day resulted in 11.55 (C), 6.43 (OP7.5), 4.62 (OP15), 9.97 (CB7.5) and 9.85 (CB15).

Our results indicate that fermentable fibre (from OP) has a strong potential in reducing GHG in field application of pig slurry not affecting EF from pig storage.

This project was funded by the Spanish Ministry of Science and Innovation (AGL2011-30023-C03) and the Valencian Government (ACOMP/2013/118).