Title Pig slurry characteristics, mineral fertilizer equivalent and biogas production emission potential as affected by separation and acidification

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Abstract

Managed properly, animal slurry is an environmentally friendly source of plant nutrients for crop production, an amendment for soil amelioration, and a resource for energy production. Mismanagement of slurry causes hazards to the environment in the form of greenhouse gas (GHG) emissions, eutrophication of recipient waters, and pollution of ground water (Sutton et al. 2011). Animal slurry is separated to avoid excessive NPK fertilization of crops in the field. To enhance the fertilizer efficiency further, the slurry and its separation products may be acidified, for instance in animal houses. This study carried out an analysis of the effect of these treatments alone and in combination on fertilizer efficiency, energy production and pollution caused by manure management. The efficiencies of manure application on cropland were enhanced by acidification and a better match of plant available NPK in manure and separation fraction and crop need is reached with acidification and separation of slurry (Kai et al. 2008). Total biogas production will not be affected by separation, whereas acidification significantly reduces biogas production, because the process is inhibited at low pH and high sulphur concentration. The amount of heavy metals applied per hectare in the dry matter-rich fraction from slurry separation is significantly higher than the amount applied with slurry and the liquid fraction. Transport and field application of solid and liquid is not increasing management costs as compared to transport of only slurry, but investment and running costs of separators and of acidification of manure increase the total management costs. The costs was calculated using the models presented by Sørensen and Møller (2006).

References