

REMAIN - Reduction of Greenhouse Gas Emissions through the Acidification of Manure from Fattening Cattle in situ

Summary

An operational group will be created to prepare a pilot project, based on the preliminary studies, with the aim of designing a post-digestive manure management strategy to reduce the emissions of nitrogen (volatilization of ammonia and nitrogen dioxide) and carbon (methane). Additionally, this first project will bring together data concerning nitrogen volatilization (mainly nitrogen dioxide), emission of gases from beef manure during the storage and the effect of the type of bedding. When evaluating these strategies it needs to be taken into account that i) methane is formed during anaerobiosis ii) and nitrogen dioxide formation increases during aerobiosis (manure aeration). So, an alternative strategy for both gases needs to be searched. Taking this into account and considering the applicability in Catalan farms (specific climatology), the following strategies could be evaluated in a first in vitro phase:

- Evaluation of the type of bedding. Different predominant types of bedding (long straw, cornstalks) and new bedding types (chopped straw) will be contrasted.
- Evaluation of the addition of acids. In a second phase (pilot project) it should be tested whether this strategy negatively affects the hooves of the animals and their welfare.

Objectives

The objective of these in vitro studies, for writing later a pilot project proposal, are:

- Evaluate the presence of straw for the maximum ammonia (and methane) emissions under anaerobic conditions.
- Selection of a weak acid to delay the methane and nitrogen dioxide production using sulfuric acid as a strong reference acid (determine quantity and concentration).

Conclusions

The addition of an acid solution of acetic acid to adjust the pH at 5,5 of the manure (mixture of feces:urine of 1:1) reduced the total C emissions compared with the total C emissions achieved with a sulfuric acid addition (-18% of the total C emissions), reduced the microbial activity of the organic matter degradation (biodegradation of 85% CT-in with acetic acid and of 99% CT-in with sulfuric acid), and in addition, its cost is lower compared with the cost of sulfuric acid (36 and 78 € sol-acid/ t-mixture feces:urine for acetic and sulfuric acid, respectively). It has been estimated that the dose should be 20 kg-sol. acetic (commercial solution of at least 80% richness) for each tonne of feces:urine (H:O=1:1) mixture. Regarding the straw size, a lower emission of N (NH₃) with long straw at pH 5,5 is expected.

Operational Group Leader

Entitat: **ASSOCIACIÓ D'EMPRESARIS DEL BOVÍ D'ALCARRÀS**

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Tipologia d'entitat:

Keyword-category

Territorial scope

Animal husbandry and welfare
Climate and climate change
Farming practice
Fertilisation and nutrients management

Province
Tarragona
Lleida
Girona
Barcelona

County
Vallès Oriental
Solsonès
Segrià
Ripollès
Pallars Sobirà
Osona
Noguera
Garrotxa
Garrigues
Cerdanya
Berguedà
Bages
Alt Urgell
Alt Empordà

Project dissemination *(publications, seminars, multimedia...)*

És probable que els resultats es presentin en una jornada de reducció d'emissions de gasos hivernacle i/o nitrogen en vaquí d'engreix, i que es facin publicacions en revistes de divulgació i revistes científiques.

Project website

Other project information

Redactat d'un projecte que es podrà aplicar a les comarques amb explotacions de boví d'engreix.

Project period

Approved budget

Starting date (month-year): Març 2017	Total budget:	18.700,00 €
End date (month-year): Setembre 2017	<i>Funding source DARP:</i>	7.461,30 €
Project status: <i>Finalised</i>	<i>Funding source EU:</i>	5.628,70 €
	<i>Own funds:</i>	5.610,00 €

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Ordre ARP/96/2016, de 27 d'abril, per la qual s'aproven les bases reguladores dels ajuts a la cooperació per a la innovació a través del foment de la creació de grups operatius de l'Associació Europea per a la Innovació en matèria de productivitat i sostenibilitat agrícoles i la realització de projectes pilot innovadors per part d'aquests grups (operació 16.01.01), i es convoquen els corresponents a 2016.

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