

New Danish Study Aims to Trap More Odour, Ammonia from Pig Manure

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DENMARK - Controlled extraction of air from the slurry channels on pig farms combined with an effective biological treatment is how a new research project at the University of Aarhus aims to reduce odour problems and ammonia emissions for employees and the environment.

Better indoor air quality for employees on pig farms, a large reduction in emissions from livestock housing and the development of an effective biological air purification system with a large national and international market potential.

These are the great and promising ambitions of a new research project involving scientists from Aarhus University who will be working on the biological air purification of livestock housing combined with a relatively new ventilation principle called partial point extraction—the ventilation of the polluted air from the manure channel under the pig house.

The combination of local exhaust ventilation and new knowledge on biological purification means that it could become possible to eliminate large amounts of ammonia and odours from the housing in an affordable way.

Project manager, Anders Feilberg from Aarhus University, explained: "The continued development of livestock production in Denmark requires cost-effective solutions to reduce ammonia emissions and odours. Compared to biological purification of the entire air volume from an animal house, an integrated solution consisting of biological air purification and point extraction has the potential to significantly reduce costs, achieve a more effective cleaning process and reduce waste volumes.

"This is because ammonia as well as odours are primarily emitted from the manure channel and can be captured in a ventilation flow that is actually only 10-20 per cent of the total air volume."

The effect of the combination of the two known technologies is not precisely known but the people behind the project expect that there is great potential and need for a future product - not least in light of the ever-stricter regulations on livestock production in a growing number of countries.

The German state of North Rhine-Westphalia has just introduced a requirement for mandatory air filter purification for all new pig finishing units with a capacity for more than 2,000 pigs. Over a three-year period, the requirement will be phased in for existing units with more than 2,000 finishers.

The project partners also expect to be able to substantially reduce odour from the housing. Dr Feilberg added: "The project will help to significantly reduce odour emissions to ensure that the livestock industry can continue to develop without causing a nuisance to the local area. We expect the air purification system can reduce odour from the manure channel by more than 80 per cent."

Large Drop in Emissions

It is expected that the combination of biological air purification and point extraction can reduce ammonia emissions by about 65 per cent. This is based on an expected efficiency of the biological air purification unit of 90 per cent combined with 70 per cent of total ammonia emissions being captured in the exhaust ventilation air.

The project also includes optimisation of the measuring and control of air flow from the exhaust ventilation to ensure an efficient capture of the polluting components from the manure channel.

The project will initially be laboratory-based where the fundamental processes in odour reduction will be investigated, but with a coincident installation of a full-scale demonstration unit at a pig facility.

Scientists from Aarhus University will be working alongside colleagues from the Pig Research Centre, Danish Technological Institute, a farmer and the ventilation company, SKOV.

The project will run until March 2016.



Scientists at Aarhus University are leading a project on biological air purification of pig housing combined with local exhaust ventilation. The hope is that odours from pig farming can be significantly reduced.

[Photo: Jesper Rais]

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