Detox NH_3 - Clean Air for Pig, Man & Environment

The DTNW - a member of the Zuse community - has been working successfully for many years on the development of so-called adsorber textiles, which are suitable, for example, for the enrichment and recovery of precious metals from industrial process waters, where they can make a significant contribution to improving circulation flows and sustainability. In an R&D project funded by the state of North Rhine-Westphalia and the EU, representatives from industry, agriculture and research have come together to expand the potential of such adsorber textiles. In addition to the research institution DTNW, which provided the ideas, these include the textile manufacturer Kayser Filtertech, the Gesellschaft für Innenraumhygiene mbH, the printed circuit board manufacturer Unimicron Germany GmbH, and the Schulze Esking pig fattening operation in the Münsterland region, which is strongly influenced by agriculture. The specific case involved the removal of ammonia gas, which is produced during animal husbandry by excretions from pigs, cattle and chickens, for example. Bound in liquid manure, it is then mostly spread on arable land, where it contributes significantly to overfertilization and contamination of groundwater. In addition, ammonia is the basis for the formation of long-lived particulate matter, which can lead to severe respiratory diseases and, last but not least, the toxic gas affects the health of humans and animals directly in the livestock farms. In the course of the project, it has now been possible, on the one hand, to manufacture and equip the adsorber textile on an industrial scale. On the other hand, a pilot plant was successfully tested under real conditions in pig fattening. In this process, the gas can be removed from the ambient air of the pig house in continuous operation and at the same time converted into a valuable mineral fertilizer that is easy to transport and therefore no longer needs to be applied directly at the point of origin.

Figure 1: Practical trial for continuous adsorption of ammonia using innovative adsorber textiles at the Schulze Esking pig fattening farm, Billerbeck.

Project Information:

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Contact DTNW: Dr. Klaus Opwis, Tel.: +49-2151-843-2014, e-Mail: opwis@dtnw.de