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Spotlight

Measuring and reducing livestock emissions – the creation of a new data platform

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Photo: Univ. of Hohenheim (J. Winkler)

For years now, Germany has not fulfilled the national emission reduction obligation within the NEC regulation (National Emission Ceilings Directive) requiring reduction of ammonia emissions to 550 kt per year. Under the new NERC directive, these emissions are to be reduced even more: by 29% up to 2030 compared with 2005, in other words by 235 kt. This represents a great challenge for agriculture. Farming is responsible for more than 90% of ammonia emissions, with the main source in this sector being livestock production where wide-ranging preventative measures are required.

Alongside the question of how emissions can be reduced, there is the necessity of reassessing fundamental data. For instance, the emission factors applied up until now in the annual emissions report inventory are based on data from the 1990s, while livestock production and management methods have changed considerably since then.

Verifying national data

The joint project EmiDaT „Emission Data for Assessing the Environmental Impact of Livestock“ applies, for the first time, verified systematic and scientific reference data. The project is coordinated by the KTBL and supported by representatives from politics, advisory services, commercial farming and research (www.ktbl.de/inhalte/themen/ueber-uns/projekte/emidat/). In that demand for reliable emission factors for ammonia is especially high from dairy farming, measurements were started in this sector. Countrywide, 14 commercial farms with different types of management and housing (solid or perforated passage flooring, with and without access to grazing) have been selected to give a representative range of housing types. So that results can be compared with one another, standardised methods coordinated at European level, have been applied. Additionally, investigations have been carried out on naturally ventilated pig barns with outdoor area, systems assessed as offering especially high animal welfare and for which, so far, absolutely no reliable data are available.

Assessment of reduction measures

Quantifying the status quo represents a start. But this immediately leads to questions regarding resultant consequences, and the ultimate efficacy of possible reduction measures. These questions will have to be clarified in a subsequent project, in that the EmiDaT financial support is not sufficient for this. Already available on the European market is a range of so-called process-integrated reduction measures, so far applied in countries such as Belgium, Denmark and the Netherlands. Up until now, no experiences are available from Germany. This applies in cattle management, e.g., for low-emission

versions of barn flooring and mechanical systems (robots, scrapers) for dung removal. Applications in feeding pig management seen as very promising include smaller-dimension liquid manure channels, cooling of liquid manure, separation of manure liquids and solids in housing systems with outdoor area, or application of urease inhibitors in housing containing emission active surfaces. No information is so far available on the results of combinations of different methods in this context.

Open Access – freely available research data

The recorded data serve as basis for simulations and model calculations so that, for the first time, a valid and reliable data basis exists. Results are to be made public online and flow into a freely-accessible research database. In this way, the basic structure for a continually expandable data platform for emissions information is created.

A big step forward

Gaps in knowledge that have existed for more than 20 years will now be at last made smaller. However, we must not forget that the conflict of aims between livestock and environment will continue to exist. A balancing of interests will still be necessary. This applies specially to housing systems with natural ventilation and additional outdoor area surfaces, the types which increasingly attract a widening application, especially within animal welfare oriented production programmes aimed at better acceptance by society and improved transparency for the general public. A reliable and comparable database is, after all, the main requirement for knowledge-based conclusions and subsequent calculations for management recommendations in agricultural, environmental and society contexts.

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