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# **NIFLUM – Nitrogen Flux Method Evaluation – Outcomes and Recommendations of an International Expert Workshop**

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## **NIFLUM – Nitrogen Flux Method Evaluation – Outcomes and Recommendations of an International Expert Workshop**

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## Static and ventilated chamber methods for the measurement of ammonia and N<sub>2</sub>O emission: pros, cons and applications

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The agricultural sector (namely animal husbandry and nitrogen fertilizers application) is responsible of up to 94% of global ammonia (NH<sub>3</sub>) and approximately 5% nitrous oxide (N<sub>2</sub>O) EU-28 emission (Eurostat, 2010). Thus, the sector poses serious risks to the environment. The range of approaches to the problem of measuring emission rates of nitrogen (ammonia and nitrous oxide) either from live-stock sector and chemical fertilizers is wide, whereas the range of available techniques for measuring ammonia concentrations and/or ammonia flux rates in air is even wider. Due to the necessity to measure emission with a good level of accuracy it's necessary to use *robust* methods, defined as methods which are able to measure emission fluxes to within acceptable levels of accuracy and precision, using techniques which do not require a high level of operator skill and are *sufficiently portable* that can be shown to function acceptably in real farm situation (Phillips et al., 2000). Moreover, the methods to be used shall allow emission measurements over time-periods from 1h upwards to 24+ hours. Nitrogen emission are influenced by several environmental and managing factors (e.g. temperature, wind speed, soil humidity, application methods), thus measuring systems shall not alter climatic conditions or shall allow to reproduce them. According to international literature when different measurement systems are used of quantify nitrogen fluxes from the same emitting source, very often final results differ significantly. Hence, standard methods for measuring emission are needed to guide research on abatement strategies and to produce international inventories.

Static and ventilated chambers are widely used to quantify nitrogen emission, nevertheless their field of application is related to the type of nitrogen flux (either ammonia or nitrous oxide) that has to be measured and to the final goal of the measurement (e.g. the need to get relative or absolute emission values). The presentation provides an overview of the possible fields of application of both systems and of their points of weakness and strength.