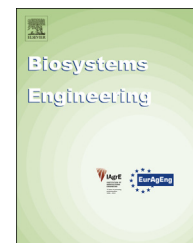




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Editorial

Special issue on emissions from naturally ventilated livestock buildings

The idea of this Special Issue was initiated during a technical session entitled "Emission from naturally ventilated buildings" at the World Congress of the International Commission of Agricultural and Biosystems Engineering (CIGR) in Quebec in June 2010. During this Quebec meeting, participants agreed to review the challenges associated with emission measurement from naturally ventilated livestock buildings and the future research needs. Research to understand and then minimise emissions from this type of livestock buildings is vital to ensure the further reduction of atmospheric pollution, particularly as demand for livestock products continues to grow. This Special Issue has been compiled to overview the latest knowledge related to this research field. It is hoped that the knowledge captured in this issue will inspire scientists and engineers (1) to improve our understanding of the emission mechanisms, (2) to solve the problems associated with measurement accuracy and (3) to reduce emissions. We very much hope that this Special Issue will be a meaningful contribution to science and therefore will generate direction for further research.

Paper #1 describes the current research focus and the future research trends as identified at the Quebec meeting. **Paper #2** reviews the origin and magnitude of errors associated with emissions estimates. The next three papers deal with modelling of ammonia emissions: **paper #3** reviews the studies dealing with process-level models using mechanistic approaches for estimating ammonia release from different surfaces in cattle, pig and poultry buildings; **paper #4** reviews the theoretical background for development of lumped ventilations models that can be integrated in models that aim to aid either the design or operation of low emission naturally ventilated buildings; **paper #5** reviews the available knowledge for inclusion in CFD models for predicting ammonia emission and the challenges associated

with developing such models. **Paper #6** is a research paper dealing with multi-location ultrasonic anemometer measurements of airflow in a dairy cow house. **Paper #7** describes experimental studies on three different methods for measurement of air exchange rates. **Paper #8** reviews the methods for gas emission measurement. It describes the state-of-art of available measurement concepts and their perspectives for improvement.

Contributions came from all the continents except Africa and the editorial team would like to thank the conference supporters, the authors and the reviewers for contributing to this Special Issue and dedicating considerable time and effort to perfect this publication during the process. We also like to thank Prof. W. Day (Editor-in-Chief, Biosystems Engineering) for the supervision of the editorial work aiming to ensure scientific quality and relevance.

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