



Aalborg Universitet

AALBORG UNIVERSITY
DENMARK

Study on the Influence of Velocity, Turbulence Intensity and Temperature on Ammonia Emission Rate in Livestock Building

Rong, Li; Nielsen, Peter V.; Zhang, Guoqiang

Published in:
Ikke angivet

Publication date:
2009

Document Version
Publisher's PDF, also known as Version of record

[Link to publication from Aalborg University](#)

Citation for published version (APA):
Rong, L., Nielsen, P. V., & Zhang, G. (2009). Study on the Influence of Velocity, Turbulence Intensity and Temperature on Ammonia Emission Rate in Livestock Building. In *Ikke angivet* Department of Civil Engineering, Aalborg University.

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal -

Take down policy

If you believe that this document breaches copyright please contact us at vbn@aub.aau.dk providing details, and we will remove access to the work immediately and investigate your claim.

Study on the influence of velocity, turbulence intensity and temperature on ammonia emission rate in livestock building

Li Rong ^{*1)}, Peter V. Nielsen¹⁾, Guoqiang Zhang²⁾

- ¹⁾ Department of Civil Engineering, Aalborg University. Sohngaardsholmsvej 57, DK-9000 Aalborg, Denmark. Email: li@civil.aau.dk
- ²⁾ Department of Agricultural Engineering, Research Centre Bygholm, University of Aarhus, Schuttesvej 17, DK-8700 Horsens, Denmark

Odor emissions from manure in livestock buildings are an important issue which concerns human beings healthy as well as animals. Ammonia is one of the most important odors in pig houses. The objective of this paper is to investigate the influence of local velocity, turbulence intensity and temperature on the ammonia emission rate. The experiments are conducted in a wind tunnel which is used to simulate part space of the slurry. The results show that the emission rate of ammonia increases with increasing the velocity and turbulence intensity as expected. The results also show that decreasing the temperature of ammonia aqueous solution decreases the ammonia emission rate dramatically, but the emission rate is more sensitive to the change of temperature at higher compared to lower temperature range. The mass transfer coefficient is power decayed with the local Reynolds number and Ar.

Key word: ammonia emission rate, velocity, turbulence intensity, temperature, livestock building