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Biogeosciences Discussions

Interactive comment on "Ammonia emissions from cattle urine and dung excreted on pasture" *by* J. Laubach et al.

Anonymous Referee #2

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General comments

This is a very thorough, detailed examination of the amounts and mechanisms of NH_3 volatilisation from urine and dung excreted by cattle and I believe it makes a worthwhile contribution to our understanding of the volatilisation process. The analysis of the resistance of the dung crust to NH_3 exchange is a very useful contribution of the paper, particularly for the treatment of dung pats as porous media. This provides a good basis for modelling NH_3 loss from grazed areas. I recommend acceptance by Biogeosciences after consideration of aspects that I mention below.

I have to say that I found the MS hard reading, rather long for its message and in some aspects rather reliant on supposition. Examples might be the comparison with the work of Bussink in *Section 4.1, Ammonia loss fractions*, and the discussion of the

secondary maximum in NH_3 loss several days after the cattle were removed from the test area, Section *4.2, Contributions of urine and dung to ammonia volatilisation*. I would encourage the authors to consider these aspects if they are revising the MS, but I concede that my perceptions of it may be my own problem, rather than the authors'.

Minor comments

2.1 Site and schedule. The experimental area was mown to 5 cm, but what about the surrounds where the dung pats were located and the wind speeds measured? The wind speed close to the ground would have been important in determining volatilisation rates.

2.5 Ammonia collection, etc. I think "passive samplers" is a more appropriate description than "Leuning samplers".

3.2 Estimation of nitrogen deposited, etc. , p.13297, line 13. Suggest "animal" for "cattle"

3.3 Ammonia emissions, p.13298, line 4. Night-time variations in NH_3 emission rates can result from the onset of dew and low winds as well as the "diurnal temperature cycle"

3.5 Moisture and mineral N of dung samples, p.13299, line 19. Suggest "were" for "was"

Interactive comment on Biogeosciences Discuss., 9, 13287, 2012.