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Estimating costs of technologies reducing ammonia emissions for finishers in pig production in Denmark for future BAT requirements

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Abstract

The ambition of EU's Clean Air Policy Package to achieve a 27% reduction in ammonia emissions by 2030 compared to 2005. The Danish ammonia emissions have already been reduced by 43% from 1990 to 2015, but further reductions are required towards 2030. The goal is to find the right technologies to ensure both a cost-efficient implementation of measures and that the costs are acceptable to the industry (not excessive costs). The focus in this analysis is on the general BAT requirements and not the site specific measures linked to Nature 2000 areas (Jacobsen et al., 2019).

A new analysis of technologies and technology combinations and costs has been carried out in order to establish a basis for future BAT requirements for ammonia emissions in livestock production in Denmark. The technologies analyzed for finishers include both stable types (share of solid floors) and technologies like cooling, air cleaning (chemical and biological), acidification and solid cover of slurry storages. The technologies are analyzed separately, but the effect and costs can then be combined based on a chain effect. The analyses cover four different sizes of production from a yearly production of 1.700 to 45.120 finishers per year.

A total of 270 combinations of the many potential combination possibilities of stable types in combination with one or more environmental technologies are included in the analysis, where an ammonia reduction is achieved. Using the old BAT level requirements with maximum costs of ≤ 1.14 per finisher and ≤ 13.4 per kg NH3-N, it is found, that few technologies can pass this test, as the costs of the technologies are higher in 2020 than in 2011. Only fixed cover of slurry tanks is cheaper than before, but this alone does not give the reduction required to fulfill the current BAT requirements. As expected, implementing the technologies is cheaper on large herd sizes than on small herd sizes, which is why the old BAT requirements where differentiated according to size of production. The cost of the measures per slaughter pig is, in several cases, twice as large per finisher for the smallest herd sizes compared to the largest. The cheapest technologies and combinations are tent covering and cooling (10W/m2).

The analysis indicates that in Denmark reducing ammonia emissions for slaughter pigs is more expensive than before. This is also the case for some of the other livestock categories,

but not all. The analysis therefore help to get an updated estimation of costs, which can be used both nationally and in the international modelling of costs and measures at the EU level.

References

Jacobsen, B.H.; Latacz-Lohmann, U.; Luesink, H.; Michaels, R. and Ståhl, L. (2019). Costs of regulating ammonia emission from livestock farms near Natura 2000 areas - Experiences from Germany, Netherlands and Denmark. Jour. of Env. Management, 246, 897-908. DOI: 10.1016/j.jenvman.2019.05.106