Data Article

Summary of performance data for technologies to control gaseous, odor, and particulate emissions from livestock operations: Air management practices assessment tool (AMPAT)

Devin L. Maurer, Jacek A. Koziel *, Jay D. Harmon, Steven J. Hoff, Angela M. Rieck-Hinz, Daniel S. Andersen

Agricultural and Biosystems Engineering, Iowa State University, Ames, IA 50011, USA

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ABSTRACT

The livestock and poultry production industry, regulatory agencies, and researchers lack a current, science-based guide and data base for evaluation of air quality mitigation technologies. Data collected from science-based review of mitigation technologies using practical, stakeholders-oriented evaluation criteria to identify knowledge gaps/needs and focuses for future research efforts on technologies and areas with the greatest impact potential is presented in the Literature Database tab on the air management practices tool (AMPAT). The AMPAT is web-based (available at www.agronext.iastate.edu/ampat) and provides an objective overview of mitigation practices best suited to address odor, gaseous, and particulate matter (PM) emissions at livestock operations. The data was compiled into Excel spreadsheets from a literature review of 265 papers was performed to (1) evaluate mitigation technologies performance for emissions of odor, volatile organic compounds (VOCs), ammonia (NH_3), hydrogen sulfide (H_2S), particulate matter (PM), and greenhouse gases (GHGs) and to (2) inform future research needs.

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* Corresponding author.
  E-mail address: koziel@iastate.edu (J.A. Koziel).

Specifications Table

Subject area	*Agricultural and Biological Sciences, Engineering, Environmental Sciences*
More specific subject area	*Air Pollution Control, Livestock Production Systems*
Type of data	*Figures, tables*
How data was acquired	*Literature Review of 265 articles up to 2014* [1–265]
Data format	*Raw*
Experimental factors	*The literature database construction started with compiling literature with the use of online scientific databases, such as Web of Science. Database searches were performed with the keywords: odor, air quality, livestock, poultry, swine, dairy, beef, volatile organic compounds, ammonia, hydrogen sulfide, greenhouse gas, emissions, mitigation, housing, manure storage, and manure land application.*
Experimental features	*The literature review consisted of four steps including (1) compilation of literature, (2) review of experimental information (reference, experimental design, technology performance, scope of study, etc.), (3) compilation and organization of study information into standardized spreadsheets, and (4) evaluation of technology and coding for mitigation performance.*
Data source location	*Department of Agricultural and Biosystems Engineering at Iowa State University, Ames, Iowa 50011, USA*
Data accessibility	*Data is within this article.*

Value of the data

- This data is the most comprehensive performance summary of air pollution control technologies applicable to livestock production systems. This data was collected from 265 published sources [1–265].

- Researchers and regulatory agencies need a summary and repository of air pollution mitigation technologies data.
- This data can help livestock producers make better decisions on technologies that are available to solve their emissions problems.
- Air pollution mitigation data is grouped by livestock and poultry species, and laboratory, pilot, and farm scale proven performance. This data shows where the knowledge gaps are in regards to emissions mitigation.
- This data shows what tradeoffs may have to be considered in implementing a particular mitigation technology.

1. Data

The data presented here is organized reduction values from the literature in regards to livestock emissions mitigation technologies. The data is organized in three Excel files based on the source of emissions: Animal Housing, Land Application and Manure Storage and Handling. Within each file there are four worksheet tabs corresponding to an individual livestock species: Swine, Poultry, Dairy and Beef. Under each species tab there are multiple tables corresponding to a mitigation technology. Within each table there are multiple literature references pertaining to that technology along with the observed reductions in emissions from each reference. Emission reductions in each table correspond to one of six emissions areas: Ammonia, Hydrogen Sulfide, Odor, Dust/Particulates, Volatile Organic Compounds, and Greenhouse Gases.

The data contains 467 technology entries with 670 emissions inputs from 265 papers [1–265]. Many papers contained data on more than one animal/poultry species, technology and/or an air