

ANIMAL WELFARE

Title: Depopulation methods in swine: what has been done and what are the knowledge gaps?
NPB #20-102

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Scientific Abstract:

Swine mass depopulation refers to the destruction of large numbers of pigs and may include not only animals affected with a disease but also healthy pigs in a facility or surrounding areas. Emerging applications of mass depopulation include reducing welfare issues associated with slaughter delays, which was observed in the United States in 2020 as a result of the Coronavirus disease (COVID-19) pandemic.

The objectives of this review were to summarize the available literature on swine depopulation methods and to highlight critical gaps in knowledge. Peer-reviewed articles were identified through a systematic search in electronic databases including Web of Science, MEDLINE, and PubMed.

A total of 68 publications were assessed. Gaseous carbon dioxide inhalation was the most commonly reported depopulation method for both small- and large-scale trials. Measurements of consciousness state, which serves to assess suffering and humaneness, appeared to be lacking in a high proportion of the studies. None of the published studies demonstrated an ideally reliable and safe way to induce rapid unconsciousness in large groups of pigs.

In conclusion, our systematic review showed that development of rapid mass depopulation methods applicable to large groups of pigs is necessary to provide industry partners with suitable and low-cost emergency preparedness procedures while adhering to personnel safety and animal welfare standards. Lastly, there is an urgent need to standardize comprehensive reporting guidelines for depopulation studies.

These research results were submitted in fulfillment of checkoff-funded research projects. This report is published directly as submitted by the project's principal investigator. This report has not been peer-reviewed.

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