

Title: Modification of a standard dump trailer to meet requirements as a CO₂ euthanasia device for market weight or adult swine – **NPB #20-121**

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Scientific Abstract/Introduction:

The current methods for on-farm euthanasia of market weight or adult swine rely on the individual handling and restraint of each animal (Meyer et al., 2005). Individual animal handling is problematic for large scale depopulation due to the stress on personnel both physically and emotionally, which leads to an increase in hazardous activities (Stikeleather et al., 2013). Carbon dioxide (CO₂) inhalation is an AVMA approved euthanasia method for swine. In a depopulation event, like a foreign animal disease outbreak, an efficient method that accounts for animal and human welfare is needed. CO₂ inhalation has an advantage over other inhalant gases due to its non-flammable properties and easy reversal if accidental human exposure occurs (Meyer et al., 2005). Previous studies on the modeling of dump trucks for the CO₂ euthanasia of pigs show that it can be effective if specific design specifications are met (Stikeleather et al., 2013). Required specifications include an airtight seal at the bottom and sides, impermeable top cover, a vent to allow displaced oxygen to escape, and for CO₂ to be introduced at a 20% volume/minute rate (Stikeleather et al., 2013). The further advantage of the dump trailer is allowing for pigs to be euthanized outside of the barn and then carcasses easily transported to the designated location for disposal. The simple process of euthanasia occurring outside the facility in a preloaded trailer is significant for mass depopulation. The ability to reduce human interaction with the process and limited need for physical labor to move the carcasses makes this an efficient and safe method of mass depopulation. This dumping of carcasses outside prevents the need to physically drag each animal out of the building, increase worker safety, and improve caretaker wellbeing. The development of specifications and modifications that anybody in the swine industry can replicate would provide an easily constructed and readily accessible option when the need for depopulation events arise. This project provides modifications needed to convert a standard 40'x8' dump trailer into a portable CO₂ euthanasia/depopulation device. This project also confirms the success of the CO₂ trailer on not only market weight animals, but also adult swine.

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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