

Method classification:

Permitted in constrained circumstances.

Suitable for:

All phases of production.

Procedure:

Ventilation shutdown (VSD) includes closing up facility openings, shutting inlets, and turning off ventilation fans. This causes the buildup of excessive temperature and moisture from body heat and respiration of the animals and results in death from hyperthermia. Case studies and simulations have found that air temperature and relative humidity increased rapidly within 30 minutes of VSD.^{1,2} VSD should only be used in facilities with the capability to adequately increase air temperature and relative humidity to a level that results in at least a 95% death rate in less than 1 hour. VSD plus uses additional heat sources or the addition of CO₂ to achieve the goal of 100% mortality. After VSD is complete and ventilation resumes in the facility, death can be confirmed and a backup euthanasia method applied to any remaining live animals.

Biosecurity risk:

No contamination from blood loss.

Labor needs and throughput estimates:

Minimal personnel are needed to implement VSD plus. Most labor needs will be associated with carcass removal from the facility. Throughput will be dependent on the size of the animals and time needed for carcass removal.

Safety considerations:

Personnel should not enter the facility while VSD plus is in progress. Allow the facility ventilation to resume before entering the barn to confirm death and remove carcasses.

Seasonality impacts:

Depending on facility design, low ambient temperatures, low relative humidity, and high wind speeds may impact VSD plus application.

Carcass disposal restrictions:

None.

Configuration:

Configuration for VSD plus will be impacted by the age and size of the facility; the insulation of the facility; the ventilation system; the ability to adequately seal fans, louvers, doors, and windows; and the number and size of animals in the facility.

Required resources:

- **Heat sources** used in addition to VSD to increase and maintain elevated temperatures. Existing heat sources in the barn may be used.
- **Carbon dioxide** used in addition to VSD to induce death. Refer to the carbon dioxide factsheet in this series for additional details on CO₂ administration.
- **Plastic sheeting or tarps** can be used with smaller pigs to decrease the head space in the room and assist with elevating temperature and humidity to lethal levels at pig level.
- **Sprayers, foggers, or drip coolers** can be used to increase humidity within the facility during VSD. Additional humidity with no air flow will aid in the development of hyperthermia.

Ancillary resources:

- **Winches or mortality carts** for carcass removal.

References:

1. Bird N. Ventilation failure alarm: 2 case studies. Dicam website. http://www.dicam.co.uk/wp-content/uploads/filebase/research/Case_Study_2_ventilation_failure_incidents.pdf. Published September 2000. Accessed April 30, 2020.
2. Zulovich JM, Bundy DS. Modeling the non-steady state conditions in swine facilities during mechanical ventilation failures. ASAE. 1990:Paper No. 90-4002.



**We want to hear from you! Do you have first-hand experience using this method for depopulation?
Please submit your feedback on the content of this factsheet at aasv@aasv.org.**