



BUILDING A MODIFIED ATMOSPHERE KILLING CONTAINER FOR EUTHANISING SPENT HENS

Modified Atmosphere Killing (MAK) of spent hens by hypoxia using carbon dioxide (CO₂) can be performed on layer farms. In the absence of commercially available MAK containers, a container must be purpose built. Any container constructed for use in MAK must be operated in accordance with the guidelines detailed in “Spent Hen Euthanasia – Australian Layer Industry Best Practice”.

MAK Container essentials

The container must be:

- gas tight
- easy to load and unload
- fitted with a gas meter to permit accurate measurement of CO₂ concentration
- designed to permit visual assessment of birds during MAK operation
- able to protect the welfare of birds until death
- able to withstand extensive handling and use on-farm
- easy to clean and disinfect to maintain bio-security
- able to be easily moved and stored
- safe to use and pose no risk to humans or animals when stored.

Design elements

For a large top loading container, two loading doors and one viewing window should be located on the top near the front corners of the container. The loading doors may have a rubber flap to stop CO₂ escaping and, under that rubber, a split flap to prevent birds escaping.

(See image back page: CO₂ Modified Atmosphere Killing Large Container).

The container is designed to be lifted with a tractor (or forklift) over a disposal vehicle (truck or trailer) to unload the birds. This necessitates that the front panel (disposal door) opens from the top to allow the dead birds to slide out into the vehicle. The container therefore empties at the front while the lifting machine holds it from the back. A releasing mechanism on the side allows the container to be locked during MAK operation and the disposal door latch to be released before emptying the container into the vehicle. The releasing mechanism for the latch requires a remote release (cord or radio control) to permit

the tractor driver to open the container while it is in the air over the disposal vehicle without getting out of the tractor.

To keep the logistics feasible, the dimensions of the container should be carefully chosen to allow access to and around the shedding facilities. The size of the container should also accommodate a commercially available transport module (trailer or truck) for easy movement from one farm to another. *(See image back page: Modified Atmosphere Killing Container Operations).*

Construction

The container should be fabricated from at least 3 mm thick steel. The interior must be smooth and free of internal bracing which could injure birds during MAK operation or prevent them sliding out. Once constructed, the container must be made gas tight.

Internal gas distribution – centralised gas delivery system

The gas should be distributed from the centre of the container or else there should be at least two CO₂ inlets, preferably on two sides of the container. Best practice would be to fit three inlets.

A centralised gas delivery system may be simply constructed from a piece of 25mm PVC pipe fitted into the top of the container. The pipe is capped at the bottom one end, and has an elbow and connection for ¾” garden hose at the inlet end at the top (a container with three inlets would, ideally, have three internal gas delivery systems fitted to it). The pipe has one 6mm hole at the end of the cap and holes every 100mm from the cap to the elbow. These holes are drilled opposing to each other to ensure there are holes on both sides. The inlet end has a poly connection, which is threaded to fit the CO₂ supply line.

By using the centralised gas delivery system, preferably with two or more cylinders of CO₂, it is possible to ensure a consistent supply of gas which continues to flow at low pressure (thus avoiding freezing issues with the CO₂ cylinders) despite the container filling with killed birds.

Measurement of CO₂

It is essential to fit a commercial CO₂ monitoring meter to the container to enable objective verification that a CO₂ concentration of at least 45% is obtained and maintained in the container during the MAK operation. As detailed in "Spent Hen Euthanasia – Australian Layer Industry Best Practice", a continuous low pressure flow of CO₂ during the MAK operation is the optimal way to operate a MAK container.

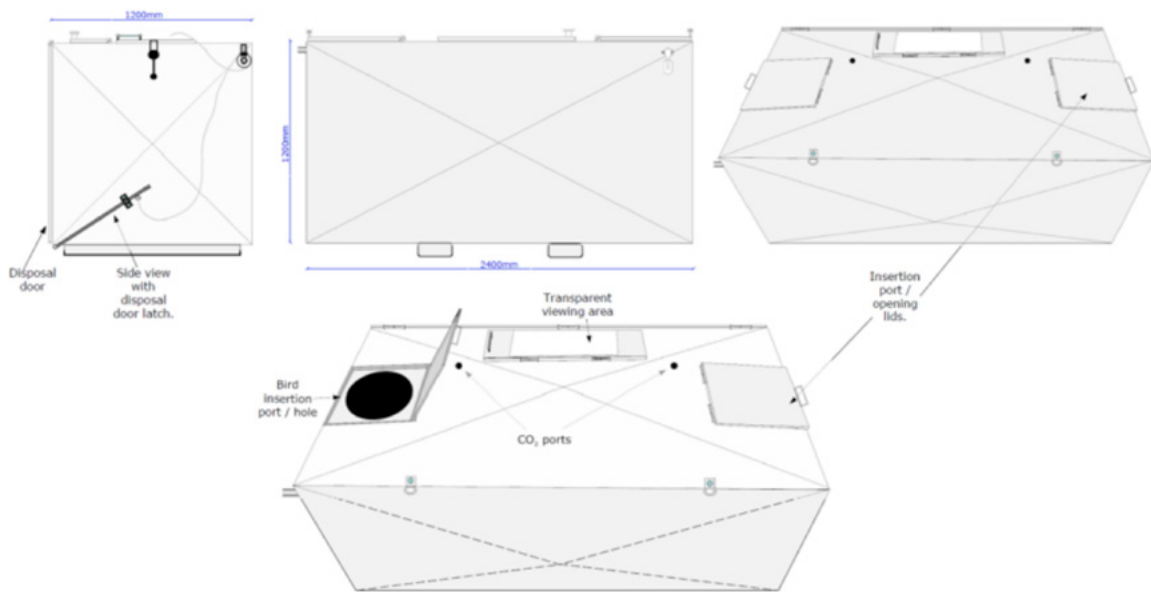
Workplace Health and Safety

Keep operators OUT of a MAK container at all times. A MAK container is potentially deadly to an operator when filled with CO₂ and, possibly, dangerous to children and animals when stored on-farm between operations.

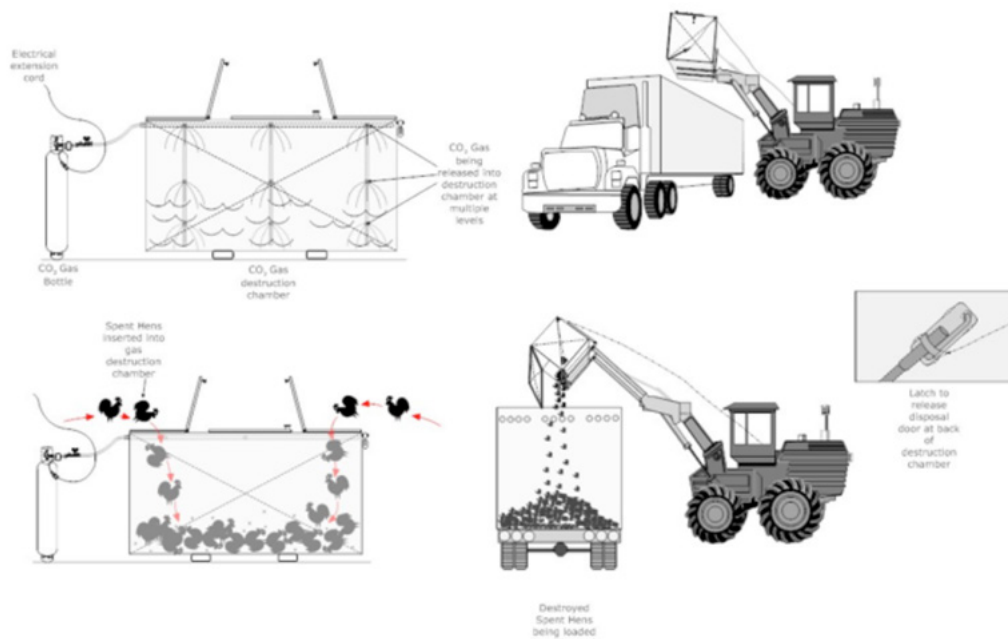
For more detailed information, see the Manual entitled "Best Practice for On-farm Euthanasia of Spent Layer Hens".



(L) Commercial CO₂ monitoring meter (R) Centralised gas delivery system



CO₂ Modified Atmosphere Killing Large Container



Modified Atmosphere Killing Container Operations