

Gas Killing of Chicks in Hatcheries

SUMMARY

Every year millions of chicks are dispatched in hatcheries because they are sickly, deformed or males unwanted for the production of eggs. Whilst the disposal of day-old chicks is a sensitive issue which many people prefer not to acknowledge, hatcheries are faced with the responsibility of making sure that each chick is disposed of in a humane way.

Operators who are involved in the disposal of chicks have a legal obligation to ensure they do not cause any 'avoidable pain, excitement or suffering to any animal' under *The Welfare of Animals (Slaughter or Killing) Regulations 1995* (WASK '95)(as amended).

This leaflet focuses on the principles of gas killing, the relevant legislation and the advantages and disadvantages of the types of gas mixture used to kill chicks in the UK. It aims to provide constructive, practical advice to maximise bird welfare.

All staff involved in the killing of day-old chicks must fully understand the operation of the equipment they are using and how to deal with any problems that might arise.

Background

The development of the poultry industry has led to birds being genetically selected for different purposes, either egg or meat production. Laying hens are bred to produce as many eggs as possible, with a minimal amount of weight gain. Only females can be used in the laying industry and it is not economically viable to keep the males of laying strains for meat production. As a result, over 40 million day-old chicks are killed each year in hatcheries because they are males unwanted for the production of eggs or because they are sickly or deformed.

Three methods are legally permitted methods for killing chicks; these are:

- exposure to gas mixtures
- Instantaneous Mechanical Destruction (IMD)(see Humane Slaughter Association (HSA) Technical Note No. 9)
- dislocation of the neck (only recommended by the HSA for use in an emergency)

Unlike the killing of adult birds using gas, it is still legal for chicks to be killed using a source of 100% carbon dioxide. However, this is an acidic gas which is thought to be highly aversive to birds at concentrations above 25%.

The HSA does not recommend 100% carbon dioxide as an acceptable method for day-old chick disposal.

Principles of gas killing

The killing of chicks with gas mixtures does not result in an immediate loss of consciousness, therefore it is important to ensure that the induction of unconsciousness does not cause distress to the chicks. In addition to this, the type of gas used must be suitable for a commercial environment. The characteristics of an ideal, humane and efficient gas mixture include that it must:

- be capable of killing chicks
- be non-aversive
- induce loss of consciousness as rapidly as possible
- be reasonably cheap and safe to use in industrial conditions
- be relatively easy to contain within an open container

Humane Slaughter Association





UK legislation

WASK '95 controls the killing of chicks by exposure to gas mixtures. Legal requirements include:

- chicks must be placed into the gas mixture and remain there until they are dead
- gas mixtures can be:
 - (i) 90% argon (or other inert gas) and a maximum of 2% total oxygen by volume (2% total oxygen by volume is the proportion of oxygen in a 90% argon, 10% air mixture, as the amount of oxygen in air is 20.9%)
 - (ii) a maximum of 30% carbon dioxide and a minimum of 60% argon (or other inert gas) with no more than 2% total oxygen by volume
 - (iii) the highest possible concentration of carbon dioxide from a source of 100% carbon dioxide (**not recommended by the HSA**)

Gas mixtures

From these specifications and further research, potentially suitable gases have so far been narrowed down to carbon dioxide, argon and nitrogen.

Carbon dioxide is relatively cheap, heavier than air (therefore easy to contain) and is an anaesthetic gas which produces rapid unconsciousness when inhaled at high concentrations. However, it is acidic and thought to be highly aversive to birds at concentrations above 25%. **Argon** is an inert gas (colourless, odourless and tasteless), that is heavier than air. It kills chicks by anoxia (lack of oxygen) and is non-aversive. Argon is more expensive than both carbon dioxide and nitrogen. **Nitrogen** has the same properties as argon except it is slightly lighter than atmospheric air, so may be more difficult to contain in high concentrations.

The differences in time taken to loss of posture (an indication of approaching loss of consciousness) do not vary much between carbon dioxide, argon and nitrogen. However, the behaviour of chicks before the loss of consciousness indicates that anoxic gases (argon and nitrogen) do not cause any apparent respiratory discomfort and therefore should be the preferred gases to use.

With all these gas mixtures convulsions may occur, but start only after the loss of consciousness and are therefore not thought to have any welfare implications.

It must be noted that when anoxic gas mixtures are used for the euthanasia of day-old chicks the residual oxygen concentration is critical. This must be kept below 2% and exposure to the gas mixture must be for long enough to ensure that all chicks are all killed effectively and as quickly and humanely as possible. The HSA recommends that residual oxygen level should not exceed 1%.

Further reading

Code of Practice for the Disposal of Chicks in Hatcheries (2nd Edition) HSA 2001
Technical Note No.9 Instantaneous Mechanical Destruction HSA 2005

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