INCINERATION

THIS CHAPTER DESCRIBES WHAT'S INVOLVED IN PROPER INCINERATION, AND:

- **its advantages**
- **equipment – types, sizing, siting**
- **costs of purchase and operation.**

Incineration is a legal option for disposal of deadstock. If done properly with the right equipment, it can reduce the carcasses to an inert ash.

The initial expense of the incinerator, the cost of fuel, and maintenance of the incinerator make this an expensive option. The poultry industry has used this method for disposal of deadstock occurring in their regular operation. However, the size and cost of units capable of incinerating large quantities of poultry or large carcasses should be considered relative to other disposal options.

In the past, more nuisance complaints were generated by improper combustion practices than by any other means of disposal. Piling deadstock, dousing them with fuel, and igniting the pile is not an acceptable method of incineration. Nor is feeding them into an outdoor furnace.

Outdoor furnaces are not suitable for incineration.

Homemade incinerators, usually constructed from 45-gallon barrels or other drums, are unsatisfactory because they do not adequately control the emission of contaminants to the air.

WHAT'S INVOLVED

Incineration refers to fuel-assisted cremation of deadstock. Specially designed on-farm incineration units use fuel, temperature controls, and enclosed environments to reach high temperatures, and secondary combustion (afterburner on flue) to reduce gaseous emissions.

Regulation 106/09 for deadstock disposal under the Nutrient Management Act, 2002 requires that an operator must not use an incinerator unless it has been issued a Verification Certificate by the Environmental Technology Verification Program (ETV Canada). This means it has a secondary chamber capable of maintaining the gases entering it from the primary chamber for:

- ▶ at least 1 second at a temperature of 1,000 °C (1,832 °F) or higher, or
- ▶ at least 2 seconds at a temperature of 850 °C (1,562 °F) or higher.

This reduces the particulate and gas emissions, thus reducing odour and smoke.

An incineration unit must have the capacity for secondary combustion to be effective and safe.

ADVANTAGES

Using fuel-assisted incineration equipment to dispose of deadstock has definite advantages. On-farm incineration is biosecure. It gets the deadstock out of public view and reduces the potential for attraction of scavengers and flies. Modern incineration equipment can reduce the deadstock to a fraction of their original weight, leaving just an inert ash behind.

Properly maintained, the equipment is easy to operate and does not have excessive labour requirements. The deadstock is simply loaded into the incinerator and the controls are set for complete burning. Only periodic observation, routine maintenance, and cleanout of ash are required.

Incineration can be used as an alternative in areas where drainage is poor (making burial unacceptable) or where rocky soil makes digging expensive.

It's one of the most biologically safe methods of disposal and does not create water pollution problems. The comparatively small amount of waste by-products (ash) can be disposed of easily.

The main environmental concern with units not equipped with the secondary burner is the emission of particulates that are generated during the burning process.

Commercial incineration units operate on propane, diesel, or natural gas.

TYPES OF INCINERATORS

Commercially available and approved incinerators are the best equipment to ensure proper burn and to avoid creating pollution.

Incinerators usually operate on diesel, natural gas, or propane. The discharge stacks must be fitted with afterburning devices in order to be approved. Diesel-fuelled incinerators require from 4 to 12 litres (0.9–2.7 Imp gal) of fuel per 45 kg (99 lb) of carcass.

Large deadstock are more difficult to burn and awkward to handle, and require more fuel per weight of carcass to reduce them to ash.

When purchasing an incinerator, consider the following features:

- sturdiness – the unit should be able to operate under heavy loading conditions and withstand high operating temperatures
- automatic controls – a unit that can be loaded, ignited, and allowed to run on a timer is a real convenience
- capacity – the livestock operation must estimate the expected daily mortality rate and consider animal size when calculating the incinerator capacity needed
  - the incinerator should be able to accommodate normal daily deadstock
  - when heavy, unexpected losses occur, alternative methods of disposal should be considered.

Homemade incineration units are unsuitable for incinerating on-farm mortalities.

Selecting an appropriately sized unit will avoid overloading and ensure proper operation for a longer period of time. Commercial incinerators are typically marketed with specific burn rates (kg/hour).

Before choosing incineration, carefully consider the start-up and ongoing cost of operating an incineration unit relative to other disposal options.

SIZING OF UNIT

Incinerators are a more viable option for smaller deadstock. Providing low and consistent volumes of deadstock is the most practical way of operating an incinerator. As the weights and volumes being incinerated increase, the required fuel-per-weight ratio increases.

This is why keeping the deadstock in cold storage and only operating the incinerator once a week makes sense in terms of labour – but requires more fuel. The prompt incineration of deadstock, as they occur, reduces the size of the unit required.

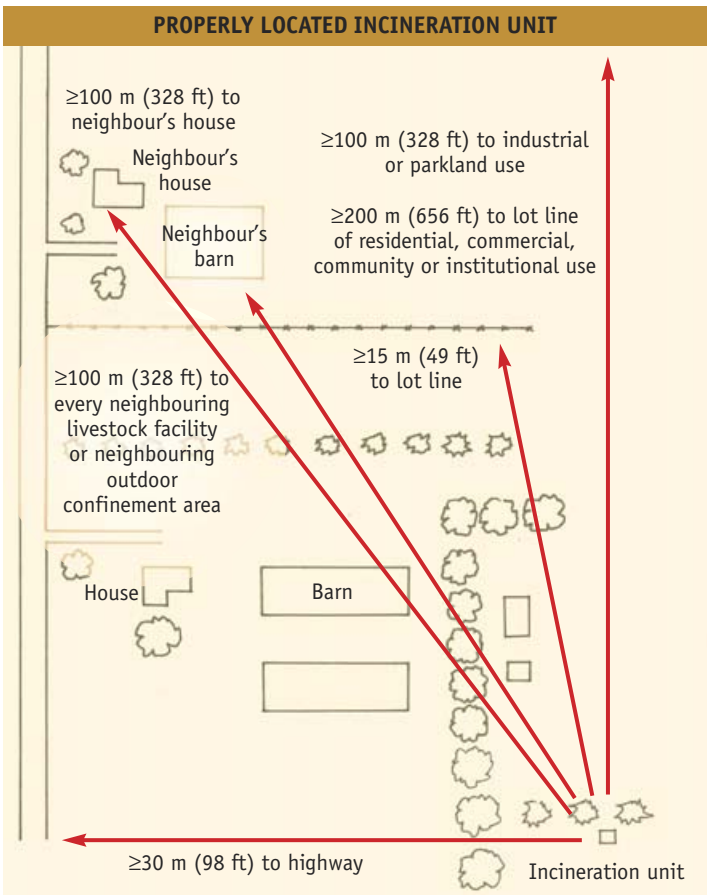
Under the regulation, a maximum of 1,000 kg (2,205 lb) of deadstock can be incinerated in a 24-hour period. A unit for poultry incineration will not require as large a chamber as one used for swine or cattle.

It is imperative that recommended procedures for locating and operating the unit are adhered to, and the units maintained to proper operating specifications.

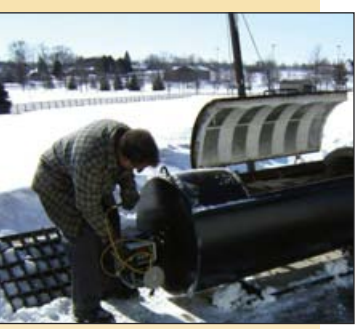
LOCATION OF UNIT

Placing the incinerator in a convenient location is very important. Care must be taken to avoid potential problems such as odour complaints from neighbouring properties and even family. Ideally, the unit should be downwind from operations, farm residences, and neighbours.

To protect the incinerator from the forces of nature and extend its life, place the incinerator on a concrete slab under a shelter. Because of the intense heat that's generated, clearance between the discharge stack and any wooden structure must be maintained in accordance with the Building Code. Any combustible roof parts must be at least 45 cm (18 in.) from the incinerator chimney.



A properly sited incineration unit will prevent issues with neighbours. Follow the procedures in the earlier Planning chapter (pg. 32) to choose the most suitable location.



Sturdiness, ease of loading, and control systems are key considerations when selecting a commercial unit.

ASSOCIATED COSTS

The capital costs of incineration equipment vary among different manufacturers and with incinerator capacity and operational features.

Other associated costs are:

- hookup to the fuel source and inspection
- specialized equipment necessary for handling the deadstock and ash
- site preparation
- the construction of a concrete slab and shelter
- fuel storage.

Some considerations in evaluating the cost of operating incinerators include the burn rate and price of fuel. Incineration costs can vary depending on weight, moisture, and fat content of the deadstock, and the loading capacity of the unit. As the size of the deadstock increases, so does the burn time.

Maintenance costs can be significant. Expendable parts and grates need to be replaced every two or three years. The entire unit may require complete refurbishment or replacement every five to seven years.