

## SECTION 7

# Mortality DISPOSAL

Disposal of dead livestock must be in accordance with Section 15 of the Livestock Manure and Mortalities Management Regulation (Appendix B). This regulation specifies that mortalities must be kept in a secure storage room, covered container or secure location and continually frozen or refrigerated if not disposed of within 48 hours after death. They must be stored in a location that prevents access by scavenger animals such as coyotes, wolves, dogs or birds. Acceptable methods of disposal include delivery to a rendering plant, burial, composting or incineration.

### 7.1 Rendering

Rendering is the ideal method of disposal for dead pigs. However, if a rendering plant is not nearby, the time and expense for traveling may make delivery impractical for small mortality numbers.



Container for temporary storage of mortalities.

Rendering companies may have restrictions on the condition of the mortalities they process. In general, the mortalities should be brought in as quickly as possible in the summer time. Pigs that die during the winter can be frozen and delivered to the rendering plant at periodic, convenient intervals. Rendering companies will generally not accept mortalities that do not remain intact when handled. Depending upon the end product of the rendering process, there may be other restrictions on mortality quality and condition.

### 7.2 Burial

Burial is an acceptable method for dead animal disposal under certain circumstances. Small operations (less than 300 A.U.) are allowed to bury routine mortalities, however, operations with 300 or more A.U. are not permitted to bury mortalities on the operation's property without written approval from the director of Manitoba Conservation.

Caution is required when selecting a burial site. The site should be at least 100 m (328 ft) from any surface watercourse, sinkhole, spring or well, property boundary, and any source of water used for domestic purposes. Areas with high groundwater levels or shallow aquifers must be avoided.

Dead pigs can be placed in a trench which is backfilled each time a mortality is added. Mortalities must be covered with a minimum one metre (3 ft) of soil. It should be noted that, depending on soil conditions, decomposition can be very slow with mortalities remaining intact for five years or more.

During the winter, mortalities must be stored in a secure location (such as a covered trailer) where they are frozen and protected from scavengers until burial is possible in the spring. If left unprotected, scavengers will drag the mortalities around, creating both a nuisance and a possible health hazard. For piglets, it may be practical to store the mortalities in a designated freezer until the numbers are sufficient to justify burial.

### 7.3 Composting

Composting is becoming an increasingly popular method of disposing of dead animals. Mortality composting is a controlled process in which bacteria, fungi, and other microorganisms convert the dead animals and organic material into a stable humus-like product through both aerobic and anaerobic decomposition.

There are two phases with mortality composting. In the primary phase, mortalities that are high in nitrogen are surrounded with a bulking material high in carbon such as sawdust, straw or wood chips. During this phase anaerobic microorganisms work to decompose the mortalities releasing fluids and gases. The material surrounding the mortality is aerobic. When the fluids and gases enter the aerobic zone, aerobic microorganisms break them down into carbon dioxide and water. Temperatures in the primary phase should reach above 40°C for at least seven consecutive days. Once the temperature in the pile drops continuously for 10 to 14 days, the primary phase is completed and it is time to turn the pile.

The secondary phase of the process involves turning the pile regularly to introduce oxygen and increase aerobic activity. Large bones and hair remaining from the primary phase decompose during the secondary phase. The pile should be turned once a week to maximize aerobic activity. This increase in microbial

activity will cause the temperature in the pile to rise again. The compost is finished and ready for storing or applying on the field when the temperature of the pile has dropped to the outside air temperature, which indicates that bacterial decomposition is complete.

During the primary and secondary phases of mortality composting, the volume and weight of the pile is reduced due to the loss of carbon dioxide and water to the atmosphere. The bulky raw materials should be transformed into a crumbly, finer-textured compost. Properly finished compost should appear as a dark, granular material resembling humus or potting soil. It may have a slightly musty odour. Some resistant materials (bones, skull parts, teeth) may be visible, but they should be soft and crumble easily.

The amount of time required to complete the entire composting process will depend on the type of bulking agent, temperature, moisture, management and mortality size. Normally, the secondary stage of composting will take roughly the same length of time as the primary phase. Turning the pile frequently to maintain aerobic activity should reduce the time required for the secondary phase.

Once the compost process is finished, the compost can be used as an inoculant to quick start a new compost pile or applied to fields. If the finished compost is applied to fields, it should be tested to determine the nutrient content and applied at a rate beneficial to the soil.

Composting piles must be sited, designed and managed so they do not cause pollution and are secure from scavengers. Composting sites should be located at least 100 m (328 ft) away from any surface watercourse, sinkhole, spring or well, property boundary, and any source of water used for domestic purposes. When locating the composting site, the farm residence and any

neighbouring residences should be taken into consideration. Proper composting should not result in offensive odours. However, the handling of mortalities and compost on a daily basis may not be aesthetically pleasing. The following factors should be considered when planning the composting site:

- traffic patterns required to move dead pigs to composting site
- soil type - some soil types (sand, gravel) will require a clay or asphalt liner
- drainage of the site - a well-drained site that is not subject to runoff or ponding water and is accessible all season
- wind direction
- aesthetics
- future expansion

### 7.3.1 Windrow or static composting

Windrow or static composting piles are commonly used in Manitoba. They are less costly than other composting structures, such as bin or in-vessel composting units. However, they require more management, since weather conditions that affect composting can not be controlled.



Multi-bin composting system

### 7.3.2 Bin composting

There are many different types of composting bins that can be used for composting mortalities. They may be constructed with wood, concrete or straw bales. Hoop structures and altered machine sheds can also be used for bin composting. A bin system usually consists of at least two primary bins and one secondary bin, along with a roofing system to help control moisture levels. An asphalt or concrete pad with a 10 to 15 cm (4 to 6 in) curb to prevent leaching may be required in areas with readily permeable soils such as sands. Each bin must be wide enough to allow access with a front-end or skid-steer loader and tall enough to accommodate up to 1.8 m (6 ft) of material.

### 7.3.3 In-vessel composting

An in-vessel mortality composter is usually a container such as a drum or silo. It is aesthetically pleasing and is ideal for farms with space constraints. Batches of materials are enclosed in the container and mechanically mixed on a regular basis. This frequent mixing introduces more oxygen to the composting process, which increase the breakdown of the material and as a result, reduces the time of the primary composting phase. With an in-vessel system, the operator is able to control the composting environment, regardless of outdoor weather conditions.



In-vessel composting system

#### **7.4 Incineration**

Incineration is an acceptable method of disposal if performed in accordance with the Incinerators Regulation or using an incinerator that is acceptable to Manitoba Conservation. For mortalities to be burned without creating an odour problem, the temperature of the incinerator must be sufficiently high. Incineration requires a large amount of energy to completely cremate mortalities.

#### **7.5 Disposal of Mass Mortalities**

In the case of mass mortalities from events such as a barn fire or a disease outbreak, operators should contact their local Environment Officer for instructions on appropriate disposal. If there is a suspected animal health issue, operators should work with their veterinarian to determine how to deal with the situation.