

Proper Disposal of Dead Animals in Michigan

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The Bodies of Dead Animals Act (BODA; Act 239 of 1982, as amended) regulates the management of dead animals in Michigan. The intent of this law is to:

- Protect human and animal health
- Reduce risk of disease transmission
- Control flies, vermin, and scavengers
- Protect ground and surface water and air quality

A person violating BODA is guilty of a misdemeanor punishable by a minimum fine of \$300 or imprisonment for a minimum of 30 days, or both. Three or more convictions for violating BODA is a felony punishable by imprisonment for up to one year or a fine of up to \$2,000, or both.

Under this act, there are currently six alternatives for dead animal disposal in Michigan:

- Burial
- Incineration
- Rendering
- Land-fill
- Composting
- Anaerobic digestion

The Michigan Department of Agriculture and Rural Development may require an alternative disposal method, at the owner's expense, if all of the current disposition methods for dead animals inadequately address potential toxicological contamination threats to human or animal health, or to the environment.

Regardless of which method of disposal is being used, all mortalities must be disposed of within 24 hours after death. The three exceptions to this rule are 1) dead animals stored secure at less than 40° F for no more than 7 days or at less than 0° F for no more than 30 days; 2) small mammals, deer, and birds taken under the authority of a damage and nuisance animal control permit issued by the MDNR (Part 401, NREPA, 1994 PA 451, MCL 324.40101 to 324.40119); and 3) road kill.

Farming mortality must only be those animals "intrinsic to an operation under common ownership or management." Carcasses may originate from multiple farm sites and be a mixture of livestock species, if all are owned by the same person or firm. Composting mortality from more than one farm site at a single composting facility can place a multiple-site operation, when under common ownership and sharing a common composting facility, into a NPDES permitted situation. Dead animals may be transported from several sites as long as BODA rules for transport are followed. Vehicles and (or) container(s) cannot leak or spill and must be covered so that public viewing of the dead animals is not possible.

Burial

Burial sites must have no contact with bodies of water; both surface and ground, and must be at least 200 feet from wells. Frozen ground makes burial difficult in winter.

Individual graves must be:

- At least 2 feet beneath the natural surface
- Limited to 100 graves/acre or 5 tons of tissue/acre
- Separated by a minimum of 2.5 feet
- Closed within 24 hours of opening

Common graves must:

- Be limited to 2.5 tons of tissue per acre
- Be separated by minimum of 100 feet
- Have each day's mortality covered with minimum of 1 foot of soil
- Not remain open for longer than 30 days
- Have at least 2 feet of soil as final cover

Incineration

Burning must not cause a public nuisance. Act 451, Part 55 "sources of air pollution" states that incinerators must be permitted by Air

Quality Division of MDEQ. Residues from the burning process must be buried as outlined above, land-applied at agronomic rates, or properly disposed of in a landfill licensed by the MDEQ.

Rendering

Rendering services must be provided by a licensed dead animal dealer, rendering plant or animal food manufacturing plant. As of April 27, 2009, rendering facilities are required to remove the brain and spinal cord of all cattle ages 30 months and older if by-products are to be used for animal feed. FDA is trying to lessen the chance of bovine spongiform encephalopathy getting into the human food supply. The rule presents new challenges for renderers and farmers, including documenting and identifying such animals.

Landfill

Farmers should contact local landfills to learn if they will take delivery or pick-up farm mortality. The number of Michigan landfills which take dead animals has varied in recent years. Arrangements can be made for carcass pick-up by the waste management firms, but they must comply with provisions for transportation as written in BODA. If a farmer delivers to the landfill, BODA rules for transport must be followed and the risks of transporting disease from the landfill site back to production facilities need to be addressed as part of the farm's biosecurity plan.

Composting

This is the biological decomposition of animal tissues under controlled or managed conditions. After composting, soft tissues should not be recognizable, bones should be broken in small pieces, and the compost should be aesthetically acceptable to other people. All composting rules under BODA must be followed. A comprehensive document named the Michigan Animal Tissue Compost Operational Standard (MATCOS) was written to explain in detail the composting options provided to farmers in BODA. These may be found on-line at: <https://www.msu.edu/~rozeboom/catrn.html>.

Under BODA, mortality composting on-farm may be done in piles or in-vessel. Piles may be shaped in: 1) bins, 2) open piles, 3) overlapping piles, or 4) windrows. With any of these methods, aeration of the compost material may be forced (mechanized with fan and ductwork), active (mechanical turning of material), or passive (air exchange within the composting material as fresh air is pulled into the lower portion of the pile as heat takes gases out of the upper portion of piles).

For smaller farms with 20,000 pounds or less of mortality annually, composting may be done in piles on bare soil without floor or roof (a.k.a. "open"). The soil must be land used for crop production. Collection of compost leachate is not required, but it must not cause a violation of any other federal, state, or local laws.

For larger farms, with more than 20,000 pounds of mortality annually, open piles or windrows may also be used, but they must be on a concrete pad or liner which is laid down according to the NRCS 313 practice standard. Using a concrete pad or liner with open pile and windrow compost ensures adequate environmental protection and provides a solid surface year-round for driving of large equipment even with freezing, thawing, and precipitation.

Site selection is important. On-farm traffic patterns, equipment access, animal housing, feedstuff movement, and adequate space around the compost materials for loading, unloading, and mixing should be considered. All composting sites must meet the following criteria:

1. Well drained soil with a minimum setback of 200 feet from waters of the state such as lakes, streams, wetlands, sinkholes, seasonal seeps, or other "hydrologically-sensitive" areas.
2. A minimum of 2 feet above the seasonal high water table.
3. A minimum of 200 feet from any well.
4. A minimum of 200 feet from the nearest non-farm residence.
5. Management of active composting is required to be done under the conditions:
6. Carbon-to-nitrogen ratio 15:1 to 40:1.
7. Moisture content, range of 40 to 60%.
8. Oxygen concentration of greater than 5% which accompanies a compost density in the range of 800 to 1200 pounds/cubic yard.

All composting systems require the controlled formation, identification, and management of compost batches. BODA requires that each batch undergoes a minimum of three heat cycles over 130° F before final utilization as "finished" compost. Timely aeration and moisture additions will allow active composting to continue in repeated heat cycles for months and minimize total composting time.

Bulking agents (a.k.a. feedstocks, amendments, carbon sources) are organic materials placed around carcasses to provide nutrients, desirable density, and aeration. An approved list of bulking agents is given in BODA.

Flies, rodents, pests, vermin and other scavengers or predators must be controlled so as not to disrupt the compost or constitute a risk or health hazard to human or animal populations. A biofilter, or layer of fresh, bulking agent, placed over a pile after each addition or each aeration, reduces odors and discourages pests. Carbon-rich materials such as chopped bean stover, chopped corn stover, chopped straw, dried grass, grain hulls, chopped dried hay, and sawdust or shavings should be used as biofilter materials. Animal

manure solids, partially-decomposed feedstocks, green grass clippings, fresh hay, green leaves, and litter cake are less effective in controlling odors, insects, and vermin and should not be used as a biofilter.

Finished compost should have no visible pieces of soft tissue when reused in new compost batches or spread on cropland. Large bones of mature animals generally take 2 to 3 times as much time as soft tissues to compost. Bones should be placed in a new batch of compost for further decomposition until easily crumbled during the mechanical spreading process. Finished compost need not be fully cured.

Records containing all of the following information must be kept by the owner or operator of the composting facility for a minimum of 5 years and must be made available to MDA immediately upon request.

1. The start date of each compost batch.
2. Date of and approximate weight of dead animal additions to new compost batches. Animal tissue additions to a new pile should be concluded in two months or less to facilitate proper management of the compost batches.
3. The internal temperature of each actively composting batch measured weekly, except twice per week for a rotating drum, continuous flow, in-vessel system. The internal temperature of curing material measured once each week.
4. The date compost material is aerated if done with loader or turning equipment.
5. The final use or distribution of finished compost, including the method, location, date, and volume for the batch.

Commercial Composting Pilot Program

While Michigan currently does not have language in its regulations allowing for cooperative and (or) commercial animal tissue composting. MDA, MDEQ, MNRCS, and MSU are currently seeking businesses interested in becoming pilot cooperative or commercial animal tissue composting enterprise.

Anaerobic Digestion

Anaerobic digestion was approved as an alternative method of disposal on June 2, 2011. Management of anaerobic digestion is required to be done under these conditions:

1. Temperature: 95 degrees Fahrenheit to 145 degrees Fahrenheit.
2. Hydraulic retention time: greater than 20 days.
3. pH: 6.8 to 7.5.
4. Volatile solids loading: in the range of 0.02 to 0.25 pounds of volatile solids per cubic foot.
5. Total solids of the digester contents: not to exceed 20% (200,000 ppm).

Modifications to the operating parameters require approval from the director and may occur when the director has sufficient evidence that the modifications will allow the process to work effectively without causing harm to humans or the environment. Processing of whole carcasses or portions is recommended prior to introduction into the anaerobic digester. Size reduction so that all pieces of tissue are less than 2 inches will improve heat transfer and expose additional surface area for biological activity.

The owner or operator of the anaerobic digester must keep records for 5 years containing the following information:

1. The approximate weight, maturity, and species of dead animals or afterbirth added each time an addition is made and the dates the tissue is added to new batches.
2. The daily input mass or volume of all other digester feedstocks.
3. The daily temperature digester contents.
4. Daily biogas production information.
5. Quarterly biogas composition information.
6. System maintenance and operation logs.
7. Design and construction documents showing the as-built capacity of the anaerobic digester
8. The final disposition of digestate, including the method, destination, date, and volume for the batch.
9. A contingency plan to remedy problems and ensure the continued proper management of dead animals.

Mass Carcass Disposal in a Major Animal Health Emergency

A memorandum between MDA, MDEQ, and the Michigan Department of Natural Resources was entered into in September of 2004, to define their respective roles and responsibilities when mass carcass disposal is needed because of a major animal health emergency (e.g. a foreign animal disease or a natural disaster). Work with your veterinarian quickly when you become aware of the potential for disease. BODA address only the normal and natural mortality occurring on a farm. Sub rule 5 in section 19 of BODA says that any increase in normal natural daily mortality, due to any cause known or unknown, shall be reported to the MDA Director immediately. This is a biosecurity measure intended to protect our state's and nations' animal agriculture industry. A document entitled Standard Operating Procedures for Michigan Mass Carcass Disposal is available at: http://www.michigan.gov/mda/0,1607,7-125-48096_48404-.00.html.