UF UNIVERSITY of FLORIDA
IFAS Extension

VM171

Methods of Large Animal Carcass Disposal in Florida[1]

J.K. Shearer, Max Irsik and Ed Jennings[2]

Introduction

Even when animals are well cared for they sometimes die, and when they do, we're left with a carcass in need of disposal. In Florida, there are plenty of coyotes, buzzards and other scavenging animals willing to assist with carcass removal. This seems a natural way to dispose of an animal carcass; it serves the purpose of disposing of the carcass and provides food for the scavengers. This practice may be acceptable on large acreages, especially those without nearby neighbors and areas containing upland woods and brush. However, this natural method isn't permitted in many areas, and some scavengers become predators when carcasses are less available. This places newborn calves and other animals weakened by disease or other maladies at risk of predation. Indeed, producers are well aware that coyotes can take a significant toll on newborns. In dairy operations, calves may be attacked at birth or later when confined to a small pen or hutch. In either situation, they can become relatively easy prey for a coyote. Furthermore, a proper method of carcass disposal is needed to prevent the spread of infectious and/or contagious disease.

The problem is that socially, economically and environmentally acceptable methods of disposal have become increasingly difficult to find. Throughout the United States the disposal of animal carcasses is regulated by state laws that vary according to animal species. While there are several methods for disposal of animal carcasses, the most common are burial, composting, incineration, and rendering.

Burial

Pit burial is the most common method of disposal in swine and poultry operations. It is the most convenient means for the disposal of numerous animals. Pit burial is also popular because it is easy to prepare and use. Generally speaking, geographic areas where the water table is deep and the soil is non-porous are best suited to pit burial. Because of ground water contamination concerns, burial pits are carefully regulated and inspected by the state Department of Agriculture to assure compliance. For example, in Georgia poultry pits cannot be within 100 ft of a well, water line, pond, lake or stream.

Individual burial is usually allowed, but rules vary from state to state and from county to county. It is necessary to consult local officials for advice since there are often regulations as to the number of pounds of animal carcass per acre per year that may be buried. Large animals, such as cows and horses, are usually buried in a trench approximately 7 ft wide and 9 ft deep. Since a mature cow requires approximately 14 sq ft of trench space and death rates may be as high as 5% or higher, large dairy operations are likely to require alternate methods of disposal.

Most Florida counties have soil survey maps that can be used to determine the suitability of a specific site for carcass burial in regard to water table depth and soil porosity.

1. This document is VM171, one of a series of the Veterinary Medicine-Large Animal Clinical Sciences Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Original publication date June 2008. Reviewed October 2011. Visit the EDIS website at http://edis.ifas.ufl.edu.

2. J.K. Shearer, DVM, MS., professor and dairy extension veterinarian; Max Irsik, DVM, MAB, assistant professor, beef cattle extension; and Ed Jennings, extension agent IV, Pasco County; Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, FL 32611.

Composting

Composting is defined as the controlled decomposition of organic materials. It is a sanitary and practical method of carcass disposal. Breakdown of the carcass occurs by bacterial degradation and yields an odorless, humus-like substance that can be applied to fields using common manure-spreading equipment. Fertilizer values typical of composted carcass material contain 25 lb of nitrogen/ton, 13 lb of phosphorous/ton, and 7 lb of potassium/ton. The use of composting as a method for the disposal of carcasses often requires a permit from the state's Department of Agriculture. Properly designed composting systems have a positive environmental impact, reduce the amount of solid waste that may potentially be dumped into landfills, yield no air or water pollution, and require no chemical additives. The ingredients required for composting are simply moisture, air, bacteria, and a carbon source (straw, inedible feed, bedding material, and other materials).

The Procedure for Composting is described as a 2-stage process. In the first stage, carcasses are placed into a compost area with carbon bulking agents (wood chips, straw, sawdust, dead leaves and/or other bedding material). When composting smaller animals such as calves one may use a bin or area with alternating layers of the carbon bulking material. Always begin with a base layer of dry material approximately one to two feet deep under the animal to act as a sponge for fluids that seep from the carcass. The bigger the animal the deeper the base layer required The base layer should extend a minimum of two feet beyond the animal on all sides.The animal should be covered with compost ingredient material to form a peaked pile so as to provide a minimum of one to two feet of cover all around the animal. Frequently, it is convenient to compost large animals such as cattle or horses in individual piles or windrows. Water may be added to the mixture. It should be left alone for a minimum of 6 months. During stage 1, soft tissue will break down completely and bones will soften and undergo partial decomposition.

After 6 to 9 months it is time to begin stage 2. Begin this stage by mixing and aerating the contents of the compost pile. When mixing is complete, re-cover the pile and leave it undisturbed for another 6 months. After this time the compost is ready for field application. Alternatively, some prefer to leave the pile alone for the entire 12 month period after which time they will remove the compost and spread it directly on crops. Regardless, one of the keys to successful composting is to leave the compost pile undisturbed during the 1st and 2nd stages of the degradation process. This assures a more complete breakdown of the soft tissues and bones.

Experience with composting has also shown that a carcass will compost more quickly if it is quartered and the thorax, abdomen and rumen are opened prior to composting. It generally requires a minimum of 9-10 months to compost an intact cow carcass. Bones from immature animals will usually degrade rather quickly in the compost, whereas bones from more mature animals may take several seasons to totally break down However, bones that do not break down may be used as base material for the next compost pile. Some suggest that bones may also be buried or placed in a "bone pile," where they may serve as a calcium source for wild animals. As bacteria compost the carcass, temperatures as high as 140o F are produced. This is sufficient to kill most pathogenic bacteria (with the exception of spores) and viruses. Composting is likely one of the best options for disposing of carcasses; however persons who may be considering this option are advised to contact their local officials on regulations regarding the use of composting systems. Some states require a training program for persons to become certified to compost livestock.

Tissue Digestion

Tissue digesters are used in diagnostic laboratories and other similar industrial facilities. This technique digests the carcass by a process of alkaline hydrolysis. A strong alkali in combination with high temperature is used to solubilize and hydrolyze the tissues, resulting in a neutralized solution of amino acids, peptides, sugars, and soap that is suitable for release into the sewer system. The only solid materials that remain after tissue digestion are minerals from bones and teeth. The College of Veterinary Medicine at the University of Florida currently uses a tissue digester for carcass disposal purposes in its diagnostic laboratory. Prior to use of the tissue digester, all carcasses at the College were incinerated. The tissue digester has major advantages for industrial use but is far too costly for use under farm conditions.

Incineration

Incineration has major advantages in terms of bio-security, but like tissue digestion, it is costly and impractical for routine carcass disposal in farm situations. When performed properly incineration of carcasses produces little or no odor. State and federal Environmental Protection Agencies regulate incinerators used for the incineration of animal carcasses.

Rendering

Rendering is a process whereby the carcass is cooked to destroy pathogens and yield usable end products such as meat, feather, bone and blood meal. This is an environmentally safe method of carcass disposal and permitted for use in approximately 50% of the states within the United States. There are restrictions on the rendering of sheep, goats, cattle, and farm-raised deer or elk in some areas because of concerns about the transmission of the spongiform encephalopathies, the most notable of which is BSE (Bovine Spongiform Encephalopathy), associated with cattle. The concern regarding rendering is that it is an industry in steady decline. Today, there are many areas of the country with little or no rendering services available.

Conclusion

The task of a good livestock steward does not end when an animal dies. Proper carcass disposal can reduce chances of groundwater contamination, inhibit the spread of disease, maintain good relationships with neighbors, and improve the image of animal agricultural industries. Burial, incineration and rendering are acceptable methods of carcass disposal depending upon potential for ground water contamination, cost of fuel, and availability of renders, respectively. Whether these options exist in all areas or not, experiences with composting suggest that it is an environmentally safe and effective alternative for carcass disposal. The one sure thing is that like all living beings, animals will die and as they do, we must be prepared to properly dispose of their carcasses. The web sites listed below provide further information on carcass disposal options.

Selected References

1. Glanville, TD, DW Trampel: Composting alternative for animal carcass disposal. 1197. JAVMA, 210(8):1116-1120.

2. Sander, JE, MC Warbington, and LM Myers: Selected methods of animal carcass disposal. 2002. 220(7):1003-1005.

3. Bonhotal, J, L Telega, and J Petzen: Natural Rendering: Composting Livestock Mortality and Butcher Waste. Fact 2002, p. 1-12.

Websites and University Sources of Information on Carcass Disposal:

Cornell University

http://cwmi.css.cornell.edu

http://cwmi.css.cornell.edu/composting.htm

http://compost.css.cornell.edu/naturalrenderingFS.pdf

Iowa State University

http://www.ag.iastate.edu/

University of Wisconsin Extension

http://cdp.wisc.edu/

University of Maryland

http://extension.umd.edu/

http://extension.umd.edu/publications/index.cfm

University of Nebraska

http://water.unl.edu/manure

Ohio State University

http://fabe.osu.edu/composting.htm

http://ohioline.osu.edu/aex-fact/0711.html

http://ohioline.osu.edu/aex-fact/0712.html

http://ohioline.osu.edu/aex-fact/0713.html

Penn State

http://composting.cas.psu.edu/

Purdue University

http://www.ces.purdue.edu/pork/

Washington State University

http://organic.tfrec.wsu.edu/compost/ImagesWeb/CompSys.html

Virginia Tech

http://www.pubs.ext.vt.edu/442/442-037/442-037.html

University of Minnesota

http://www.extension.umn.edu/administrative/disaster-response/bmp96.html

Michigan State University

http://www.msu.edu/user/mdr/news/mortality.pdf

Texas A&M University

http://tammi.tamu.edu/research.html

Utah State Extension

http://extension.usu.edu/