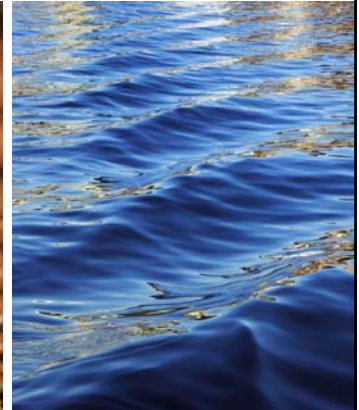


# Mortality as Part of a Comprehensive Nutrient Management Plan (CNMP)

Renee Hancock, NRCS State Water Quality Specialist



## *NRCS Practice Standard* Animal Mortality Facility (Code 316)

- Reduce impacts to surface and groundwater resources;
- Reduce the impacts of odors;
- Decrease the spread of pathogens.



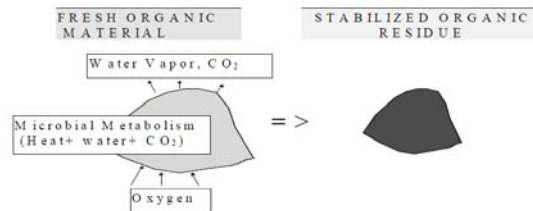
# Carcass Composing

*In General*

- Practical for all sizes of carcasses, including whole cattle.
- “Farming Microorganisms”
  - Providing optimum conditions for microbes to do the real work.
  - Temperature Management is critical
- Takes 2-12 months, depending on mortality size & conditions.
- Converting organic matter into fine-particle humus-like material.
- Nutrients & organic matter in finished product can benefit crop, hayland, pasture and forest.



## Composting Process



## *NRCS* Conservation Plan for Animal Mortality Facility

- Site Plan Map of livestock operation, including the planned facility location
  - Practice Unit Estimates
  - Structural Details of All Components
- Soils map & soils description; Topography Map
  - [Sensitive Areas & Setbacks](#)
- Number and Capacity of Facility (estimated mortality) – Show Calculations
- Nutrient Management for Final Compost
- Operation and Management Requirements
- Record Keeping
- Odor Management or minimization requirement

## Site Guidelines

### *Resource Concerns & Regulatory Requirements*

- Surface Water Quality
  - Leachate Control (DEQ)
  - Runoff Control
- Ground Water Protection
  - 3 Feet above Ground Water
  - Seepage Control
    - Concrete, compacted clay liner
- Biosecurity
- Public Perception
- Traffic
- Regulatory Requirements maintain applicable setbacks as designated by
  - NE Dept. of Ag (NDA).
  - NE Dept. of Environmental Quality (NDEQ)



#### **Bins and Bunkers**

- Made from hay bales, treated wood, metal and/or concrete
- **Roofed or open – may be influenced by U.S. location.**
- Smaller footprint
- Bales may absorb runoff – if any
- Less Visual Nuisance

## Area Requirements

### *Footprint & Sizing*

#### **Windrows & Piles**

- Generally require more land space
- Largest physical footprint
- If composting is not properly managed, then prone to:
  - Scavengers
  - Visually Unattractive
- Lowest Capital Costs



#### **Invesel**

- Requires less space than Windrows & Piles, a little less than bins/bunkers.
- Good process control because of Self Containment
- Covered Structure
- Higher Capital Costs
- Careful management required.

## Nutrient Management (Code 590)

- Nutrient Value of Compost
- Cropping History – Crop Rotation, Tillage, Yields, Soil Test Reports
- Budget - Estimate Cropland Requirements & Application Rates
- Land Application Sites
  - Control/Ownership
  - Site Aerial Site Maps, Soils Maps, Location of Sensitive Areas
- Risk Assessments – N & P
- Equipment – Loaders/Spreaders
  - Annual Calibration of Spreaders
- Sampling Protocols
  - Soil
  - Compost – final Product



## Nutrient Value

*Estimated*

	General - Mortality Composting		Poultry Composting (with poultry litter)	
	Lb./Ton	%/Ton	Lb./Ton	%/Ton
Total nitrogen (N)	20 lbs./T	1.0%	40	2%
Ammonium-N	4 lb./T	0.2%	12	0.6%
Organic-N	16 lb./T	0.8%	28	1.4%
Phosphorus	2 lb./T	0.1%	20	1.0%
Potassium	6 lb./T	0.3%	25	1.25%

\*Ohio's Livestock & Poultry Mortality Composting Manual, 2000 Ohio State University Extension.

N%-P%-K%

In General

1%-.1%-.3%

Lbs. / Ton

16- 2- 6

Poultry Litter

2%-1%-1%

Lbs. / Ton

28-20- 25

If Broadcasting, No Incorporation

## ESTIMATING QUANTITIES

**BEEF - 12 cu ft per 1200 lbs of dead or 1 cu ft of carbon source for each per 100 lbs. of carcass.  
(Remember 1 cu yard = 27 cu ft)**

*Calculate pounds of startup = (Annual pounds of deads divide by 1000) multiple by 12.0 cu yards. To convert to cubic feet, multiply by 27.*

Annual pounds of dead	1,200	÷ 1000 x 12.0 cu yd =	12.0	cu yd of cornstover
			324.0	cu ft of cornstover
Round bales of corn stover needed (1 bale = 140 cu ft)			2.3 Round bales ave. 1200 lb.	

**1200# beef + 2.3 bales (at 1200#) = 3690# - Assume 50% degradation = 1845 lb. compost to apply at 16-2-6 lbs N-P-K (or a bit less).**

## Record Keeping

- Mortality
  - Mortality Date, Cause of Death, Type of Animal & Weight, Date entered into Facility.
- Composting Process (with dates)
  - Composting Recipe – Bed layer depth, cover depth, etc.
  - Carbon source
  - Temps (if taken)
  - Turning
  - Moisture content
- Sampling Finished Compost
  - Ammonium-N, Organic-N, Total N, P, K, moisture
  - Pathogens – not required (\$\$\$)
- Nutrient Budget & Actual Crop /Yield
  - Soil Sampling
- Actual Application
  - Date, Amount Applied and/or Application Rate, Application Method, Location, and Nutrient Value Applied



NDA, Title 23, Ch. 17, §54-744  
*NE Dept. of Ag Regulations*

**Definitions**

- ***Livestock Carcasses*** means dead bodies of cattle, swine, sheep, horses, mules, goats, domesticated cervine animals, ratite birds and poultry, or the parts of.
- ***Completely Composted*** means to have a carcass or carcass parting in a composting facility until there is no visual sign of soft tissue or bones which have not demineralized before spreading on land.

**Composting Facility Operations – O&Ms**

- Ensure that the livestock carcasses are not visible from public roads or habitable structures;
- Begin processing with 24 hours of death:
- Keep livestock carcasses in the composting facility until completely composted before spreading on land;
- Remove all “finished compost” within 12 months of the completion of the compost process.

State LWCF Permits

*How will this affect my NDEQ permit?*

- Minor Modification of NDEQ permit
  - Submit Addendum to NDEQ & include:
    - Use NDEQ Normal Morality Form or equivalent,
    - Include Map indicating location of compost facility,
    - Provide Nutrient Value of Estimated Compost Volume and land requirements.
- NO FEE REQUIRED for Addendum

## The End – Questions???

