

Mortality Management Planning and Response Considerations - Addressing Natural Resources in Emergencies

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Goals of Presentation

- Nature of animal mortalities in disaster (as differentiated from naturally occurring or daily)
 - Causes
 - Issues of Concern
 - Scale
- Methodologies of disposal
 - Environmental considerations
- Roles and responsibilities
- Considerations

Daily Mortality

- Before its final intended use
 - Harvest (food animals)
- At its predetermined conclusion
- Old age, natural death
- No-value food animals (spent hens)
- Biomedical animals
- Producers must have a plan for this (under BODA, MAEAP, NPDES Permits)

Cause of Death During Emergencies

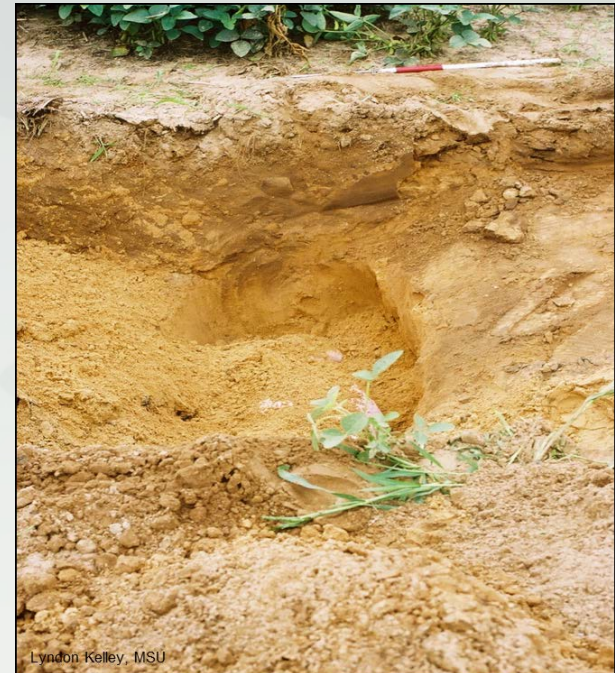
- Physical disaster
 - Fire, toxin, weather, building collapse
- Transboundary Disease
 - FMDs, CSF
- Direct euthanasia
 - Due to injuries or disease or proximity to disease
- Collateral euthanasia
 - Mortalities created by disruptions of marketing and transport systems caused by the disaster

Management Methods

- Burial
- Land-fill
- Composting
- Incineration
- Rendering
- Feeding to other animals
 - Fur-bearing, alligators
- Treat (vaccination-hold)
 - Anaerobic digestion
 - Gasification
 - Alkaline hydrolysis or digestion
 - Harvest

Burial

- All body parts at least 2 feet beneath the natural surface
- No contact with bodies of water
- 200 feet from wells



Common Graves

- Maximum 2.5 tons/acre
- Separated by minimum of 100 feet; 4 graves per A
- Covered with minimum of 1 foot of soil within 24 hr
- Entire grave not open longer than 30 d
- At least 2 feet of soil as final cover

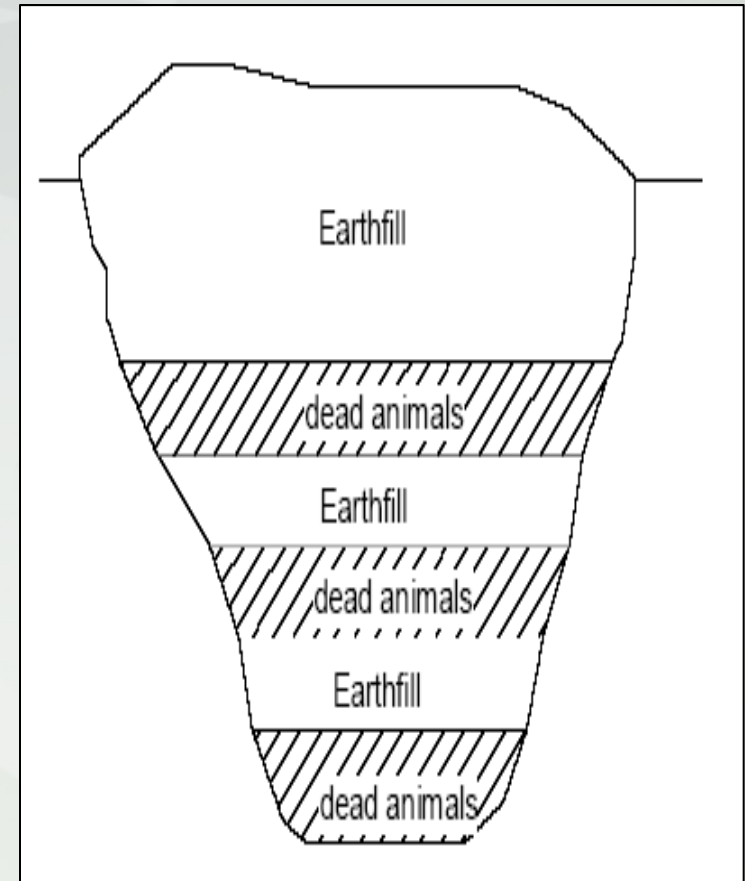
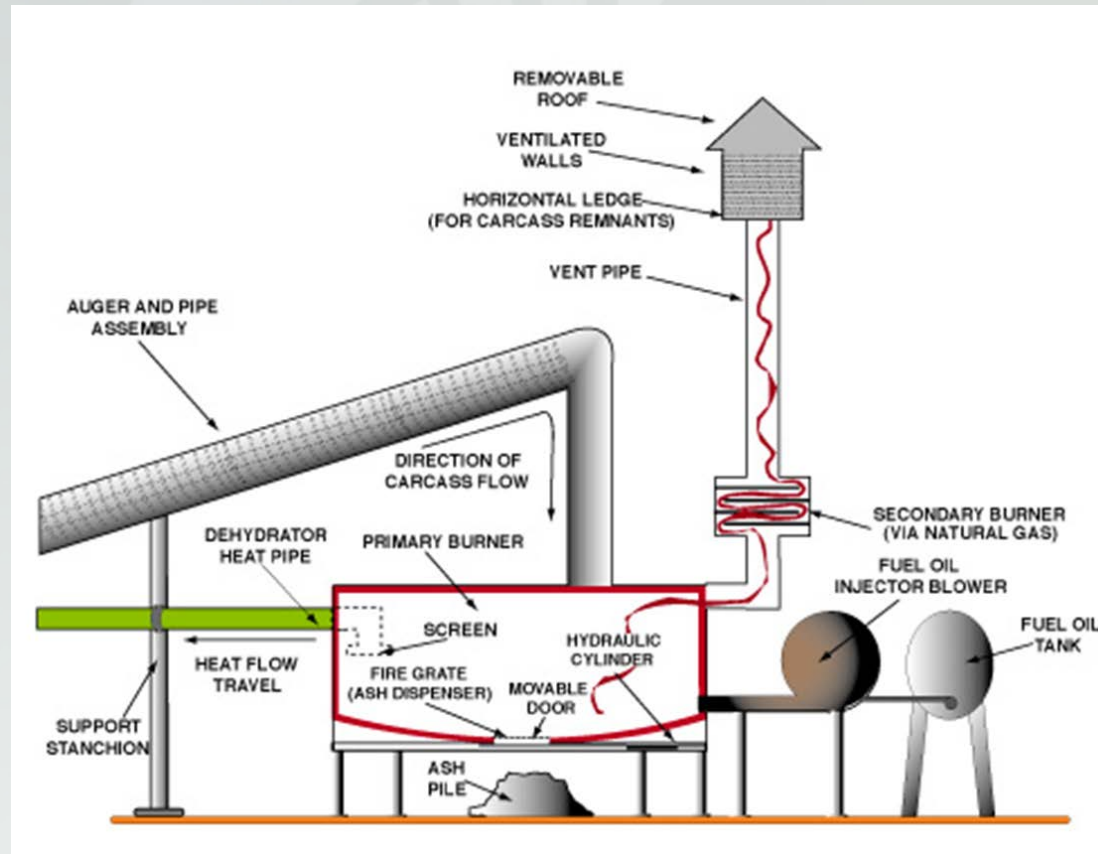


Illustration from Texas Animal Manure Management Issues (TAMMI) Website

Incineration

- Cremation is a controlled and rapid oxidation of organic matter
 - Complete reduction of volume
 - Destroys pathogens
 - Expensive - initial cost and energy cost
 - Natural gas or diesel fuel
 - This is not coal-oil, old tires and a lit cigarette
 - Greatest utility is for small animals
 - Oxidizes volatile gases (odors)
 - Air quality permit may be required

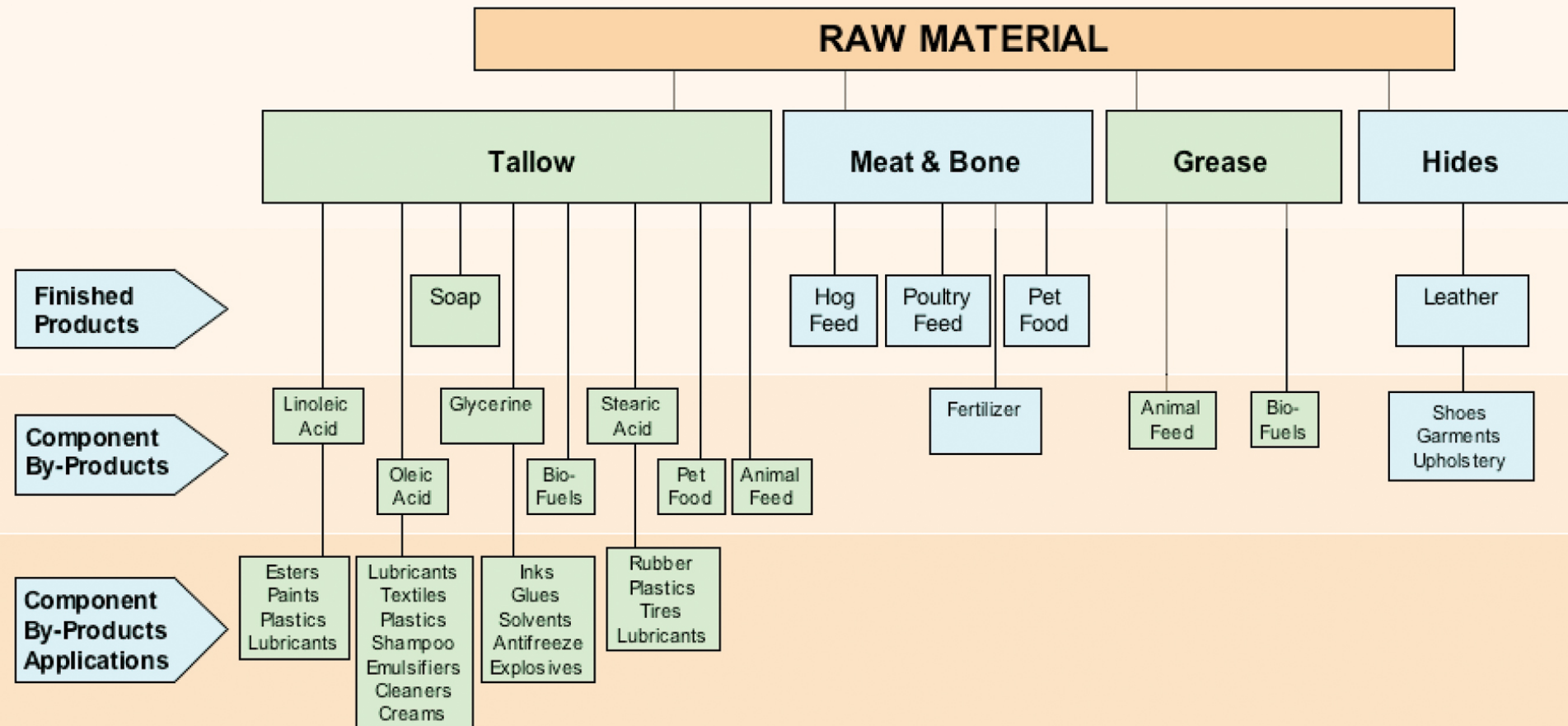
Incineration – Institutional/Commercial



Curtain Incineration



Rendering



Rendering – pros and cons

- Recycles the nutrients in the dead animal
- Bio-security measures must be observed
- Low maintenance
- Flexible to handle single carcass or 1000 tons or more
- Storage of animals is required until pickup
- Fees charged for pickup
- Rendering services may not be available

Landfill

- Availability must be determined
- Flexible to handle small and large amounts of mortality
- Generally no pick-up by waste management companies unless large consistent quantity
 - If farmer must deliver normal mortality
 - Must avoid complaints in transport
 - However, license is not required as farm is not a “dead animal dealer”

Composting

- The controlled biological decomposition of organic material under (aerobic and anaerobic) conditions



Composting

- So that storage, handling and land application of compost can be done without adversely affecting the environment or people
 - Not recognizable
 - Aesthetically acceptable
 - Not a nuisance
- Recycling nutrients

Terminology

- Active composting
 - Rapid decomposition into CO₂, water, heat, minerals, and compost (humus)
 - Temperature of 120 to 150° F
 - Several weeks – “primary”
 - May or may not aerate
 - Do not if disease agent involved
 - Continue 2-3 months, until soft tissues are totally decomposed and H₂O vaporized
 - Complete composting process
 - Landfill
 - Combustion – preferably gasification

Windrow



Density

- Dead animal density (lbs./ft³) in compost
 - Range 3 to 15; but 5 is effective and safer
 - Optimum depends on desired speed of composting process
- About 80 ft² active area per 1500 lbs. of mortality
 - 240 ft² with apron working area
 - 1.1 A for 200 cows
- Rule of thumb: 2 to 2.5 parts amendment to 1 part animal

Best Conditions for Active Composting

- Moisture content, range of 40 to 60 %
- Carbon-to-nitrogen ratio, range of 15:1 to 35:1
- Amendment particle size, range of 0.1 to 2 inches
- Temperature range of 100 to 150°F
- pH range of 5.5 to 9.0

Composting Amendment

- Blend
 - Dairy manure compost
 - Horse stall bedding
 - Finished swine mortality compost
 - Dry wood shavings

Item	
Moisture, %	48.3
Mineral matter, %	5.91
N, %	0.761
P, %	0.176
P ₂ O ₅ , %	0.402
K, %	0.512
K ₂ O, %	0.617
Ca, %	0.864
Mg, %	0.190
Na, %	0.129
S, %	0.146
C, %	24.113
B, ppm	7.4
Fe, ppm	1308.6
Mn, ppm	86.8
Cu, ppm	16.5
Zn, ppm	46.7
C:N	31.8
pH	8.72

Anaerobic digestion



Other Methods

- May be approved by the Director
 - Alkaline hydrolysis or digestion
 - Gasification
 - Feeding to other animals
 - Fur-bearing, alligators

Alkaline hydrolysis



Gasification



Considerations

- Cause or agent
- Resources
 - Available workers & equipment
 - Local, state and federal funds
 - Live animal management pre-euthanasia
 - Transportation
 - Fuels, composting feedstocks, alkaline substrate

Considerations

- Biosecurity and disinfection
 - Contain disease or other contaminants to a confined area and prevent spread to other locations
 - Operate disinfection station with limited impact on environment
 - Location should provide easy access for residents and responders.

Considerations

- Human safety
 - Personal Protective Equipment (PPE) to prevent occupational injuries and disease
 - Plan to minimize any negative environmental effects associated with the disposal or reduction/recycling of contaminated PPE
- Social
 - Publicity about farm
 - Public information officer (PIO)
 - Mental health offices and professional counseling services

Considerations

- Natural resources
 - Waters of the state
 - Distance to any septic drain field or fields
 - Location relative to tiled fields
 - Geology
 - Ensure containment of leachate in the long term
 - Topography
 - Water (slope), but also odor, noise and visual effects
 - Compatibility with surrounding land use

Web Soil Survey

http://websoilsurvey.nrcs.usda.gov/app/WebSoilSt... Thelen, Marilyn - Outlook Web... Web Soil Survey - Home Web Soil Survey Web Soil Survey

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Convert Select

Area of Interest (AOI) **Soil Map** Soil Data Explorer Shopping Cart (Free)

Printable Version Add to Shopping Cart

Search

Map Unit Legend

Clinton County, Michigan (MI037)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BnB	Boyer sandy loam, 0 to 6 percent slopes	10.2	12.3%
CaA	Capac loam, 0 to 4 percent slopes	17.9	21.6%
Gf	Gilford sandy loam	19.3	23.4%
MdA	Matherton loam, 0 to 3 percent slopes	12.8	15.5%
Pr	Parkhill loam	4.3	5.2%
Sb	Sebewa loam	4.1	5.0%
ThA	Thetford loamy sand, 0 to 3 percent slopes	0.3	0.4%
WbA	Wasepi sandy loam, 0 to 3 percent slopes	13.7	16.6%
Totals for Area of Interest		82.6	100.0%

Soil Map

Scale (not to scale)

11:06 AM
7/14/2011

State / Local Roles in Animal Disease

FUNCTION	MDARD	MDAG	MDCH	MDEQ	MDMVA	MDOC	MDOT	MDNR	MDTMB	MIOSHA	MSP	MSP/EMHSD	Local EM	LHD
Animal Related Quarantines	P										S			
Livestock / Household Animal Disease Response	P		S							S			S	S
Animal Carcass Disposal	P		S	S	S	S	S	S	S	S			S	S
Mental Health Support			P							S				P
Biosecurity Training	P		S							S				
Human Health Consequences			P											P
Emergency / Disaster Declarations												P		
Communications Support												P	S	
Movement Restrictions Enforcement					S		S				P		S	
Resource Procurement / Management	P		S		S				S			S	S	
Legal Consultation / Assistance		P												
Wildlife Disease Response	S							P						

Feds Roles in Animal Disease

FUNCTION	USDA/APHIS VS	USDA/APHIS ESF11	USDA/APHIS VSNHERC	USDA/APHIS NVS	USDA/FSIS	USDA/APHIS WS	USDA/APHIS OIG	USDA/NRCS	USFWS	USCBP	FBI
Animal Carcass Disposal	P							S			
ESF 11 Guidance		P									
Veterinary Assistance Teams	P		S								
Livestock / Household Animal Disease Response	P				S					S	
Wildlife Disease Response						P			P		
Criminal Investigation of Trans-Boundary Animal Disease							P				P
Movement Restrictions Enforcement										S	S
Slaughter Inspection / Disease Surveillance					P						
Continuity of Operations Assistance				P			S				

State / Local Roles in Animal Disaster

FUNCTION	MDARD/SART	MDAG	MDCH	MDEQ	MDHS	MDMVA	MDOC	MDOT	MDNR	MDTMB	MOSA	MSP	MSP/EMHSD	Local EM	LHD
Field Operations for Animal Related Issues	P											P		P	
Supplemental Personnel Resources	P													S	
Animal Care Needs Assessment	P													S	
Animal Care Resource Procurement	P					S							S	S	
Animal Care Donations Management	S				P	S				S			S		
Heating / Cooling Stations and Congregate Care Shelters with Companion Animal Provisions	S				P									P	
Wildlife Issues Coordination									P					S	
Animal Carcass Disposal / Debris Management	P		S	S			S		S	S			S	S	
Congregate Care Shelter Cleaning / Disinfection Guidance	S		P	S											P
Human Health Assistance			P								S				P
Transportation for Persons with Companion Animals								S				S		P	
Legal Consultation / Assistance		P		S											
Information Dissemination	P		S		S				S	S	S		S	S	S

Feds/ Others Roles in Animal Disaster

FUNCTION	USDA/APHIS AC	USDA/APHIS ESE11	USDA/APHIS WS	USDA/FSA	DHS	DHHS/NVRT	FEMA	AVMA/VMAT	MSU DCPAH	Multi-State Partnership	MSU Extension	MSU/CVM	MVMA	Livestock	Industry Groups Nonprofit	Humane Groups	ARC/MI
ESF 11 Guidance	S	P			S		S										
ESF 8 Guidance	S				P		S										
Supplemental Veterinary Services						S	S	S			S		S				
Animal Transport, Sheltering, Confinement, Husbandry and Quarantine Assistance									S		S			S	S		
Resource Support				S	S		S										
Wildlife Issues Coordination			P						S		S						
Information Dissemination					S		S	S		S	S		S	S	S	S	S
Animal Carcass Disposal / Debris Management							S		S		S						
Supplemental Veterinary / Animal Care Personnel Resources										S	S		S	S			
Heating / Cooling Stations and Congregate Care Shelters with Companion Animal Provisions													S			S	S
Supplemental Animal Care Resources (e.g., cages, food, etc.)											S	S	S	P	S		

Suggested Readings

- Michigan Mass Animal Carcass Management, Mass Carcass Management Committee. In review, anticipated release 2013.
- Foreign Animal Disease Preparedness and Response Plan (FAD PReP) Standard Operating Procedures Available at:
http://www.aphis.usda.gov/emergency_response/tools/aphis_role_emergency_tools_disposal.shtml