Carcass Management Course Emergency Management Tools Module

USDA United States Department of Agriculture

CUBIC Enabling a Safer World

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Overview

Welcome to the Emergency Management Tools Module of the online Carcass Management Course. The purpose of this module is to familiarize you with a number of tools available on the APHIS website which can help you make rapid, accurate decisions on the optimal carcass management strategy for a specific scenario in order to develop an efficient management plan. While completing this module, you may encounter references to Health, Safety, and Personal Protection Equipment; Secure Transport; and to Biosecurity, which are broadly covered in their own separate training modules. These modules are found in the Introduction Modules, beginning with the Orientation Module.

Effective management of animal carcasses and associated materials is a critical component of a successful response during an animal health emergency. Carcass management measures contain, treat, or destroy contaminated or potentially contaminated materials in order to:

- Prevent spread of a disease outbreak to protect the nation's agricultural industry
- Protect the environment by preventing carcass waste products from contaminating soil, water, and air
- Protect decaying carcasses from insects and scavengers which can transport pathogens to other locations
- Safeguard public health by removing potentially contaminated food products from the human food supply
- Safeguard animal health by removing potentially contaminated feed from the animal feed supply

Objectives

This module presents information in two different lessons:

- Introduction
- Evaluation and Planning

Upon completing this module, you should be able to:

- Describe the U.S. Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS) Animal Health Emergency Carcass Management Tools
- Utilize the U.S. Environmental Protection Agency (EPA) Incident Waste Decision Support Tool (I-WASTE)
- Understand the USDA Natural Resources Conservation Service (NRCS) Web Soil Survey (WSS)
- Locate and use other useful planning tools, such as the AgAware Tool, the Carcass Management Option Calculator, the Carcass Disposal and Transportation Tool, and the Routes and Ports for Integrating Management Zones tool
- List the key elements of a Carcass Management Plan

Introduction Lesson Overview

USDA APHIS is the lead federal agency responsible for responding to animal disease outbreaks affecting livestock in the U.S. In order to assist carcass management decision makers during the response, APHIS has developed a set of tools which are described in this module. The tools consist of the components described below:

- Carcass Management Options Matrix which compares and ranks the major management options against 15 different criteria
- Carcass Management decision loop which walks the user through the various options in order of preference based on the matrix so the user can select the most appropriate carcass management option for a specific scenario
- Checklist which allows the user to quickly determine if a particular option can be implemented at their site
- AgAware Tool which enables the user to map an infected premises and determine proximity and cost of various options
- Automated version of the Matrix, Loop and Checklist described above which enables the user to enter basic data about an infected premises and obtain suitable carcass management options
- Carcass Disposal and Transportation Tool which helps user determine how long it will take to manage the amount of biomass at an infected premises based on the capacity of feasible carcass management options; also estimates number and size of trucks required to manage infected material in the shortest time
- Routing tool which helps user determine best routes and staging areas for transporting and transferring infected carcasses

Introduction Lesson Contents

This lesson is divided into the following key sections:

- Carcass Management Options Matrix– ranks the major options into a matrix using 15 different criteria and weighting factors based on importance
- Carcass Management Decision Loops – provides a series of questions arranged in order or preference based on the matrix and quickly guides the decision process from the most to the least preferred option. There are two different loops; one for poultry and one for other livestock. Both are described in this module.

Carcass Management Tools

USDA APHIS has developed tools to be utilized during an animal health emergency. The tools include a Matrix, decision Loop, and Checklist (MLCh).

The first component is the Carcass Management Options Matrix.

- It ranks the major options. The “Criteria” column lists the 15 different areas and the leftmost column indicates a weighting factor based on importance
- Columns to the right represent the most common options. The numbers in each box represent the ranking for each criterion as it relates to each option.
- The rankings were determined by a team of U.S. federal subject matter experts from USDA, U.S. Department of Homeland Security (DHS), EPA, and other agencies
- A higher numerical ranking indicates a more preferable option
- The notes below the table contain detailed explanations for the rankings of each criterion
- When the numerical rankings are totaled and divided by the number of applicable criteria, the average scores determine the relative ranking of the various options
- The options are listed left to right in the table in order of preference
- A green color indicates a favorable rating for the specific criterion, a yellow color indicates a less favorable rating, and a red color indicates the least favorable rating

NOTE

The order of preference from the matrix-from the most preferable to the least preferable option - is used throughout this course. Note that the order is slightly different for the poultry version of the decision loop.

Carcass Management Options Matrix

In the case of poultry, the onsite options may be preferred over offsite options such as landfill, rendering, or incineration. This is because the animals are small enough that they are more likely suited for management on the infected premises, which avoids potential risks associated with transport.

It is important to note the matrix is merely a guide based on a number of assumptions and the preferred option for a particular circumstance may be different from those shown here.

Figure 1. Carcass Management Options Matrix (Click on Image to Enlarge it)

Weighting	Criteria	Off-Site Landfill	Rendering	Off-Site Incineration	Composting	Open Air Burning	On-Site Burial
Most Important (x3)	Public Health Risk (1)	9	9	9	9	6	3
	Biosecurity (2)	6	6	6	3	3	3
	Pathogen Inactivation (3)	3	6	9	6	9	3
	Environmentally Sustainable (4)	9	9	9	9	3	3
Important (x2)	Need to Transport Carcasses Offsite (5)	2	2	2	6	6	6
	Volume Reduction (6)	4	6	6	4	6	4
	Availability(7)	6	4	2	4	4	4
	Throughput (8)	6	6	2	4	4	4
	Speed to Implement (9)	6	4	4	4	4	4
	Public Acceptance (10)	6	4	6	4	2	4
Less Important (x1)	Cost Effectiveness (11)	3	2	1	1	1	3
	Efficiency (12)	3	3	3	2	1	2
	Operability (13)	3	3	3	2	1	3
	Regulatory limitations (14)	2	3	2	2	1	1
	Denial of use (15)	3	2	2	2	2	1
	Total Points	71	69	66	62	53	48
	Average Score	4.7	4.6	4.4	4.1	3.5	3.2

Matrix Explanation

- 3 point score - Green technologies
- 2 point score - Yellow technologies
- 1 point score - Red technologies
- Scores were weighted according to the importance of the criteria.
- Scores for each column were totaled then averaged to obtain the ranking

Color Key

Ideal

Not Ideal

Not Suitable

Matrix Footnotes

Values in matrix may be incident specific.

1. Public health risk – based on the UK 2001 human health qualitative risk assessment which excluded composting and mobile technologies. The rankings are consistent with the public health risks tabulated by the United Kingdom (UK) Department of Health (now the Department for Environment, Food and Rural Affairs), in “A Rapid Qualitative Assessment of possible risks to Public Health from current Foot & Mouth Disposal Options, Main Report,” June 2001.
2. Biosecurity – if process can be contained and easily disinfected = 3, if process is somewhat contained, but the processing area is difficult to disinfect = 2, if process is not contained = 1.
3. Pathogen Inactivation – If process completely inactivates pathogen = 3, partial inactivation = 2, no inactivation = 1.
4. Environmental sustainability – low risk of environmental contamination and useful end product = 3, low risk of contamination or useful end product = 2, risk of environmental contamination and no useful end product = 1.
5. Transport carcasses offsite – Yes = 1, No = 3.
6. Volume reduction – process reduces volume of biomass = 3, same volume = 2, increases volume = 1.
7. Availability – option is widely available = 3, regional or somewhat available = 2, very limited availability = 1.
8. Throughput – the amount of biomass that can be processed per day. If >200K lbs. / day = 3, between 200K lbs. / day - 50K lbs. / day = 2, <50K lbs. / day = 1. Note: Throughput X Availability = Capacity.
9. Speed to implement – how quickly can option begin taking first carcasses including obtaining regulatory approval where immediately = 3, <5 days = 2, more than 5 days = 1.
10. Public acceptance – likelihood of public protests where low = 3, medium = 2, and high = 1.
11. Cost effectiveness – cost to perform option from K State Carcass Disposal: A Comprehensive Review where <$100 / ton = 3, $100 / ton - $250 / ton = 2, > $250/ton = 1.
12. Efficiency – amount of inputs (utilities, chemicals, fuel, carbon source) to contain and stabilize biomass over a short period of time.
13. Operability – ease of implementation, for example simple to do, operators readily trained and available.
14. Regulatory limitations – permits or regulator exemptions would have to be obtained in order to utilize this method.
15. Denial of use – land or equipment is no longer able to be used for its intended purpose due to method.

Carcass Management Decision Loops

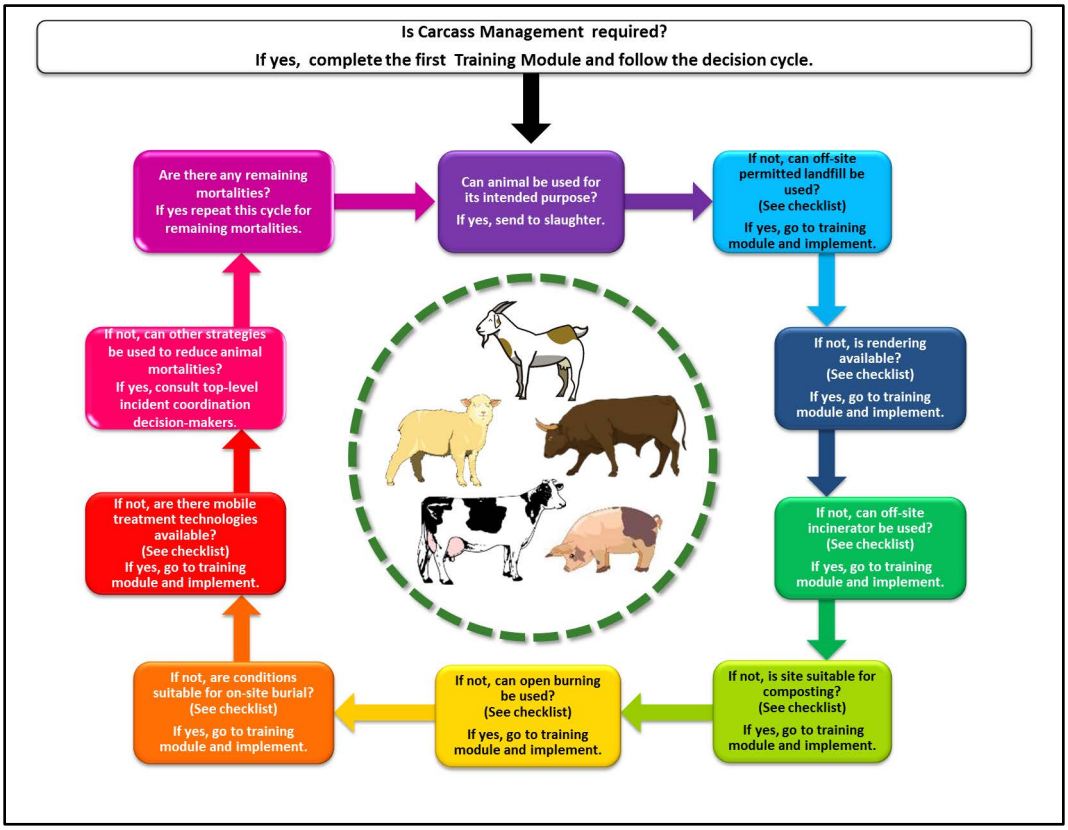
The second component of the MLCh Tool is the Carcass Management Decision Loop.

- This series of questions is arranged in order of preference based on the Matrix
- The tool quickly guides the decision-maker through the options from most preferable to least preferable
- The first decision loop shown applies primarily to a large animal disease outbreak and follows the same order of preference as the matrix
- The second decision loop applies to Highly Pathogenic Avian Influenza (HPAI) infected poultry. The HPAI loop begins with onsite options which are preferred for disease containment and are more feasible due to the small size of the birds.

In order to answer the questions in the loop, click each question to view the corresponding checklist. In addition to helping answer the questions, the checklist also serves as a tool to facilitate implementation of each option. Additional details are found in the next lesson.

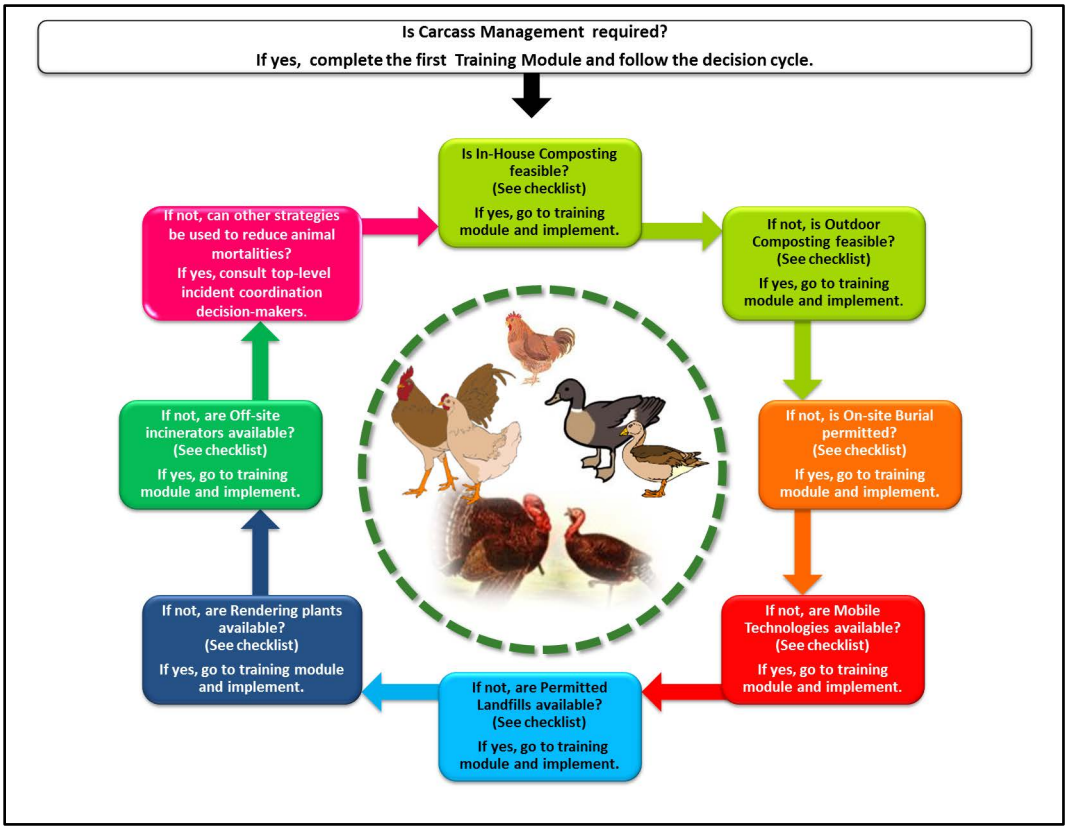
Large Animal Carcass Decision Loop

Figure 2. Large Animal Carcass Management Decision Loop



HPAI Carcass Decision Loop

Figure 3. HPAI Carcass Mgmt. Decision Loop



Evaluation and Planning Lesson Overview

This lesson contains information to help you further use the various tools to develop a plan to guide the Disposal Group in preparing for and undertaking carcass management operations. The various tools are designed to provide a method for analyzing the emergency situation and developing suitable courses of action.

Objectives for this lesson include:

- Knowing how to use the carcass management options checklist
- Understanding the automated tools
- Using the information developed from the various tools to prepare and implement a comprehensive carcass management plan

Evaluation and Planning Lesson Contents

This lesson presents the following information:

- Carcass Management Options Checklist – Groups a series of important questions into a checklist to assist in managing an animal response emergency
- Incident waste decision support tool – Provides a comprehensive database of waste management facilities, including location and contact name and phone number
- Web Soil Survey – Provides soil data useful for determining if on-site burial or on-site composting of animal carcasses is advisable based on soil conditions
- AgAware Tool, the Carcass Management Option Calculator, the Carcass Disposal and Transportation Tool, and the Routes and Ports for Integrating Management Zones Tool – Automate common tasks associated with carcass management options to facilitate selection and implementation
- Carcass Management Plan – Provides a guideline for developing a site-specific carcass management plan

Carcass Management Options Checklist

The Carcass Management Options Checklist serves as a guide to quickly determine which carcass management options are practical at specific premises. Once impractical options are ruled out, the checklist also serves as a guide to implement the possible options. When completed, the checklist helps in developing a realistic and effective site-specific plan with the following goals:

- Efficient outbreak containment
- Environmental sustainability including minimizing waste
- Stakeholder acceptance
- Cost effectiveness

Proceed to the next slide to begin using the option checklists.

Can animal be used for its intended purpose?

- Can livestock and poultry entering the food chain meet food safety requirements? Consult with food safety officials to:
    - Ensure animals are safe for human consumption
    - Ensure public acceptance of products
    - Ensure pathogens are contained
- If so, send to slaughter or other processing. If not, ensure that depopulation methods are compatible with carcass management capacity. Consider storage options so depopulation rate does not exceed carcass management rate.

NOTE

If depopulation rate exceeds the carcass management rate, then carcasses may begin to decompose and attract vectors which can transport pathogens; in this case, storage or containment can be used until carcass management commences.

Can off-site permitted landfill be used?

- See a comprehensive list of landfills on the EPA database: Incident Waste Decision Support Tool (I-WASTE DST)
    - Logon to the I-WASTE Tool and obtain a password
    - Enter user ID and password
    - Choose treatment and disposal facilities button on the lower left.
    - Enter filter criteria such as “facility type (e.g., rendering, incinerators, or landfill)”
    - Construction debris landfills are not suitable for carcass carcass management
    - Hazardous waste landfills are not necessary unless the carcasses are contaminated by chemical or radiological agents causing them to be classified as hazardous
    - Enter state or EPA region, and click “View List of Facilities” button
- Contact facilities and determine if they will accept your livestock or poultry and meet some or all of your capacity needs
    - Consider potential environmental and biosecurity concerns
    - Consider pretreatment of carcasses at the infected premises so waste will be more readily accepted. Examples of pretreatment include grinding with aerosol collection followed by heating or mixing with citric acid to inactivate pathogens.

If permitted landfilling is an option, see the Off-site Permitted Landfill Module.
If not, proceed to the next slide.

Is rendering available?

- See a complete list of renderers on the EPA database: Incident Waste Decision Support Tool (I-WASTE DST)
    - Logon to the I-WASTE Tool and obtain a password
    - Enter userID and password
    - Choose treatment and disposal facilities button on the lower left
    - Enter filter criteria such as “facility type (e.g., rendering, incinerators, or landfill)”
    - Enter State or EPA region, and click “View List of Facilities” button
- Contact facilities and determine if they will accept your livestock or poultry and meet some or all of your capacity needs
- Before sending any materials to a rendering plant, a thorough plant and site assessment needs to be done
    - The assessment may reveal that actual plant modifications may need to happen before materials can be accepted
    - If the capacity is less than needed, can the carcasses be stored or refrigerated while awaiting carcass management?

If rendering is an option, see the Rendering Module.
If not, proceed to the next slide.

Can off-site incineration be used?

- See a complete list of incinerators on the EPA database: Incident Waste Decision Support Tool (I-WASTE DST)
    - Logon to the I-WASTE Tool and obtain a password
    - Enter user ID and password
    - Choose treatment and carcass management facilities button on the lower left
    - Enter filter criteria such as “facility type (e.g. rendering, incinerators, or landfill)”
    - Enter State or EPA region, and click “View List of Facilities” button
- Contact environmental regulatory authorities to verify operations are not in violation of their air permits
- If the facilities are compliant, contact them and determine if they will accept your livestock or poultry
- If carcasses contain active pathogens, ensure incineration can be conducted in a biosecure manner

If off-site incineration is an option see the Off-site Incineration Module.
If not, proceed to the next slide.

Is site suitable for in-house composting?

- Identify a suitable site in accordance with the checklist items, below
    - If off-site, consider the need for secure transport and follow criteria for outdoor composting
- Is the production facility suitable for in-house composting?
    - Is a credentialed mortality composting subject matter expert available to assist with this assessment?
    - Are capable service providers identified for heavy equipment operations?
    - Are there provisions for carbon source production and delivery (2–3 pounds of carbon source per pound of carcass or as directed by the composting expert)?
    - Are regulatory requirements identified?
    - Does the facility have sufficient space to maneuver composting equipment and construct windrows?
    - Is there enough open space and is the ceiling high enough to allow the loader to construct windrows at least 4.5 feet high and 8 feet wide?
    - Is it located in an area that is accessible by the composting equipment? (This facilitates the delivery of carbon source and compost removal)
    - Does it offer access doors that allow composting equipment to enter?
    - Does it offer access doors that can be secured against vandals, scavengers, or disease vectors?

If not, proceed to the next slide.

Is site suitable for outdoor composting? (cont.)

Based on guidance from state authorities and credentialed mortality composting subject matter experts are the site conditions suitable for outdoor composting of the number of animals affected?

- In general, emergency poultry mortality compost sites should be large enough to accommodate all of the generated carcasses, litter, waste feed, and other contaminated materials, as well as have the ability to store any additional amendment materials that may be needed for successful composting. Along with the criteria noted above, ideal compost sites should
- Have enough space to allow compost windrows to be constructed without driving on the pile and compacting the base
- Be located such that the prevailing wind directions do not travel to nearby residence, or other susceptible animal production facilities
- Be located at the top of the slope of the field, on moderately to well drained soils,
- Have a gentle slope to encourage on-site drainage
- Contain on-site soil depths in excess of 24 inches to seasonal high water tables,
- Contain on-site soil depths in excess of 36 inches to bedrock
- Not be located on a flood plain
- Be constructed or designated for the current emergency, have (or construct) diversion ditches, terraces, or berms to direct surface water flows and storm water away from active compost piles. (Note that if piles are located between production houses, then roof and surface drainage should be directed away from the compost area), and the edges of the identified site should have these following minimum setbacks, including:
    - 200 feet from a water supply well used for drinking;
    - 200 feet from water bodies, including: ponds, lakes, streams, rivers;
    - 200 feet from a nearby residence (not owned by the premises);
    - 50 feet from a drainage swale that leads to a water body (see above); and
    - 25 feet from a drainage swale that does not lead to a water body.

Site suitability continued on the next page.

Is site suitable for outdoor composting? (cont.)

- If so, is mortality composting subject matter expert (from APHIS roster) available to guide proper windrow construction so pathogens are inactivated?
- If so, is there a sufficient local supply of carbon source such as wood chips (1.5 - 3 pounds carbon source per pound of biomass)?
    - Check with local agencies and organizations to determine if stockpiles of carbon source are available (e.g., parks department, municipalities). Ensure that the carbon source is free of any pests or pathogens and does not contain unacceptable items such as gravel, concrete, glass, plastic, rubber, etc. (by contacting appropriate state or local authorities) which could threaten local species.
- If so, have you arranged for the necessary equipment and supplies to be delivered to the site?
    - Personnel
    - Composting supplies (e.g., thermometers) and carbon source
    - Personal protective equipment and personal supplies
    - Cleaning and disinfecting (biosafety) supplies
    - Hand tools (pitchforks, rakes, shovels)
    - Heavy equipment (mid-size skid-steer loader, tractor with bucket loader, excavator, bulldozer, payloader, forklift, truck, containers and caps, polyethylene material for lining carcass transport container)

If composting is an option see the Composting Module.

If not, proceed to the next slide.

Is site suitable for open air burning?

- Does the applicable permitting authority allow open air burning?
  - Local Fire Department
  - State Department of Agriculture, Animal Health
  - State Department of Environment or Natural Resources
  - USDA-APHIS and EPA
- If so, can the permit conditions be met in a timely manner?
- If so, are the site conditions suitable for open air burning?
  - What environmental testing is required and at what frequency?
  - How and where would the ash be disposed?
  - Are weather conditions suitable for open air burning?
- If so, will burning be publically acceptable?

If open air burning is an option, see the Open Burning Module.

If not, proceed to the next slide.

Is site suitable for on-site burial?

- Will the state environmental and agricultural regulatory authorities permit unlined burial and can permit conditions be met?
- If so, are soils suitable for mass livestock carcass burial? (USDA NRCS online Web Soil Survey)
- If so, based on the advice of a groundwater hydrologist, will leachate contaminate groundwater in excess of public health standards?
    - Consider all groundwater pathways including the presence of drain tiles, soil characteristics, depth to groundwater, use of groundwater, etc.
    - Consider collecting at least three soil borings to the water table to evaluate soil permeability and confirm Web Soil Survey estimates
- If not, will the burial site create a stability or explosion hazard from production of methane?
- If not, is adequate land available for on-site burial?
- If so, will land owner accept on-site burial, associated environmental liabilities, and potential loss of property value or use?

If on-site burial is an option, see the On-site Burial Module.

If not, proceed to the next slide.

Are mobile treatment technologies available for your area?

- Contact all appropriate mobile treatment technology vendors
    - Verify the units are available for deployment to your site
    - Verify your ability to meet all site/utility requirements
    - Verify units can be fully disinfected after use
    - Verify the units have adequate capacity to meet your needs
    - If the capacity is less than needed, can the carcasses be stored or refrigerated while awaiting carcass management?
    - Verify the availability of skilled operators and spare parts to keep the units operational
    - Verify the unit can be set-up on the site
- If so, is the technology permitted by the applicable regulatory authorities?
    - State Department of Agriculture, Animal Health
    - State Department of Environment or Natural Resources
    - USDA-APHIS and EPA
- If so, can the permit conditions be met?
- If so, can the technology process byproducts be readily disposed?

If mobile treatment is an option, see the Mobile Treatment Technologies Module.

Can other strategies be used to reduce animal mortalities?

- If you were unable to find a method of carcass management for all animals, consult with top level incident coordination decision-makers about how to minimize the number of carcasses. Vaccination may be one way to maintain animal health.

If you still need to dispose of animals, return to the Carcass Management Decision Loop and Options Checklist to repeat the cycle until all carcasses can be managed.

Tools and Calculators

The next series of slides will present various online tools and calculators which are useful during an animal emergency response. Some tools provide important reminders or checklists and others access comprehensive databases, such as waste management facilities. Other tools provide information necessary for determining the best course of action or response.

Incident Waste Decision Support Tool

Handling, transporting, treating, and disposing of large volumes of waste generated by natural disasters, chemical, biological, or radiological incidents, and animal disease outbreaks present unique challenges. Effective and timely management of these materials is critical for protecting and restoring communities and the environment.

The EPA developed the Incident Waste Decision Support Tool (I-WASTE DST) which is a valuable source of information related to emergency waste management. The tool:

- Can be used by emergency response authorities and property owners; permitting agencies and treatment and carcass management planners
- Provides access to technical information, regulations, and guidance
- Creates an incident planning and/or response record
- Accesses debris/waste estimators
- Accesses treatment and carcass management facility databases
- Provides an embedded tutorial

Incident Waste Decision Support Tool (cont.)

The I-WASTE Decision Support Tool includes both an agricultural biomass carcass management section and a facility information section which are especially useful for animal health emergencies.

These sections of I-WASTE include information and guidance on:

- Characteristics of waste, debris and potential contaminants, as well as characteristics of decontamination agents
- Database of treatment, disposal, and recycling facilities with locations, contact information, and potential capacities for the different types of waste
- Building residue characteristics and an estimator for generating estimates of volumes and masses of waste and debris
- Water systems characteristics and equipment module from different geographical areas to support the unique waste management challenges from decontamination of water treatment and distribution systems
- Natural disaster debris disposal including case studies organized by disaster type
- Debris transportation, packaging, and storage information
- Radiological waste management information
- Contaminant and decontaminant characteristics
- Worker protection information

Web Soil Survey

The Web Soil Survey (WSS) provides soil data and information produced by the National Cooperative Soil Survey.

- It is operated by the USDA Natural Resources Conservation Service (NRCS) and provides access to the largest natural resource information system in the world
- NRCS has soil maps and data available online for more than 95 percent of the nation's counties and anticipates having 100 percent in the near future
- The site is updated and maintained online as the single authoritative source of soil survey information
- Soil surveys can be used for general farm, local, and wider area planning

Onsite investigation is needed in some cases, such as soil quality assessments and certain conservation and engineering applications.

Figure 4. WSS Logo

Below are the basic steps in using the WSS tool:

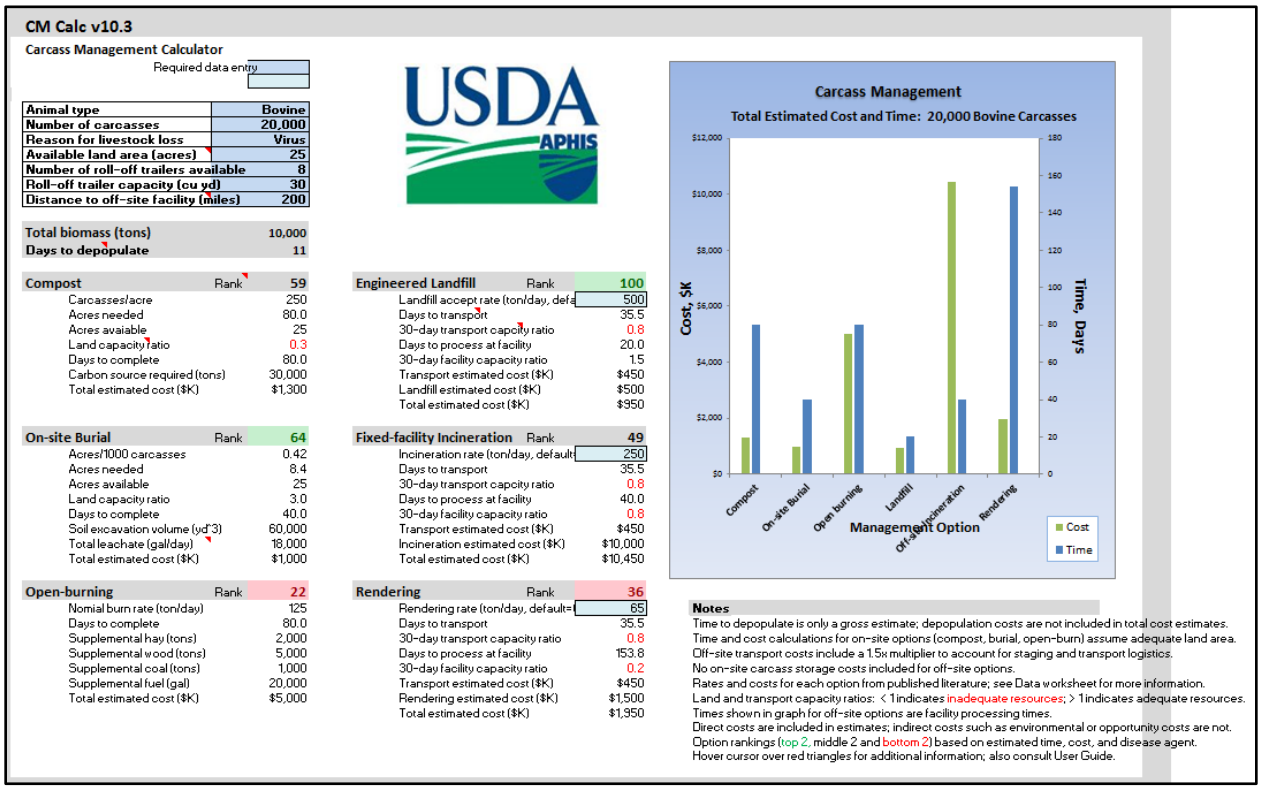
1. Go to Start Web Soil Survey.
    - Type in address of property
2. Click "View".
3. Click Area of Interest "AOI" button at top of screen,
    - Then drag box to cover property area
    - When hatched area comes up, click "Soil Data Explorer" tab at top
    - Select "Disaster Recovery Planning" at left
    - Then select "Catastrophic Mortality, Large Animal, Trench" from the drop-down list
4. Click "View Rating" button. Suitability is graphically shown by color:
    - Green = suitable
    - Yellow = limited suitability
    - Red = not suitable
    - Explanations are in the table below the graphical image

Carcass Management Option Calculator

Developed by Cubic Global Defense

This is an Excel-based® tool that accompanies the carcass management options checklist in the MLCh tool discussed earlier in this lesson. The calculator estimates key parameters for each carcass management option, such as: time to depopulate, capacity ratio (in terms of land available or transport resources), and estimated time and cost to complete carcass management by each option.

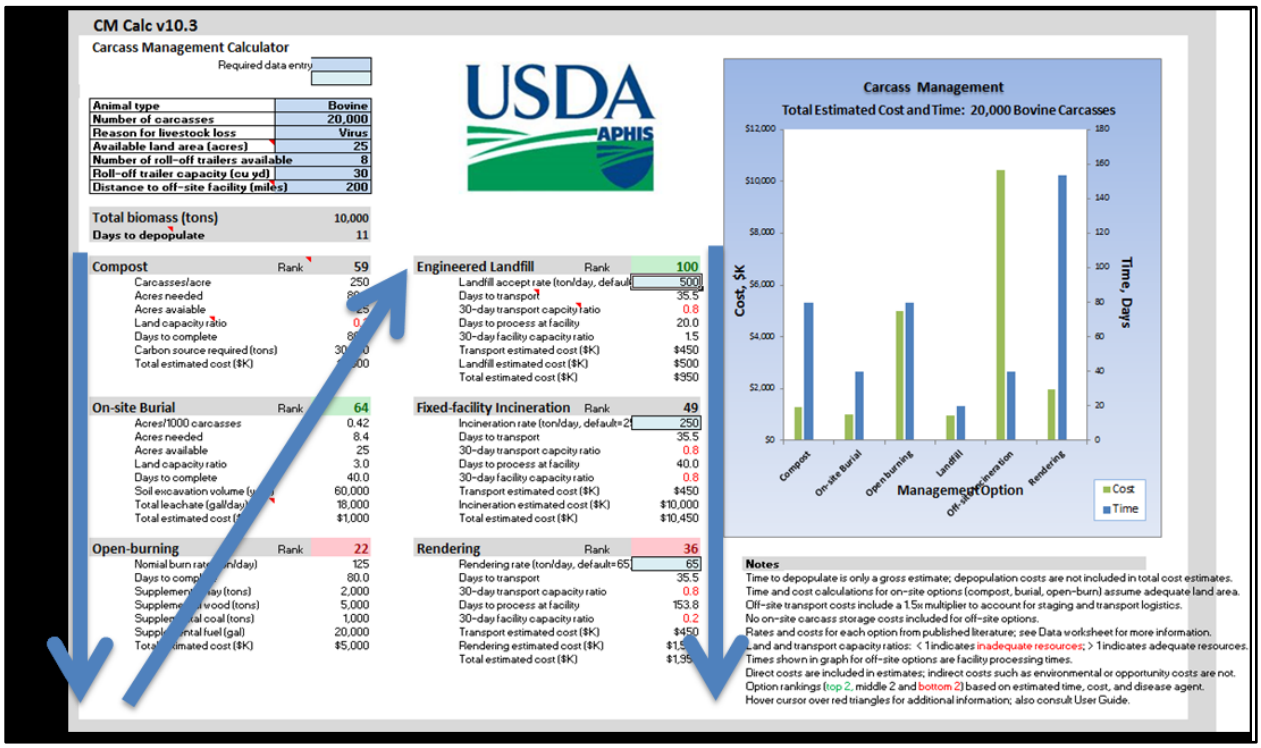
Figure 5. Carcass Management Option Calculator



Carcass Management Option Calculator (cont.)

The CM Calc tool is intended primarily as a first-look, high-level, problem-scoping aid to be used by planning or first responder communities in anticipation of a mid- to large-scale carcass management scenario. The tool is not intended for routine animal mortalities encountered during day-to-day livestock agriculture operations.

Figure 6. Example of a Carcass Management Scenario



Carcass Disposal and Transportation Tool

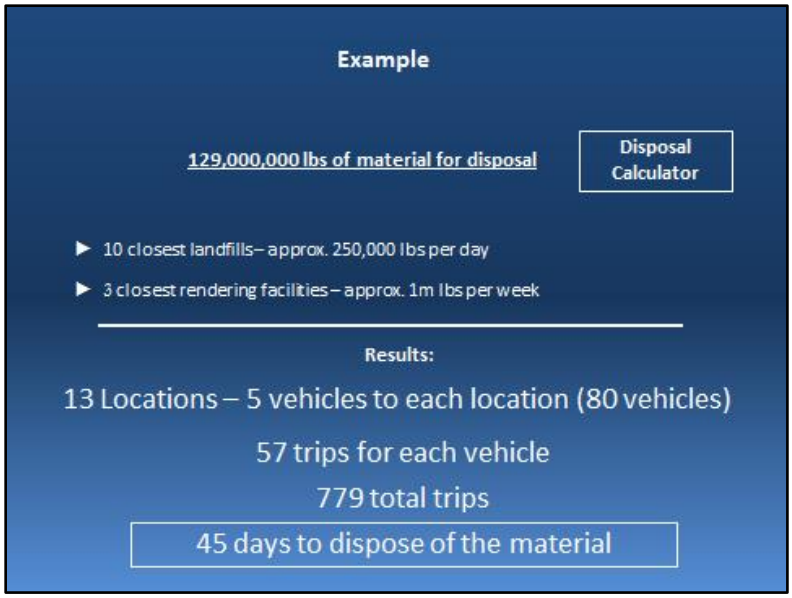
Developed by the North Carolina Department of Agriculture and Consumer Services, Emergency Programs Division

The tool calculates the amount of biomass to be managed from an infected premises (based on animal type and number of animals), then allows the user to select a waste management option such as landfill, rendering, and burial. The tool also allows the user to select the number and type of transport conveyances to transport the biomass to the waste management site, and finally gives an estimate of the time to manage the biomass and the route from premises to carcass management site.

This tool was initially developed as an excel program then converted to a web-based application. The tool incorporates locations of landfills and rendering facilities across the United States. It enables the user to input a starting location, select the nearest waste management facilities (i.e. landfill, renderer, etc.), types of conveyance to be utilized, and animal type.

The tool then brings all the information into an easy to read summary page.

Figure 7. Carcass Disposal Tool Calculation Example



Carcass Management Plan

Planning is essential to ensure that carcass management is performed efficiently, cost-effectively, and with minimum impacts to human health, livestock health, and the environment. Ideally, each livestock production premises should have a site-specific emergency carcass management plan. Without having a plan in advance, it is difficult to rapidly choose an optimal carcass management strategy during the stress of an emergency, and this can delay response and ultimate recovery for producers.

The Disposal Group Leader will provide a written plan detailing how carcass management will be performed at a given site. The Disposal Group Leader, in consultation with the owner or the owner's agent and other officers, prepares a site-specific management plan. The Incident Commander must approve the plan before implementation.

The plan must contain key elements of information, such as site characteristics, waste characteristics and PPE. For more information, refer to this Site Specific Carcass Management Plan template.

Summary

Congratulations! You have completed the Emergency Management Tools Module of the Introduction Modules. In this module, you have learned to:

- Describe the U.S. Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS) Animal Health Emergency Carcass Management Tools
- Utilize the U.S. Environmental Protection Agency (EPA) Incident Waste Decision Support Tool (I-WASTE)
- Understand the USDA Natural Resources Conservation Service (NRCS) Web Soil Survey (WSS)
- Locate and use other useful planning tools, such as the AgAware Tool, the Carcass Management Option Calculator, and the Carcass Disposal and Transportation Tool,
- List the key elements of a site-specific Carcass Management Plan

Please click here to download the certificate of completion for this module. You can enter your name on the certificate and save or print it for your records. Proceed to the Home Page to begin the next module, Health, Safety, & PPE.