Carcass Management Course
Open Burning Module

USDA United States Department of Agriculture

CUBIC
Enabling a Safer World

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Overview

Welcome to the Open Burning Module of the online Carcass Management Course. While completing this module, you may encounter references to the Emergency Management Tools; 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.

> This training module is presented from the perspective that you have already used the MLCh Tool (Matrix, Decision Loop, and Checklist) explained in the Emergency Management Tools Module and selected open burning as the preferred carcass management option.

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 the material in four different lessons:

- Introduction
- Planning
- Evaluation
- Operations

Upon completing this course, you should be able to:

- Describe open burning as a method for carcass management
- Understand the advantages and disadvantages of open burning
- Identify personnel health risks associated with open burning
- Consider environmental risks associated with open burning
- Obtain regulations governing open burning by consulting with state officials
- Identify factors used to evaluate open burning as a carcass management option
- List critical elements when planning open burning
- Recognize key components of open burning operations

Introduction Lesson Overview

Definition: Open burning involves combustion of waste at high temperatures, converting the waste into heat, gaseous emissions, and ash. The gaseous emissions are vented directly into the atmosphere without passing through a stack or chimney. Open burning is also termed open-air burning, and uncontrolled burning.

The general process of open burning may include:

- Burning on open land above-ground, in a dug-out pit, or combustible piles (pyres)
- Using combustible materials or fuels such as straw or hay, untreated timbers, wood, coal, or petroleum products such as diesel fuel to initiate and/or maintain combustion

Figure 1. Burning Carcasses

Introduction Lesson Contents

This lesson is divided into the following sections:

- Description – Presents the key features of open burning
- Advantages – Describes the benefits of using open burning as a carcass management option
- Disadvantages – Covers the many difficulties and drawbacks associated with open burning of animal carcasses

Description

Open burning is a process which involves constructing a bed of combustible materials such as wooden timbers, placing the carcasses on the bed, adding more combustible material over the carcasses, and igniting the pile. There is no containment of materials in this process. Historically, open or uncontrolled burning has been used to thermally destroy animal carcasses and associated materials during animal health crises. Open burning may be termed uncontrolled burning because it has the least opportunity for inputs and outputs to be monitored or regulated.

- Neither the fuel nor air inputs can be reliably or accurately controlled, which can result in incomplete, smoke-filled and relatively low-temperature combustion
- Carcasses can be burned in open fields, on combustible heaps called pyres, or with other burning techniques that are unassisted by incineration equipment
- Many states specifically prohibit open burning of carcasses; state and local regulations should always be checked before deciding to use open burning
- Public perception of open burning can be very negative
- May result in significant negative traditional and social media coverage
- The potential for aerosol pathogen transmission must be addressed when considering open burning

Figure 2. Fire Trench

Advantages

Open-air burning has a few advantages:

- May be relatively inexpensive
- May eliminate the need for off-site transportation
- Complete incineration combines sterilization and carcass destruction into one operation
- Can be used anywhere a permit can be obtained, although it may be difficult to meet air emission, solid waste, and fire prevention requirements
- Requires minimal specialized equipment but does need experienced personnel

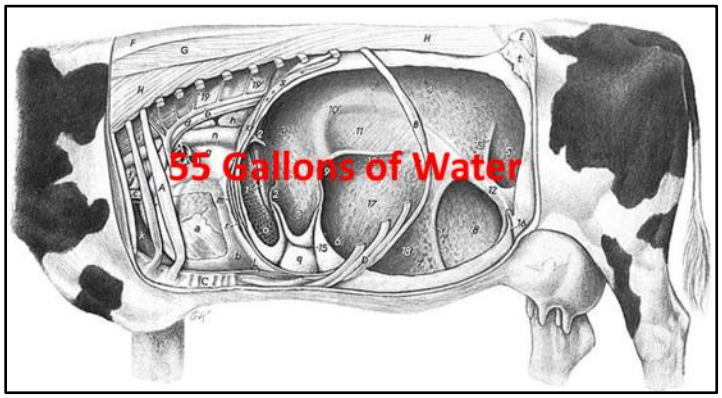
Figure 3. Burning Heap (Pyre)

Disadvantages

Open burning is an option of last resort, as it has significant regulatory limits, high environmental impacts, and very low public acceptance. Other disadvantages include:

- Potentially creating a public nuisance, causing unintended fires, and creating permitting challenges
- It is an inefficient and time-consuming process, which
    - Requires intensive labor and fuel
    - Requires favorable weather conditions
    - Requires a suitable species of animal. Carcasses are among the worst combustible classification of waste - composed of more than 50 percent water. Also, the percentage of animal fat influences the length of time a carcass will burn.
    - In addition, the bulky nature of some animal species (e.g., cattle) makes it difficult to achieve effective mixing of the fuel, air, and carcass material

Figure 4. Cow Rumen



Disadvantages (cont.)

- Potentially generating excess air pollutants, including smoke and odor
    - Emissions from carcass combustion, like all combustion processes, will likely include particulate matter, carbon monoxide, hydrocarbons, heavy metals and metal salts, fuel specific chemicals, nitrous particles, sulfur dioxide, nitrogen oxides, dioxins and other pollutants
    - There is possibility for dispersal of partially combusted particles, laden with active pathogens
    - Animals fed arsenic-derived antimicrobials may result in arsenic-containing air emissions as well as arsenic-containing ash
    - Fuels that are used may result in toxic air emissions
    - Plastic and other materials used to line trucks may create hazardous byproducts when burned
- Potentially contaminating the ground water and soil
    - From applying liquid hydrocarbon fuels to the pyre
    - From burying ash, produced due to combustion of carcasses. One ton of carcasses yields 0.3 tons of ash.
    - From burying ash produced due to combustion of wood or other solid non-hydrocarbon fuels
- May require significant and costly ash removal and site remediation

Evaluation Lesson Overview

This lesson contains information to help assist you in determining if open burning is a suitable method for disposing of carcasses following an animal health incident.

Factors in the evaluation include:

- Knowing and understanding applicable regulations
- Identifying the waste stream
- Evaluating the availability and delivery logistics of auxiliary fuel
- Evaluating the open burning site
- Recognizing the environmental impact

Evaluation Lesson Contents

This lesson presents the following information:

- Regulations – Covers many of the key regulations governing open burning
- Waste Stream Evaluation – Contains questions to assess the material on the infected premises to determine suitable management options
- Incineration Site Evaluation – Has information including questions to assess whether or not open burning is suitable for carcass management, including evaluating the availability and delivery logistics of auxiliary fuel
- Environmental Impact – Includes a discussion of potential environmental impacts, important biosecurity considerations, and public health considerations

Regulations

In order to properly manage waste, the waste must be classified so applicable regulations can be followed. In general, infected animal carcasses are not classified as hazardous under EPA regulations. Depending on the state, infected carcasses may or may not be classified as infectious or pathological waste. Because of the complexity of environmental regulations, planning and response efforts for waste management should include consultation with experienced personnel familiar with all applicable regulations in the affected areas. Some laws and regulations which may apply to open burning include:

- Clean Air Act for air emissions
- Resource Conservation and Recovery Act (RCRA) for solid waste management
- The U.S. Occupational Safety and Health Administration (OSHA) has set requirements and recommendations for those engaged in hazardous waste operations and emergency response involving disease-causing organisms (29 CFR 1910)
- State or local Departments of Health may issue regulations that determine which wastes are considered 'regulated' or require special handling. Check the Regulated Medical Waste RMW State Locator to find the classifications.

Regulations (cont.)

All waste materials slated for management and/or transport must be correctly classified by a certified waste management professional prior to assure that appropriate carcass management and transportation methods are selected. The classification of the waste will depend upon the specific type of incident and the federal agency with primary authority. Refer to the Emergency Management Tools Module for additional guidance.

Below are some of the considerations for classifying and transporting waste:

- Solid Waste - Most animal related waste generated during a response to an animal health incident will be classified as solid waste for carcass management purposes
- Medical And Infectious (Solid) Waste - A portion of the waste material associated with a response to an animal health emergency may be classified as medical and/or infectious waste, such as used sharps or needles, and will be subject to state regulations
- Hazardous Materials - If carcasses are moved on public roads, their movement is regulated under US Department of Transportation authority, as well as USDA authority discussed in the next bullet
    - Hazardous material will require packaging, manifesting, and transport to an appropriate facility approved to accept the materials in accordance with DOT requirements
    - It is important to note that the hazardous material classification for transportation is not the same as hazardous waste under RCRA
- Permitted Movement – When infected carcasses are permitted to move under APHIS/state authority, they will require DOT designation as hazardous material
    - In compliance with 49 CFR 105.5 and 49 CFR 173.134, as well as, other related 49 CFR requirements, and
    - In compliance with incident-specific state and federal requirements for biosecurity, transport method, chain of custody, and cleaning/disinfection (e.g., using VS Form 1-27)
    - Refer to the NAHEMS Guidelines: Quarantine and Movement Control for additional information

Waste Stream Evaluation

The following are issues one should consider before starting open burning activities:

- What types of affected material?
    - Carcass: type, size, number and condition
    - In-barn manure/litter: type, volume, moisture content, density
    - Stored manure/litter: type, volume, moisture content, density
    - Feed? Quantity and location
    - Eggs? Quantity and condition
    - Bedding? Non-infected manure compost?
    - Paper products? Other debris?
- How much material needs to be incinerated?
    - If there is more material than on-site open burning can handle, off-site carcass management may be required
    - Plastics, treated lumber, and other materials may not be suited for open burning because they may produce hazardous air pollutants
    - The material from a large outbreak may have to be sent to multiple off-site locations if capacities are reached for onsite open burning which may increase the risk of biosecurity breaches

Open Burning Site Evaluation

A number of factors affect the decision to use open burning to manage infected animal carcasses and related debris. Some factors to consider are listed below:

- Is an agreement or are regulations already in place with the state that allow emergency carcass management using open burning? If so, this will help speed implementation of the carcass management process.
- How will emissions be monitored to protect public health? Will the pathogen be spread by open burning before the material is fully combusted?
- Who owns the land or facility where open burning will occur? Open burning and related waste products such as ash and leachate may contaminate the area where the burning occurs.
- Is it part of a large poultry or cattle producing company? If so, you may be able to access company resources to help with the on-site carcass management process.
- Can the site be completely secured at all times? What security measures are in place? What measures would be needed to make the site secure?
- What actions will be taken to reduce odor and vermin? Ensuring that the operation is following regulations and procedures effectively is important to avoid any negative publicity surrounding the carcass management activities.
- Can a sufficient supply of appropriate fuel be acquired and delivered?
- Do the applicable permitting authorities allow open burning?
- Can the permit conditions be met?
- Proximity to water bodies, wells, public areas, roadways, dwellings, residences, municipalities, or property lines
- Proximity to historic sites, burial and tribal sites
- Are short (days) and longer term (weeks) climatic and weather factors suitable to allow complete incineration and any immediate remediation to be completed? (e.g., the direction of the prevailing winds) and seasonal conditions (e.g., wet or frozen ground)

Open Burning Evaluation Questions

Crisis management and farm officials should conduct a survey of potential open burning sites and their overall suitability. Technical expertise will be required for large open burning operations at multiple sites during the extended open burning process.

- Does the open burning plan meet regulatory requirements and does it prevent environmental contamination?
- Are on-farm land areas limited? Will this limit the open burning option during animal disease outbreaks with resulting high mortalities?
- Will selection of open burning be made jointly by farm owners and the members of an incident command structure (ICS) including state or local authorities?
- Has explicit approval by competent institutions and agencies been received to begin open burning?

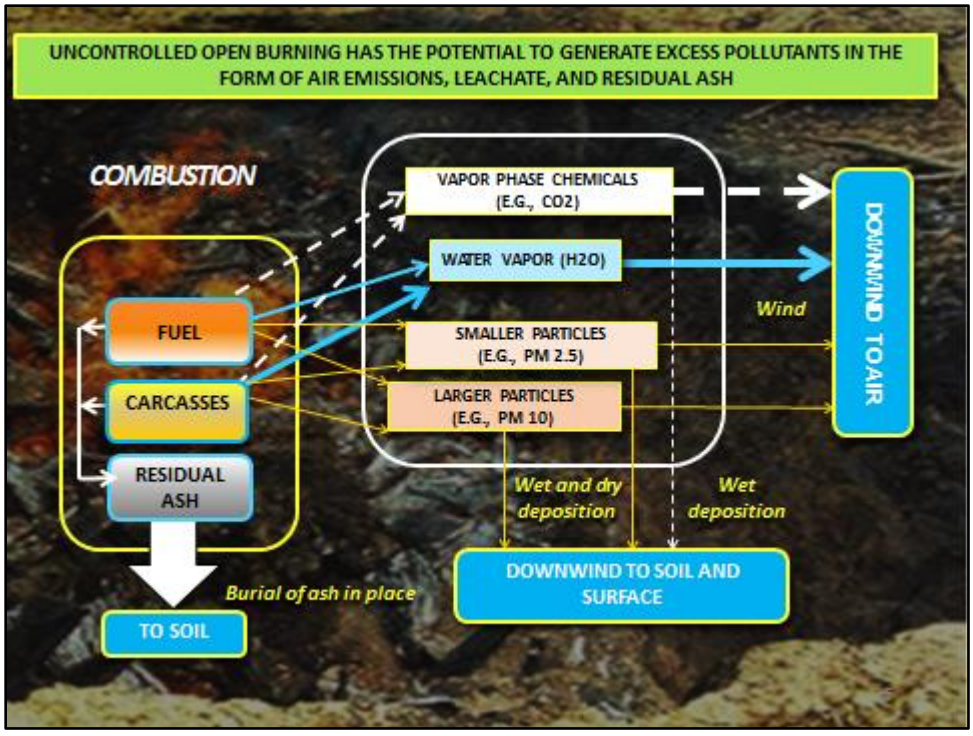
Many states have orders of priority for carcass management options. The ICS must be aware of these and plan to execute carcass management actions, based on these priorities.

Environmental Impact

There are a number of potential environmental impacts from open burning, including those listed below:

- Uncontrolled open burning has the potential to generate excess pollutants in the form of air emissions, leachate, and residual ash. Open burning may also have environmental impacts because carcasses have high water content and require large amounts of fuel to burn and to sustain the fire.
- Open burning of carcasses, fuel and other material can emit hydrocarbons, heavy metals and metal salts, fuel specific chemicals, nitrous particles, sulfur dioxide, nitrogen dioxide, dioxins and other pollutants into the air
- Ground water and soil contamination may also result from pollution by hydrocarbons
- The volume of ash generated can be significant, requiring onsite burial or transportation to landfills

Figure 5. Open Burning Potential Risks (Click on Image to Enlarge It)



Environmental Impact Questions

- Is there a plan in place to dispose of the ash generated through the incineration process?
    - Will ash be considered hazardous waste?
    - What type of confirmatory sampling is required to make the determination that the ash is not hazardous?
    - Does it have to be buried at a regulated landfill?
- Is the premises in compliance with all permit requirements?
- Does record keeping meet the regulatory requirements?
- Who will keep the records?
    - This is important to identify who may be legally liable, in case there is an environmental release in the future

Biosecurity

Biosecurity is a series of management practices designed to prevent the introduction and spread of disease agents on an animal production facility. These measures are necessary to keep disease agents out of healthy livestock and poultry populations and prevent the spread of disease agents from infected groups to uninfected groups within the same population.

Below are some biosecurity considerations. For more comprehensive biosecurity information, refer to the Biosecurity Module.

- Written plans must be in place to prevent disease spread during transportation, if any is required for open burning. For more information see the Secure Transport Module.
- Workers who handle infectious carcasses need to take proper precautions and should be equipped with appropriate PPE in accordance with site-specific plans. Refer to the Health, Safety, & PPE Module.
- In cooperation with appropriate public health agencies, personnel should be monitored afterward for signs of illness if pathogen of interest is potentially zoonotic

NOTE

The agent causing the disease may not be the only agent that poses a risk to personnel. Other potential risks may occur from *Salmonella, Campylobacter*, Q fever and coliforms.

- Proper storage for carcasses awaiting management should prevent scavenging by wildlife and access by other vectors
- Some disease scenarios (prions, spore-forming bacteria) are incompatible with open burning since temperatures may not be high enough to inactivate the disease agent

Public Health Considerations

A comprehensive understanding of the type and strain of pathogen as well as other pathogens associated with the carcasses is essential to prevent further spread of infection and to safeguard human, animal, and environmental safety and security. Biosecurity measures along with cleaning and disinfection protocols will be governed by the type and strain of pathogen present. The list below outlines some open burning considerations:

- Negative public perceptions may be an issue in the event of large-scale (or even small scale) on-site open burning. Care must be taken to conduct open air burning operations in such a manner that public impact is minimized.
- Off-site open burning or other management options will also require transportation of potentially contaminated biomass that may have additional public perception implications
- Heightened public health concerns will exist and must be addressed when dealing with a zoonotic disease agent
- Emissions from open burning can include dense smoke containing particulates, metals, and other potentially-hazardous by products which can cause short-term respiratory problems and possible long-term effects in humans
- Temperatures reached during open burning vary throughout the pyre, so pathogens may not be inactivated and could be dispersed with particles
    - Disease agents responsible for Transmissible Spongiform Encephalopathy (e.g., scrapie, BSE, and CWD) must be subjected to temperatures 1,560° F (850°C) for at least 15 minutes, to render them noninfectious. It is likely these temperatures will not be achieved in a pyre.
    - TSE experts agree that open burning should not be considered a legitimate TSE-related carcass management option

Public Health Questions

The following questions will help evaluate the public health concerns associated with open burning activities:

- Are there incident and site-specific health and safety plans that are approved by a credentialed Safety Officer?
- Are open burning operators trained in proper handling of potentially infected material and the requirements of the health and safety and biosecurity plans? If not, will specialized operators be available to oversee the process?
- Is employee health and safety and biosecurity monitored and are the rules enforced? If the pathogen poses an increased health risk to employees, it is important that personnel use required protection and are monitored regularly by healthcare workers to ensure they are not exhibiting effects of exposure.

Planning Lesson Overview

This lesson contains information to help you plan for open burning of carcasses resulting from an animal health emergency. Planning is essential to ensure that the carcass management tasks are carried out efficiently and unimpeded by a lack of resources. Successful management of a large number of contaminated animal carcasses requires proper planning to protect workers, the general public, susceptible animals, and the environment.

Important considerations include:

- Classifying and characterizing the waste material
- Identifying suitable open burning sites
- Finding adequate carcass storage facilities
- Assessing availability of secure transportation equipment and materials to safely move infected materials to the open burning site

Planning Lesson Contents

The material in this lesson is divided into the following sections:

- Personnel – Highlights requirements and related issues associated with personnel involved with open burning activities
- Waste Classification – Discusses the procedures necessary to categorize the various materials being managed so each type can be managed properly
- Materials, Supplies, and Equipment – Provides a list of equipment and supplies which might be needed for open burning
- Secure Transportation – Presents important questions to consider before transporting carcasses to the open burning location
- Site Suitability – Describes planning considerations for selecting and using an open burning site

Personnel

There are certain planning aspects that are common to all carcass management options. Those aspects include human health and safety, biosecurity, and physical security, as described below.

- Health and safety – Planning to implement open burning as a carcass management option should include measures to protect workers and the public from hazards associated with loading infected materials for transport to the burn site, and transporting the materials to the open burning site. For more information on health and safety practices, refer to the Health, Safety, & PPE Module and the Secure Transport Module.
- Biosecurity – Planning to use open burning must include strict biosecurity measures to minimize disease spread when handling infected materials. For more information on Biosecurity practices, refer to the Biosecurity Module.

Warning

Tyvek® and Tychem® fabrics are not flame resistant and should not be used around heat, flame, sparks or in potentially flammable or explosive environments. Nomex® fiber is suitable for flame hazards, as described on the Dupont® website.

Disclaimer: This module is not endorsing the product of a specific vendor, but merely used the data on this product as an example.

Personnel (cont.)

- Physical Security – Open burning planning efforts should consider security of personnel at the infected premises, security of infected material during transport to the burn site, and security at the open burning site. Below are some ideas for minimizing physical security risks:
    - Provide a single entry point to the infected premises
    - Provide badges to all authorized personnel entering the infected premises
    - Require all personnel to sign in and out of the premises
    - Seal truckloads at the origin and ensure the seals are unbroken at the destination
    - Provide escorts to ensure the loads are undisturbed during transport and watch for leakage

Figure 6. Briefing the Carcass Management Team

Waste Classification and Characterization

Classification is a determining factor in considering whether a management option is appropriate for each type of waste. Because regulations may vary between states, do not assume all states' waste classifications and associated regulations are similar. This is particularly relevant if waste generated during a response is transported across state lines. Consult a certified waste management professional when classifying waste. Response personnel should perform the following:

- Identify all waste materials designated for management (in accordance with the site-specific carcass management plan, if available). For more information, refer to the Emergency Management Tools Module.
- Mark waste materials if possible and verify with the Disposal Group Supervisor that all designated materials are to be disposed of
- Sort materials by type (recyclables, putrescible waste, debris, medical/infectious waste such as sharps, and potentially hazardous waste)
- Stage the various waste materials in suitable areas and containerize putrescible or wet materials to avoid leaching to the environment. Waste materials may require secondary containment to collect runoff and leachate, and coverings such as tarps or shelter coverings.
- Estimate the quantities of each waste type and record the information
- Characterize each waste type in accordance with all applicable local, state, and federal regulations
    - Improper waste storage and management can result in civil and criminal penalties (fines or imprisonment)
    - Document the characteristics of each waste type and label all waste types in accordance with applicable regulatory requirements

Material, Supplies, and Equipment

The Disposal Group must identify all necessary materials, supplies, and equipment to carry out the chosen site-specific carcass management method(s).

The list is provided as an example of the types of materials, supplies, and equipment which might be needed for open burning:

- Personal protective equipment appropriate for heat, flames and sparks
- Personnel, supply, and equipment decontamination equipment
- Secure transport equipment (driven by trained drivers) for carcass loading and unloading
- Vehicle cleaning and disinfection equipment

Figure 7. Example Supplies Needed for Cleaning and Disinfection

Material, Supplies, and Equipment (cont.)

- Vehicle liners, such as plastic sheeting or specialized bags
- Heavy equipment to move the carcasses from staging area to the pyre and to place into the pyre
- Absorbent material to prevent leakage
- Regulatory authority approved containers, including sharps containers
- Bio hazardous waste bags and containers, if applicable Note: use biohazard bags only for identified biohazard waste. Putting non-biohazard waste into biohazard bags results in excess expenses for waste management.

Biohazard Waste

Includes plastic ware such as pipettes or pipette tips, culture plates, specimen vials, etc. that are contaminated with biological specimens, bacterial and cell culture material, or nucleic acids. It also includes towels and bench paper that are biologically contaminated (i.e., used where samples or cultures are opened and manipulated). It may also include culture or sample containers (e.g. plastic tubes of blood) that are contaminated with biological materials. The categories are based on the UN assigned by the United Nations Committee of Experts on the Transport of Dangerous Goods (UNECE).

Additional equipment and spare parts must be available for:

- Excavation of trenches or pits if burying ash onsite
- Ash disposal
- Firefighting
- Emergency communication systems

Material requirements for open burning may include:

- Dry straw or hay
- Untreated timbers
- Kindling wood – dry with a low moisture content, and not from green vegetation
- Coal
- Diesel fuel

Ensure a sustained supply of fuel source, an adequately sized area for unloading and storage and for continued combustion.

Temporary Carcass Storage

When the Euthanasia Group generates mortalities at a faster rate than the Disposal Group can process them, some means of temporary carcass storage must be provided. It is important to identify where carcasses can be collected and stored until carcass management can commence. Guidance related to storage and collection of solid waste which may have some relevance to carcass collection and staging, refer to 40 CFR 243.200-1(a).

Considerations for temporary storage include:

- Can the storage area be secured to prevent unauthorized access, scavengers, odors, rapid decomposition, and potential disease spread to susceptible species?
- Will the carcasses be stored using refrigeration or some other stabilization method such as grinding and preserving them in containers?
    - If so, are the equipment, supplies and materials available?
    - Can the equipment be cleaned and disinfected?
- Will the storage capacity be sufficient to accommodate the difference between the maximum expected euthanasia rate and the maximum carcass management rate?
    - If not, avoid euthanizing animals at a rate that exceeds carcass management and storage capacity
    - When maximum carcass management and storage capacities are reached, curtail euthanasia until adequate capacity is available
    - Consult with Incident Coordination Group leadership for strategies to minimize the number of animals to be euthanized and managed

Secure Transportation

Transport vehicles will be needed to move carcasses and other materials from barns/pens to the burn site. If the material must travel on public roads, it should be transported in closed, leak-resistant and/or lined trucks or dumpsters. Secondary containment may be needed, depending on the type of material being transported. Consult a certified waste management professional when developing this section of the carcass management plan. Some transport planning considerations are listed below:

- Are haulers to be used for the response properly equipped to haul carcasses in accordance with all applicable laws?
- Are transport vehicles designed to handle the materials to be transported?
- Are the drivers adequately trained in biosecurity?
- Can two-way communications be maintained with the hauler during transport?
- Do shipments require law enforcement escorts or approved routing to avoid sensitive areas?
- Will travel routes from the barns/pens to the burn site avoid uninfected farms, road construction, neighborhoods, and densely populated areas?
- Has an alternate travel route been identified?
- What procedures will be followed if the vehicle is damaged during transit?
- How is the waste classified for transport? What packaging standards apply? Are all standards consistently met, including labeling, placarding, and manifesting, if required?
- How will transport vehicle traffic be minimized into the Control Area?

For more information, refer to the Secure Transport Module.

Site Suitability

Members of the carcass management team must contact or visit the premises and/or the appropriate state regulatory authorities to ensure open burning is accomplished in accordance with all applicable laws and regulations. See the Site Specific Carcass Management Plan in the Emergency Management Tools Module.

During an animal disease outbreak, the carcass management team should consider the following:

Selection of environmentally suitable locations for open-burning of infected livestock carcasses is important in the disease management process

- Because of the virulent nature of many pathogens, it is important to locate such sites within or in close proximity to the infected premises
- The site access should be able to handle heavy truck traffic and allow for biosecurity around the site's perimeter
- Will open burning create a hazard due to reduced visibility from smoke?
- Due to the relative putrescibility of the carcasses and associated manure/bedding, as well as the quantity and density of smoke that will result from open burning, it is critical to choose sites that will not be adversely impacted by potential releases of nutrient-laden leachate nor will result in nuisance complaints in the event that smoke, odors, flies, or scavengers begin to appear on-site
- Site should not pose a risk of starting a grassland or forest fire

Operations Lesson Overview

This lesson contains general procedures in preparing for and managing carcasses by utilizing open burning. The following topics will be addressed:

- Open burning preparation
- Health and safety
- Open burning operations

Critical steps used during recent U.S. animal disease outbreaks are also included.

Figure 8. Carcass Management Team Wearing PPE

Operations Lesson Contents

The material in this lesson is presented in a step-wise manner that provides detailed instructions and key steps based on the criteria and measures instituted during recent U.S. animal disease outbreak responses.

- Incident Management – Provides general guidelines to the Disposal Group personnel when dealing with an animal emergency situation
- Infected Premises Preparation – Lists steps for assessing facility readiness to begin operations
- Open Burning Operations – Describes procedures for safe and proper carcass management using open burning

Incident Management

All Disposal Group personnel should familiarize themselves with the approved site-specific carcass management plan. The Disposal Group Supervisor should review the plan with the Disposal Group and brief them on all relevant aspects of the carcass management effort. For further guidance, refer to the FAD PReP APHIS Foreign Animal Disease Framework: Roles and Coordination.

1. The Incident Coordination Group (ICG) / Incident Management Team (IMT) should ensure there is a system in place to identify carcass management team members with the required expertise.
2. The Disposal Group Supervisor, Disposal Coordinator, or other assigned officials should verify the credentials, training, and security clearances, and arrange just-in-time training for carcass management team members.
3. The Disposal Group Supervisor should prepare briefings and reports for the Operations Section Chief.
4. The Safety Officer should brief all responders on safety precautions and will provide a briefing on the nature of the disease and other circumstances affecting the response.
5. The Safety Officer or Biosecurity Officer should brief all responders on biosecurity protocols
6. Plans should be developed to be sure that all onsite carcass management related personnel are briefed on safety requirements, site conditions, and tasks.
7. The Public Information personnel should develop material, such as Frequently Asked Questions, to address public concerns.

Infected Premises Preparation

1. Consult with local, county, state, and federal environmental officials to obtain specific information for the region or community in order to minimize any negative environmental effects associated with the open burning of infected carcasses.
2. Determine all applicable public health or environmental protection laws, including fire codes and other regulations.
3. Consider regional climate and seasonal trends (e.g., general direction of prevailing winds, precipitation, thermal factors).
4. Verify the availability of adequate carcass storage facilities such as refrigerated rooms, transport vehicles, freezers or other means of carcass preservation if needed.
5. Identify haulers, if applicable, who:
    - Are equipped to haul carcasses in accordance with State and Federal laws
    - Can provide secure, leak resistant, transport for the infected carcasses and contaminated materials
    - Possess vehicles in good mechanical condition and capable of carrying the load without difficulty
    - Have vehicles which can be covered with a tarpaulin if they do not have closed tops
    - Employ licensed drivers adequately trained (see 49 CFR 172 and 49 CFR 173 for further guidance)
    - Have an emergency plan which addresses spills/excess leakage; vehicle break-downs; traffic accidents; adverse weather conditions; terrorist attacks

Infected Premises Preparation (cont.)

6. Calculate the amount of material required to accomplish the open burning. One adult bovine carcass is equivalent to five finishing pigs or five adult sheep. According to US and Canadian experience, one adult bovine carcass may require the following quantities of materials. Note: this list is an example of quantities and types of materials that may be required; actual requirements will vary based on conditions and available materials at the time and place of the incident.
    - 3 bales of straw or hay,
    - 1 cord (128 cubic feet) untreated heavy lumber,
    - 50 pounds of kindling wood,
    - 100 pounds of coal pieces that are 6–8 inches in diameter, and
    - 5 gallon of liquid fuel. Do not use gasoline. The type and amount of fuel used for incineration will be influenced by local fuel availability and conditions. For effective burning, fuel should be as dry as possible.
7. Obtain equipment such as mechanical chains and lifting equipment. Identify personnel properly trained in the use of this equipment.
8. Ensure fire safety equipment is readily available.
9. Ensure only properly trained and credentialed personnel conduct open burning and that local fire authorities are included in decision making.

Estimating Average Bovine - Equivalent Carcasses

- 1 adult cow or bull - 1 bovine-equivalent carcass
- 5 adult swine - 1 bovine-equivalent carcass

Open Burning Operations

1. Consult with the appropriate state regulatory agencies for air-quality and solid-waste management requirements on potential sites before initiating carcass management operations.
2. Work with the local authorities, including firefighting officials, about the planned open burning. Secure ample fire retardant, equipment, personnel, and gear. Provide the appropriate cleaning, disinfection, space and personal protective gear.
3. Ensure availability of adequately prepared work area (e.g., paved or gravel pad) to support operations.
4. Coordinate with the local utility company to provide electricity (for example, drop service from power lines for different electrical equipment), and secure batteries and generators for remote sites
5. Calculate space requirements. Allow a fire-bed length of at least 3 feet for:
    - One adult cattle carcass
    - Five swine carcasses
    - Five sheep carcasses
6. Ensure all employees involved in the operation wear PPE in accordance with CDC, OSHA, the incident-specific Health and Safety Plan (HASP). APHIS employees should refer to the APHIS Emergency Management, Safety and Security Division EMSSD website for more information.
7. Prepare the bed:
    - Build the fire bed in a manner to minimize the amount of sparks, soot, and objectionable odors blowing toward buildings or across public roads
    - Stake out and fence the selected burning site for the fire-bed construction making sure to allow access for equipment needed to maintain the burn
    - Allow a fire-bed length of at least 3 feet for each adult cattle carcass, five swine carcasses, or five sheep carcasses
    - Lay three rectangular rows of straw or hay bales lengthwise along the line of the fire bed. Rows should be 12 inches apart and each bale should be separated by a 12 inch gap.

Open Burning Operations (cont.)

- Place loose straw in the spaces between the rows and bales to provide natural air flow
- Place large pieces of lumber lengthwise on top of each row. Distribute large and medium-sized pieces of lumber across the fire bed, leaving 6-12 inches of space between them.
- Place small kindling wood on the fire bed and cover loosely with straw
- Spread 6-8 inch-diameter coal evenly at the rate of 500 pounds per square yard; use of a liquid fuel such as diesel or furnace oil may cause soil and groundwater contamination, so is not recommended unless small amounts are required to initiate the pyre. Then, solid fuels should be used to maintain combustion.
- This process must be approved by appropriate state or local regulatory agency
- Lay the carcasses on the fire bed
- Use mechanical chains and lifting equipment (such as front-end loaders) to accomplish all the loading, spreading, and handling of solid fuels and carcasses
- Position carcasses on their backs with their feet in the air and alternately head to tail if possible
- Two goats, sheep, or swine carcasses can be placed on top of each bovine carcass and burned without additional fuel
- Place loose straw on top of the carcasses and all spaces in between
- Spray liquid fuel over the fire bed with a pump, or use sprinkling cans or buckets
- Soak rags in kerosene oil or waste oil and place them every 30 feet along the fire bed for a better and more harmonized ignition
- Make sure that people and equipment are at least 25 feet from the burning pile
- Have fire-fighting equipment readily available
- Ignite the fire bed; stir the burning pile with front-end loaders. Add more fuel as needed.

WARNING

- DO NOT burn carcasses with explosive or highly volatile materials, such as gasoline. (Consult fire department or state environmental regulators for acceptable accelerants)
- DO NOT burn carcasses with tires, rubber, plastics, or similar materials
- DO NOT allow personnel to approach the carcass-burning site from downwind without proper personal protective equipment

Open Burning Operations (cont.)

8. Upon completion of the open burning operation, thoroughly clean and disinfect all contaminated equipment. See the FAD PReP SOP15: Cleaning and Disinfection and FAD PReP SOPs: Biosecurity.
9. Dispose of ash in accordance with permit requirements after all carcasses have been burned completely and the fire has been extinguished. Note: It may be several days before the ash is cool enough to be managed without damaging the heavy equipment used to move it.
10. If allowed by permit and approved nutrient management plan, apply the ash to agricultural lands. Otherwise, dispose in accordance with applicable local, state and federal requirements.
11. Restore open-burning site to its original condition

Summary

Congratulations! You have completed the Open Burning Module. In this module, you have learned to:

- Describe open burning as a method for carcass management
- Understand the advantages and disadvantages of open burning
- Identify personnel health risks associated with open burning
- Consider environmental risks associated with open burning
- Obtain regulations governing open burning by consulting with state officials
- Identify factors used to evaluate open burning as a carcass management option
- List critical elements when planning open burning
- Recognize key components of open burning operations

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.