

Carcass Management Course Orientation Module



United States
Department of
Agriculture



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Getting Started

Welcome to the Orientation Module of the online Carcass Management Course. This course will present a series of Introduction and Carcass Management Modules, which address carcass management planning and operations, during animal health emergencies.

Completion of the five modules in the Introduction Modules is recommended, before undertaking any of the seven Carcass Management Modules.

System Requirements

You must have the following programs installed to fully access this course:

- Modern desktop browser such as Microsoft® Internet Explorer® 8 or higher, Google® Chrome, or Mozilla® Firefox
- Adobe® Reader

The modules in the Carcass Management Course may be viewed in any order; however, completion of the entire Introduction Module Series is recommended before completing any of the Carcass Management Option Modules.

- To exit a module before completion, simply close it
- If using AgLearn, its bookmarking feature provides the option for returning to the last-viewed page
- If the course is being viewed from a website or from a self-launching CD, bookmarking may not be available

For questions concerning course content or to recommend changes to the course, please contact the Veterinary Services, Office of Science, Technology, and Analysis Services (STAS), Interagency Coordination at 301-851-3565.

If you have difficulties with AgLearn functionality, contact the AgLearn Help Desk at 866-633-9394.

Course Information

Target Audience: The target audience for this course includes:

- Federal, State, & Local employees
- Animal health emergency responders
- Academia & industry personnel
- Accredited veterinarians
- Livestock and poultry operators
- Contractors (e.g., equipment operators, truck drivers, laborers, etc.)

Prerequisites: None

Course completion: The Introduction Module series is followed by seven Carcass Management Modules. After finishing each training module, you can download a Certificate of Completion.

Additional course information can be found by visiting the following sections:

- [Acronyms](#)
- [Definitions](#)
- [References](#)

Acknowledgements

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Course Overview

This course focuses on the responsibilities of carcass management personnel, evaluation of carcass management options, and selection and execution of optimal methods.

During a foreign animal disease (FAD) outbreak, effective management of animal carcasses and materials is a key component of a successful response. Proper management can help prevent or mitigate the spread of pathogens.

The goal of carcass management is to protect the agricultural and national economy through the control and containment of disease by conducting carcass management operations in a timely, safe, biosecure, aesthetically acceptable, and environmentally responsible manner.

If any materials (for example, bedding or feed) are potentially contaminated, they must undergo treatment or other management method to inactivate or contain the infectious agent or pathogen. Wastes requiring management may include: carcasses; contaminated manure, litter, and bedding; contaminated feed; contaminated personal protection equipment (PPE); contaminated materials and equipment that cannot be cleaned and disinfected; as well as chemicals from cleaning and disinfecting. It is also possible that milk and milk products from a quarantined area will require management.

Course Objectives

The objectives of the course are as follows:

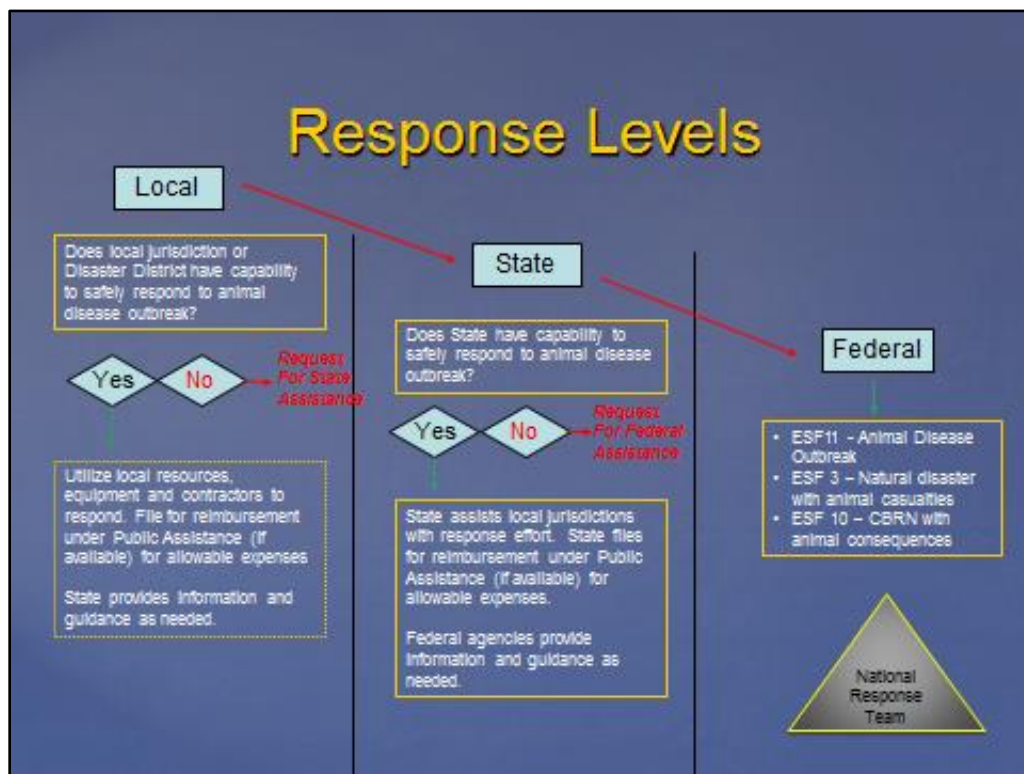
- Studying the APHIS Animal Health Emergency Management Tools for choosing the appropriate carcass management options
- Selecting health, safety, and personal protective equipment (PPE) measures necessary to reduce risk to human health and preventing the spread of harmful agents to other people or animals
- Implementing Secure Transport guidelines for movement of large numbers of contaminated or infected carcasses to prevent undesired environmental impacts, public health risks, and disease spread
- Determining risks and applying Biosecurity controls focused on movements of animals, personnel, and conveyances
- Reviewing Carcass Management methods and procedures and selecting the most suitable option, based on pertinent Federal, State, and Local restrictions

Emergency Support Function

The Emergency Support Functions (ESF) provide the structure for coordinating Federal interagency support for a Federal response to an incident, both for declared disasters and emergencies under the [Stafford Act](#) and for non-Stafford Act incidents.

- ESF #11 is activated by the Secretary of Homeland Security if requested by the primary agencies
- The USDA and the U.S. Department of the Interior (DOI) are the primary agencies for ESF #11. USDA is the ESF #11 Coordinator and has delegated its coordinating role to APHIS. Figure 2 lists the key roles and responsibilities.
- The USDA Natural Resources Conservation Service (NRCS) may provide local assistance for carcass management under the Emergency Watershed Protection Program (EWPP), and may also provide private landowners with technical assistance for carcass management if requested following a natural disaster.
- The USDA Farm Service Agency (FSA) may provide assistance for farmland debris cleanup through the Emergency Conservation Program
- If there is evidence that an animal was exposed to a pest or disease of livestock, USDA may exercise authority under the Animal Health Protection Act to destroy and dispose of the animal carcass

Figure 1. Local, State, & Federal Response Levels (Click to Enlarge Image)



Animal Health Incidents and Carcass Management

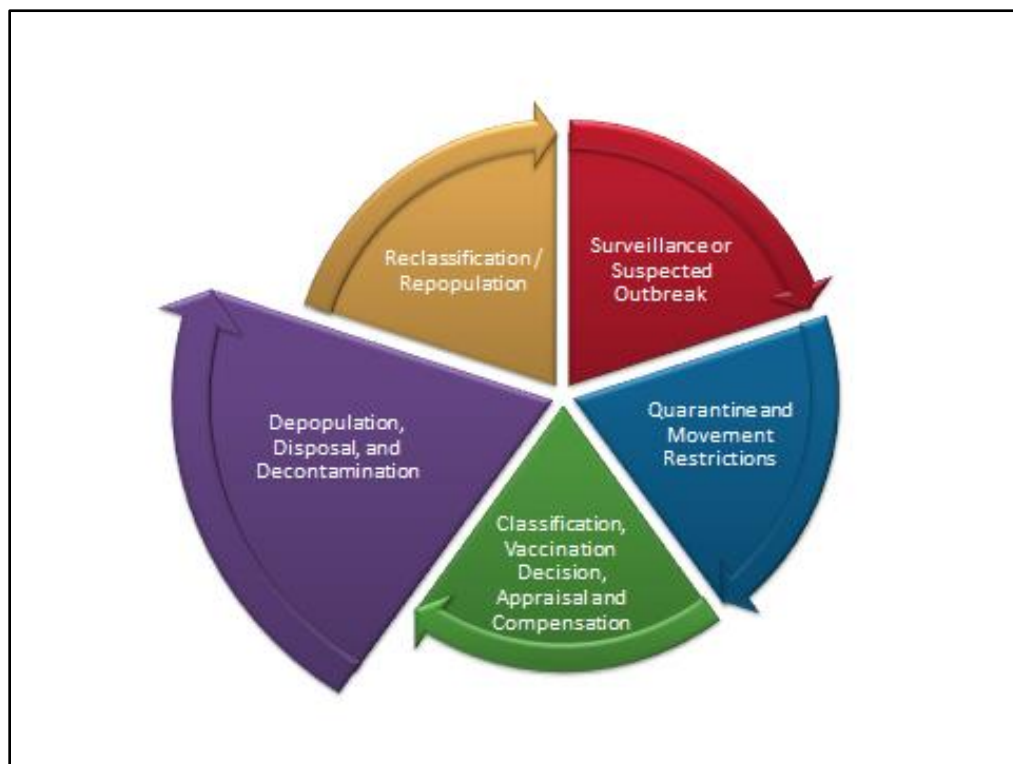
Although this course focuses on carcass management, it is important to have an understanding of the entire depopulation, carcass management and decontamination process during a response operation:

The general order of events is:

- Depopulation of animals, management of the waste materials including carcasses, and decontamination of facilities, equipment, personnel, and non-disposable supplies
- Once the site is released from quarantine, animal agriculture operations can resume

Methodologies used in the various phases of the operation are interrelated. Therefore, it is important to coordinate activities and communicate with all teams involved to ensure the animal health emergency response operation goes as smoothly as possible.

Figure 2. 3D Operations



Course Structure

The Carcass Management Course contains five Introduction Modules and seven Carcass Management Modules. Below is the list of modules and the approximate amount of time needed to complete each one.

Introduction Modules

1. Orientation Module: 30 minutes
2. Emergency Management Tools Module: 45 minutes
3. Health, Safety, and PPE Module: 1 hour
4. Secure Transport Module: 1 hour
5. Biosecurity Module: 1 hour

Carcass Management Modules

1. Off-site Permitted Landfill Module: 1 - 2 hours
2. Rendering Module: 1 hour
3. Off-site Incineration Module: 1 hour
4. Composting Module: 1- 2 hours
5. Open Burning Module: 1 hour
6. On-site Burial Module: 1 hour
7. Mobile Treatment Technologies Module: 1 -2 hours

Introduction Modules

Orientation

This module is the first of a series of Introduction Modules to the Carcass Management Course. This module provides an overview of the set of modules comprising the course, and introduces the Carcass Management Options Matrix and the Carcass Management Decision Loops.

Emergency Management Tools

This module familiarizes responders with key decision making tools for use during an animal health emergency. This module introduces a suite of tools and emphasizes the importance of building a carcass management plan. A Site Specific Carcass Management Plan template is also provided in the module.

Health, Safety, and PPE

This module highlights the risk to human health and recommends mitigations for preventing human exposure to contaminants during carcass management operations. Responders must take the appropriate precautions to protect themselves from exposure to harmful agents, and they must ensure that they do not spread the hazard to other people or animals.

Secure Transport

This module discusses the safe and secure transportation of large numbers of contaminated or infected livestock carcasses. This activity requires significant planning and preparation to prevent undesired environmental impacts; public health risks, and further disease spread through diseased animal transport.

Biosecurity

This module describes the biosecurity procedures needed to prevent the spread of disease. When properly implemented, these measures help reduce the risk of pathogen transmission during the movement of personnel and material necessary for the extensive activities of an incident response, such as carcass management.

Carcass Management Modules

Seven carcass management options are presented in the course.

Off-site Permitted Landfill

This module addresses the use of off-site permitted landfills which are engineered structures built into or on top of the ground in order to isolate waste from the environment (groundwater, air, rain). Landfills differ from "dumps" in that they have a liner (usually clay or plastic) to keep the waste from polluting the surrounding area.

Rendering

This module addresses rendering which uses heat and pressure to convert carcasses into protein-based solids, water, and tallow. Rendering plants may be either integrated with existing packing or processing plants or independent, receiving animal carcasses from farms and ranches.

Off-site Incineration

This module addresses off-site incineration, which involves securely transporting carcasses to a fixed incineration facility, such as incinerators dedicated to: municipal waste, medical infectious waste, hazardous waste or pathological waste. Incinerators consist of a hearth where waste materials are combusted at high temperatures, resulting in ash. Fixed incinerators have air emissions control devices to reduce pollution.

Carcass Management Modules (cont.)

Composting

This module describes composting as a carcass management method that promotes biomass decomposition through placement of carcasses between layers of carbon rich organic materials. The decomposition process requires a prescribed level of nitrogen, carbon, oxygen, and moisture for optimal tissue breakdown. In the composting process, carcasses serve as the source of nitrogen, while the addition of high carbon plant material meets the carbon requirement.

Open Burning

This module addresses open-air burning, which involves combustion of waste at high temperatures, converting it into heat, gaseous emissions, and ash. Open-air burning may be accomplished by burning on open land at an above-ground site, in a dug-out pit, or on combustible heaps called pyres. Open-air burning operations are strictly regulated by State or Local officials.

On-site Burial

This module explains the use of on-site burial which can include lined and unlined trench or pit methods. The two on-site carcass management methods covered in this module include unlined trenches and lined burial sites.

Mobile Treatment Technologies

This module describes several mobile treatment technologies which can be delivered to the infected premises and treat the carcasses on-site avoiding the risk from transport. The ones mentioned in this module include: Mobile Incineration, Mobile Autoclave Shredding and Mobile Alkaline Hydrolysis.

Carcass Management Options Matrix

USDA APHIS has developed emergency management tools to be utilized during an animal health emergency. The tools have been grouped together into a single Matrix, Decision Loop, and Checklist (MLCh Tool).

The first component of the MLCh Tool is the Carcass Management Options Matrix that ranks the major carcass management options based on 15 different criteria. A more detailed explanation of the Matrix is found in the Emergency Management Tools Module.

Figure 3. Carcass Management Options Matrix (Click on the Image to Enlarge It)

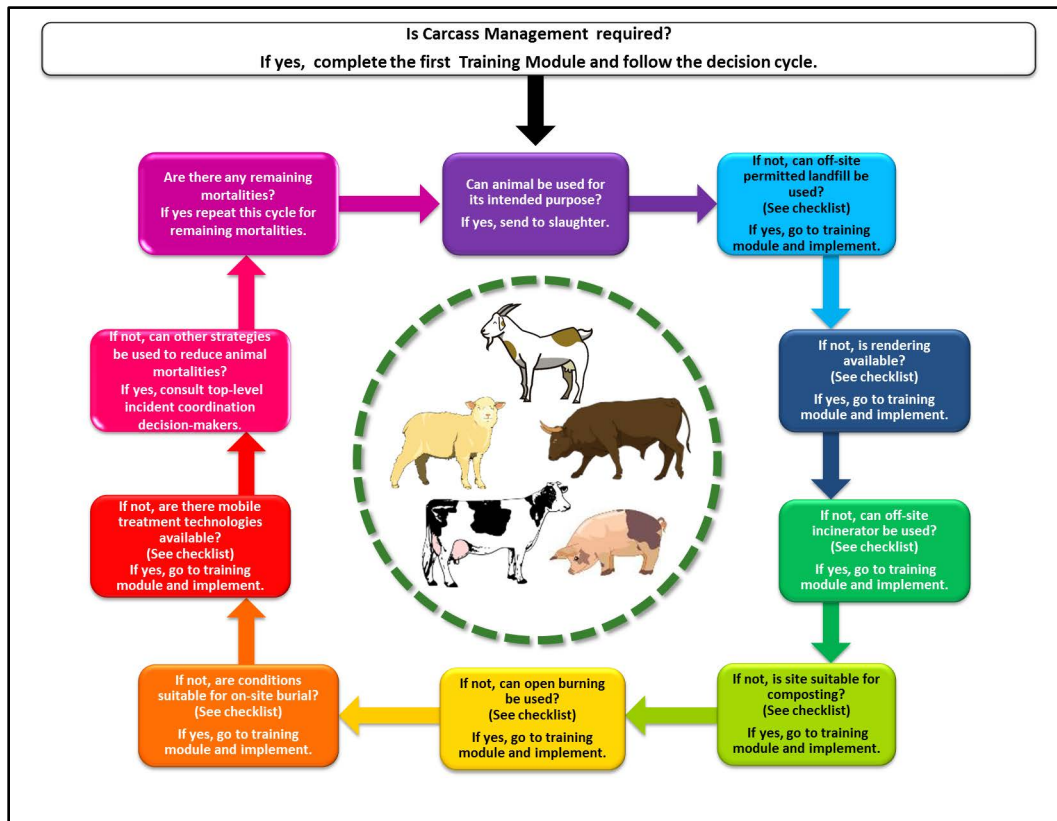
Weighting	Criteria	Off-Site Landfill	Rendering	Off-Site Incineration	Composting	Open Air Burning	On-Site Burial
Most Important (x3)	Public Health Risk (1)	9	9	9	9	6	3
	Biosecurity (2)	6	6	6	3	3	3
	Pathogen Inactivation (3)	3	6	9	6	9	3
	Environmentally Sustainable (4)	9	9	9	9	3	3
Important (x2)	Need to 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

Large Animal Carcass Decision Loop

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 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

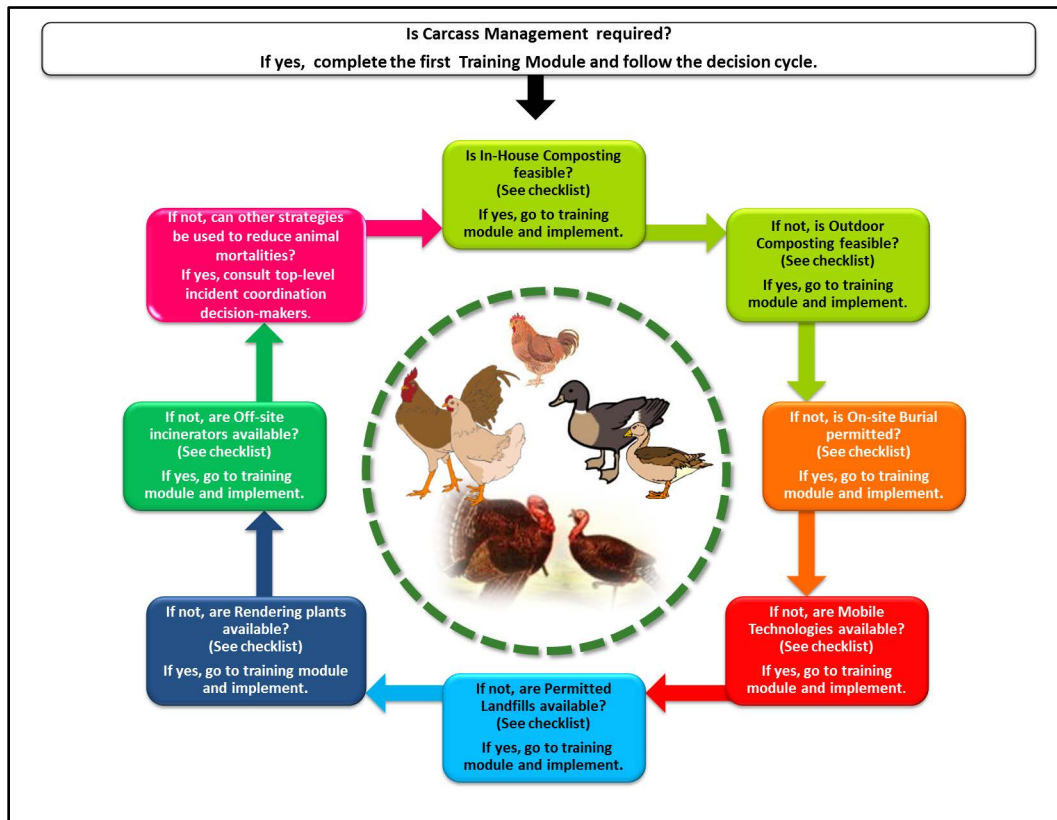
Figure 4. Large Animal Decision Loop (Click on the Image to Enlarge It)



HPAI Carcass Decision Loop

The HPAI loop begins with onsite options which are preferred for disease containment and are more feasible for poultry than for large animals due to the small size of the birds.

Figure 5. HPAI Management Decision Loop (Click on the Image to Enlarge It)



A detailed explanation of the Decision Loops and Options Checklist can be found in the Emergency Management Tools Module.

Costs of Carcass Management

The cost of the various carcass management options are a factor in choosing from among the various alternatives. The management of large numbers of animal carcasses must be cost effective and protective of human health and the environment.

- Contingency plans must consider the economic costs and the availability of resources for the actual carcass management/treatment, as well as numerous related costs
- In 2001, cost estimates for large-scale management of animal carcasses in the United Kingdom exceeded \$400 million (McClaskey, 2004)
- In the 2002 avian influenza outbreaks in Virginia, costs for carcass management were estimated at \$149 million
- Since the 1920s, the 10 multi-flock outbreaks of bird flu in the US cost the poultry industry \$368 million, which does not include increased egg and poultry prices (Pepin et al., 2014)
- The 2014/2015 HPAI outbreak in the US cost the federal government approximately \$171M for carcass management alone

Additional information can be found in the USDA, [Carcass Management during a Mass Animal Health Emergency](#), Final Programmatic Environmental Impact Statement, December 2015.

Contracts

In an emergency, the incident command team identifies a need for depopulation activities, or carcass management by hauling waste, for example. That need may be satisfied through several different means:

- First, with existing personnel and resources (using stockpile materials for example), or
- Second, through agreements with producers or other entities, or
- Finally, through use of contracts.

Contracts can be for goods, services, or some combination of both. This process is governed by Federal Acquisition Regulations (FAR), the Agricultural FAR Supplement (AGAR), Appropriations Law, and Dept. of Agriculture Directives and Procurement Advisories.

- Regulations require that procedures be followed that allow for maximum competition and transparency in government contracting
- A competitive process based on principles of fairness and transparency provides vendors with notice, information, and opportunities
- Solicitations are posted on the fbo.gov website, allow time for vendors to submit quotes, and evaluate proposals based on criteria established in the solicitation

Contracts (cont.)

To use contracting as a means to obtain goods and services, the command team must submit a requisition package to the Procurement branch. That requisition package must contain funding, a description of the requirement (often called a Statement of Work), any known sources, a technical point of contact (POC) and any required justifications.

- One justification that is often used in an emergency is Unusual and Compelling Urgency ([FAR 6.302-2](#))
- This authority allows “When the agency’s need for the supplies or services is of such an unusual and compelling urgency that the Government would be seriously injured unless the agency is permitted to limit the number of sources from which it solicits bids or proposals, full and open competition need not be provided for.”
- This justification allows the government to use a different procedure in an emergency to save time

The contracting officer will use the information submitted by the command team to create a solicitation.

- The solicitation will be sent to a vendor (or vendors depending on the situation)
- Vendors will submit a price and a proposal and the information will then be evaluated by the contracting officer and the technical POC
- The process may or may not include negotiation. Vendors may also be asked for past performance and capability information.

Contracts (cont.)

Only warranted contracting officers have the authority to enter into contracts and to make changes in contracts. When an individual or government employee enters into a contract or directs the performance of a vendor without the authority to do so, it creates an unauthorized commitment.

- Employees can then be held financially responsible for these commitments unless a ratification is obtained
- A ratification occurs when the Government agrees to pay for the unauthorized commitment
- Ratifications can only be approved by high level APHIS officials under certain circumstances ([FAR 1.602-3](#))

As part of its ongoing mission, APHIS Veterinary Services stockpiles supplies. Contracting for supplies for the stockpile is ongoing and as supplies are used, they are replenished.

The Government is limited in its ability to contract ahead of time for an emergency. Appropriations law principles prevent contracting when a need does not yet exist. In addition, it may not be practicable to contract for services, before knowing when or where they might be needed.

Summary

You have completed the Orientation Module of the Introduction Modules. In this module, you have been introduced to:

- The carcass management course overview and objectives
- The emergency response process during a 3D operation
- The Introduction Modules
- The Carcass Management Modules
- The Carcass Management Matrix, Decision Loops, and Checklist (MLCh) tool

Return to the Home Page and begin the next module, Emergency Management Tools.