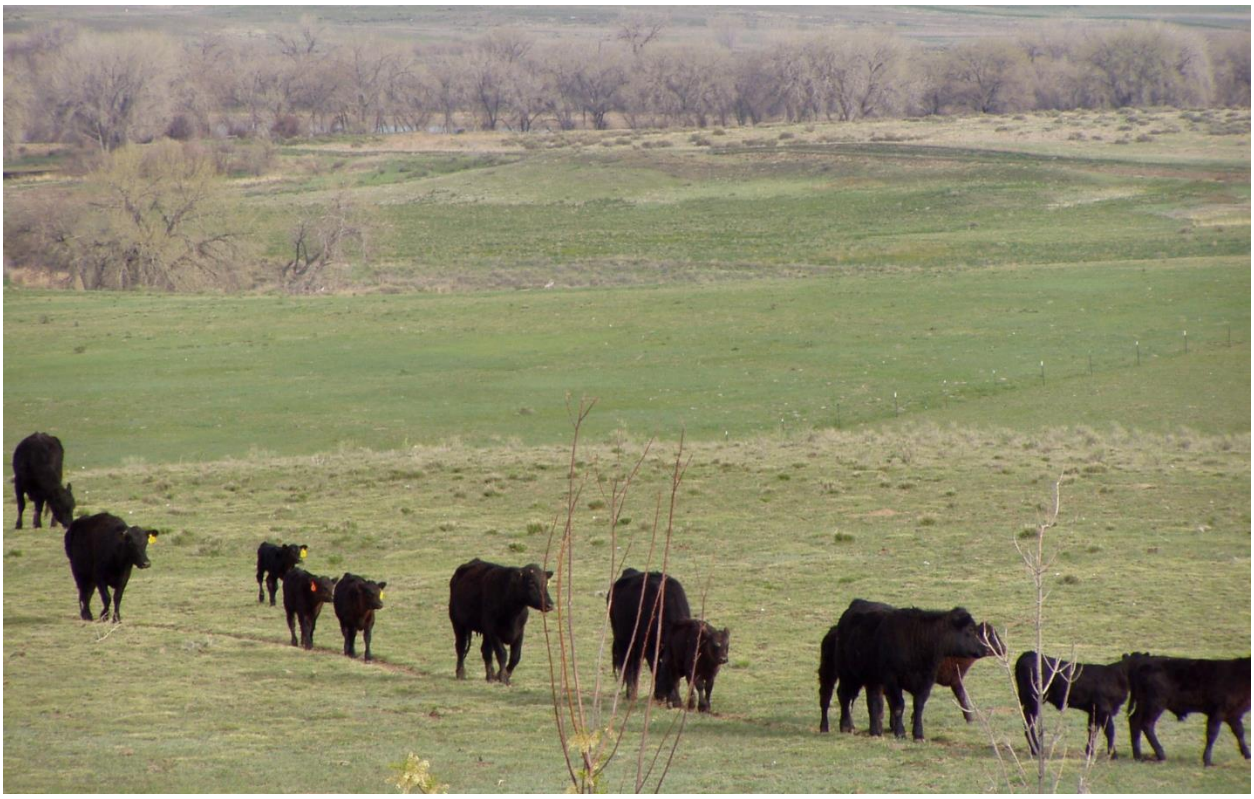
COLORADO
Department of Agriculture
Animal Health Division

Cow-Calf Emergency Disease Response Plan



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1.0 Introduction

Potential emergencies facing cow-calf producers may include an outbreak of a highly contagious animal disease, serious toxic exposures, and foreign animal diseases (FADs). A rapid response to an animal disease emergency will be necessary to halt the spread of disease and will require interaction between local, state, and federal agencies and industry partners. The Colorado Department of Agriculture (CDA) *Cow-Calf Emergency Disease Response Plan* describes the response actions that will be implemented by the CDA in collaboration with the United States Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS), state agencies and entities, local and state emergency management personnel, local and state law enforcement, brand inspectors, and ranching industry partners to swiftly detect, control, and eradicate a disease outbreak on a cow-calf ranching operation.

1.1 Purpose and Scope

The purpose of the CDA *Cow-Calf Emergency Disease Response Plan* is to provide a framework to ensure a rapid and coordinated response to an outbreak of a highly contagious disease on a cow-calf operation within the State of Colorado. The goal of this plan is three-fold: to control and eradicate the disease on infected premises as quickly as possible; to help affected cow-calf operations recover; and, to protect and maintain business continuity on unaffected premises during a disease outbreak.

This plan provides the operational considerations and details necessary to minimize the impact of an outbreak affecting a cow-calf operation and will be applicable to any highly contagious or economically destructive disease or event that causes significant morbidity or mortality in cow-calf herds.

Natural disasters may also cause devastation in the State's cattle population requiring a similar response. Many of the protocols and procedures presented in this plan, such as disposal methods, will be applicable in a natural disaster event affecting cattle. In such incidents, the CDA *Cow-Calf Emergency Disease Response Plan* may be used as a template to help ensure an adequate response, generally guided by a local jurisdiction such as a county.

1.2 Scope of Authority

As stated in Colorado Revised Statutes (CRS) 35-50-105, "(1) The commissioner is responsible for regulation related to livestock disease or other livestock emergencies among or affecting livestock in the state." Commissioner of the Colorado Department of Agriculture is responsible for regulation related to livestock disease or other livestock emergencies among or affecting livestock in the state." As such, the CDA will serve as the State's lead agency during an outbreak of a highly contagious disease affecting livestock in Colorado.

Although CDA serves as the lead agency during an animal disease outbreak in Colorado, natural disasters affecting livestock are managed at the local level. County emergency managers can assist producers with developing animal emergency response plans for their premises. When responding to a natural disaster or an outbreak of a highly contagious disease in cattle, local area producers

may become a critical response component by providing resource provisions and communicating the threat to area neighbors.

1.3 Situation

The potential impact on Colorado's economy from a disease outbreak in cow-calf operations could be devastating. Such an event would be far-reaching, affecting many different sectors beyond the cow-calf producer including feedlots, processors, distributors, and retailers.

1.4 Assumptions

- Response to an animal disease outbreak will begin at the local level.
- If an animal disease emergency occurs in Colorado's cow-calf operations, the most probable means of discovery will be by cattle producers, private practice veterinarians, and /or trace information from an animal disease investigation in another state. Local livestock experts, such as brand inspectors and livestock extension agents, may be involved in initial local detection and background information about livestock diseases and conditions.
- Private veterinary practitioners will likely be the first responders to any animal disease outbreak.
- Veterinarians are required to immediately notify the State Veterinarian or the USDA-APHIS-VS District 6 Colorado Office of any suspected foreign animal disease (FAD).
- An animal disease outbreak may occur through natural pathways or could be introduced as an act of terrorism.
- Diagnosis of a highly contagious or emerging animal disease in Colorado, the United States, or surrounding countries may significantly restrict the intrastate, interstate, and international movement of animals (especially livestock) and animal products.
- Initiation and implementation of response actions for a suspected or confirmed positive foreign animal disease (FAD) will be under the jurisdiction of the CDA and carried out by the State Veterinarian or official designee. Producer input will be highly valued and integrated into the response.
- The State Veterinarian and the USDA-APHIS-VS Colorado Office will work in close coordination in any animal health emergency. There are established protocols for investigating and reporting potential FADs and new and emerging infectious animal diseases.
- Response measures for an animal disease emergency may involve the mutual aid support from sister counties and municipalities as well as local private industry support.
- Animal disease emergencies may lead to prolonged economic impact requiring long-term federal and state assistance in response and recovery.
- Psychological counseling and support may need to be available for owners losing livestock or having to depopulate a herd in an animal disease emergency, or for persons responding to the situation.

1.5 Plan Maintenance

The State Veterinarian is responsible for the management and maintenance of this plan, under the jurisdiction of the Colorado Agricultural Commission and the Commissioner of Agriculture or his designee. The CDA *Cow-Calf Emergency Disease Response Plan* will be reviewed and updated as required but as often as needed to incorporate updates to Homeland Security Presidential Directive (HSPD) 9 – *Defense of United States Agriculture and Food*, Emergency Support Function (ESF) 11– *Agriculture and Natural Resources*, and legislative updates as well as lessons learned that are identified in the debriefing process and after-action reports following an actual event or training exercise.

2.0 Concept of Operations

The concept of operations provides the operational framework for activating this plan and how the CDA will classify the response. In addition, this section outlines the diseases of concern in cow-calf populations. It also provides an overview of the CDA's responder health and safety program and guidance on how the Department will interface with agencies, the livestock industry, media, and the public during an emergency response event.

2.1 Animal Diseases Significant to Cattle

Animal diseases found in cattle vary in virulence, ease of transmission, mode of transmission, and host affinity. Diseases of concern are highly contagious diseases that cause significant morbidity and/or mortality in cattle. Such diseases often present similar clinical signs as diseases that do not result in a high level of morbidity and/or mortality. Diagnostic testing is required to determine the specific disease agent. Upon diagnosis, if the disease identified is not considered highly contagious, it will be managed within normal business operations, management, and best production practices.

Animal diseases likely to cause high morbidity or mortality in cattle, and trigger activation of this plan, are FADs and new and emerging diseases. A list of diseases cattle are susceptible to is provided by Iowa State University's Center for Food Security and Public Health: Bovine Diseases and Resources. The website provides additional information on disease transmission, vaccine availability, and recommended control measures for listed FADs. Cattle diseases of major concern include Bovine Spongiform Encephalopathy (BSE), Foot and Mouth Disease (FMD), Contagious Bovine Pleuropneumonia (CBPP), and Rift Valley Fever (RVF), which are described in the following section.

2.1.1 Categorization of Animal Diseases

Animal diseases of concern are commonly categorized in the following manner.

- **Foreign Animal Disease** (also known as an exotic animal disease or transboundary disease) is defined as an important transmissible disease of livestock believed to be absent from the United States and its territories.

- **New or Emerging Disease** is defined as a completely new disease, an old disease occurring in a new place with a new presentation, or a disease that is newly resistant to available treatments.
- **OIE List of Reportable Diseases** is a unified list of reportable diseases maintained by The World Organization for Animal Health, once known as the Office of Internationale des Epizooties (OIE). For several years, the OIE created two lists (A and B) with different reporting obligations, but these were combined into a single unified list of reportable diseases in 2005. This unified list has over 115 diseases and is revised periodically.

  OIE List of Reportable Diseases (2017)

  The four criteria used to develop the list are: potential for international spread, potential for zoonotic transmission, potential for significant spread within a naïve population, and emerging diseases.
- **CDC Bioterrorism Agents/Diseases** are biological agents that are rarely seen in the United States. The Centers for Disease Control and Prevention (CDC) prioritizes these agents based on risk to national security into A, B, & C categories: CDC Bioterrorism Agents: A,B,C, Categories
  - **Category A** agents and diseases are easily transmitted from person-to-person, have high mortality rates and have the potential for a major public health impact.
  - **Category B** agents and diseases are moderately easy to disseminate and result in moderate morbidity rates and low mortality rates.
  - **Category C** agents and diseases include emerging pathogens that could be engineered for mass dissemination.
- **Zoonotic disease** is defined as a disease that can be transmitted from animals to humans and/or humans to animals. According to the CDC, approximately 75% of recently emerging infectious diseases affecting humans are diseases of animal origin.

2.1.2 Bovine Spongiform Encephalopathy (BSE)

Bovine Spongiform Encephalopathy (BSE) is a fatal degenerative zoonotic disease that mainly affects cattle, although other ruminants and humans are occasionally affected. BSE is acquired by eating infected tissues from an affected animal. Infected animals or people do not become ill for years, however, the disease is always progressive and fatal once clinical signs develop.

BSE is a neurodegenerative disease caused by a prion, from the family of transmissible spongiform encephalopathies (TSEs). The incubation period is estimated to be 2 to 8 years, but could be longer. Onset of clinical signs is insidious. Clinical signs include:

- Gait abnormalities
- Difficulty negotiating obstacles
- Low head carriage
- Hyper-responsiveness
- Loss of condition
- Teeth grinding
- Decreased milk production
- Recumbency

- Tremors
- Mental dullness
- Behavioral changes
- Coma
- Death

The United States tests cattle at slaughter to detect cases of BSE. Testing targets non-ambulatory cattle or cattle with neurologic signs. When an infected animal is identified, the affected herd is quarantined and the source of infection investigated. Cohorts of an infected animals are euthanized and tested, and offspring are tracked. Because classical BSE can be prevented by not feeding infected ruminant tissues to cattle, many nations (including the United States) have banned most use of either ruminant or mammalian proteins in livestock feed. Many countries have also enacted various trade bans on importation of ruminants and ruminant products.

2.1.3 Contagious Bovine Pleuropneumonia (CBPP)

Contagious Bovine Pleuropneumonia (CBPP) is a contagious bacterial disease of cattle. Morbidity increases with close confinement. High mortality rates are associated with naïve cattle herds, and many cattle that survive remain chronic carriers.

CBPP is caused by the bacteria *Mycoplasma mycoides* subspecies *mycoides* small-colony type. CBPP affects the respiratory and reproductive systems. The organism is mainly transmitted from animal to animal in respiratory aerosols, and close contact is generally thought to be necessary for transmission. The organism can be found in saliva, urine, fetal membranes, and uterine discharges. It does not survive for long periods on fomites. The incubation period is 3 weeks to 6 months. Morbidity can approach 50 to 80% and mortality can range from 10 to 80%, depending on the strain. Clinical signs include:

- Peracute death
- Fever
- Loss of appetite
- Depression
- Coughing
- Mucopurulent nasal discharge
- Rapid respiration
- Dyspnea
- Swollen throat and dewlap
- Decrease in milk production
- Loss of condition
- Abortion and stillbirth
- Polyarthritis in young calves

Measures taken to control a CBPP outbreak include quarantines and movement restrictions, euthanasia of affected and exposed animals, and cleaning and disinfection of affected premises. Vaccination must be approved by state and federal animal health officials, but may be used to control CBPP or protect specific animals. Methods of disease eradication will be considered based on the epidemiological risk assessment, economic impact on the state, and upon the joint agreement of the State Veterinarian, USDA-APHIS-VS, and the cattle industry.

2.1.4 Foot and Mouth Disease (FMD)

Foot and mouth disease (FMD) is a highly contagious viral disease that primarily affects cloven-hooved livestock and wildlife. Although adult animals generally recover, the morbidity rate can be very high, and the disease can cause significant pain and distress. After recovery, cattle can

carry the virus for up to six months, and sometimes longer.

FMD can be readily re-introduced into disease-free regions via animals or animal products. Once introduced, the virus can spread rapidly, particularly if livestock densities are high or detection is delayed. Outbreaks can severely disrupt livestock production, result in embargoes by trade partners, and require significant resources to control.

FMD is caused by an *Aphthovirus* of the family *Picornaviridae*. There are more than 60 strains of FMD and immunity to one FMD virus serotype does not protect animals from other serotypes. FMD virus can be found in all secretions from infected animals, including expired air, saliva, milk, urine, feces, and semen, as well as in the fluid from FMD-associated vesicles. Some animals can shed FMD virus for up to four days before the onset of clinical signs. The virus can enter the body by inhalation, ingestion, skin abrasions, or mucous membranes. Cattle are particularly susceptible to the aerosolized virus. The incubation period is 2 to 14 days and morbidity can approach 100%.

Clinical signs include:

- Vesicles on tongue, dental pad, gums, soft palate, nostrils, and muzzle
- Vesicles on coronary band, interdigital space, and mammary gland
- Lameness
- Anorexia
- Mucopurulent nasal discharge
- Profuse salivation
- Lethargy
- Rapid loss of condition
- Severe decrease in milk production
- Increased mortality in young calves

Measures taken to control an FMD outbreak include quarantines and movement restrictions, depopulation of affected and exposed animals, and cleaning and disinfection of affected premises, equipment, and vehicles. Vaccination must be approved by state and federal animal health officials, but may be used to reduce the spread of FMD virus or protect specific animals. Methods of disease eradication will be considered based on the epidemiologic risk assessment, economic impact on the state, and upon the joint agreement of the State Veterinarian, USDA-APHIS-VS, and the cattle industry.

2.1.5 Rift Valley Fever (RVF)

Rift Valley Fever (RVF) is a zoonotic viral disease affecting many species, including cattle, sheep, goats, and camels. Infections are most severe in sheep and goats. Morbidity varies with breed, pregnancy status, and age of animals, with younger animals being more severely affected. Among adult animals, deaths are most common among pregnant ewes that abort. Outbreaks in domestic animals are often accompanied by human disease.

RVF is caused by a *Phlebovirus* of the family *Bunyaviridae*. There are several genetic lineages of the virus, which differ in virulence. RVF is transmitted by mosquitoes, although the epidemiology of the disease outside savannah regions is poorly understood. Sheep, goats, and cattle are thought to be the primary amplifying hosts among domesticated animals. RVF can be found in blood, as well as abortion and birth products. Small amounts of virus have also been found in oral fluids, nasal discharge, semen, and are thought to occur in milk. Risk from contact with infected animal

secretions is debated. The incubation period is approximately 1 to 3 days. Mortality rate is highest in young animals, with mortality in some outbreaks approaching 100% in newborn lambs and kids. Abortion rates in sheep can approach 100%. RVF affects the reproductive, gastrointestinal, and neurologic systems. Clinical signs include:

- Abortion
- Fever
- Anorexia
- Weakness
- Lymphadenopathy
- Hemorrhagic diarrhea
- Melena
- Regurgitation
- Abdominal pain
- Nasal discharge (may be bloody or mucopurulent)
- Elevated respiratory rate
- Neurologic signs
- Ocular signs
- Decreased milk production
- Peracute death in young animals

For humans, specific risk factors include assisting at animal births, having contact with infected animal tissues, and consumption of unpasteurized milk. Measures taken to control a RVF outbreak include public education, vector control, movement restrictions, and possibly vaccination. Methods of disease eradication will be considered based on the epidemiologic risk assessment and economic impact on the state, and upon the joint agreement of the State Veterinarian, USDA-APHIS-VS, and the cattle industry.

2.2 Colorado Reportable Diseases of Cattle

An additional animal disease category is the Colorado Reportable Disease List. A Colorado reportable disease is an infectious or contagious disease reportable to the State Veterinarian. An infections or contagious disease is defined by Colorado Revised Statues CRS 35-50-103 as a reportable or emerging disease of livestock that poses a significant risk to the livestock industry of the state resulting from infectious agents, such as viruses, rickettsia, bacteria, fungi, protozoa, internal or external parasites, or prions, or any reportable disease or emerging communicable disease that is capable of being transmitted from one animal to another animal or to a human, whether communicated directly or indirectly through an intermediate plant or livestock host, vector or the environment. Colorado Reportable Diseases of Cattle are listed below.

- Anaplasmosis (clinical disease only)
- Anthrax
- Babesiosis
- Bluetongue (clinical disease only)
- Bovine Spongiform Encephalopathy (BSE)
- Brucellosis
- Epizootic Hemorrhagic Disease (EHD)
- Malignant Catarrhal Fever
- Any Vesicular Disease
- Paratuberculosis (Johne's Disease)
- Pseudorabies
- Rabies
- Scabies
- Screwworm
- Trichomoniasis
- Tuberculosis
- Vesicular Stomatitis
- Any suspected FAD
- Any infectious disease or parasite of livestock not previously known to exist in Colorado
- Any disease of unusual morbidity or mortality than does not fit the normal expected clinical picture

2.3 Incident Command System and Response Levels

Since incidents will vary in size and scope, the level of activation will depend on the nature of the outbreak. Not all cattle disease incidents will require local, state, or federal emergency response functions. Many incidents are handled routinely by private practice veterinarians and/or veterinarians employed by the State Veterinarian or USDA-APHIS-VS Veterinary Medical Officers (VMOs). The cow-calf industry has also invested time and resources in developing plans to deal with their own livestock incidents and situations.

In the event of a highly contagious disease outbreak in cattle, the CDA will manage the incident using the National Incident Management System (NIMS). NIMS provides standardized incident management processes, protocols, and procedures for all emergency responders. During an incident, CDA will implement the Incident Command System (ICS), as mandated by NIMS. Designed to be a flexible all-hazard incident management tool, ICS allows decision makers to fill ICS positions to meet the complexities and demands of the incident. For example, a localized disease event of a short duration may only require the Incident Commander position to be filled; whereas a regional or more wide-spread disease outbreak may require all positions in an ICS incident organization chart to be filled. See Appendix C for an ICS incident organization chart designed for an animal disease outbreak occurring in CDA's authority and jurisdiction.

CDA will also follow NIMS incident typing and will respond to an animal health emergency using the activation levels described below. NIMS incident typing will assist decision makers in determining resources required for specific incidents. *Table 1: Response Levels and National Incident Management System (NIMS) Incident Typing System* summarizes level of response, lead agencies, and NIMS protocol for each level of response.

2.3.1 Level 5 Response

A level 5 response refers to a situation with little complexity that could be managed with one or two single resources. This level of response would be of a short duration and likely would consist of one 12-hour operational period or less.

2.3.2 Level 4 Response

A level 4 response is normally limited to one 12-hour operational period and requires minor state resource input to manage the incident. This level of response does not require an Incident Action Plan (IAP) and can be managed using the resources and personnel of the CDA Animal Health Division. Level 4 activities will include those identified for Level 5 in addition to the following:

- Increase animal origin verifications.
- Notify private practice veterinarians of specific clinical symptoms of the disease(s) in question.
- Notify USDA-APHIS-VS Colorado Office of the situation.
- Review of the CDA *Cow-Calf Emergency Disease Response Plan* relative to a potential response to the disease in question.
- Notify beef industry representative(s) of the disease outbreak and clinical symptoms.

2.3.3 Level 3 Response

A level 3 response reflects the elevated surveillance, preparation, and response that may be initiated by the state if there is a presumptive positive or confirmed diagnosis of a FAD in Colorado. A level 3 response may trigger activation of the State Emergency Operations Center (EOC) and deployment of the Eastern Colorado Incident Management Team (ECIMT) or a similar Type 3 Incident Management Team (IMT).

The ECIMT will be activated to support incident management for incidents that exceed departmental capability to manage the incident effectively. Type 3 IMTs are deployed as a team of 10-20 trained personnel to manage major and/or complex incidents requiring a significant number of local, regional, and state resources. A level 3 response may evolve into multiple operational periods that require a written IAP for each operational period. Level 3 activities will include those activities identified for all proceeding levels and also the following:

- Suspend the importation of beef cattle from affected or potentially affected areas, or possibly all beef cattle from impacted states, pending control and eradication of the disease.
- Inventory relevant state resources and review and implement contract mechanisms to support the logistics portion of the response.
- Review and update public relations materials and collaborate with key contributors in preparation for release. CDA and USDA-APHIS-VS will be consulted for their message map on the appropriate disease and its implications for public health, animal health, and the livestock industry.

2.3.4 Level 2 Response

A level 2 response reflects a full-scale multi-state response that may require regional and/or national resources to effectively manage the incident. Level 2 activation occurs in response to a large, complex incident that will involve multiple operational periods. A written IAP is required for each operational period. A Rocky Mountain Type 2 or equivalent IMT may be deployed to

support management of the incident. A Type 2 IMT is deployed as a team of 20-35 to manage incidents of regional significance and other incidents requiring a large number of local, regional, state, and national resources.

2.3.5 Level 1 Response

A level 1 response will be declared for the most complex incidents that require national resources to safely and effectively manage the incident. A level 1 response will be managed by a Type 1 IMT. A Type 1 IMT is deployed as a team of 35-50+ individuals to manage incidents of national significance and other incidents requiring a large number of local, regional, state, national, and federal resources over multiple operational periods.

Table 1. Response Levels and National Incident Management System Incident Type

Response Level	NIMS Incident Type	Lead Agency	Emergency Response Actions*	Source of Resources
Level 5 – Local Response	Type 5	CDA	- One 12hr. Operational Period - Incident action plan not required* - Emergency Operations Center not activated	- Local
Level 4 – Limited State Response	Type 4	CDA	- One 12hr. Operational Period - Incident action plan not required* - Emergency Operations Center not activated - ICS command and general positions activated as needed	- CDA Animal Health Division - Federal
Level 3 – State Response	Type 3	IMT Command with Unified Coordination: - CDA - USDA-APHIS-VS	- May extend into multiple operational periods - IAP may be required* - ICS some/all command and general positions activated - A Type 3 IMT like ECIMT will manage incident - State EOC may be activated	- Local (Support) - State - Federal - May require regional resources
Level 2 – Multi-State Response	Type 2	Joint or Unified Command and Unified Coordination. National and regional coordination required	- Extends into multiple operational periods - IAP required - ICS some/all command and general positions activated - A Type 2 or equivalent IMT will manage incident. - State EOC activated	- Local (Support) - State - Regional - May require national resources
Level 1 – National Response	Type 1	National Unified Command and Coordination: National, regional, and state	- Extends into multiple operational periods - IAP required for each operational period - ICS all command and general positions activated - Type 1 IMT will manage incident - State EOC activated	- Local (Support) - State - Federal - Regional - National

*** IAPs are required for all HAZMAT incidents regardless of the type of incident.**
Source: Based on the Department of Homeland Security, National Incident Management System, 2009
For all incidents triggering activation of this plan, the Public Information Officer(s) will be Industry's contact for information on the incident.

2.4 Incident Complexity Analysis

The exact moment when an incident shifts from one level of complexity to the next is often a matter of perception. The State Veterinarian/Commissioner of Agriculture or designee must assess the complexity of an incident and authorize a level of response to meet the needs of the event. An Incident Complexity Analysis may be completed to assist in determining the appropriate level of

response. The assessment tool consists of a series of questions regarding the incident and associated information that when answered will help determine the appropriate level of response and resources required to meet the needs of an incident. An example of an Incident Complexity Analysis worksheet is located in Appendix D.

2.5 Responder Health and Safety Program

A fundamental requirement for CDA is ensuring the safety of Department employees involved in responding to a disease outbreak. CDA developed the Responder Health and Safety Program to meet this obligation. The CDA Responder Health and Safety Program is composed of three components:

(1) Personal Protective Equipment Guidelines

(2) Respiratory Protection Program

(3) Medical Monitoring and Rehabilitation.

Combined, these documents and programs provide a means to assess employee fitness for emergency work, provide for personal health protection via the use of protective equipment and decontamination procedures, monitor vital signs, and provide support to assure employees maintain fitness levels needed to conduct assigned activities.

2.5.1 Personal Protective Equipment (PPE)

This general guidance document provides a plan to be followed to assure a safe working environment while allowing flexibility to meet varying needs that might be expected in a livestock emergency response. The guidance offers guidelines that incident commanders, operations section chiefs, Foreign Animal Disease Diagnostician **(**FADD) veterinarians, team or task force leaders or others can use in assessing and determining equipment and procedures they will use when conducting their assigned missions. See Appendix E for Personal Protective Equipment (PPE) guidance for zoonotic and non-zoonotic diseases.

Initially, while the causative agent is unknown, high levels of protection may be used. Once the agent is identified, levels of protection can be adjusted (usually decreased) to fit specific challenges an agent might pose. Once the disease agent has been identified, it is likely the level of protection will be similar to producer-placed biosecurity programs.

Of special note is the fact Colorado is a “non-Occupational Safety and Health Administration (OSHA)” state. This means state employees are not subject to the same regulations as are production facilities and their respective employees. The CDA program has essentially been placed to close this gap. Even so, producers remain responsible to follow appropriate OSHA programs related to their facilities. State employees cannot provide any equipment or certain training to private employees, although they may recommend general levels of PPE to be utilized for different operational activities.

2.5.2 Respiratory Protection Program

A respiratory protection program is important, especially during a disease outbreak. Respiratory protection becomes essential when there are potential health risks from respiratory exposure to the disease agent, to chemicals used in cleaning and disinfection, and to risks inherently present on livestock operations. Individuals who may be deployed to an incident are required to have completed a medical questionnaire that has been reviewed and approved by a medical doctor familiar with such programs. These individuals must be trained and fit-tested to use specific respiratory equipment. Production facilities may or may not have similar programs in place. It is anticipated if they do not, employees could still work in less hazardous areas or accommodations could be made to have employees trained and fit-tested for such activity.

2.5.3 Medical Monitoring and Rehabilitation

Emergency response often requires long hours doing strenuous work in adverse conditions and environments. Physical exertion can lead to dehydration or exacerbation of environmental factors such as heat or cold conditions. It is essential that responders be medically fit and cleared to work in such conditions. Individuals with underlying medical problems (such as a pre-existing cardiac issue) who work in such challenging situations can place themselves at risk for debilitating injuries and even death. Medical monitoring affords an opportunity to identify underlying problems and mitigate them before they become serious. Such monitoring is risk-based, and is conducted both prior to assignment and throughout the assigned work period. Rehabilitation periods are scheduled to allow responders a break in which to rest, rehydrate and eat.

Production workers generally have scheduled breaks to eat or drink. These may need to be extended, and rehydration beverages or food provided, dependent upon work schedules and on environmental factors such as temperature and humidity. Medical monitoring of production employees may be arranged via local public health or emergency medical service departments.

2.6 Communication Plan

Effective emergency management response depends on communication – the ability to maintain a common operating picture through the constant flow of information. Integrated communication forges a link among operational and support units to enable common awareness of the incident and actions to achieve the objectives of Incident Command. Equipment, systems, protocols, and expertise are needed to achieve this integration. Procedures and protocols governing communication among the emergency responders must be established in advance of an outbreak.

The **objectives** communication plan in the face of an animal disease emergency are as follows:

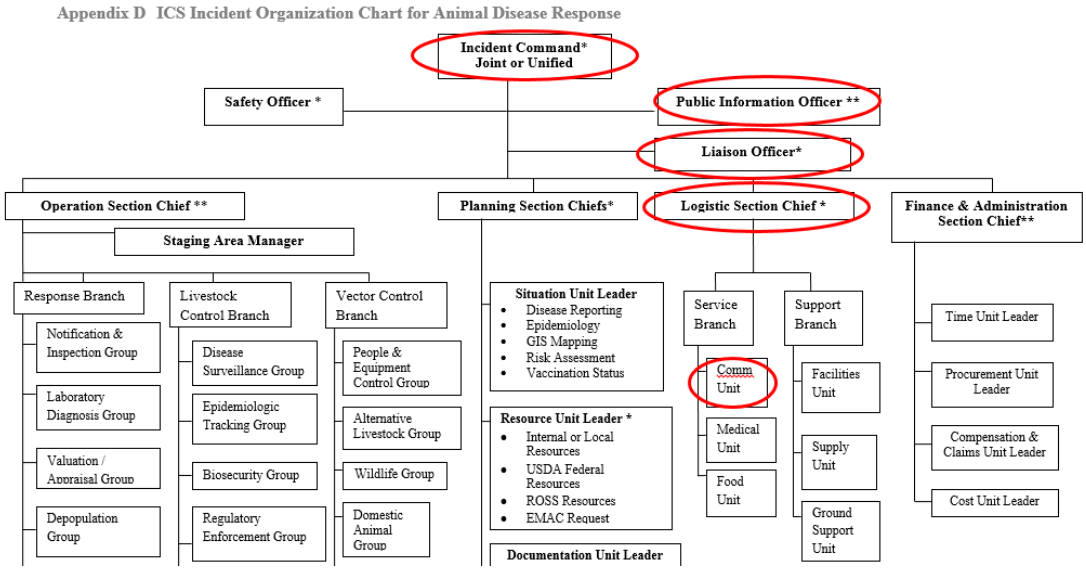
- Furnish accurate, timely, and consistent information
- Maintain credibility and instill public confidence in the State's ability to respond to an outbreak
- Minimize public panic and fear
- Address rumors, inaccuracies, and misperceptions as quickly as possible; and
- Inform the public and producers what they can do to mitigate the disease or event in their lives and on their production systems

The **goals**, which will help to achieve the communication objectives, are as follows:

- Establish a network of stakeholders and systems for communication, prior to an incident or outbreak
- Test or exercise the systems for communication at regular intervals, prior to an outbreak
- Brief the media, public, industry, Congress, trading partners, and others on the outbreak and the actions being taken by the CDA, USDA, and other partners to control, contain, and eradicate the disease
- Highlight the importance of good biosecurity practices and steps that producers and owners can take to protect against infection
- Coordinate with USDA, HHS, DOI, DHS, State agencies, local agencies, Tribal entities, and CSU and CSU Extension to ensure a consistent message regarding animal health, public health, and food safety

2.6.1 Incident Command Structure: Communication

The figure below indicates which ICS positions will have a role in communication activity:



The PIO will develop an external communications strategy, which the Incident Commander must approve before implementation. This plan should include the following:

• Designated line and staff responsibilities for the information teams	• Response team after-hours contact numbers
• Internal information verification and approval procedures	• Contact numbers for emergency response information partners
• Agreements on information release authorities, including who releases what, when, and how	• Procedures to secure needed resources to operate the public information and media operation 24 hours a day, 7 days a week, and fund an 800 hotline number
• Regional and local media contact list	• Agreements and procedures to join the JIC, if activated

• Procedures to coordinate with field response teams	• Designated spokespersons for animal health issues and third party validators in an emergency
• Vehicles of information dissemination	• Key messages to stakeholder groups

2.6.2 External Communications Planning:

External communication during an outbreak will be the responsibility of the State Veterinarian and the CDA Director of Communications and Public Awareness. The State Veterinarian, with assistance from the CDA Liaison Officer will direct and maintain communication with federal, state, and local government agencies and partners that have a statutory responsibility in emergency response. Additionally, the CDA Communication Director will communicate and collaborate with livestock industry representatives throughout the incident.

Specific beef industry representatives who would be included in the communication planning would be – Colorado Livestock Association (CLA), Colorado Cattlemen's Association (CCA), Farm Bureau, and dairy associations such as the Western Dairy Association (WDA) and Dairy Farmers of America (DFA). In a situation where the disease affecting cattle would also affect other livestock species such as pigs, sheep, and goats those associations would also be included (Colorado Pork Producers Council, Colorado Woolgrowers Association, and goat breed associations).

Correspondence and communication with the media and public regarding the incident will be directed and managed by the CDA Director of Communications. The CDA Director of Communications or assigned designate may assume the ICS role of Public Information Officer (PIO) upon activation of this plan. In the event the ECIMT or another IMT is deployed to manage the incident, the CDA PIO shall work in collaboration with the IMT, State EOC, State and local public health agencies, livestock associations and industry, and local emergency management PIO(s) in a Joint Information Center (JIC).

2.6.3 Internal Communications Planning:

The Colorado Department of Agriculture has guidance documents available on SharePoint for internal communication processes.

The 5 W's of Critical Information Sharing:

1. What do we know?
2. Who needs to know it?
3. What do they need to know?
4. Who has the information?
5. What will we do to get the information out?

- Division Crisis Communication Plan
- Incident Report using ABCD Template which helps to initially organize needed components of the disease response

    - A = Assessment
    - B = Briefings
    - C = Communication
    - D = Delegate Roles and Responsibilities
- Disease Response Checklist, Day 0; and Post Confirmation Checklist
    - Outlines initial communication contacts
- Emergency Response Contact List
    - Contact names and phone numbers for each pertinent agency
- Incident Action Plan
    - Form ICS 205 and ICS 205a for communication plans
- Animal Emergency Response Communication Retrieval Process
    - Process for logging messages from internal cell phones, desk phones, and email and assignment of personnel to return phone calls and emails
- Office Messaging Template
    - Narrative for office and field staff to use; includes: messaging to use within CDA, phone recording, email response, and website

3.0 Disease Outbreak Response

This section describes the processes and protocols utilized by the CDA during a disease outbreak affecting cattle. These processes and protocols are designed to enable execution of the responsibilities of the CDA and to integrate federal, state, local, and industry efforts into an effective and coordinated approach to a disease outbreak in cattle. Responding to a disease outbreak in cattle will involve the actions described below. *Table 2. Timeline for Disease Control Response Activities* provides a timeline for each action phase.

- **Disease Detection:** Investigate suspected animal disease and initiate movement restrictions
- **Disease Control:** Quarantine infected and exposed premises and control movement of cattle and cattle products
- **Surveillance:** Develop surveillance plan based on epidemiologic investigation
- **Epidemiology:** Determine the extent of the outbreak and/or confirm non-infected status
- **Stabilization:** Control, prevent spread, and, as possible, eradicate disease
- **Business Continuity:** Protect economic viability and continuity of operations
- **Recovery:** Return affected premises to normal business operations

Table 2. Timeline for Disease Control Response Activities

Disease Outbreak Response	12 hours Within a confirmed	24 Hours Within a confirmed	48 Hours Within a confirmed	24 Hours Within determination	72 Hours Within determination
Disease Control -- Quarantine Infected and Exposed Premises and Control Movement of Animals					
Mobilize livestock disease-related incident command personal.					
Establish initial control areas.					
Enhance biosecurity procedures on infected, contact and susceptible premises.					
Establish quarantine zones for infected and contacted premises and/ or broader movement restrictions.					
Surveillance -- Develop Surveillance Plan Based on Epidemiological Investigation					
Develop a surveillance plan and implement existing diagnostic support.					
Epidemiology -- Determine the Extent of the Outbreak and / Or Confirmed Non-Infected Status					
Implement epidemiological surveillance and diagnostic support plan in at-risk species and notify other states of trace-outs.					
Stabilization -- Control, Prevent Spread of, and, as Possible, Eradicate Disease					
Begin treatment, inoculation, and /or depopulation of animals at identified site.					
Begin decontamination and disposal procedures at identified site.					
Business Continuity -- Protect Economic Viability and Continuity of Operations					
Implement procedures for the creation of bio-secure transportation corridors to market or other key facilities for disease –free goods and animals.					
Develop procedures for managing contaminated products.					
Establish storage and /or disposal areas for animals or products stopped in transit.					

Source: Based on Department of Homeland Security, Federal Emergency Management Agency. *Livestock and Poultry Disease Emergencies Capability,* August 2009.

*** Disease Detection and Recovery Actions are not in the scope of the above timeline.**

† Communication with neighboring states will be initiated within 4 hours of a confirmed positive case.

4.0 Disease Detection: Investigation and Initiate Movement Restrictions

Rapid detection of reportable diseases is essential to minimize spread and impact on industry and local economy. Timeliness of the initial response is critical. In most situations, a private and/or accredited veterinarian will be the first to encounter a Foreign Animal Disease (FAD) and that veterinarian is required by law to report any suspected FAD to the State Veterinarian. Once a suspect case is identified, a FAD Investigator will be dispatched to collect samples. If there is adequate suspicion that an FAD is present the FAD Investigator can place a verbal hold order. This hold order will be converted to a quarantine if samples are confirmed positive by the National Veterinary Services Laboratory (NVSL). During this time the CDA will begin activating the emergency response plan outlined in this document.

4.1 Foreign Animal Disease Investigation

Upon notification of a suspected case of FAD, the Colorado State Veterinarian or USDA-APHIS-VS Colorado Office will dispatch a FAD Diagnostician (FADD) to conduct a FAD Investigation. See CDA website for VMO territories in Colorado:
https://www.colorado.gov/pacific/sites/default/files/atoms/files/VMO%20Map%20Colorado.pdf

The investigation is conducted using a standardized format developed by USDA. Information and data collected during the FAD Investigation includes a general assessment, number and species of livestock present, gathering site information, samples, and epidemiological data. In addition, the FADD collects the following information about the facility:

- Premises Identification Number (PIN) or USAHERDS Location ID (LID)
- Type of facility
- Plat map description
- GPS Coordinates
- Type and number of buildings
- Available resources
- Number of personnel or employees

The goal of the investigation is to confirm or rule out the presence of disease in a rapid and efficient manner. As such, the FADD examines the animals on-site and packages the appropriate diagnostic samples for delivery to a state and federal diagnostic laboratory – please refer to the FAD Investigation Manual and FAD PReP Disease Response Documents for protocols on submission of samples. Information from the investigation is reported to the State Veterinarian who, in consultation with the FADD and the USDA-APHIS-VS Colorado Office, determines the classification and diagnostic sample prioritization (defined below). This decision is critical and determines turnaround times on diagnostic samples and aids in establishing appropriate disease control measures. The priority established will determine where the samples are sent, how they are handled for transportation, and the level of response the lab gives the samples. Operations in the collection, shipping, and management of laboratory samples shall be in accordance with the USDA-APHIS-VS protocol for FAD Investigations.

- **Priority 1**: High Suspicion of FAD and needs rapid or extraordinary methods for sample collection, submission and transport. Testing is conducted immediately upon arrival.

- **Priority 2**: Intermediate Suspicion of FAD and needs rapid methods for sample collection, submission and transport. Testing is conducted as necessary according to business hours.
- **Priority 3**: Low Suspicion of FAD and needs routine methods for sample collection, submission and transport. Testing is conducted in accession order.
- **Priority A**: Intermediate or Low Suspicion of FAD but circumstances of investigation indicate needs rapid methods for collection, submission and transport. Testing conducted immediately upon arrival.

In most cases, preliminary results are available within 24 hours. However, during the investigation, the State Veterinarian may implement certain movement restrictions for livestock and/or other products. Decisions relative to movement controls would be based on the general clinical assessment, morbidity and mortality of the disease outbreak, and the risk to other livestock facilities. A description of zones, areas, and premises used for restricting movement is located in Section 5.

4.2 Hold Order

There are three possible outcomes of a FAD Investigation: (1) negative, (2) presumptive positive, or (3) confirmed positive. In the event a FAD is suspected as the initial outcome of the FAD Investigation, the State Veterinarian may issue a hold order as authorized by CRS 35-50-103 to restrict animal movement. CRS 35-50-103 defines a hold order as "a temporary order issued by the state veterinarian when an infectious disease is suspected in livestock to isolate any specific livestock premises, county, district; and specify sanitary measures, pending completion of testing." The State Veterinarian may authorize the hold order through accredited veterinarians or through another appointed official.

4.3 Quarantine

A presumptive positive test result must be confirmed by the National Veterinary Services Laboratories (NVSL). Once the appropriate NVSL lab has verified the testing results are a confirmed positive, the State Veterinarian, as the Commissioner of Agriculture's designee, may place the infected premises under quarantine. CRS 35-50-103 defines quarantine as "an order issued by the commissioner when testing has confirmed the presence of an infectious or contagious disease in livestock, which order isolates specific livestock, premises, counties, districts, or sections of the state; restricts the movement of livestock; and specifies sanitary measures."

4.4 Response Plan Activation Sequence

The activation of an emergency plan is at the discretion of the State Veterinarian. Upon confirmation of a presumptive positive test result of a highly contagious animal disease, from the Colorado State University Veterinary Diagnostic Laboratory (CSU-VDL) or NVSL, the State Veterinarian will activate the CDA *Cow-Calf Emergency Disease Response Plan*.

The State Veterinarian will immediately contact the Commissioner of Agriculture, Deputy Commissioner, the USDA-APHIS-VS Colorado Office, along with other collaborative response agencies/partners as necessary, and relay all known information on the positive test notification.

The State Veterinarian should be prepared to make recommendations with respect to any gubernatorial declarations and/or the need to activate the state EOC and appropriate level of response. Specifically, the State Veterinarian will relay the following information:

- Name and contact information of the verifying laboratory official reporting the confirmatory test
- Name(s) and location(s) of the infected premises including Global Positioning System (GPS) and USAHERDS Location ID (LID) and/or Federal Premises Identification Number (PIN) if available.
- Type of production facility and number of cattle on the infected premises.

If notification of a presumptive positive or confirmed positive of a highly contagious animal disease occurs after normal working hours, on a weekend or holiday, the State Veterinarian will communicate with the Commissioner, Deputy Commissioner, the USDA-APHIS-VS Colorado Office, and the necessary staff of the Animal Health Division of CDA at their after-hours contact numbers. Based on direction from the Commissioner, Deputy Commissioner, and Assistant Director of USDA-APHIS-VS District 6 Colorado Office, the State Veterinarian will take appropriate action to activate the response level based on incident type. See *Table 1. Response Levels and National Incident Management System Incident Typing System.*

5.0 Disease Containment: Quarantine and Movement Control

Upon confirmation of a suspected or confirmed case of a highly infectious animal disease, the State Veterinarian will implement a series of response actions to control the spread of disease and minimize the impact of an outbreak. Although actions will vary based on the disease agent, the following section presents a series of possible control activities that may be used to contain a highly infectious disease in cattle.

5.1 Movement Restrictions

Movement restrictions for cattle, vehicles, and possibly people may be used to prevent further spread of disease. Once an outbreak has been confirmed, the Infected Premises (IP) will be placed under quarantine (see Section 4.3 for additional information on livestock quarantines). Diseased or disease-exposed animals will need to remain on the IP until the necessary control measures are determined by the State Veterinarian. A Control Zone, which includes any Contact Premises (CP - farms or areas with a connection to the Infected Premises), will be established.

Road blocks and/or check points (See 11.2.3.2 Colorado State Patrol (CSP)) and possibly decontamination stations may be needed at ingress and egress locations in the Control Area. Additional zones may be designated to control and monitor the disease. Descriptions and a diagram of Premises, Zones, and Area designations follow in Section 5.2. See Section 9.1 for additional information regarding Controlled Animal Movement.

5.2 Premises, Zones, and Area Designations

The designation of Control Areas and Zones is essential to successful quarantine and movement control activities. The State Veterinarian shall determine premises classification in the event of a presumptive positive or confirmed case of a highly contagious livestock disease. He/she shall work with the USDA-APHIS-VS Colorado Office and FADD veterinarians, emergency response teams, the state EOC, law enforcement, and other local and state agencies/entities to establish area and zone designations that will allow for identification, implementation, and enforcement of quarantine and movement controls. Table 3 and Table 4 summarize designations used in a response. Figure 1 gives a visual representation of the zones and areas described in Table 3 and Table 4.

Table 3. Summary of Premises Designations

Premises	Definition	Zone
Infected Premises (IP)	Premises where a presumptive positive case or confirmed positive case exists based on laboratory results, compatible clinical signs, HPAI case definition, and international standards.	Infected Zone
Contact Premises (CP)	Premises with susceptible animals that may have been exposed to HPAI, either directly or indirectly, including but not limited to exposure to animals, animal products, fomites, or people from Infected Premises.	Infected Zone, Buffer Zone
Suspect Premises (SP)	Premises under investigation due to the presence of susceptible animals reported to have clinical signs compatible with HPAI. This is intended to be a short-term premises designation.	Infected Zone, Buffer Zone, Surveillance Zone, Vaccination Zone
At-Risk Premises (ARP)	Premises with susceptible animals, but none of those susceptible animals have clinical signs compatible with HPAI. Premises objectively demonstrates that it is not an Infected Premises, Contact Premises, or Suspect Premises. At-Risk Premises seek to move susceptible animals or products within the Control Area by permit. Only At-Risk Premises are eligible to become Monitored Premises.	Infected Zone, Buffer Zone
Monitored Premises (MP)	Premises objectively demonstrates that it is not an Infected Premises, Contact Premises, or Suspect Premises. Only At-Risk Premises are eligible to become Monitored Premises. Monitored Premises meet a set of defined criteria in seeking to move susceptible animals or products out of the Control Area by permit.	Infected Zone, Buffer Zone
Free Premises (FP)	Premises outside of a Control Area and not a Contact or Suspect Premises.	Surveillance Zone, Free Area
Vaccinated Premises (VP)	Premises where emergency vaccination has been performed. This may be a secondary premises designation.	Containment Vaccination Zone, Protection Vaccination Zone

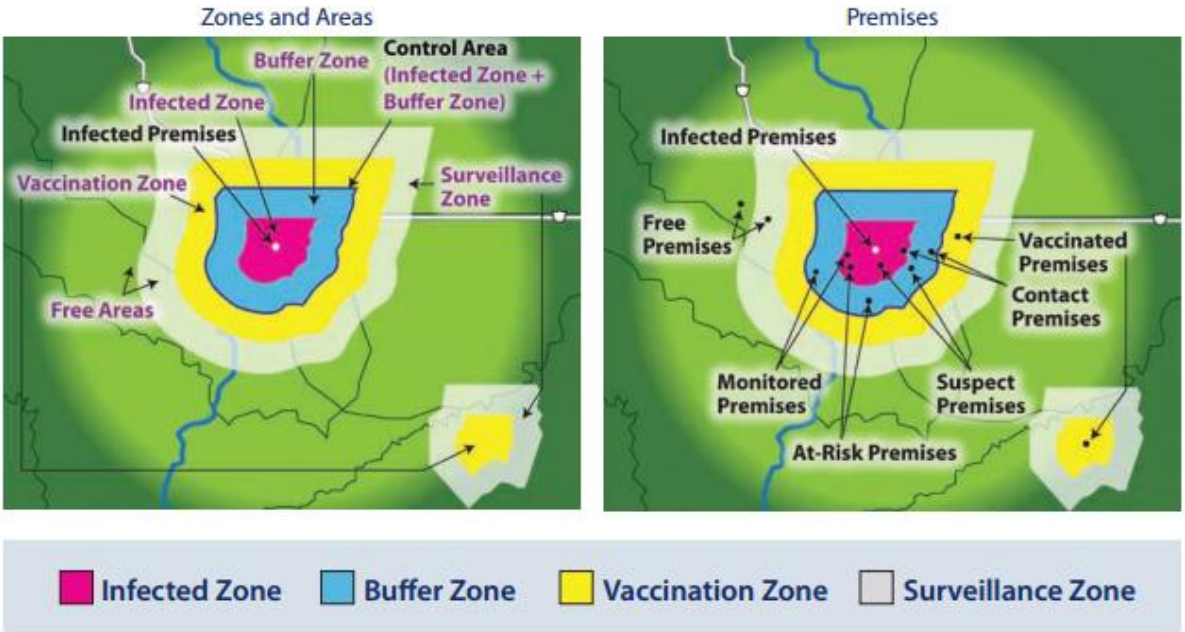
Adapted from: FAD PReP Cow-Calf Industry Manual, Jan 2012, Section 6.

Table 4. Summary of Zone and Area Designations

Zone/Area	Definition
Infected Zone (IZ)	Zone that immediately surrounds an Infected Premises.
Buffer Zone (BZ)	Zone that immediately surrounds an Infected Zone or a Contact Premises.
Control Area (CA)	Consists of an Infected Zone and a Buffer Zone.
Surveillance Zone (SZ)	Zone outside and along the border of a Control Area. The Surveillance Zone is part of the Free Area.
Free Area (FA)	Area not included in any Control Area. Includes the Surveillance Zone.
Vaccination Zone (VZ)	Emergency Vaccination Zone classified as either a Containment Vaccination Zone (typically inside a Control Area) or a Protection Vaccination Zone (typically outside a Control Area). This may be a secondary zone designation.

Adapted from: FAD PReP Cow-Calf Industry Manual, Jan 2012, Section 6.

Figure 1. Example of Zones, Areas, & Premises in an FMD Outbreak Response



Adapted from: FAD PReP Cow-Calf Industry Manual, Jan 2012, Section 6.

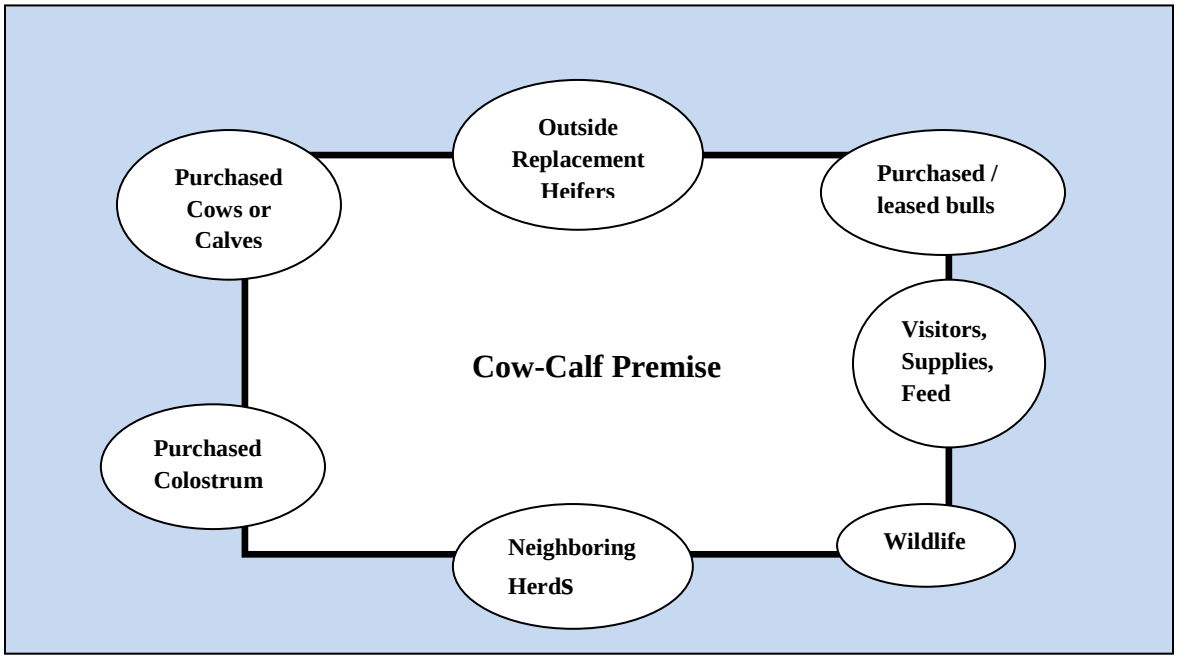
5.3 Biosecurity and Disease Control Measures

USDA-APHIS-VS defines biosecurity as the use of certain management practices designed to prevent the introduction and spread of disease. Good biosecurity can mitigate the spread of a disease once it has been introduced into a herd or area. Most cow-calf producers already incorporate biosecurity measures into their daily operations as part of cattle health and management practices.

Example biosecurity measures for routine operations in cow-calf operation are available in Appendix J, the Secure Beef Supply Plan, the FAD PReP Cow-Calf Industry Manual, and the Center for Food Safety and Public Health's FMD Prevention Checklist.

Unlike many animal production operations, cow-calf premises typically involve large land area. Possible modes of disease being introduced into cow-calf premises are illustrated in *Figure 2. Biosecurity Risks for Cow-Calf Operations.*

Figure 2. Biosecurity Risks for Cow-Calf Operations



Source: Farm and Ranch Biosecurity, 2002. Cooperative effort between the University of Nebraska, Iowa State University, and Kansas State University

Biosecurity recommendations for cow-calf operations are located in Appendix J.

During a health emergency in cattle, the State Veterinarian may prescribe additional biosecurity measures for premises located in defined zones for each of the target areas. Biosecurity measures will be dependent upon the disease and its mode(s) of transmission.

Biosecurity measures will be required and evaluated, even for uninfected premises in the Control Area and other areas of the state, for producers to maintain continuity of business.

5.3.1 Site Security

Any site that is under investigation as an Infected Premises, a Suspect Premises, or a Contact Premises shall take steps to prevent all non-essential traffic from entering the premises. All traffic should be prohibited except for essential personnel. Essential personnel are defined as having a direct role in the care and feeding of cattle or a direct role in the emergency response. Site security procedures that may be recommended include:

- Establish one ingress and one egress location into and from the facility. All other access points must be blocked or gates locked to prevent unregulated entry or exit from the facility. If possible, the ingress and egress location should be located on a level and solid surface with access to water (by hose or tanker truck) for cleaning and disinfection purposes. Vehicles transporting workers or supplies may need to park at the access gate and shuttle people and supplies in through a safe corridor system or transport on foot – exceptions would be large truck transport vehicles.
- Cease all non-essential work on the farm and restrict access to the facility to essential personnel. All vehicles and equipment on the premises may be prohibited from leaving the premises unless approved by the State Veterinarian. All vehicles leaving the premises will likely be required to be cleaned and disinfected.
- Require all essential personnel to wear PPE at a level determined necessary to protect or prevent the spread of disease and to mitigate any zoonotic disease potential. Personnel entering the premises will be required to wear disposable or adequately cleaned and disinfected boots, coveralls, gloves, head/hair covering, and possibly masks. The level of protection will be determined by the specific disease agent and area and nature of work in which individuals are to engage. PPE must be donned prior to entry onto the premises, or a specified area therein, and must be removed and thoroughly disinfected or disposed of prior to leaving.
- Maintain a log of all movement onto and off of the premises. Verify premises log book is complete. Deliveries for farm essentials shall be by appointment only.

5.3.2 Cleaning and Disinfection Procedures for Vehicles and Personnel Leaving an Infected Premises

Establishment of decontamination procedures for vehicles and personnel leaving a premises is designed to prevent the spread of disease from an infected herd and premises. Cleaning and disinfection procedures are essential both during and after an animal disease event. Materials that should be available at the designated entry/exit point on the infected premises includes: brushes, buckets, hoses, water, disinfectant, and a pressure washer. Cleaning and disinfection must be performed on all personnel, equipment, and vehicles leaving the infected premises or control area. A comprehensive EPA chart of diseases and approved disinfectants is provided on the USDA-APHIS Animal Health Emergency Management website. Cleaning and disinfection procedures that may be required by the State Veterinarian include:

- Establishing a designated decontamination area/corridor on the premises. This is an area where personnel, vehicles, and equipment will undergo cleaning and decontamination before leaving the premises. This area should be close to the entry/exit point, located on a hard surface, and have access to water.
- Establishing a designated area for personnel to don and doff personal protective equipment, and protocols for disposing of or treating contaminated personal protective equipment.

- Establishing a pest, especially rodent, control program.

5.3.3 Wildlife Management

If an animal disease outbreak has potential wildlife impacts or can be spread by wildlife, the Colorado Parks and Wildlife (CPW) will collaborate and lead all appropriate wildlife response activities. Two important questions to ask are: "Are there sick wildlife?" and "Can wildlife carry this disease to other premises?" Section 11.2 provides additional information on the CPW role in an animal disease outbreak.

5.3.4 Public Health Involvement

If an animal disease outbreak is identified as a zoonotic disease and has potential public health impacts, the State Veterinarian or other designated representative of the CDA will contact the Colorado Department of Public Health and Environment (CDPHE) to seek assistance to protect the public's health. An important question to ask is, "Are there people with potential exposure to the disease agent getting sick?" If so, CDPHE and/or local health departments will be involved and will conduct their own epidemiologic investigation. Section 11.2 provides additional information on the CDPHE's role in an animal disease outbreak.

6.0 Surveillance: Develop Surveillance Plan Based on Epidemiologic Investigation

Surveillance is a critical activity during a disease outbreak. The response goals include: (1) to implement surveillance plans within 48 hours of the confirmation of the outbreak; (2) to implement a surveillance plan that will define the present extent of the disease and detect unknown infected premises quickly; and (3) to develop surveillance plans that can achieve desired outcomes by leveraging available resources, satisfying jurisdictional requirements, and implementing continuity of business measures.

Animal disease surveillance activities involve collecting and interpreting data from animal populations to determine their health status regarding diseases of concern. Surveillance programs are currently in place to assist in rapid detection of an animal disease incursion. Active surveillance techniques are also used in an animal disease response to determine the extent of a disease known to be present, and during the recovery phase of a response to provide the necessary evidence for the elimination of the disease.

Surveillance methods that may be used during a disease outbreak include inspecting animals for clinical signs of the disease and diagnostic testing. Inspection of animals for clinical signs involves observing animals for any clinical presentation of the disease. Surveillance information is also obtained through the collection and testing of various biological samples from all cattle herds within a certain distance of an Infected Premises, regardless of clinical appearance. The biological samples required will vary depending on the disease agent. Possible biological samples include: blood, skin scrapings, fecal material, tissue, and necropsy of dead cattle.

The speed at which these actions occur will have a direct effect on the extent and thus the outcome of an outbreak. Once control areas, zones, and premises are identified, a surveillance plan for each area or zone will be developed by the State Veterinarian. The surveillance plan will include information on methods to collect, manage, and analyze animal health data. Since each animal disease outbreak is unique, the surveillance plan will be tailored to the event and disease agent. Guidance on surveillance is available from the following resources:

- NAHEMS Guidelines: Surveillance, Epidemiology, and Tracing
- FAD PReP SOP: Surveillance
- FAD PReP Foot-and-Mouth Disease Response Plan: The Red Book
- Secure Beef Supply: Surveillance Guidance Document

7.0 Epidemiology: Determine Extent of Outbreak and/or Confirm Non-Infected Status

To respond quickly and effectively to an animal disease event, the CDA animal health officials need to know which animals are involved, where they are located, and what other animals might have been exposed. The sooner reliable data is available, affected animals can be located, appropriate response measures can be established, and disease spread can be halted.

7.1 Disease Trace-back and Trace-forward

An important component of an animal disease outbreak investigation is to establish trace-forward and trace-backs from the premises to determine both the source of the disease and the risk for disease transmission to other premises with susceptible species. Trace-backs and trace-forwards are usually applied from a minimum of 2 times the maximum incubation period prior to the onset of clinical signs until the time quarantine is imposed.

Trace-backs are conducted to assist in identifying the source of the virus or pathogenic microbes and to help determine how the disease was introduced to the facility. Trace-back procedures include collecting information from producers on the origins of all cattle (and possibly other animals), animal products, feed, equipment and vehicles, (livestock trucks, feed trucks, veterinary trucks), and people (sales and feed representatives, visitors, veterinarians, and brand inspectors) that have visited the premises prior to the outbreak.

Trace-forward procedures gather similar information on animal, people, and equipment movements off the farm to identify other premises that received potentially infected animals, contaminated animal products, or equipment.

Producers may be required to participate in a traceability system. Accurate tracing investigations are critical to determining the magnitude of an outbreak and halting the spread of the disease.

It is recommended that cow-calf producers maintain up-to-date herd records. Among other advantages, accurate herd records assist in the completion of timely trace-forward and trace-back investigations. The following are some types of records that may be traced during a disease investigation:

- **Herd Inventory**: Herd information, specifically: animal ID, breed, age, species, and origin. Animals that die or are culled from the herd should be identified.
- **Herd Movement**: Animal movement to-and-from the farm logs, such as: date of movement, animal identification, origin, destination, reason, driver, vehicle used, previous owner name, and contact information.
- **Farm Services**: Visitor logs with names, phone number, reason for visit, time since last contact with livestock, and facilities entered. Visitors include all non-employees (veterinarians, brand inspectors, feed salesman, inseminators, livestock dealers, repairmen, neighbors, etc.). May also include equipment, feed, semen/embryo movement logs (dates, origin, application site, volume, and application method).
- **Animal Health Information**: Vaccination and treatment records, including: animal ID, date, reason for treatment/vaccination, and medication (product used). Records of any postmortem examination and/or testing of any dead stock by the producer or veterinarian should be maintained and made available for review.
- **Farm Employees**: Employee record (name, address, phone number, and does the employee have contact with other livestock).
- **Pets and Animals**: Pets and other animals located on the premises.

7.2 USAHERDS Animal Health Information Management System

USAHERDS is the animal health information management system within the Animal Health Division of the Colorado Department of Agriculture. It is a repository of Colorado livestock premises data, animal IDs, and livestock movement information that can be addressed and used during an animal disease outbreak to assist in the tracing of cattle and premises. Data for the USAHERDS database is received from cow-calf operations and existing data sources, and integrated into one system that can be accessed by CDA Animal Health officials during an animal disease emergency. USAHERDS enables CDA to respond quickly and to prevent disease at unaffected facilities when a significant disease event may impact a specific production area or a specific species of cattle.

7.3 Cow-Calf Operations and Traceability

The contracts and business arrangements of the beef industry could be utilized to efficiently and effectively improve biosecurity, prevent further spread of the disease, and to mitigate the negative impact to the cattle industry. CDA is committed to working with the industry and associations to provide for good business continuity of operations. (See Section 9 for further discussion of Continuity of Operations)

8.0 Stabilization: Control, Prevent Spread, and Eradicate Animal Disease

Elimination, if possible, of a highly contagious disease involves a series of activities that will be implemented by the State Veterinarian in collaboration with the USDA-APHIS-VS Colorado Office personnel. Actions taken will be based on the particular circumstances of the outbreak

including: the disease agent, epidemiology of the disease, and vaccine and resource availability. Descriptions of possible response actions to eliminate an animal disease (and sources of equipment and materials used to carry out these actions) are described in the following sections.

8.1 Appraisal and Indemnity

According to the U.S. Code of Federal Regulations 9CFR53.3 a percentage of fair market value will be paid to the owners for livestock that must be depopulated or materials that must be destroyed to prevent the spread of an animal disease.

Additionally, CRS 35-50-113 grants the CDA Commissioner the authority, under certain circumstances and upon the recommendation of the State Veterinarian, to authorize the payment of indemnity to any livestock owner whose herd is depopulated due to exposure or diagnosis with an infectious or contagious disease although State indemnity funds are extremely limited.

With federal qualifying events, the federal appraisal and indemnification process outlined in 9 CFR 53.3 is the most efficient appraisal process for livestock owners. The process outlined in CRS 35-50-113 can be used in situations in which depopulation of livestock is deemed necessary by the Commissioner and the State Veterinarian, but are not identified as federal qualifying events. For both processes, valuation of livestock must be mutually agreed upon by the owner and state or federal officials prior to depopulation. Under certain situations, this may require a physical appraisal of livestock.

In previous highly infectious disease outbreaks, the USDA paid for the cost of euthanasia, carcass disposal, and decontamination. Colorado will follow USDA procedures to request assistance with indemnification of cow-calf producers in response to an eligible disease event.

8.2 Depopulation

CRS 35-50-113 authorizes the State Veterinarian to order euthanasia, mass depopulation, and carcass disposal to mitigate an animal disease in Colorado and is an integral part of a comprehensive response plan. In the event that a highly contagious animal disease in cattle is confirmed in the state of Colorado, cattle depopulation and carcass disposal may represent the most effective means of disease control and eradication. If deemed necessary by the State Veterinarian to contain a disease outbreak, the CDA will take every measure to ensure rapid and humane depopulation of all animals affected by the disease outbreak. The State Veterinarian will develop a comprehensive depopulation and disposal plan based on guidance from the American Veterinary Medical Association (AVMA) Guidelines on Euthanasia, National Agricultural Biosecurity Center, Kansas State University, industry capabilities, and other available resources.

The State Veterinarian's depopulation plan will be dependent upon the type, number, and size of animals to be depopulated. *Table* 5. *Methods of Depopulation Appropriate for Cattle* provides an overview of the approved methods of depopulation for cattle. *Table 6: Considerations for Approved Depopulation Methods for Cattle* provides an overview of the advantages, disadvantages, and considerations for human safety for depopulation methods appropriate for cattle.

It is important to consider depopulation methods in conjunction with carcass disposal options. Carcass disposal will be carried out in collaboration with the CDPHE as defined in the CDA/CDPHE joint Interagency Agreement (IA), Memorandum of Understanding (MOU), state statutes, and state rules/regulations. Additional information on carcass disposal is located in Section 8.3.

The AVMA Guidelines for the Depopulation of Animals is currently under development and will be a useful resource for development of a depopulation plan.

Table 5. Methods of Depopulation Appropriate for Cattle

	Calf	Heifer	Bull
Gun Shot	Yes	Yes	Yes requires specialized gun
Penetrating Captive Bolt	Yes	Yes	Yes requires specialized captive bolt gun
Electrocution (Head to Heart)	Yes	Yes	Yes
Barbiturates	Yes	Yes	Not Practical

Sources: American Veterinary Medical Association. *AVMA Guidelines on Euthanasia*, 2007; **American Association of Bovine Practitioners,** *Practical Euthanasia of Cattle: Considerations for the Producer, Livestock Market Operator, Livestock Transporter, and Veterinarian*, 1999.

8.2.1 Gunshot

Gunshot to the brain is an AVMA approved method to euthanize cattle. The caliber, projectile, and propellant load should be appropriate for the species. Full metal jacket ammunition should never be used. Muzzle energy charts should be used to determine the appropriate caliber and type of ammunition for the type of animal. Appropriate muzzle energy is 300 foot-pounds of force for animals up to 400 pounds and 1000 foot-pounds of force for animals over 400 pounds.

8.2.2 Penetrating Captive Bolt

The AVMA has approved the penetrating captive bolt as a possible form of euthanasia for cattle. This is a gun-like device that is placed against the skull of the animal and when fired a rod (bolt) in the gun is forced into the skull and into the brain tissue. The rod is attached to the gun and removed after the skull is penetrated. It is strongly recommended that an adjunct measure such as exsanguination or “pithing” be administered to ensure death. This method is practical for numerous animals, and is especially useful for animals over 200 pounds.

8.2.3 Electrocution

This is a two-step process in which the first step passes electricity through the brain and stuns the animal. The second step passes electricity through the body and stops the heart. This method is very dangerous to personnel, requires special equipment, and an electrically safe environment in which to conduct the activity. For cattle, electrocution as a depopulation method should only be applied using specialized slaughter plant equipment that applies a minimum of 2.5 amps across the brain. A 120 volt electrical cord does **not** apply sufficient amperage to induce unconsciousness.

8.2.4 Barbiturates

Barbiturates and pentobarbital combinations are used to depress the central nervous system, causing deep anesthesia that progresses to respiratory and cardiac arrest. This method is considered to be very humane but it requires intravenous injection into the animal and will render the carcass unacceptable for rendering.

Table 6. Considerations for Approved Depopulation Methods for Cattle

Depopulation Method	Human Safety Risk	Advantages	Disadvantages	Equipment
Gun Shot	Bullet poses considerable risk	Recommended for animals that cannot be restrained or are difficult to handle.	- May not kill animal - May present biosecurity risk from leaking body fluids - May preclude evaluation of brain if damaged by shooting	- Skilled and licensed operator - Appropriate firearm and ammunition for cattle - .22 caliber 'long rifle' for calves
Penetrating Captive Bolt	Moderate	- Safer for operator than free bullet method - Reduces the need to move animals	- May be a two-step process based on size - Misplaced captive bolt gun may compromise animal welfare - Captive bolt gun must be maintained, cleaned - Several must be used to reduce overheating	- Different sizes of captive bolt guns for different size cattle.
Electrocution	High - requires considerable operator knowledge	- No tissue or blood exposure - Physically demanding for operator - Requires monitoring to ensure	- Restraint is necessary - Two-step process for large animals	- Electrical supply - Electrodes
Barbiturates	Low	- Humane & rapid killing of animals	- Animals must be restrained - Administered by a trained professional - Limited access to drugs	- Syringes & needles - Drug to be injected

Sources: American Veterinary Medical Association. *AVMA Guidelines on Euthanasia*, 2007;
American Association of Bovine Practitioners, *Practical Euthanasia of Cattle: Considerations for the Producer, Livestock Market Operator, Livestock Transporter, and Veterinarian*, 1999;
United States Animal Health Association, *Foreign Animal Disease*, 2008

8.3 Disposal

All-Hazards Event: Large quantities of animal carcasses that result from an all-hazards event (blizzard, flood, tornado, etc.), any disease-related mass deaths of livestock, or an event in which the State Veterinarian determines that depopulation of animals is required, must be managed in a manner that prevents the spread of infection and contamination of soil and ground water. During these events, the CDA is the lead agency and will direct all activities related to management and disposal of carcass wastes. The CDA and CDPHE have a MOU that provides guidance related to the roles and responsibilities associated with a mass mortality or depopulation event. The MOU, *Regarding Storage, Treatment or Disposal of Livestock Carcasses During any All-Hazards Event*, is available on CDPHE website: https://www.colorado.gov/cdphe/swguidance. Agricultural waste sucha livestock that died in a natural disaster or disease outbreak are covered within the CDA/CDPHE MOU on disposal of livestock mass mortalities due to an all hazards event. Such waste is exempted from the CDPHE composting regulations.

Other Events: Carcasses that are disposed of due to mortality or disease unrelated to an all-hazards event or that cannot be used for their original intended purpose are considered to be a solid waste and must be managed in compliance with the Colorado Solid Waste Act (30-20-100.5 et.seq., C.R.S.) and its implementing regulations (6 CCR 1007-2, Part 1). Be aware that under these regulations, special requirements apply to animals known or suspected of being contaminated with infectious substances contagious to humans.

Local Ordinances: The local or county governments may also have regulations and ordinances regarding the proper management of carcasses. Therefore, contact the local public health department concerning local ordinances for disposal. Inappropriate management of these wastes may spread infection or cause contamination of soil or ground water.

The goal of disposal is to facilitate the decomposition of carcasses and destroy any pathogenic disease agent present. Proper disposal is an essential component in the eradication of a disease outbreak. Methods utilized should limit the potential for the spread of the disease or exposure of susceptible species to disease and limit any potential adverse environmental impact. Commonly used disposal methods include: burial, composting, incineration, alkaline digestion and rendering (see Table 7).

When applicable, cattle carcasses will be disposed of on the infected premises to limit the potential spread of disease. However, factors such as the number, size, and species of livestock, the location of the infected premises, the soil types and groundwater locations, and the particular disease agent will dictate the most appropriate method of carcass disposal. The State Veterinarian will collaborate with the USDA-APHIS-VS Colorado Office and CDPHE Solid and Hazardous Waste

Program personnel to determine the location and type of disposal method. Possible methods of carcass disposal are outlined below.

Table 7. Ruminant Disposal Methods: Considerations

Disposal Method	Advantages	Disadvantages	Required Resources
Mass Burial On-Site	- Removal of large amounts of biomass - Facilities can be decontaminated immediately upon removal of livestock - Risk of disease spreading is reduced upon burial of livestock.	- May serve as a containment site rather than decomposing livestock - Requires multi-agency approval - Significant site planning - Public opposition - Potential environmental contamination - Safe management of fluids from decay process	- Excavation equipment - Cover material - Appropriate landscape
Landfill	- Cost/ton is manageable in many instances - Infrastructure is in place to accept large quantities of materials quickly. - Back-up safety and compliance teams exist - Subtitle D liner systems for containment are in place	- Requires transporting carcasses off-site - Permitting process may lead to delay in burial - Operator may refuse to accept materials - Safe management of fluids from decay process - Standard practices are different for each site	- Approved landfill site
Composting	- Removal of large amounts of biomass - Produces a humus-like product containing nutrients and organic matter that can be recycled onto cropland - Cost effective	- Slow carcass decay - Poor odor retention - Leachate production	- Carbon source *i.e. sawdust, straw, corn stover* - Appropriate composting site - Tractor or skid loader - Long stem dial-type composting thermometer
Incineration			
Fixed Facility	- Biosecure	- Fixed capacity - Public Opposition - Expensive to operate - Incinerators are incapable of handling large volumes of carcasses	- Fuel - Incineration facility
Air-Curtain	- Mobile	- Fuel intensive - Logistically challenging	- Fuel - Air-curtain incineration facility
Alkaline Hydrolysis	- Combine sterilization and digestion into one process - Reduction of waste volume and weight by as much 97%. - Complete destruction of pathogens including prions.	- Currently limited capacity for destruction of large volumes of carcasses in US - Potential issues regarding disposal of effluent	- Jacketed stainless steel pressure vessel. - Sodium hydroxide or potassium hydroxide - Water, energy for steam generation
Rendering	- Good biosecurity at rendering plants - High rendering temperatures destroy disease pathogens - Environmentally sound	- Requires transporting carcasses off-site - Cost of transportation to rendering plant - Capacity constraints in handling surges - Some geographic areas not served - Biosecurity as trucks move farm-to-farm	- Rendering Plant

Sources: National Agricultural Biosecurity Center, Kansas State University, *Carcass Disposal: A Comprehensive Review* (2004); Council for Agricultural Science and Technology, *Pig Carcass Disposal Options for Routine and Catastrophic Mortality* (2008).

8.3.1 Rendering

Rendering is a process of both physical and chemical transformation resulting in three end products, carcass meal, melted fat, and water. The main carcass rendering processes include size reduction followed by cooking and separation of fat, water, and protein materials. The resulting carcass meal can often be used as an animal feed ingredient. It is unlikely that rendering will be used as a method of disposal during a highly contagious disease outbreak of cattle.

Carcasses may be sent to a licensed rendering plant with the rendering plant operator's prior approval. Contact the plant to make arrangements before sending carcasses. These facilities may have specific preparation and packaging requirements for the carcasses that must be met before they will accept carcasses for disposal.

8.3.2 Composting

Composting involves a multi-phased decomposition of animal carcasses over a period of time. The process involves the breakdown of organic materials by microorganisms such as bacteria and fungi which results in the release of heat, water, CO_2 and other gases. The heat is the primary process for virus inactivation. The process can be complex and requires an appropriate site, proper management, and a carbon source (such as, wood chips, straw, cornstalks, or similar products.) Often it is vital to have composting subject matter experts (SMEs) on site when constructing windrows. Guidelines and protocols for disposal and virus inactivation can be found in the FAD PReP SOP: Disposal. Windrow composting is often used for disposal of large animals. There are specific livestock composting contractors within Colorado that may be used as subject matter experts or contracted to do the composting work.

Off-site: Carcasses may be sent to an off-site composting facility that is permitted to accept such wastes. Contact the composting facility directly and determine their waste acceptance policies prior to shipping the carcasses.

On-site: Composting of carcasses may be allowed on-site. Depending on the specifics of the operation, it may be regulated 1) by the Colorado Department of Agriculture and exempt from Solid Waste regulations; or 2) regulated under dual authority of the CDPHE Solid Waste Program and the local governing authority in accordance with Section 14 of 6 CCR 1007-2. Under option 2, an approved composting plan must be in place before conducting such operations. Composting plan requirements are described in Colorado's solid waste regulations (6 CCR 1007-2, Part 1, Section 14.11). These plans must include, but are not limited to:

- The basis for selecting the composting site, including site conditions that make it appropriate for a composting operation.
- Structures to be used for run-on and runoff controls.
- Odor management.

- A description of the composting operation, including how the compost will be managed and tested, and what will be done with the final product.

8.3.3 On-site Burial

Carcasses may be buried on-site once concurrence has been obtained from CDA, CDPHE, and the appropriate local agencies. CDPHE has put forth the following best management practices:

- Layers of lime or quicklime should be applied below and above the carcasses to help accelerate decomposition of the waste. Care should be used in applying lime as it is caustic and can cause severe burns to the skin and eyes.
- Burial pits must be covered with a minimum of two feet of soil.
- Carcasses cannot be placed in any body of water, seasonal creek or pond, or in areas that may carry or hold water such as gullies, ditches, blowouts, or natural depressions.
- To minimize potential impacts to groundwater, large numbers of bigger carcasses (e.g., more than ten cows) should not be limed and buried together.
- Surface water must be diverted from the burial site through the use of berms and other structures.
- All carcasses must be buried at least 150 feet away from any water supply source.
- All carcasses must be buried downgradient from any groundwater supply sources.
- The bottom of the burial pit must be at least five feet above the high point of the uppermost groundwater table to ensure that carcasses do not come into contact with groundwater.
- Burial sites must be located at least one mile away from any residence of any person.
- Burial sites should not be located in areas with fractured or cavernous rock, high seasonal water tables or highly permeable soils.

8.3.4 Landfill Burial

The use of permitted landfills for carcass and material disposal may be an option. Some landfills may need a waiver or exemption from the CDPHE to accept livestock carcasses and there may be a limit placed on the landfill concerning the number of carcasses that they may accept for burial. The necessary equipment, personnel, procedures, and containment systems are already in place. Transport of the carcasses to the landfill can pose some risk of disease spread and landfill personnel would have to adhere to additional biosecurity measures.

Carcasses may be sent to a permitted solid waste landfill for disposal with the landfill operator's prior approval. Contact the landfill operator first to determine their waste acceptance policies. Many landfills have specific days or times when they will accept carcasses for disposal or may have certain packaging requirements that must be met before they will accept the waste.

8.3.5 Incineration

There are three broad categories of incineration: open-air, fixed facility, and air-curtain.

- Open-air includes burning carcasses in an open field.

- Examples of fixed facilities are crematoria, small carcass incinerators at veterinary colleges, large waste incineration plants, on-site incinerators, and power plants.
- Air-curtain incineration involves a machine that fan-forces a mass of air through a manifold that accelerates the incineration process generally conducted in an earthen trench. Air-curtain incineration has been used in Colorado to dispose of animals infected with a prion that causes chronic wasting disease.

Off-site: Carcasses may be sent to an off-site incinerator (for example, a pet crematory) that is permitted and approved by local authorities and/or CDPHE's Air Pollution Control Division to accept such wastes. Contact the facility to see if they have any preparation or quantity limitations prior to transporting the carcasses.

On-site: In certain cases, carcasses may be incinerated in an onsite pit. Open burning permits, obtained through CDPHE's Air Pollution Control Division, are required for this process. Pit incineration is generally used when there are several animal mortalities that resulted from disease and there is a risk for disease transmission if the carcasses are transported for disposal offsite. Additional controls, such as plans for disposition of the ash and other remains, must be specified prior to using this process.

8.3.6 Alkaline Hydrolysis

Alkaline Hydrolysis is a process that uses a caustic agent, such as sodium hydroxide, and heat to hydrolyze carcasses into a sterile solution and calcium products. The process requires expensive equipment and provides only low volume capacity; therefore, this method has limited application in a disease outbreak situation.

8.4 Alternatives to Depopulation: Vaccination

In most disease outbreaks, depopulation will be the primary method used to stop transmission and spread of the disease agent within affected animals on diseased premises. However, under certain circumstances, additional methods may need to be implemented. The use of emergency vaccination strategies may be considered in an FMD outbreak. This decision will be made by federal and state animal health officials based on the characteristics of the outbreak and other unique factors related to a particular outbreak. An emergency vaccination strategy can help achieve the goals of an FMD response effort. In order to be effective, vaccines used in an emergency vaccination for FMD must be matched to the specific serotype, and ideally matched with the field strain causing the outbreak.

Vaccination is a tool that can be utilized in conjunction with stamping out to alleviate a disease outbreak. Policy frameworks for the use of vaccines during an outbreak include:

- Stamping out with emergency vaccination to kill
- Stamping out with emergency vaccination to slaughter
- Stamping out with emergency vaccination to live
- Emergency vaccination to live without stamping out

The use of emergency vaccination will be determined by the Unified Command and State Veterinarian in collaboration with the USDA-APHIS-VS Deputy Administrator. Use of vaccines can alter a country's willingness to receive import of livestock and livestock products from the United States and can affect disease-free status as defined by the OIE. Detailed information about vaccination strategies can be found in the FAD PReP Foot-and-mouth Disease Red Book.

New technology in vaccine development has resulted in some 'marker' vaccines. This type of vaccine allows, via serological testing, animal health officials to distinguish vaccinated animals from naturally infected animals. Such a distinction is critical when providing proof of disease free status to world animal health organizations and individual countries.

8.4.1 Vaccination Strategies

Vaccines can be utilized for different purposes during an animal health emergency. Strategies for vaccine use are described below.

A suppressive vaccination strategy is used as a disease control measure to reduce the viral shedding of livestock that have been exposed to the disease agent. This type of strategy is more commonly used in situations of intensive farming, usually due to resource constraints, such as constraints on carcass disposal.

A preventive vaccination strategy is used for high-risk animals not included in the control area, but in close proximity to the infected premises and considered at-risk for exposure. This strategy is an alternative to the traditional stamping-out policy. Numerous factors should be considered prior to implementing this strategy such as: acceptance of vaccine internationally and the effectiveness of the vaccine. A preventive vaccination is also an option for threatened or endangered species that may be considered at risk due to exposure the disease agent.

A barrier vaccination policy can be used to implement a preventive vaccination strategy. This policy is based on a spatial pattern developed to create a barrier between the infected premises and at-risk premises. The intent of barrier vaccination is to inhibit the disease transmission rate by vaccinating all suspected livestock. Common types of vaccination barriers are illustrated below. The area of the barrier will be dependent upon the epidemiology of the pathogen, livestock density, and available resources. See *Figure 3. Barrier Vaccination Examples.*

A targeted vaccination policy can also be used preemptively. Targeted vaccination is commonly used to vaccinate livestock in facilities with a high animal density. Targeted vaccination may also be used to protect threatened and endangered species. See *Figure 4. Targeted and Area Vaccination Diagram*.

Area or Blanketed Vaccination, also known as a mass vaccination, entails vaccinating all livestock within a delineated geographical area. The defined area may be an isolated area, a large region or a state. Often area vaccinations are used when traditional stamping out methods are not meeting disease control objectives. See *Figure 4. Targeted and Area Vaccination Diagram.*

Figure 3. Barrier Vaccination Examples

Firebreak Vaccination **Ring Vaccination**

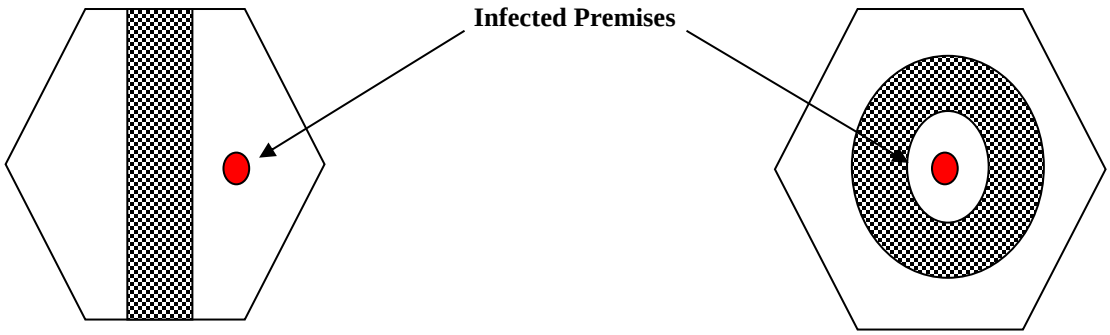
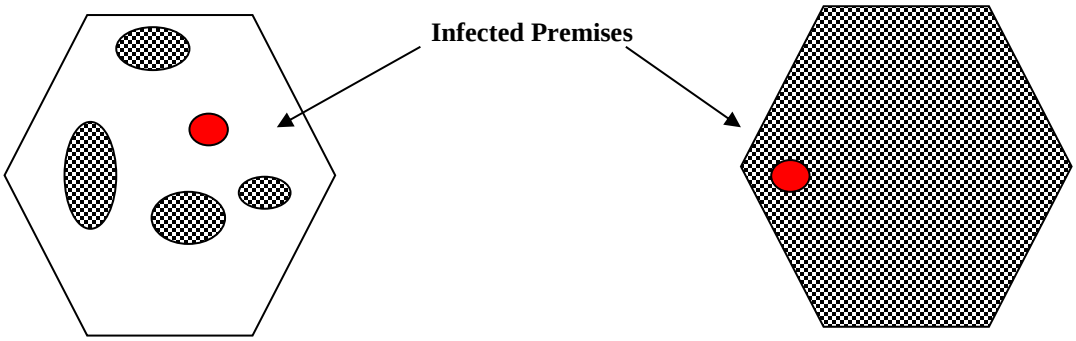


Figure 4. Targeted and Area Vaccination Diagram

Targeted Vaccination **Area or Blanketed Vaccination**



Vaccination information is based on: Williams, Rob. Veterinaria Italiana, 43 (2), 225-235. *The Use of Vaccination in Emergency Animal Disease Responses*.

8.5 Cleaning and Disinfection of an Infected Premises

After disposal of infected carcasses is complete and before the facility can be restocked, the infectious organism must be eliminated from the premises. Cleaning and disinfection procedures (also known as virus elimination require careful planning and coordination to ensure optimum reduction or elimination of the targeted pathogen on the infected premises, to prevent further movement of pathogens between premises, and to ensure the safety of the response personnel, animals, and environment. Selected cleaning and disinfection methods should account for the physical characteristics of the premises and other factors, such as environmental conditions, which may influence the effectiveness of virus elimination.

Pathogens vary in their ability to survive of persist in the environment as well as their susceptibility to disinfection. It is important to be aware of the suspect or confirmed pathogen involved in order to select the most efficacious disinfection method. This will include understanding the general

properties of the disease agent, its ability to persist in the environment, its transmission, and its susceptibility to disinfection. For chemical disinfection, see the EPA chart of diseases and approved disinfectants.

Pest control must be completed before cleaning and disinfection can commence. Care must be taken to reduce the generation and dispersal of infective dust and aerosols. If items cannot be adequately cleaned and disinfected, they must be disposed of by other appropriate means determined by the Incident Command.

If available personnel or materials are insufficient, Incident Command can request emergency 3D (depopulation, disposal, and decontamination) contractor support from the National Veterinary Stockpile (see section 8.7).

Table 8. Cleaning and Disinfection Definitions

Cleaning	The removal of gross contamination, organic material, and debris from the premises or respective structures, via mechanical means like sweeping (dry cleaning) and/or the use of water and soap or detergent (wet cleaning). The goal is to minimize organic material so disinfection can be effective.
Disinfection	Methods used on surfaces to destroy or eliminate a specific species of infectious microorganism through physical (e.g., heat) or chemical (e.g., disinfectant) means. A combination of methods may be required.
Virus Elimination	Cleaning and disinfection measures conducted with the primary purpose to destroy or eliminate all virus on the premises as cost effectively as possible.

Source: NAHEMS Cleaning and Disinfection Guidelines

Key cleaning and disinfection coordination activities:

- Collaborate with unified Incident Command personnel to develop an effective cleaning and disinfection strategy, including issues such as environmental conditions
- Determine supply requirements and delivery locations, date, and time in collaboration with the Logistics Section
- Arrange facility access and determine personnel requirements with Operations Section
- Prepare for and organize personnel supplies, equipment, and daily accommodations (e.g., food, water, and lodging) with the Logistics Section
- Establish cleaning and disinfection stations that adhere to biosecurity measures, such as vehicle entry and movement control checkpoints with the Animal Biosecurity Group
- Ensure that cleaning and disinfection and disposal processes are properly conducted with the Disposal Group
- Coordinate with the property owner to ensure a smooth process

Cleaning and disinfection activities are coordinated and overseen by the unified Incident Management Team from the Incident Command Post. After a Cleaning and Disinfection Group is established, depending on the incident, the Cleaning and Disinfection Group Supervisor may deploy one or more cleaning and disinfection teams to complete the response activities. These teams may be either Task Force teams or Strike teams depending on the incident requirements.

See the following guidance documents for cleaning and disinfection of premises:

- FAD PReP SOP: Cleaning and Disinfection
- NAHEMS Guidelines: Cleaning and Disinfection

The following sections outline different methods used for cleaning and disinfection. Traditionally, facilities have been dry cleaned, followed by power washing and application of a chemical disinfectant. More recently, dry cleaning followed by heat disinfection have been used successfully. There are pros and cons to each method and depend on the type of facility being treated.

8.5.1 Dry Cleaning

Whether the second step is wet cleaning or heat application, both require a thorough dry cleaning of the facility first. Dry cleaning involves the removal of any gross contamination and organic material (e.g., soil, manure, bedding, feed) from production areas or equipment.

Shovels, manure forks, brooms, and brushed should be used to sweep, scrape, and remove organic material and debris from surfaces. In situations involving highly contagious FADs, moistening the area or item with water may be helpful for controlling dust and minimizing aerosolization of pathogens. Bins may air in transport of the material to the disposal area. Heavy equipment such as bobcats or tractors may be needed to remove large quantities of manure and bedding. Air blowers should not be used for dry cleaning due to the risk of spreading pathogens.

Disposal of all materials should be in a manner that minimizes further spread of pathogens and that is compliant with federal, state, and local regulations and policies. This may involve the burning, burial, or composting of material. Items that are difficult to clean or are of limited financial value (e.g., wooden gates or bunks, ropes, halters, pallets) should be appraised and disposed.

This process may require considerable time and effort, depending on the size and type of facility, but it is essential as this material can harbor pathogens and reduce the efficacy or inactivate some disinfectants. Surfaces may not necessarily be visibly clean when this step is complete due to organic matter that adheres to the surface.

8.5.2 Wet Cleaning and Chemical Disinfection

Chemical disinfection has long been shown to be an effective method of decontamination. Chemical disinfectants cannot penetrate debris or organic material, so a facility must be thoroughly cleaned and all organic debris removed prior to application. Environmental conditions such as organic load, surface topography, temperature, pH, water hardness, relative humidity, and the presence of other chemicals can impact the efficacy of disinfection procedures.

There are downsides to chemical disinfection, mostly related to the cleaning processes. Preparation of facilities for chemical disinfection can be very challenging and time-consuming. Removal of organic debris must be done by hand, and some areas can be difficult to access. Wet cleaning can damage electrical systems. There are as challenges with preparation for chemical

disinfection as the wet cleaning/power washing step can damage clay floors and leave standing water.

Wet Cleaning:

Following the removal of gross contamination (dry cleaning), areas or items should be washed with detergent. The washing helps to further reduce the number of pathogens as well as removing any oil, grease, or exudates that may inhibit the action of disinfection. Washing prior to disinfection is one of the most commonly overlooked steps in the cleaning and disinfection process.

Prior to washing, all electrical equipment should be turned off and removed, or covered tightly with plastic sheeting. An electrician may need to be contacted for the removal of thermostats, timing devices, motor controls, and remote sensing equipment prior to washing. An alternative power supply (e.g., adjacent building, portable generator) may be needed to power electrical washing equipment.

Areas and items with organic material adhered to the surfaces should be pre-soaked for several hours. Soaps or detergents can help disperse and remove organic material; however, the cleaning product used must be compatible with the disinfectant selected. Some disinfectant products may be formulated with a detergent component. Washing with a cleaner or detergent is required for disinfectants that do not contain these components.

Mechanical scrubbing and scraping (e.g., brushes) may be necessary to remove oils, grease, or exudates. Rough surfaces should be scrubbed with a wire brush to ensure that they are as clean as possible. Deep cracks, crevices, or other surface irregularities should be given special attention to dislodge accumulated grime.

High pressure water and detergent is very effective in removing the heavy accumulation of urine and feces often present in the environment and for cleaning porous surfaces. However, in cases of highly infectious or zoonotic pathogens, high pressure systems should be avoided or used with caution to avoid further dispersal of the pathogen or risk to the applicator.

Rinse and Dry:

After washing, all surfaces should be thoroughly rinsed, as residues from cleaners and detergent can inactivate certain chemical disinfectants. Rinsing should be done with cold water at a low pressure. Whenever possible, surfaces should be allowed to dry completely (if possible overnight) before application of a disinfectant. Excess moisture may dilute and reduce the efficacy of the disinfectant applied to the surface. In cool or cold weather, drying can be accomplished by heating the building and circulating the air with auxiliary blowers.

Disinfection:

Once surfaces are completely cleaned, rinsed, and dried, application of an appropriate disinfectant can proceed. Application methods may involve spraying, fogging or misting, immersing or wiping or mopping methods. Because products differ in formulation, the directions for use also differ.

The specific manufacturer's instructions for effective use of a disinfectant should be followed. Appropriate safety measures should be taken when implementing the disinfection process.

The USDA does not recommend any specific disinfectant, but does require that the one selected be EPA approved: EPA chart of diseases and approved disinfectants.

Regardless of the disinfectant chosen, one of the most important components of the procedure is to allow adequate contact time for the process to have its impact. In some cases, the chemical disinfectant may need to be reapplied to keep the surface wet for the required contact time.

Following the application and subsequent contact time of chemical disinfectants, items and areas should be thoroughly rinsed. Most chemical disinfectants can be harmful to animals and should be rinsed with potable water and surfaces should be allowed to air dry prior to restocking of the area.

8.5.3 Heat Disinfection

An alternative to chemical disinfection is heat. Heat disinfection was recently demonstrated as a cost-effective option as an accepted method of disinfection/virus elimination (in recent HPAI outbreaks in the United States). Heat treatment may not be appropriate in all situations (e.g., older, drafty barns or in the middle of winter in cold areas of the state). The challenge with heat disinfection is primarily maintenance of appropriate temperatures within the facility during treatment.

Preparation for heat disinfection is limited to the dry cleaning step. Heat penetrates surfaces and residual organic debris, and eliminates the need for wet cleaning/power washing. Wet cleaning is not recommended in preparation for heat disinfection due to likelihood of standing water and water pooling.

Current policy guidance (only developed for HPAI) states that barns/houses must be heated to between 100°F and 120°F for a total of 7 days; with at least 3 consecutive days (of the 7 days) of heating continuously to within this temperature range. To avoid damage to structures and fixtures, temperatures should not exceed 120°F.

Transport Vehicle Heat Disinfection:

Although heat disinfection has not been routinely used in cattle operations, it should be considered as an option for transport vehicles in an emergency disease outbreak if appropriate facilities are available.

Heat disinfection (also known as thermos-assisted drying and decontamination) has successfully been used in livestock operations to decontaminate transport vehicles. For example, PEDV has been inactivated by heating trailers to 160°F for 10 minutes and PRRSv has been inactivated by heating trailers to 160°F for 20+ minutes.

General information on heat treatment:

Heat can be applied under moist (e.g., autoclave, steam) or dry (e.g., flame, baking) conditions. Moist heat can be effectively applied through steam, boiling, or pasteurization. Steam under pressure (e.g., autoclaving) is the most efficient since it can achieve temperatures above the boiling point of water, which may be necessary when dealing with thermally resistant bacterial spores. Dry heat applications involve incineration (i.e., flaming) or hot air (i.e., baking). It can be useful for disinfection of heat-resistant materials, such as glass or metals.

Most vegetative bacteria inactivated at moist-heat temperatures of 131-149°F. Rapid destruction can occur at higher temperatures (e.g., less than 20 seconds at 161°F or within seconds at temperatures above 176°F). Many viruses are labile at temperatures close to 158°F. Bacterial endospores require temperatures of 250°F or more for at least 15 minutes for destruction. Prions, such as those that cause BSE, exhibit exceptional thermal stability.

8.6 Evaluation of Cleaning and Disinfection of an Infected Premises

Evaluation of a site following cleaning and disinfection should ensure all tasks detailed on the premises assessment have been performed. Factors to be addressed should include the following:

- All grossly contaminated areas have been identified and properly cleaned and disinfected
- All personnel are aware of and are implementing cleaning and disinfection measures for themselves and their equipment (e.g., PPE, tools, instruments).
- Gross debris (e.g., manure, unused feed, or bedding) has been removed and properly disposed of.
- Any contaminated wood or items difficult to disinfect have been appraised, removed, and disposed of in a manner that minimized the spread of pathogens (e.g., burned, composed, buried).
- All fixtures and fittings have been dismantled, cleaned, and disinfected.
- All infected or suspected areas have been properly washed, rinsed, and disinfected. Visual inspection should be conducted to ensure surfaces are clean and no organic material has been left behind.
- An EPA-registered or exempted disinfectant that is efficacious against the target microorganism was used at the appropriate concentration.
- The necessary contact time for the disinfectant was allowed.
- Effluent from the C&D procedures has been handled in a manner to minimize or avoid environmental impact.

Final inspection of the premises should be conducted by experienced personnel. If there is any doubt or sign of inadequate procedures, the disinfection measures must be repeated. Once final inspection of the premises has occurred, any and all personnel should proceed through the cleaning and disinfection site before leaving the premises.

8.7 National Veterinary Stockpile

The National Veterinary Stockpile (NVS) is the Nation's repository of vaccines and other critical veterinary supplies and equipment. The NVS is designed to augment state and local resources in the fight against dangerous animal diseases that could potentially devastate American agriculture, significantly affect the economy, and threaten the public's health. Homeland Security Presidential Directive 9 (HSPD-9) established the NVS in 2004. The Directive requires APHIS to be able to deploy the NVS to the site of a dangerous animal disease outbreak within 24 hours. To accomplish this critical mandate, the NVS has defined agents of greatest interest to animal health and has prioritized its resources accordingly. The NVS currently holds or has systems in place to provide:

- Personal protective equipment (PPE) for 310 responders for 10 days in a high-risk environment.
- Further PPE to protect 3,000 responders for 40 days
- Anti-viral medications for 3,000 responders for 6 weeks
- Satellite data and voice transmission equipment that is portable and capable of establishing temporary command posts
- Decontamination supplies
- Vaccines and other supplies

More information on the National Veterinary Stockpile can be found in the Colorado National Veterinary Stockpile and Agricultural Logistics Plan (2012).

9.0 Business Continuity: Protect Economic Viability and Continuity of Operations

Maintaining business continuity and the movement of livestock and animal food products that are unaffected by a disease outbreak is a critical component of the CDA *Cow–Calf Emergency Disease Response Plan*. The movement of livestock and animal food products will be at the discretion of the State Veterinarian in collaboration with USDA-APHIS-VS officials and will be based on the epidemiology of the disease agent.

Guidance on the managed movement of cattle and cattle products during a disease outbreak is found in the Secure Beef Supply plan, and covers biosecurity and testing requirements prior to movement. The goals of the Secure Beef Supply Plan are to maintain business continuity for beef producers and processors during an FMD outbreak; minimize disease spread; and assure a continuous supply of beef products to consumers.

The following are additional resources that provide guidance on movement control and permitting:

- Foot-and-Mouth Disease Response Plan: The Red Book
- Secure Beef Supply
- FAD PReP Cow-Calf Industry Manual
- FAD PReP Manual 6-0: Permitted Movement
- NAHEMS Guidelines: Quarantine and Movement Control

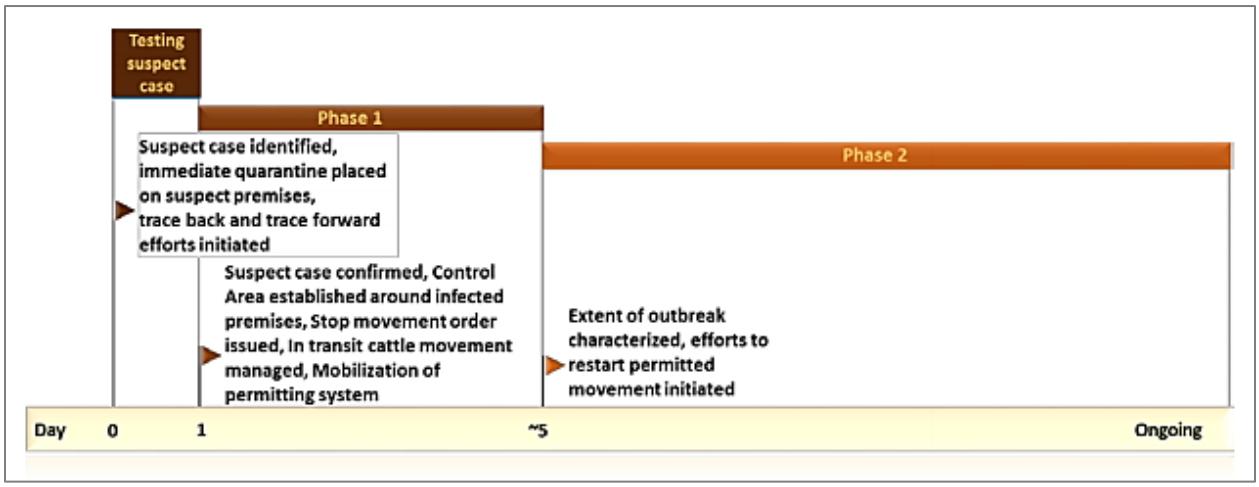
9.1 Controlled Animal Movement

Initially, during a disease outbreak, the State Veterinarian may issue livestock movement controls for all cattle or for those species involved in transmission of the disease, as well as find an acceptable destination for any truckloads of livestock in transit. Once the outbreak has been characterized, a system will be set up to restart movement of cattle, feed, and other livestock under permit from the State Veterinarian's Office and appropriate biosecurity. The managed movement of cattle during an FMD outbreak will be divided into two chronological periods separated by a period of non-movement to establish appropriate movement permitting systems. See *Figure 5. Timeline of Early Events in a Foot and Mouth Disease Outbreak*.

By restricting the movement of animals, animal products, and contaminated fomites, quarantine and movement control can be a powerful tool in controlling and containing an FAD outbreak. Movement control is accomplished through a permit system that allows entities to make necessary movements without creating an unacceptable risk of disease spread. Operational staff members need to strictly adhere to movement control procedures, which are based on the best scientific information available at the time.

During a disease outbreak, producers should be prepared to manage their feedlot without being allowed to move animals for several days to weeks if they are located in a regulatory Control Area. This will give time to conduct surveillance to demonstrate a lack of evidence of disease and move confidence that a movement does not present a significant risk for disease spread.

Figure 5. Timeline of Early Events in a Foot and Mouth Disease Outbreak



From the Secure Beef Supply Plan: Managed Movement (April 2016)

Once the extent of the outbreak can be reasonably estimated, appropriate movement permitting systems will be established. In order for a permit to be issued, minimal criteria must be met. These are subject to change, depending on the disease, extent of the outbreak, and the best science- and risk-based information available. See Tables 11, 12, and 13 in Section 9.5.

9.2 Bio-secure Transportation Corridors

As mentioned, allowing unaffected animals and animal food products to move during an animal disease outbreak is essential to maintaining industry business continuity. This, movement of cattle and other livestock that are deemed disease-free will take place along bio-secure corridors.

Bio-secure corridors are transportation routes located outside of the quarantine area that will allow livestock and animal food products to travel safely without the risk of exposure to an animal disease. Identifying bio-secure corridors will be the responsibility of the CDA with assistance from the Colorado State Patrol, CDOT, and local law enforcement agencies. Livestock associations and the trucking industry will be essential in the effective implementation of livestock movement corridors.

9.3 Secure Beef Supply: Permitted Movements

The Secure Beef Supply (SBS) Plan covers Continuity of Business Permits (secure food supply permits) for At-Risk and Monitored Premises only in a Foot-and-Mouth Disease Outbreak. Some of these guidelines may be followed in outbreaks with other diseases.

9.3.1 SBS Biosecurity

Stringent biosecurity measures will be essential to prevent entry of virus into each herd. Producers must review and implement the items in the "Self-Assessment Checklist for Enhanced Biosecurity for FMD Prevention: Beef Feedlots," including developing a site-specific biosecurity plan. The

Biosecurity checklists, Biosecurity Information Manuals, and materials for training employees are available on the SBS website: www.securebeef.org. The SPS emphasizes three concepts that all feedlots must implement to help protect their animals from endemic diseases and to be prepared in the event of an FAD outbreak in the U.S.:

- A Biosecurity Manager
- A written site-specific biosecurity plan
- A defined Line of Separation

9.3.2 SBS Surveillance

Surveillance in the SBS Plan is the ability to demonstrate a lack of evidence of FMD infection in order to request a movement permit. Other producers, and those managing the disease outbreak, want assurances that the cattle are not infected and spreading FMD. Potential surveillance methods are described in the SBS: FMD Virus Surveillance Guidance for Beef Cattle in a Control Area.

These potential surveillance methods include:

- Completion of an epidemiologic questionnaire
- Serological surveillance
- Virological surveillance
- Periodic inspection of cattle for evidence of FMD infection
- Daily Active Observational Surveillance

9.3.3 Establishment of Permitting Teams

A permitting team will be established under the Operations Section of the Incident Command Structure. The Permitting Team will be responsible for collecting relevant information for each permitted movement request using available resources and the USAHERDS animal health information management database.

A USDA-APHIS National Permitting Unit may also be established. This unit's purpose is to coordinate and facilitate intrastate and interstate movements and to maintain a national database for all permits issued during an outbreak. This Unit would integrate with the CDA's Permitting Team within the ICS structure of the State. Authority to approve permitted movement into and out of control areas in Colorado remains with the State Veterinarian.

9.3.4 To Request a Permit for Movement during an Outbreak

The CDA will set up an online information sharing center and provide public information news releases for producers, stakeholders, and the public at the start of and during an FAD outbreak which will allow the CDA to better control the disease. There will be multiple ways for livestock producers to request a movement permit: via telephone, through an internet link to access an online form, or by contacting the animal health field personnel providing service to that premises. Producers will be required to provide the following information when requesting a permit (Table 9):

Table 9. Information Required for Permitted Movement

Information to be provided	Description
Permit class	Where products are moving in relation to the Control Area
Permit reason	Why products are moving
Origin premises	Premises, including LID and/or PIN, entered in USAHERDS
Destination premises	Premises, including LID and/or PIN, entered in USAHERDS
Item permitted	Category of product being moved (feed, cattle, manure, etc.)
Item class	Specifically what is moving (e.g. steers to slaughter)
Duration/span of permit	First movement date, and expected duration of movements

Source: Secure Beef Supply Plan

Producers should be prepared to have the following information available upon request prior to issuance of movement permit:

- A completed copy of the epidemiology questionnaire (if applicable)
- A completed copy of the Biosecurity Checklist and site-specific biosecurity plan
- Written assurance of compliance with the Biosecurity Checklist
- Information demonstrating normal health status for the animals on the production site involved (e.g., herd health monitoring documents and/or certificate of veterinary inspection signed by an Accredited Veterinarian)
- Laboratory results from samples tested, if required for movement
- For animal movements to another production site, the site of destination must include that they understand the risks associated with accepting the animals

9.3.5 Colorado Permitting Process

When a request for a permit is received by the permitting team, they will evaluate the following:

Table 10. Summary of Movement Permit Guidance for Beef Cattle within a FMD Control Area

Permitting Guidance for Movement of Cattle and Cattle Products	Condition Met? *Yes or No*
1. Biosecurity Measures listed in the Biosecurity Checklist[2] in place	Yes
2. Traceability Information available (PIN, USAHERDS Location ID (LID), GPS Coordinates, information on type and number of animals moved)	Yes
3. Epidemiology Questionnaire[3] data acceptable	Yes
4. Destination premises and state willing to accept the animals or semen	Yes
5. No evidence of infection based on surveillance	Yes

6. Permit Guidance to move beef cattle if all above responses are "Yes"	Consider issuing MOVEMENT PERMIT

Adapted from Secure Beef Supply Plan - Summary

[2] The Biosecurity Checklist is the 'Self-Assessment Checklist' from the Secure Beef Supply Plan

[3] See Appendix I in the *FMD Response Plan: The Red Book* for an example Epidemiology Questionnaire

Once a permit is issued by the CDA and documented in USAHERDS, a copy of the permit will be forwarded to the national permitting unit or incident command personnel will enter the information into EMRS (the federal emergency management response system tracking database).

If the permit is for a movement out of state, the Permitting Team will email (or fax) the permit and required/requested additional information to the state of destination for approval. If the permitting information is immediately entered into EMRS, the destination state may approve the movement from that location.

If the permit is approved, the producer will receive the approved permit (likely as an electronic PDF) from the appropriate official with the CDA or Incident Command. The permitted movement must comply with all requirements on the permit; all subsequent permitted movements associated with that permit must be submitted to and recorded in USAHERDS and/or EMRS.

9.4 Secure Beef Supply: Movements Definitions

For the Secure Beef Supply Plan, movements will be classified as those Outside or Inside a Control Area.

- **Outside a Control Area**: If a production site is outside a Control Area, cattle movements from that site will either be to another premises outside a Control Area(s) or to a premises inside a Control Area.
- **Inside a Control Area**: If a production site is inside a Control Area, cattle movements from that site will either be to another premises inside of a Control Area or to a premises outside a Control Area.

9.4.1 Movement from Outside a Control Area

- Movement from outside to outside:

  Cattle with no evidence of infection should be allowed to move to other premises outside of Control Areas if the movements can be completed without passing through a Control Area.
- Movement from outside to inside:

  Cattle movements to a premises inside a Control Area should be limited to finished cattle moving directly to slaughter, although during a lengthy outbreak limited shipments of other cattle may need to move into a Control Area to maintain continuity of business. All cattle movements from outside a Control Area to inside a Control Area should be accompanied by a permit. Vaccination may be required before cattle are permitted to move.
- Traffic:

Production sites outside of a Control Area will have traffic entering their premises to deliver commodities and goods, pick up finished cattle for slaughter, remove animals to be rendered and other waste products, and provide nutrition and veterinary services, as well as other purposes. Production sites should verify vehicles have not come from inside or passed through a Control Area without undergoing appropriate cleaning and disinfection procedures before allowing entry across the Line of Separation (see SBS Information Manual for Enhanced Biosecurity) onto the site. Enhanced biosecurity for all traffic entering a production site is encouraged for all.

9.4.2 Movement from Inside a Control Area

- Demonstrate lack of evidence of infection and meet Biosecurity Performance Standards:

  Any premises within a Control Area that wishes to move cattle should provide documentation demonstrating a lack of evidence of infection (as described in SBS Surveillance) and meet Biosecurity Performance Standards in order to request a movement permit.
- Valid Movement Permit required:

  Any cattle movement from inside a Control Area should be accompanied by a valid movement permit.
- Move directly to slaughter:

  Finished cattle that demonstrate a lack of evidence of infection *and* are accompanied by a valid movement permit may be allowed to move directly to slaughter. If the cattle need to travel to a packing plant outside the Control area, the driver should follow a pre-determined route to minimize the risk of exposing susceptible animals to the virus.
- Traffic:

  Traffic will need to move into production sites that are inside of Control Area. The size of the outbreak and choice of response strategy will determine what kind of movements will need to enter the Control Area. Traffic that crosses onto a livestock premises within a Control Area should be accompanied by a valid movement permit and undergo appropriate cleaning and disinfection procedures.

9.4.3 Transporters

- Outside a Control Area:

  Transporters operating outside of a Control Area should be mindful of where Control Areas exist and alter routes to avoid entering or passing through Control Areas. Transporters may need to modify their routines to accommodate increased biosecurity requirements implemented by livestock premises working to protect their herds.

- Inside a Control Area:

Any traffic entering a premises with susceptible animals within a Control Area should be accompanied by a valid movement permit.

Any traffic that has entered a Control Area should be assumed to have come in contact with contaminated roadways. At a minimum, the tires, wheels, and undercarriage of the vehicle should undergo cleaning and disinfection procedures before crossing a Line of Separation (LOS) to enter any premises with susceptible species.

9.4.4 Processors

- Outside a Control Area:

  If a packing plant outside of a Control Area has received or is receiving cattle from inside one or more Control Areas, the receiving plant and any roadways that the shipments from the Control Area have traveled on should be considered to be potentially contaminated. Traffic that has entered the premises of one of these packing plants should undergo cleaning and disinfection procedures as required by Incident Command, especially before traversing a LOS at an uninfected premises.

  If a packing plant outside of a Control Area has not received or is not receiving shipments of cattle from inside any Control Area, traffic should continue normally while keeping in mind that the status of any premises, the status of shipments, and areas designated as Control Areas may change rapidly. Therefore, the packing plants should be prepared to implement cleaning and disinfection procedures as required by Incident Command in a prompt manner. These packing plants should work with transport companies to assure shipments are not traveling through Control Areas en route to the plant.

- Inside a Control Area:

  If a packing plant is located inside a Control Area, cattle movements should continue to the plant in order for the plant to maintain continuity of business and to get apparently healthy cattle processed as quickly as possible. This will decrease the number of naïve susceptible animals at risk of contracting FMD. If possible, packing plants within the Control Area should harvest cattle from within the Control Area.

  Cattle movement to the plant should be accompanied by a valid movement permit.

  Ideally, all trucks delivering cattle should undergo cleaning and disinfection procedures as required by Incident Command regardless of the origin of the cattle shipment. Availability of resources and weather conditions will greatly impact the logistics of implementing cleaning and disinfection procedures.

  Ideally, all trucks transporting meat products from the plants should undergo cleaning and disinfection procedures for the tires, wheels, and undercarriage upon leaving the plant and/or Control Area if they share traffic routes with trucks delivering live animals.

Packing plants should explore options for transporting employees to and from the plant in a manner that minimizes potential cross-contamination of personal vehicles and carrying virus on employees' apparel and footwear.

9.5 Movement Tables:

The following tables are from the FMD Red Book and provide useful guidance on movement of products during an FMD outbreak.

- Table 11. Movement into a Control Area from outside a Control Area
- Table 12. Movement within a Control Area
- Table 13. Movement from inside a Control Area to outside a Control Area

Table 11. Movement into a Control Area from outside a Control Area

Item moving into a Control Area to a/an…	Infected Premises	Suspect Premises^	Contact Premises^	At-Risk Premises	Monitored Premises
Susceptible animals	Prohibited, except under certain circumstances as determined by the IC, such as slaughter.	Prohibited, except under certain circumstances as determined by the IC, such as slaughter.	Prohibited, except under certain circumstances as determined by the IC, such as slaughter.	Permit for movement must be approved by the IC with appropriate biosecurity measures.	Permit for movement must be approved by the IC with appropriate biosecurity measures.
Susceptible animal products	See continuity of business plans for information on susceptible animal products, or guidance and processes as determined by the IC. Please see Section 5.10.5 which contains OIE FMD-specific guidance for inactivating FMD.				
Other animals (non-susceptible) from premises **with** susceptible species	Prohibited unless permit approved by IC and appropriate biosecurity measures.	Prohibited unless permit approved by IC and appropriate biosecurity measures.	Prohibited unless permit approved by IC and appropriate biosecurity measures.	Allowed with appropriate biosecurity measures. IC may require a permit for movement depending upon FMD epidemiology and characteristics of destination premises.	Allowed with appropriate biosecurity measures. IC may require a permit for movement depending upon FMD epidemiology and characteristics of destination premises.
Other animals (non-susceptible) from premises **without** susceptible species	IC will determine movement restrictions based on FMD epidemiology and characteristics of destination premises.	IC will determine movement restrictions based on FMD epidemiology and characteristics of destination premises.	IC will determine movement restrictions based on FMD epidemiology and characteristics of destination premises.	Allowed with appropriate biosecurity measures. IC may require a permit for movement depending upon FMD epidemiology and characteristics of destination premises.	Allowed with appropriate biosecurity measures. IC may require a permit for movement depending upon FMD epidemiology and characteristics of destination premises.
Equipment, vehicles, and other fomites from premises **with** susceptible species	Allowed with appropriate biosecurity measures.	Allowed with appropriate biosecurity measures.	Allowed with appropriate biosecurity measures.	Allowed with appropriate biosecurity measures.	Allowed with appropriate biosecurity measures.
Semen, embryos from susceptible animals	Prohibited.	Prohibited.	Prohibited.	Allowed with appropriate biosecurity measures.	Allowed with appropriate biosecurity measures.

Note: Movement control and permit processes will change over time depending on situational awareness and operational capabilities.

^ Contact Premises and Suspect Premises are intended to be short-term premises designations. Ideally these Premises should be re-designated before movements occur.

Source: Foot-and-Mouth Disease Response Plan: The Red Book

Table 12. Movement within a Control Area

Item moving within a Control Area to a/an…	Infected Premises	Suspect Premises^	Contact Premises^	At-Risk Premises	Monitored Premises
Susceptible animals	Prohibited, except under certain circumstances as determined by the IC, such as slaughter.	Prohibited, except under certain circumstances as determined by the IC, such as slaughter.	Prohibited, except under certain circumstances as determined by the IC, such as slaughter.	Allowed to move by permit approved by the IC; surveillance, negative diagnostic tests, premises biosecurity, and risk-assessment may be required for permit.	Allowed to move by permit approved by the IC; surveillance, negative diagnostic tests, premises biosecurity, and risk-assessment may be required for permit.
Susceptible animal products	See continuity of business plans for information on susceptible animal products, or guidance and processes as determined by the IC. Please see Section 5.10.5 which contains OIE FMD-specific guidance for inactivating FMD.				
Other animals (non-susceptible) from premises **with** susceptible species	Prohibited unless specific permit granted by IC and appropriate biosecurity measures.	Prohibited unless specific permit granted by IC and appropriate biosecurity measures.	Prohibited unless specific permit granted by IC and appropriate biosecurity measures.	Allowed to move by permit approved by the IC; surveillance, negative diagnostic tests, premises biosecurity, and risk-assessment may be required for permit.	Allowed to move by permit approved by the IC; surveillance, negative diagnostic tests, premises biosecurity, and risk-assessment may be required for permit.
Other animals (non-susceptible) from premises **without** susceptible species	n/a (Infected Premises have susceptible species)	n/a (Suspect Premises have susceptible species)	n/a (Contact Premises have susceptible species)	n/a (At-Risk Premises have susceptible species)	n/a (Monitored Premises have susceptible species)
Equipment, vehicles, and other fomites from premises **with** susceptible species	Prohibited unless specific permit granted by IC and appropriate biosecurity measures.	Prohibited unless specific permit granted by IC and appropriate biosecurity measures.	Prohibited unless specific permit granted by IC and appropriate biosecurity measures.	Allowed by permit approved by IC and appropriate biosecurity measures.	Allowed by permit approved by IC and appropriate biosecurity measures.
Semen, embryos from susceptible animals	Prohibited.	Prohibited.	Prohibited.	Allowed by permit approved by IC and appropriate biosecurity measures.	Allowed by permit approved by IC and appropriate biosecurity measures.

Note: Movement control and permit processes will change over time depending on situational awareness and operational capabilities.

^ Contact Premises and Suspect Premises are intended to be short-term premises designations. Ideally these Premises should be re-designated before movements occur.

Source: Foot-and-Mouth Disease Response Plan: The Red Book

Table 13. Movement from inside a Control Area to outside a Control Area

Item moving out of a Control Area from a/an…	Infected Premises	Suspect Premises^	Contact Premises^	At-Risk Premises	Monitored Premises*
Susceptible animals	Prohibited, except under certain circumstances as determined by the IC.	Prohibited, except under certain circumstances as determined by the IC.	Prohibited, except under certain circumstances as determined by the IC.	At-Risk Premises must become Monitored Premises to move susceptible livestock out of a Control Area.	Allowed to move by permit approved by IC; surveillance, negative diagnostic tests, premises biosecurity, and risk-assessment may be required for permit.
Susceptible animal products	See continuity of business plans for information on susceptible animal products, or guidance and processes as determined by the IC. Please see Section 5.10.5 which contains OIE FMD-specific guidance for inactivating FMD.				
Other animals (non-susceptible) from premises **with** susceptible species	Prohibited unless specific permit approved by IC and appropriate biosecurity measures and risk-assessment.	Prohibited unless specific permit approved by IC and appropriate biosecurity measures and risk-assessment.	Prohibited unless specific permit approved by IC and appropriate biosecurity measures and risk-assessment.	Allowed to move by permit approved by IC; surveillance, negative diagnostic tests, premises biosecurity, and risk-assessment may be required for permit.	Allowed to move by permit approved by IC; surveillance, negative diagnostic tests, premises biosecurity, and risk-assessment may be required for permit.
Other animals (non-susceptible) from premises **without** susceptible species	n/a (Infected Premises have susceptible species)	n/a (Suspect Premises have susceptible species)	n/a (Contact Premises have susceptible species)	n/a (At-Risk Premises have susceptible species)	n/a (Monitored Premises have susceptible species)
Equipment, vehicles, and other fomites from premises **with** susceptible species	Prohibited unless permit approved by IC and appropriate biosecurity measures.	Prohibited unless permit approved by IC and appropriate biosecurity measures.	Prohibited unless permit approved by IC and appropriate biosecurity measures.	Allowed by permit approved by IC and appropriate biosecurity measures.	Allowed by permit approved by IC and appropriate biosecurity measures.
Semen, embryos from susceptible animals	Prohibited.	Prohibited.	Prohibited.	At-Risk Premises must become Monitored Premises to move semen, embryos from susceptible livestock out of a Control Area.	Monitored Premises only allowed by permit approved by IC and appropriate biosecurity measures.

Note: Movement control and permit processes will change over time depending on situational awareness and operational capabilities.

^ Contact Premises and Suspect Premises are intended to be short-term premises designations. Ideally these Premises should be re-designated before movements occur.

* Continuity of business plans may apply.

Source: Foot-and-Mouth Disease Response Plan: The Red Book

9.6 Risk Reduction and Contingency Planning

Each cow-calf operation should develop an emergency disease response plan, which may be useful in the event of a disease emergency to prevent the spread of disease and effect a more rapid response. This emergency disease response plan has the added benefit of aiding response to unexpected endemic disease losses. The FAD PReP Cow-Calf Industry Manual and the Center for Food Safety and Public Health's FMD Prevention Practices Checklist provide additional information on developing an emergency disease action plan for cow-calf operations.

10.0 Recovery: Returning Affected Premises to Normal Business Operations

The actions taken during the recovery period are focused on restoring the situation to normal or near normal as quickly as possible. Issues to consider are repopulation of production facilities, financial considerations, re-establishing public trust and consumer confidence, and review of risk reduction measures. It is important to note that the recovery phase of an incident may last an extended length of time.

10.1 Release of Control Area Restrictions

Quarantine and movement controls will be maintained until at least two incubation periods have elapsed since the decontamination of all confirmed infected premises and negative results of surveillance activities. The State Veterinarian and Incident Command need to plan for the release of quarantine prior to or during the issuance of quarantines and movement controls. Such a plan would specify procedures by which quarantined premises will be evaluated for disease freedom and how the quarantine will be released (by sections, by risk, or in its entirety).

10.2 Repopulation

Restocking guidance: Following appropriate cleaning and disinfection procedures, infected premises will remain vacant for a period of time (fallow period) before restocking susceptible animals onto premises. The fallow period should be a minimum of two disease incubation periods or other appropriate time period determined by the State Veterinarian. If it is not possible to carry out full cleaning and disinfection procedures, the premises must remain vacant for a longer period of time to be determined by the Incident Commander. It is critically important that in restocking, the IC consider the likelihood of disease survival based on environmental conditions, the execution of cleaning and disinfection procedures, and specific circumstances of the outbreak.

The producer should, in collaboration with Incident Command, come up with a restocking plan, including details of the susceptible species, number of animals, and locations of sentinel animals (if used). Once introduced to the previously infected premises, no animals may leave until all locations on that premises have been restocked and serological diagnostics are negative.

Testing Requirements for Restocking: These guidelines will vary depending on the disease agent. Animals may subject to clinical inspection and diagnostic sample collection and submission.

For example, with FMD virus, during restocking animals will be subject to clinical inspection every 3 days for the first 14 days (one OIE incubation period), and once per week thereafter up to 28 days (two OIE incubation periods). At 28 days after the last animals are introduced, each animal must be clinically examined by a veterinary inspector and samples tested for the presence of FMD antibodies.

Approved Sources of Livestock: Introduced livestock must come from areas not subject to quarantine and movement control measures. Depending on the disease agent, animals may be required to test negative prior to introduction.

For example, with FMD virus, all livestock must test negative before introduction. A 24-hour pre-movement clinical inspection is also required. Animals must originate on and come from premises on which there has not been a confirmed case of FMD within 6.2 miles (10 kilometers) for at least 30 days.

Sentinel Restocking: The alternative to fully restocking is to use a small number of sentinel cattle. Serologically negative sentinel cattle are introduced to a facility to determine if pathogens are still present and viable. Sentinel cattle may be retained for at least two specific pathogen incubation periods (to be determined by the State Veterinarian). They will be monitored for clinical signs of the disease and biological samples tested. In the event that sentinel cattle become infected or test positive for the disease, the sentinels will be depopulated and the cleaning and disinfection process will be repeated. The same holds true for facilities that restock with normal herd numbers.

After the sentinel restocking, monitoring, and testing process is complete and the premises is determined to be free of disease, it is released and livestock may be purchased to repopulate the ranch.

Written Consent: Producers must have written consent from the State Veterinarian and USDA-APHIS-VS official to begin the restocking process. If producers choose to restock without explicit permission from the State Veterinarian or USDA-APHIS-VS officials, do not follow the restocking surveillance and testing requirements, and subsequently become re-infected, they may not be eligible to receive indemnity.

10.3 Recovery of Free Status

There are separate requirements (e.g., time and surveillance) for the recovery of free status in previously disease free countries. These requirements are based on the disease agent and can be found in the OIE Terrestrial Animal Health Code (2016).

11.0 Roles and Responsibilities

Response to an outbreak of a highly contagious animal disease will require the coordination of multiple government agencies, industry representatives, and stakeholders. Local, state, and federal agencies and their possible roles in an outbreak response are listed in section 11.2.

11.1 Industry's Role in a Disease Outbreak

Industry will play an important role both in preventing a disease outbreak and in response to such an event. Communication between government agencies and industry will be essential to effective disease response and for timely return to normal cow-calf operations. It is vital for each cow-calf operation to have the following in place prior to an outbreak.

- A biosecurity plan with written SOPs and appropriate training for employees
- A depopulation plan with written SOPs and a list of equipment needed, as well as a plan or contracts in place to obtain supplies and resources if equipment isn't already in hand.

For more information and details on industry's role in an outbreak, see Appendix J.

11.2 Local, State, and Federal Agencies Roles and Responsibilities

11.2.1 Roles and Responsibilities of the LEAD AGENCY – Colorado Department of Agriculture (CDA)

The CDA, Animal Health Division is the lead agency in any livestock health related emergency occurring in Colorado. CDA will respond by using the NIMS protocol. The specific components will be under the joint command of the State Veterinarian and USDA-APHIS-VS officials. Their overall responsibility will encompass command and management of the disease event, overseeing the management and dissemination of resources, establishing a communication and information management system, and securing supporting technologies. The State Veterinarian may use any or all of the following action steps to control and/or eradicate the disease encountered in the event.

- Assign an emergency response level to the incident.
- In consultation with USDA-APHIS-VS officials, determine the scope and level of initial response and initiate a task force.
- In consultation with USDA-APHIS-VS, determine the location and size of hold/ quarantine areas.
- Establish quarantine area(s) and issue quarantine orders as needed.
- In consultation with USDA-APHIS-VS officials and other agency personnel, strategically assign duties and areas of responsibility to state, deputy-state and federal veterinarians, members of the Colorado Veterinary Response Team, brand inspectors and animal health technicians.
- Determine appropriate movement restrictions for animals, people, equipment, feed, commodities and conveyances.
- Prepare information for dissemination to the public, producers, processors and other concerned groups through the Joint Information Center (JIC). Development of this information will be a collaboration between the CDA, USDA-APHIS-VS, and/or the Incident Management Team (EMT) and the Public Information Officer (PIO).
- Notify Colorado Division of Homeland Security and Emergency Management (HSEM) when a cattle disease sample is being sent to the Foreign Animal Disease Diagnostic Lab

(NVSL or FADDL - Plum Island, NY) for analysis and is likely to be a highly contagious or infectious disease or agent of concern.

- Coordinate with HSEM, USDA, Colorado Department of Transportation (CDOT), Colorado State Patrol (CSP), local jurisdictions, and other agencies as needed to enforce stop movement orders.
- Conduct livestock disease assessments at the site of the event to determine needs and priorities.
- Coordinate state-level livestock disease emergency response and recovery activities.
- Prioritize activities and areas of greatest urgency for state response and personnel in the field.
- Coordinate with USDA-APHIS-VS, and provide liaison between other federal, state and local organizations when required.
- With consultation from CDPHE, develop protocols for worker protection related to incident-specific health and safety site plans, risk (hazard/exposure) assessments and PPE.
- Direct disease investigations, epidemiologic investigations and trace-outs to determine source of disease and scope of disease outbreak.
- Identify contaminated feed, beef, and agricultural products that must be destroyed and disposed of or decontaminated.
- In collaboration with CDPHE, identify and approve animal carcass disposal sites.
- In collaboration with CDPHE, identify sites for disposal of contaminated feed and other contaminated items.
- In collaboration with CDPHE, identify and approve temporary waste disposal sites for effluent from cleaning and disinfecting stations.
- Coordinate with appropriate organizations for the deployment of inspectors and veterinarians for agricultural response and recovery.
- Establish and/or coordinate appropriate regulatory controls.
- In collaboration with the CDA PIO, provide advisories and related public information.
- Coordinate with CSP, county and local law enforcement for site security and related issues.
- Maintain ongoing animal agriculture surveillance of affected communities in order to rapidly identify and address disease-related problems.
- Notify CPW of any wildlife disease threat or involvement.
- Work in close collaboration with the Colorado Brand Board and livestock industry groups as well as the major pork producer associations and local producers.

11.2.2 Roles and Responsibilities of SUPPORT AGENCIES – Local government

Since all emergency response begins at the local level, local emergency management officials will be actively involved in the response and will be a key provider of resources for operational missions. Each county has a comprehensive emergency management plan which provides the framework for the jurisdiction's response to emergencies and disasters. Counties, through their assets of County Commissioners, County Extension Offices and their networks, will utilize their resources and provide an additional line of communication with local farmers, industry groups and the community. Additionally, as part of a coordinated response, local law enforcement officers with assistance from Brand Inspectors and Bureau of Animal Protection Agents (BAP) may:

- Assist in identifying bio-secure transportation corridors for moving unaffected livestock and animal food products safely during an animal health incident.
- Provide security in implementing a hold or quarantine for the infected area.
- Assist in the conduct of a criminal investigation.
- Provide site security and conflict resolution as needed to ensure the safety of veterinarians, inspectors, all other responders and the general public should any conflicts arise.

11.2.3 Roles and Responsibilities of SUPPORT AGENCIES – State Agencies

State agencies have diverse roles within the state government and may contribute essential aspects of an emergency response to large-scale animal disease outbreaks. Depending on location and scale, certain smaller outbreaks may not require all of these agencies to be involved.

11.2.3.1 Colorado Division of Homeland Security and Emergency Management (DHSEM)

Colorado Division of Homeland Security and Emergency has many resources to address emergencies and experiences with all hazard responses. Their support and involvement will be to:

- Activate the State Emergency Management Plan and state EOC to support CDA.
- Support the CDA by providing statewide coordination for logistical support, security, biosecurity, support personnel, procurement of supplies, equipment, vehicles, food, lodging and administrative support during livestock disease emergency response and recovery. Coordinate with CDA for the provision of biosecurity training to support agencies and provide biosecurity training to agency personnel designated for operations in the affected area.
- Deployment of State Incident Management Teams (IMTs) to manage incidents such as the Eastern Colorado IMT with whom CDA has entered into a Memorandum of Understanding (MOU).

11.2.3.2 Colorado State Patrol (CSP)

Colorado State Patrol's (CSP) support and involvement will be to:

- Quickly respond to, diligently investigate, coordinate with, and take direction from the CDA to prevent the introduction of or spread of a FAD, such as FMD.
- Be the primary agency for controlling vehicles carrying agricultural products. The State Patrol will work closely with the CDA, the Colorado Division of Homeland Security and Emergency Management (DHSEM), Colorado Department of Transportation (CDOT), local law enforcement, and other support agencies in the operation of road closures and the diversion of vehicles carrying agricultural products.
- Provide law enforcement support and coordination with conducting traffic checkpoints and roadblocks, enforcing controlled movement orders (CMOs) for animals and animal products, and securing quarantined areas and related sites during animal disease emergencies.

11.2.3.3 Colorado Department of Public Health and Environment

The CDPHE will likely be involved in the response if a potential zoonotic condition exists. Their roles and responsibilities will be to:

- Coordinate with CDA if a zoonotic condition exists.
- Support public information efforts.
- Consult with CDA and USDA-APHIS-VS regarding biosecurity issues related to zoonotic diseases.
- Provide veterinary and epizooitologic support.
- Assist and collaborate with CDA on subjects such as carcass disposal, cleaning and disinfection, and other issues that may affect humans through potential contamination of soil, water and air quality.
- Liaison with Environmental Protection Agency (EPA) to address issues that may arise.
- Provide laboratory emergency response and/or surge support.
- Colorado Human Services Department may provide or coordinate mental health staff to assist in crisis counseling efforts.

11.2.3.4 Colorado Parks and Wildlife (CPW)

CPW will work with CDA to provide the following services:

- Provide disease surveillance in free-ranging wildlife and wildlife in zoos, parks, and other natural areas.
- Survey for and/or dispose of contaminated items and wild animals.
- Conduct wild animal inventories in the area of a disease event to identify susceptible species.
- In collaboration with the State Veterinarian, collect wildlife specimens and samples for disease testing to determine presence or absence of disease or transmission of the disease agent or impact of disease on wildlife.
- Provide field personnel to assist in livestock disease response, control, and recovery efforts.

- Depending on the disease outbreak and the transmission characteristics, it may affect hunting. CPW would inform hunters on the changes and provide education to hunters. Wildlife and livestock are often susceptible to the same pathogens, so close collaboration between CDA and CPW would be important. Hunters depend on landowners and livestock producers for full enjoyment of their sport.
- In the event that wildlife are involved in a FAD outbreak in domestic livestock, hunting and other activities, such as field trials, should be identified to determine the risk. Wildlife personnel and any wildlife or wildlife product physically transported by personnel must adhere to the quarantine and movement control guidance provided by Incident Command.

11.2.3.5 Colorado Department of Transportation (CDOT)

CDOT's roles and responsibilities during a disease outbreak will be to:

- Assist in the movement of state resources during livestock disease emergencies.
- Provide traffic control and routing assistance, barricades, and road monitoring.
- Provide equipment and operators to assist with animal disposal.

11.2.3.6 Colorado State University (CSU)

Colorado State University's College of Veterinary Medicine and Biomedical Sciences (CVMBS) is involved in programs related to livestock diseases, from providing surveillance testing to providing educational materials to the community. During a major livestock disease outbreak, their responsibilities will be to:

- Provide veterinary support and expertise throughout the emergency as requested by CDA.
- Colorado State University Veterinary Diagnostic Laboratory may provide appropriate diagnostic support services as requested by CDA.
- Colorado State University Extension may provide, communication, and liaison between Incident Command, affected industry groups and local communities during emergencies.

11.2.4 Roles and Responsibilities of SUPPORT AGENCIES – United States Department of Agriculture (USDA)

There are multiple federal agencies that have the potential to be involved during a disease outbreak depending on areas affected and size and scope of the outbreak. There is great need for cooperation and interagency support to accomplish all of the processes involved with mitigating and eradicating a significant infectious disease. These federal agencies will work collaboratively with each other, CDA and the state and local agencies discussed above.

11.2.4.1 USDA Animal and Plant Health Inspection Service (APHIS)

USDA-APHIS-VS is the primary federal agency in charge of significant animal disease outbreaks of concern. Across the nation, USDA-APHIS-VS collaborates daily with each State Veterinarian's office to monitor FADs and emerging infectious diseases, and to administer programs to eradicate diseases such as tuberculosis and brucellosis.

USDA-APHIS-VS maintains a group of national IMTs, each composed of 20–30 VS employees, ready to deploy and assist with containing and eradicating disease outbreaks of concern. During an outbreak, Colorado's State Veterinarian may request the assistance of USDA-APHIS-VS's national IMT to deploy and help with all aspects of the response:

- Assist in everything from quarantine, evaluation and indemnification of livestock, slaughter, disposal, cleaning and disinfecting, epidemiology and trace-backs, to facilitating permitting for cattle movement.
- Assist in acquiring appropriate contractors to conduct various response activities such as those listed above.
- Consult with state and local authorities regarding eradication proceedings.
- Collect, analyze, and disseminate technical and logistical information.
- Define training requirements for temporary employees or support agencies involved in eradication operations.
- Issue a declaration of extraordinary emergency.
- Coordinate with state and local agencies to define quarantine and buffer zones.
- Prepare information for dissemination to the public, producers, processors and other concerned groups through the Joint Information Center (JIC).
- Allocate funding for indemnifying to the owner(s) of depopulated animals or related property loss.
- Allocate funding for activities related to depopulation, disposal and virus elimination.
- Define restrictions on interstate commerce.

11.2.4.2 USDA-APHIS Wildlife Services (WS)

Wildlife Services (WS) is a division of USDA-APHIS and its mission is to resolve wildlife conflicts to allow people and wildlife to co-exist. During a disease outbreak in cattle, USDA-APHIS-WS will assist in surveillance of wildlife populations for the disease of concern. As part of USDA-APHIS, WS employees may also be deployed to work within the incident as members of the IMT.

11.2.4.3 USDA Food Safety Inspection Service (FSIS)

USDA-FSIS is charged with protecting the Nation's food supply by providing inspectors and veterinarians in meat and pork product plants to prevent, detect, and act in response to food safety emergencies. FSIS has developed the infrastructure needed to confront new biosecurity challenges. FSIS may assist state and local authorities in disease eradication activities and/or emergency foodborne illness investigations.

11.2.4.4 USDA Customs and Border Protection (CBP)

CBP shall inspect and regulate movement of at-risk people, agricultural products or product containers or at-risk ports-of-entry (such as Denver International Airport) to prevent, detect or act in response to agricultural emergencies.

11.2.5 Roles and Responsibilities of SUPPORT AGENCIES – other federal agencies

Under Emergency Support Function (ESF-11) federal regulations, the USDA is responsible for response to animal disease emergencies. However, other federal agencies outside of the USDA may also have jurisdiction in a disease outbreak response.

11.2.5.1 Food and Drug Administration (FDA)

One of FDA's mandates is to protect the public health by assuring the safety of our nation's food supply. FDA also has an important role in prevention and control of contaminated animal feed. FDA may assist state and local authorities in disease eradication activities and/or food-borne illness emergency investigations.

11.2.5.2 Federal Bureau of Investigation (FBI)

The FBI is the agency responsible for investigating cases of bio-terrorism or agro-terrorism a part of the mission of a Joint Terrorism Task Force (JTTF). When food animals are the target of a terrorists attack and evidence suggests a foreign animal disease may have been intentionally introduced or threatened, CDA will notify the CIAC who in turn will coordinate activities with the JIFF within the Denver Office of the FBI.

11.2.5.3 Environmental Protection Agency (EPA)

The federal agency that may collaborate with CDPHE & CDA on decisions of carcass disposal, cleaning and disinfection and their effect on soil, air and water or the environment in general.

11.3 Stakeholders: Local Livestock Industry Groups

Livestock Industry Groups serve as liaison on matters relating to livestock industries affected by an animal disease outbreak.

- Identify individuals who may be qualified to assist in disease control efforts.
- Develop a list of qualified appraisers.
- Provide assistance to families affected by an animal disease outbreak.
- Provide support for disease control and eradication activities.
- Provide appropriate information for dissemination to industries and public (through close coordination with CDA or the IMT Public Information Officer).
- Support response and recovery with all available resources.

11.4 Roles and Responsibilities of Local Cow-Calf Operators and Practicing Veterinarians

Cow-Calf Operators and practicing veterinarians may be the first to encounter an emerging disease or FAD outbreak. It is imperative that they report to the State Veterinarian's Office or USDA-

APHIS-VS Colorado Office any situations in which cattle are experiencing a high morbidity or mortality rates, cases with clinical signs consistent with FMD or any new or emerging disease, and any cases of unknown cause or unusual clinical signs. Early detection and diagnosis is the key to mitigating losses to the cattle industry!

Another key responsibility of cow-calf operators is to implement proper biosecurity protocols. Good biosecurity can greatly reduce the introduction of infectious diseases into a herd. Cow-calf operators should create plans for responding to disease outbreaks in their herds. By having SOPs in advance for depopulation and disposal, they can greatly reduce response times and decrease the potential for spread to other facilities.

12.0 Conclusion

The introduction of a highly contagious disease or a cattle incident resulting from an all-hazards event could have devastating effects on Colorado's cattle industry. Planning and preparation is vital to limiting the scope of a disease outbreak, which depends on rapid detection and eradication. These plans for response to disease eradication can be easily applied to all-hazard events such as wildfires, flooding and tornados, or economically destructive disease that causes significant morbidity or mortality in cattle.

The CDA *Cow-Calf Emergency Disease Response Plan* provides the response actions that will be implemented by the CDA in collaboration with the USDA-APHIS-VS and cattle industry partners. Execution of the plan will allow swift detection, control, and eradication of a cattle disease outbreak.

Appendix A: Foreign Animal Disease Investigation Action Steps by Animal Health Officials upon Report of Suspected Foreign Animal Disease

The Colorado State Veterinarian or USDA-APHIS-VS personnel will dispatch a Foreign Animal Disease Diagnostician (FADD) to initiate an investigation within 24 hours of the initial notification.

The FADD will make an appointment to visit the premises to assess the disease situation and collect and submit laboratory samples. If the FADD has a high suspicion for an FAD, a hold order may be placed. The FADD will file a report with the State Veterinarian and USDA-APHIS-VS Colorado Office. The State Veterinarian and USDA-APHIS-VS officials will assign a priority level to the laboratory submissions, which will govern the response of the federal lab(s).

Further actions may be taken at the discretion of the State Veterinarian in collaboration with USDA-APHIS-VS officials and in consultation with the FADD that investigated the case, along with other veterinary staff.

Laboratory results will be reported to the State Veterinarian and USDA-APHIS-VS officials who will notify the appropriate staff and the FADD of the case. The FADD, in consultation with the State Veterinarian and USDA-APHIS-VS Colorado Office, will then notify the practitioner and the owner/manager of the facility. See the *Ready Reference Guide* below for a visual representation of the steps outlined above.

Information collected during a FAD Investigation:

- Name and Address of Owner/Manager
- Physical location of the affected premises
- Type of operation being investigated
- Number and type of animals on premises
- Movement of animals on and off premises and date of movement
- Location of animals prior to arriving on premises
- Location of animals after leaving premises
- Number of sick and dead animals
- Physical examinations of the affected animals
- Results of postmortem examinations
- Number and types of samples taken
- Name of suspected disease

Contacts for a suspected FAD:

- Colorado State Veterinarian's Office at the Colorado Department of Agriculture (CDA) - Animal Health Division: (303) 869-9130
- USDA-APHIS-VS – Colorado Office: (303) 231-5385

Ready Reference Guide: Procedures and Policy for Investigation of Potential FAD Incidents

READY REFERENCE GUIDE: PROCEDURES AND POLICY FOR THE INVESTIGATION OF POTENTIAL FOREIGN ANIMAL DISEASE (FAD)/EMERGING DISEASE INCIDENTS (EDI) (VS GUIDANCE 12001.2)

USDA United States Department of Agriculture

FAD INVESTIGATION IS INITIATED

ADD and **SAHO** will:

- Assign an FADD.
- Ensure FAD Referral Control Number is assigned in EMRS.
- Assign FAD/EDI Case Coordinator(s).
- Ensure that initial case report is prepared and transmitted to the FADD.
- Consult with FADD, NVSL, and NAHLN lab to determine a diagnostic sample submission plan. Include ADD and SAHO for State of NAHLN lab, if different from the State of sample origin.
- Consult with FADD to ensure that an investigation classification and a diagnostic sample submission priority are assigned.
- If ADD, SAHO, and FADD designate Priority 1 or A, immediately call VS District and NPIC.

NPIC or **DISTRICT OFFICE**

Coordinates conference call within 2 hours if Priority 1 or A.

FADD will:

- Contact producer/owner/veterinary practitioner within 8 hours, and conduct a site visit within 24 hours. Situations involving interstate or international commerce must be investigated immediately.
- Contact NVSL Ames/NVSL FADDL and the NAHLN lab by phone prior to sample shipment/transport with the following:
  - Tracking number or transport identification,
  - Estimated time of arrival, and
  - Classification and priority.
- Ensure VS 10-4 Specimen Submission Form is completed for all diagnostic samples.
- Contact ADD, SAHO, and Tribal Officials with quarantine or hold order recommendations.
- Along with ADD, ensure that EMRS data entry and follow-up forms are completed.

PRIORITY 1	PRIORITY 2	PRIORITY 3	PRIORITY A
• High Suspicion • NPIC or District Office coordinates conference call within 2 hours • Rapid or extraordinary methods for sample collection and transport • Testing conducted immediately upon arrival (overtime services as needed)	• Intermediate Suspicion • Rapid methods for sample collection and transport • Testing conducted as necessary (overtime services as needed) • If sample arrives before close of business test immediately; after close of business test the following day; Saturday test on weekends only with prior notification and approval	• Low Suspicion • Routine methods for sample collection and transport • Testing conducted in accession order (no overtime services)	• Intermediate or Low Suspicion • NPIC or District Office coordinates conference call within 2 hours • Potential circumstances of investigation indicate need for rapid or extraordinary methods for sample collection and transport • Testing conducted immediately upon arrival (overtime as needed)

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Ready Reference Guide: cont.

DIAGNOSTIC SAMPLE REPORTING PROCEDURES

FADD

Submits sample. If only one set is collected, send to NVSL. If two are collected, send the first to NVSL and the second to NAHLN.

Second Set

First Set

NAHLN Laboratory receives positive or inconclusive results and...

- Submits sample to NVSL as "Priority 1."
- Immediately reports result to NVSL Director.
- Notifies SAHO.
- Enters results in the NAHLN Database.
- Provides final report, including results from NVSL to:
  - Client,
  - ADD, and
  - NVSL Director.

NVSL Reference Lab

- Performs confirmatory tests.
- Reports results to NVSL Director.

NVSL Director Notifies:

VETERINARY SERVICES

- VS DA, and
- VS ADA for Surveillance, Preparedness, and Response Services.

NPIC or **DISTRICT OFFICE**

Coordinates conference call within 2 hours if results are positive, suspect, or inconclusive.

ADD for the State of the NAHLN Laboratory.

ADD for the State of the Sample Submission

- Secures all paperwork.
- Determines source of submission.
- Determines last known premises.
- Notifies District Office, State Officials, and FADD.

FADD

Notifies the producer, owner, manager, agent, and veterinarian.

NVSL FADDL	
Main Office	(631) 323-3256
AFTER HOURS AND WEEKENDS	
Diagnostic Services Section Head	(631) 375-5314
Acting Diagnostic Services Section Head	(631) 332-6814
Courier	(631) 377-9877
NPIC (M-F, 8:00 AM – 4:30 PM ET)	
Main Office	(301) 851-3595
Jon Zack	(240) 252-8074
Darrel Styles	(240) 581-3958
Nathan Birnbaum	(240) 508-9888
AFTER HOURS AND WEEKENDS	
NPIC/NVS 24/7 Emergency Answering Service	(800) 940-6524

NVSL AMES	
NVSL Director	(515) 337-7301
Diagnostic Virology	(515) 337-7551
Pathobiology	(515) 337-7526
Diagnostic Bacteriology	(515) 337-7568
AFTER HOURS AND WEEKENDS	
Nat'l Centers for Animal Health Dispatch	(515) 337-7200
APHIS VS DISTRICT OFFICES	
District One	(508) 363-2290
District Two	(352) 313-3060
District Three	(517) 337-4700
District Four	(512) 383-2400
District Five	(970) 494-7400
District Six	(916) 854-3950

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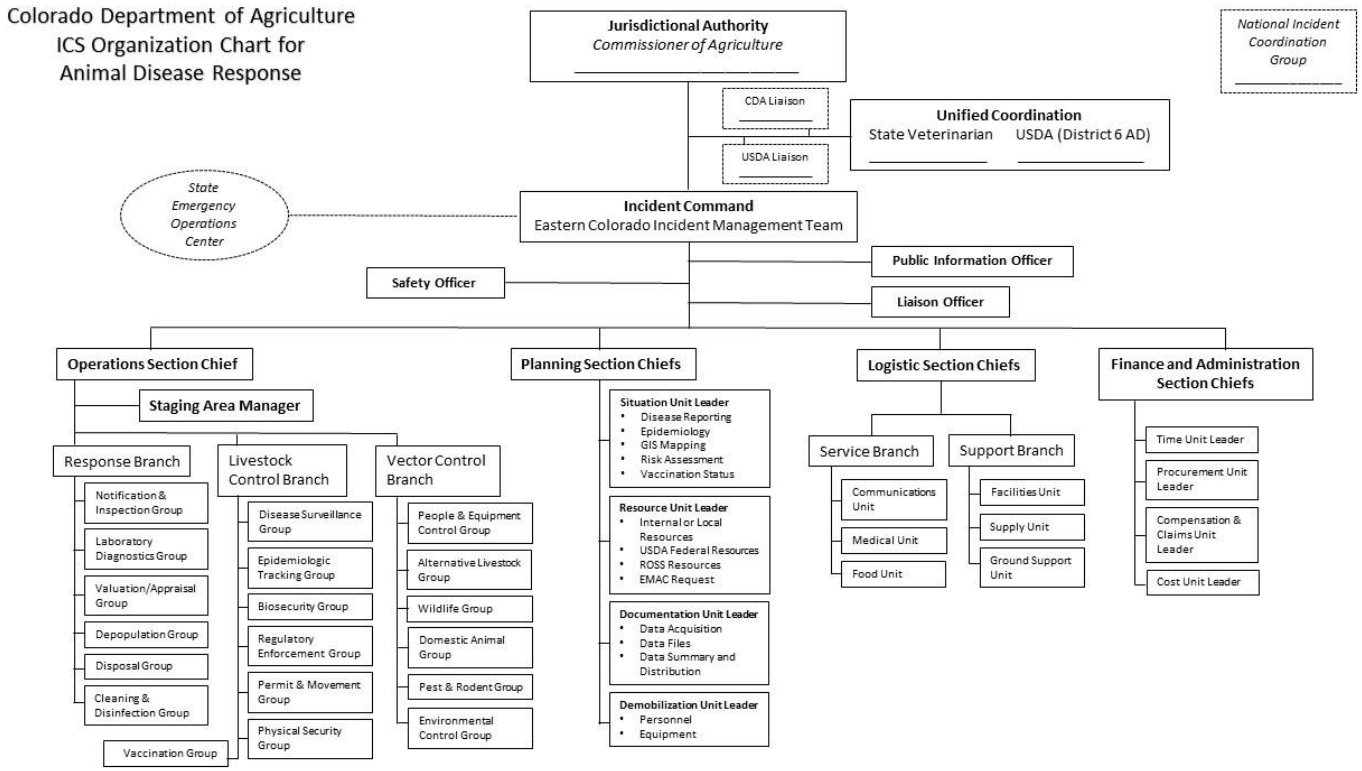
Appendix B: List of Acronyms

APHIS	Animal and Plant Health Inspection Service
AVMA	American Veterinary Medical Association
CCR	Code of Colorado Regulations
CDA	Colorado Department of Agriculture
CDC	Centers for Disease Control and Prevention
CDHSEM	Colorado Division of Homeland Security and Emergency Management
CDPHE	Colorado Department of Public Health and Environment
CDOT	Colorado Department of Transportation
CFR	Code of Federal Regulations
CIAC	Colorado Information Analysis Center
CO_2	Carbon Dioxide
CRS	Colorado Revised Statutes
CSP	Colorado Safety Patrol
CSU	Colorado State University
FBI	Federal Bureau of Investigation
FDA	Food and Drug Agency
FSIS	Food Safety Inspection Service
GPS	Global Positioning System
HSPD	Homeland Security Presidential Directive
IA	Interagency Agreement
IAP	Incident Action Plan
ICS	Incident Command System
IMT	Incident Management Team
JTTF	Joint Terrorism Task Force (within FBI)
MOU	Memorandum of Understanding
NIMS	National Incident Management System
NVSL	National Veterinary Service Laboratories
OIE	World Organization of Animal Health (previously Office of Internationale des Epizooties)

Appendix B – cont.

CVMBS	College of Veterinary Medicine and Biomedical Sciences
CPW	Colorado Parks and Wildlife
ECIMT	Eastern Colorado Incident Management Team
EOC	Emergency Operation Center
EPA	Environmental Protection Agency
ESF	Emergency Support Function
FAD	Foreign Animal Disease
FADD	Foreign Animal Disease Diagnostician
FADDL	Foreign Animal Disease Diagnostic Lab
OSHA	Occupational Safety and Health Association
PIN	Premises Identification Number
PIO	Public Information Officer
PPE	Personal Protective Equipment
SEOC	State Emergency Operations Center
SOP	Standard Operating Procedure
USDA	United States Department of Agriculture
VMO	Veterinary Medical Officer
VS	Veterinary Services

Appendix C: Organization Chart



Appendix D: All Hazard Incident Complexity Analysis

Incident Name:	**Date:**	
Incident Number:	**Time:**	
This Complexity Analysis is weighed based on the relevance to Life Safety, Incident Stabilization, and Property Conservation.		

Complexity Factors	**Check if Pertinent**
Impacts to Life, Property, and the Economy	
Urban interface; structures, developments, recreational facilities, or potential for evacuation.	
Community and Responder Safety	
Performance of public safety resources affected by cumulative fatigue	
Overhead overextended mentally and/or physically	
Communication ineffective with tactical resources or dispatch	
Incident action plans, briefings, etc. missing or poorly prepared	
Resources unfamiliar with local conditions and tactics	
Potential Hazardous Materials	
Potential of Hazardous Materials	
Weather and other Environmental Influences	
Unique natural resources, special-designation areas, critical municipal watershed, protected species habitat, cultural value sites	
Likelihood of Cascading Events	
Variety of specialized operations, support personnel or equipment	
Potential Crime Scene (including Terrorism)	
Potential crime scene	
Potential of terrorism	
Political Sensitivity, External Influences, and Media Relations	
Sensitive political concerns, media involvement, or controversial policy issues	
Organizational Performance Values and Product Development	
Non-IAP Products not being developed or deficient.	
Area Involved, Jurisdictional Boundaries	
Incident threatening more than one jurisdiction and potential for unified command with different conflicting management objectives.	
Availability of Resources	
Operations are at the limit of span of control.	
Unable to property staff air operations.	

Limited local resources available for initial attack/response		
Heavy commitment of local resources to logistical support.		
Existing forces worked 12 hours without success.		
Percentage Score		**%**
If 10% or lower look at going to or staying at Type 4 Team.		
If 10 % to 20% maintain or go to Type 3 Team		
If greater than 20% increase to Type 2 Team or additional overhead		
Prepared By	**Date:**	**Time:**

Appendix E: Personal Protective Equipment Guidelines for Colorado Department of Agriculture Employees

Zoonotic Animal Disease Incident																
Environment	Zoonotic Disease not Diagnosed in the U.S.		Zoonotic Disease Diagnosed in the United States													
			Suspect Disease Outbreak Investigation			Confirmed Zoonotic Disease Diagnosis – Emergency Response Activities										
						General Operations Areas Surveillance		Near or Contact Premises Surveillance		Biological Control Area Surveillance		Biological Control Area Activity				
Equipment	Routine Surveillance	Suspect Disease Outbreak Investigation	Routine Surveillance	Environment		Environment		Environment		Environment		Indoor Depopulation Preparation	Indoor Depopulation Re-Entry CO_2 & CO_2 Level	Routine Surveillance Operations	Outdoor Environ-ment	Any Cleaning and/or Disinfectio
				Outdoor	Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor	Indoor					
Coveralls, Work Uniforms, etc.	X															
Tyvek Coveralls		X	X			X		X		X		X	X			
Tychem Coveralls														X	X	X
Exam gloves (heavy Disposable)	X	X	X	X	X	X	X	X	X	X plus X	X plus X	X plus X	X plus X	X plus X	X plus X	X plus X
Rubber Gloves (heavy duty)																
N-95 or N-100 Filtering Face		X	X	X	X plus X or X	X	X	X plus X or X	X plus X or X	X plus X or X					X plus X or X	
Goggles (indirect vented)**				+/-			+/-									
Full-face APR with N-100 Canister											X	X		X		X
SCBA (Self-contained breathing apparatus)													X			
Boot Covers (Disposable)	+/- or X	+/- or X	+/- or X			+/- or X	+/- or X									
Rubber Boots				X	X			X	X	X	X	X	X	X	X	X

* Examples of zoonotic disease with higher transmission risk would include influenza in poultry or other non-avian species, anthrax, plague and tularemia, among others.

** A separate table has been developed for avian influenza. See HPAI PPE Guidelines.

Appendix E (cont.): Personal Protective Equipment Guidelines for Colorado Department of Agriculture Employees Non- Zoonotic Animal Disease Incident

Environment	Suspect Disease not Diagnosed in the U.S.		Suspect Disease Diagnosed in the United States							
			Suspect Disease Outbreak Investigation	Confirmed Diagnosis of Suspect Disease – Emergency Response Activities						
				General Operations Areas Surveillance	Near or Contact Premises Surveillance	Biological Control Area Surveillance	Biological Control Area Activity			
Equipment	Routine Surveillance	Suspect Disease Outbreak Investigation	Routine Surveillance	Routine Surveillance Operations	Routine Surveillance Operations	Routine Surveillance Operations	Indoor Depopulation Preparation	Indoor Depopulation Re-Entry CO_2 & CO_2 Level Testing	Routine Surveillance Operations	Any Cleaning and/or Disinfection Activity
Coveralls, Work Uniforms, etc.										
Tyvek Coveralls		X	X	X	X	X	X	X		
Tychem Coveralls									X	X
Exam gloves (heavy Disposable)	X	X	X	X	X	X plus	X plus	X plus	X plus	X plus
Rubber Gloves (heavy duty)						X	X	X	X	X
N-95 or N-100 Filtering Face piece*		X	X	X	X	X	X		X	X
Goggles (indirect vented)**										X
Full-face APR with N-100 Canister										X
SCBA (Self-contained breathing apparatus) ***								X		+/-
Boot Covers (Disposable)	+/- or	+/- or	+/- or	+/- or						
Rubber Boots	X	X	X	X	X	X	X	X	X	X

* Filtering face pieces are recommended to avoid transmission of a disease agent to other physical locations via the responder's respiratory system as can occur with agents such as the Foot and Mouth Disease (FMD) virus.

** Goggles /full race piece maybe considered for dust control in any location /activity and should routinely be used in cleaning and disinfection activities.

*** SCBA should be used in altered environments such as gas euthanasia or high risk confined space such as manure pits.

Appendix F: County Emergency Management Offices of Colorado

Current as of Feb 2017

Colorado County	Website	Phone Number (24-Hour)	Fax Number
Adams	Adams County website	720-521-2182 (pager)	720-523-6150
Alamosa	Alamosa County website	719-589-5807 (dispatch)	719-587-5207
Arapahoe	Arapahoe County website	303-795-4711 (dispatch)	720-874-4158
Archuleta	Archuleta County website	970-731-4799	970-731-4800
Baca	Baca County website	719-523-4511(dispatch)	719-523-6776
Bent	Bent County website	719-456-1365	719-456-0476
Boulder	Boulder County website	303-441-4444 (dispatch)	303-441-3884
Broomfield	Broomfield County website	303-438-6400	*720-887-2001*
Chaffee	Chaffee County website	719-207-2730	*719-539-7442*
Cheyenne	Cheyenne County website	719-767-5633 (sheriff)	719-346-8542
Clear Creek	Clear Creek County website	303-679-2393 (dispatch)	303-679-2438
Conejos	Conejos County website	719-589-5804	719-376-5661
Costilla	Costilla County website	719-672-3302 (dispatch)	*719-672-3003*
Crowley	Crowley County website	719-267-5555 x1 (dispatch)	*719-267-3114*
Custer	Custer County website	719-783-2270	719-783-2410
Delta	Delta County website	970-874-2015 (dispatch)	970-874-2027
Denver	Denver County website	720-865-5500	720-865-7691
Dolores	Dolores County website	970-677-2500	*970-677-2880*
Douglas	Douglas County website	303-660-7500 (dispatch)	*303-814-8790*
Eagle	Eagle County website	970-479-2201	*970-328-8694*
Elbert	Elbert County website	303-660-7500	*303-805-6159*
El Paso	El Paso County website	719-575-8422	*719-575-8591*
Fremont	Fremont County website	719-792-6411	*719-276-7304*

Colorado Department of Emergency Management. Feb 2017. http://www.coemergency.com/p/local-info-sources.html

Appendix F (Cont.): County Emergency Management Offices of Colorado Current as of Feb 2017			
Colorado County	**Website**	**Phone Number (24-Hour)**	**Fax Number**
Garfield	Garfield County website	970-625-8095	970-945-6430
Gilpin	Gilpin County website	303-582-5500 (dispatch)	
Grand	Grand County website	970-725-3311	970-887-1698
Gunnison	Gunnison County website	970-641-8000	970-641-7693
Hinsdale	Hinsdale County website	970-641-8201 (dispatch)	970-944-2630
Huerfano	Huerfano County website	719-738-1044 (dispatch)	
Jackson	Jackson County website	970-723-4242 (dispatch)	*970-723-4706*
Jefferson	Jefferson County website	303-277-0211 (dispatch)	*303-271-4905*
Kiowa	Kiowa County website	719-456-1363 (dispatch)	*719-438-5503*
Kit Carson	Kit Carson County website	(719) 343-0911 (office)	*719-349-8542*
Lake	Lake County website	719-486-1249	*719-486-0139*
La Plata	La Plata County website	970-385-2900	*970-382-6272*
Larimer	Larimer County website	303-656-3214 (cell)	*970-498-9203*
Las Animas	Las Animas County website	719-846-2211 (sheriff)	719-846-4111
Lincoln	Lincoln County website	719-743-2426 (sheriff)	719-743-2815
Logan	Logan County website	970-520-0991 (cell)	*970-521-0632*
Mesa	Mesa County website	970-242-6707	
Mineral	Mineral County website	719-658-2600 (sheriff)	*719-658-2764*
Moffat	Moffat County website	970-824-6501	*970-826-2423*
Montezuma	Montezuma County website	970-565-8441	*970-565-3991*
Montrose	Montrose County website	303-435-4637	*970-249-7761*
Morgan	Morgan County website	970-867-8531	*970-867-7344*
Otero	Otero County website	719-384-5941 (dispatch)	*719-384-2272*

Colorado Department of Emergency Management. Feb 2017.
http://www.coemergency.com/p/local-info-sources.html

Appendix F (Cont.): County Emergency Management Offices of Colorado

Current as of Feb 2017

Colorado County	Emergency Manager	Phone Number	Fax Number
Ouray	Ouray County website	970-318-1271	*970-325-0452*
Park	Park County website	719-839-1602	719-836-3273
Phillips	Phillips County website	970-854-3644 (dispatch)	970-854-3811
Pitkin	Pitkin County website	970-920-5300 (sheriff)	*970-920-5307*
Prowers	Prowers County website	719-336-3977	*719-336-4883*
Pueblo	Pueblo County website	719-583-6250 (dispatch)	*719-583-6218*
Rio Blanco	Rio Blanco County website	970-878-9620	970-878-3127
Rio Grande	Rio Grande County website	719-657-4000 (sheriff)	
Routt	Routt County website	970-846-1552 (cell)	970-870-5561
Saguache	Saguache County website	719-655-2525 (dispatch)	
San Juan	San Juan County website	970-387-5531 (sheriff)	970-387-0251
San Miguel	San Miguel County website	970-728-1911(dispatch)	*970-728-9206*
Sedgwick	Sedgwick County website	970-474-3355 (sheriff)	*970-474-2607*
Southern Ute Indian Tribe	Southern Ute Indian Tribe website	970-563-4853	*970-563-0215*
Summit	Summit County website	970-423-8907 (office)	*970-453-7329*
Teller	Teller County website	719-492-6508 (cell)	719-686-7900
Ute Mountain Ute Indian Tribe	Ute Mountain Ute Indian Tribe website	970-564-5441 (office)	*970-564-5443*
Washington	Washington County website	970-345-2244 (sheriff)	970-345-2701
Weld	Weld County website	970-304-4015 x2700	970-336-7242
Yuma	Yuma County website	970-848-0464	*970-848-0160*

Colorado Department of Emergency Management. Feb 2017.
http://www.coemergency.com/p/local-info-sources.html

Appendix G: County Sheriff's Offices of Colorado

Current as of March 2016

Colorado County	Sherriff's Office Website	Phone Number**
Adams	Sherriff's Office Website	303-288-1535
Alamosa	Sherriff's Office Website	719-589-6608
Arapahoe	Sherriff's Office Website	720-874-3600
Archuleta	Sherriff's Office Website	970-264-8430
Baca	Sherriff's Office Website	719-523-4511
Bent	Sherriff's Office Website	719-456-0796
Boulder	Sherriff's Office Website	303-441-3650
Broomfield*	Chief of Police Website	303-438-6400
Chaffee	Sherriff's Office Website	719-539-2596
Cheyenne	Sherriff's Office Website	719-767-5633
Clear Creek	Sherriff's Office Website	303-679-2376
Conejos	Sherriff's Office Website	719-376-2196
Costilla	Sherriff's Office Website	719-672-0673
Crowley	Sherriff's Office Website	719-267-5555
Custer	Sherriff's Office Website	719-783-2270
Delta	Sherriff's Office Website	970-874-2000
Denver*	Sherriff's Office Website	720-913-2000
Dolores	Sherriff's Office Website	970-677-2257
Douglas	Sherriff's Office Website	303-660-7505
Eagle	Sherriff's Office Website	970-328-8500
Elbert	Sherriff's Office Website	303-621-2027
El Paso	Sherriff's Office Website	719 390-5555
Fremont	Sherriff's Office Website	719-276-5555
Garfield	Sherriff's Office Website	970-945-0453

County Sheriffs of Colorado. **http://www.csoc.org/counties.asp.** **March 2016**

***Chief of Police for Broomfield and Denver Counties; **Non-emergency number**

Appendix G (Cont.): County Sheriff's Offices of Colorado

Current as of March 2016

Colorado County	Sheriff	Phone Number**
Gilpin	Sherriff's Office Website	303-582-1060
Grand	Sherriff's Office Website	970-725-3343
Gunnison	Sherriff's Office Website	970-641-1113
Hinsdale	Sherriff's Office Website	970-944-2291
Huerfano	Sherriff's Office Website	719-738-1600
Jackson	Sherriff's Office Website	970-723-4242
Jefferson	Sherriff's Office Website	303-277-0211
Kiowa	Sherriff's Office Website	719-438-5411
Kit Carson	Sherriff's Office Website	719-346-8934
Lake	Sherriff's Office Website	719-486-1249
La Plata	Sherriff's Office Website	970-247-1157
Larimer	Sherriff's Office Website	970-498-5100
Las Animas	Sherriff's Office Website	719-846-2211
Lincoln	Sherriff's Office Website	719-743-2846
Logan	Sherriff's Office Website	970-522-2578
Mesa	Sherriff's Office Website	970-244-3500
Mineral	Sherriff's Office Website	719-658-2600
Moffat	Sherriff's Office Website	970-824-4495
Montezuma	Sherriff's Office Website	970-565-8452
Montrose	Sherriff's Office Website	970-249-7755
Morgan	Sherriff's Office Website	970-542-3445
Otero	Sherriff's Office Website	719-384-5941
Ouray	Sherriff's Office Website	970-325-7272
Park	Sherriff's Office Website	719-836-2494
Phillips	Sherriff's Office Website	970-854-3144

County Sheriffs of Colorado. http://www.csoc.org/counties.asp. March 2016

****Non-emergency number**

Appendix G (Cont.): County Sheriff's Offices of Colorado

Current as of March 2016

Colorado County	Sheriff	Phone Number**
Pitkin	Sherriff's Office Website	970-920-5300
Prowers	Sherriff's Office Website	719-336-8050
Pueblo	Sherriff's Office Website	719-583-6125
Rio Blanco	Sherriff's Office Website	970-878-9620
Routt	Sherriff's Office Website	970-879-1090
Saguache	Sherriff's Office Website	719-655-2525
San Juan	Sherriff's Office Website	970-387-5531
Sedgwick	Sherriff's Office Website	970-474-3355
Summit	Sherriff's Office Website	970-453-2232
Teller	Sherriff's Office Website	719-687-9652
Washington	Sherriff's Office Website	970-345-2244
Weld	Sherriff's Office Website	970-356-4015
Yuma	Sherriff's Office Website	970-332-4805

County Sheriffs of Colorado. **http://www.csoc.org/counties.asp.** **March 2016**

**** Non-emergency number**

Appendix H: Colorado County Extension Offices

Current as of Feb 2017		
Colorado County	**Phone Number**	**Address**
Adams	(303) 637-8100	9755 Henderson Road, Brighton, CO 80601
Alamosa	(719) 852-7381	1899 E. Hwy 160, Monte Vista, CO 81144
Arapahoe	(303) 730-1920	6934 South Lima St, Suite B, Centennial, CO 80112
Archuleta	(970) 264-5931	344 Highway 84, Pagosa Springs, CO 81147
Baca	(719) 523-6971	700 Colorado St., Springfield, CO 81073
Bent	(719) 456-0764	1499 Ambassador Thompson Blvd, Las Animas, CO 81054
Boulder	(303) 678-6238	9595 Nelson Road, Longmont, CO 80501
Broomfield	(720) 887-2286	One DesCombes Drive., Broomfield, CO 80020
Chaffee	(719) 539-6447	10165 County Road 120, Salida, CO 81201
Cheyenne	(719) 767-5716	425 South 7th W., Cheyenne Wells, CO 80810
Clear Creek	(303) 679-2424	111 Rose St, Georgetown, CO 80444
Conejos	(719) 852-7381	1899 E. Hwy 160, Monte Vista, CO 81144
Costilla	(719) 852-7381	1899 E. Hwy 160, Monte Vista, CO 81144
Crowley	(719) 267-5243	613 Main Street, Ordway, CO 81063
Custer	(719) 783-2514	205 South 6th, Westcliffe, CO 81252
Delta	(970) 874-2195	525 Dodge Street, Delta, CO 81416
Denver	(720) 913-5270	888 E. Iliff Avenue, Denver, CO 80210
Dolores	(970) 677-2283	409 North Main Street, c/o Courthouse, Dove Creek, CO 81324
Douglas	(720) 733-6930	410 Fairgrounds Road, Castle Rock, CO 80104
Eagle	(970) 328-8630	441 Broadway, Eagle CO 81631
El Paso	(719) 520-7690	17 N Spruce St., Colorado Springs, CO 80905
Elbert	(303) 621-3162	95 Ute Avenue, Kiowa, CO 80117
Fremont	(719) 276-7390	615 Macon Avenue, Canon City, CO 81212
Garfield	(970) 625-3969	Fairgrounds, 1001 Railroad Avenue, Rifle, CO 81650
Colorado State University Extension, http://extension.colostate.edu/staff-directory/ Feb 2017		

Appendix H (Cont.): Colorado County Extension Offices

Current as of Feb 2017

Colorado County	Phone Number	Address
Gilpin	(303) 582-9106	230 Norton Drive, Blackhawk, CO 80422
Grand	(970) 724-3436	210 11th Street, Extension Hall, Fairgrounds, Kremmling, CO 80459
Gunnison	(970) 641-1260	275 South Spruce, Gunnison, CO 81230
Huerfano	(719) 738-2170	928 Russell Ave, Walsenburg, CO 81089
Jackson	(970) 723-4298	312 5th Street, Walden, CO 80480
Jefferson	(303) 271-6620	15200 W Sixth Ave, Unit C, Golden, CO 80401
Kiowa	(719) 438-5321	County Courthouse, 1305 Goff, Eads, CO 81036
Kit Carson	(719) 346-5571	817 156th Street, Burlington, CO 80807
La Plata	(970) 382-6463	2500 Main Ave., Durango CO 81301
Larimer	(970) 498-6000	1525 Blue Spruce Drive, Ft Collins, CO 80524
Las Animas	(719) 846-6881	2200 North Linden Ave, Trinidad, CO 81082
Lincoln	(719) 743-2542	326 8th Street., Hugo, CO 80821
Logan	(970) 522-3200	508 South 10th Ave, Sterling, CO 80751
Mesa	(970) 244-1834	2775 Highway 50, Grand Junction, CO 81503
Mineral	(719) 852-7381	1899 E. Hwy 160, Monte Vista, CO 81144
Moffat	(970) 824-9180	539 Barclay Street, Craig CO 81625
Montezuma	(970) 565-3123	109 West Main Street, Cortez, CO 81321
Montrose	(970) 249-3935	1001 North 2nd, St. Montrose, CO 81401
Morgan	(970) 542-3540	914 E. Railroad Ave, Fort Morgan, CO 80701
Otero	(719) 254-7608	411 North 10th St., Rocky Ford, CO 81067
Park	(719) 836-4296	880 Bogue St., Fairplay, CO 80440
Phillips	(970) 854-3616	22505 US Highway 385, Holyoke, CO 80734
Prowers	(719) 336-7734	1001 S. Main St., Lamar, CO 81052
Pueblo	(719) 583-6566	701 Court Street, Suite C, Pueblo, CO 81003

Colorado State University Extension, http://extension.colostate.edu/staff-directory/ Feb 2017

Appendix H (Cont'd): Colorado County Extension Offices Current as of Feb 2017		
Colorado County	**Phone Number**	**Address**
Rio Blanco	(970) 878-9490	779 Sulphur Creek Road, Meeker, CO 81641
Rio Blanco-Western Annex	(970) 878-9495	17497 Highway 64, Rangely, CO 81648
Rio Grande- Saguache	(719) 852-7381	1899 E. Hwy 160, Monte Vista CO 81144
Routt	(970) 879-0825	136 6th St. Steamboat Springs, CO 80477
San Luis Valley Area	(719) 852-7381	1899 E. Hwy 160 Monte Vista, CO 81144
San Miguel	(970) 327-4393	1120 Summit, Norwood CO 81423
Sedgwick	(970) 474-3479	315 Cedar, Julesburg, CO 80737
Summit	(970) 668-3595	37 Peak One Dr., CR1005, Frisco, CO 80443
Teller	(719) 686-7961	800 Research Dr, Ste 230, Woodland Park, CO 80863
Washington	(970) 345-2287	181 Birch Avenue, Akron, CO 80720
Weld	(970) 400-2066	525 North 15th Ave., Greeley CO 80631
Yuma	(970) 332-4151	310 Ash Street, Wray, CO 80758
Colorado State University Extension, http://extension.colostate.edu/staff-directory/ Feb 2017		

Appendix I: Resources and Links

The following resources and links can provide the most up to date information for livestock disease emergency response. It is by no means comprehensive, but it can provide a starting point to locate the most recent standard operating procedures (SOPs).

Foreign Animal Disease (FAD) Investigation

The most current forms can be found on the USDA-APHIS-VS Laboratory Information and Services website. The most common submission form is the VS Form 10-4

The FAD Investigation Manual can be found on the USDA-APHIS-VS FAD PReP website: FAD Investigation Manual

World Organisation for Animal Health (OIE)

OIE List of Reportable Diseases is a unified list of reportable diseases maintained by The World Organization for Animal Health. For several years, the OIE created two lists (A and B) with different reporting obligations, but these were combined into a single unified list of reportable diseases in 2005. This unified list has over 115 different diseases and is revised periodically. OIE List of Reportable Diseases (2017)

The four criteria used to develop the list are: potential for international spread, potential for zoonotic transmission, potential for significant spread within a naïve population and emerging diseases.

USDA-APHIS-VS Response Plans (Red Books), SOPs, and FAD PReP

The Red Books review in detail USDA-APHIS-VS emergency response plans: Foot and Mouth Disease Red Book (2014)

The separate USDA-APHIS-VS website FAD PReP hosts standard operating procedures (SOPs) for animal emergency response, as well as many other documents and guidelines:

- Standard Operating Procedures:
  - SOP: Surveillance
  - SOP: Cleaning and Disinfection
  - SOP: Disposal
- Industry Manuals
  - Cow-Calf Industry Manual
- Disease Response Documents
- Permitted Movement
- NAHEMS Guidelines: Surveillance, Epidemiology, and Tracing

Secure Food Supply Plans

The Secure Food Supply Plans are designed to maintain business continuity during a disease outbreak. There are plans for various animals and animal products. The plan that addresses cattle

is the Secure Beef Supply (SBS) Plan. The Secure Beef Supply Plan is the result of a multi-year collaborative effort by industry, state, federal, and academic representatives. The project is funded by USDA-APHIS National Preparedness and Incident Coordination Center (NPIC). SBS: Managed Movement; SBS: Surveillance

USDA-APHIS-VS List of EPA Approved Disinfectants for Selected Foreign Animal Diseases

The United States Environmental Protection Agency (EPA) approved disinfectants for use against foreign animal diseases in farm settings. These are provided through the USDA-APHIS Animal Health Emergency Management website: EPA chart of diseases and approved disinfectants (2016)

Center Food Safety an Public Health (CFSPH)

The mission of the Center for Food Safety and Public Health is to increase national and international preparedness for accidental or intentional Introduction of disease that threaten food production or public health. CFSPH provides specific FAD response guides, as well as general information about FADs important by species. Bovine Diseases and Resources; FMD Prevention Practices Checklist

Centers for Disease Control and Prevention (CDC)

CDC Emergency Preparedness and Response provides information about bioterrorism agents, including fact sheets and case definitions. Bioterrorism agents are biological agents and diseases rarely seen in the United States. The CDC categorizes these agents into priority A, B, and C categories according to risk to national security. CDC Bioterrorism Agents: A,B,C Categories

Appendix J: Industry's Role in Emergency Response – Biosecurity

Biosecurity refers to the measures put in place to protect livestock against exposure to endemic and emerging diseases and to limit the spread of such diseases within the livestock population. A detailed cow-calf biosecurity plan can mitigate the risk of an animal disease entering into a ranch, spreading within the cow-calf population and being passed to other livestock operations. During an outbreak of FAD, it is the producer's responsibility to protect their animals from becoming infected, focusing on management practices designed to prevent the introduction and spread of disease agents onto or off of the ranch.

Biosecurity Planning

Animal Movement

Movement off an uninfected premises may be temporarily halted during a highly contagious FAD event, depending on the proximity of infected premises, cow-calf operators should develop preparedness plans so that they can ensure feed and other necessities related to animal care and husbandry will continue to be delivered in an outbreak. Details can be found in the FAD PReP Cow-Calf Industry Manual.

- Calves
- Cull cows
- Market animals

On Arrival

Details found in the Center for Food Security and Public Health's FMD Prevention Checklist.

- Maintain thorough and accurate records of animal movement.
- Know the health status and the source of any animal(s) brought to your ranch.
- Any animals that are newly arriving should be quarantined for 30 days.
- Do not allow contact of ranch animals with neighboring livestock

Livestock Monitoring

Details found in the Center for Food Security and Public Health's FMD Prevention Checklist.

- Educate employees about FADs and the signs of illness
- Monitor animals closely and frequently for any developing illness or signs of disease
- Isolate sick animals from the herd to minimize disease spread.
- Contact your herd veterinarian immediately to examine sick animal

Manure Management

Details found in FAD PReP Cow-Calf Industry Manual and the FAD PReP SOP: Disposal - *Section 14.4.4.5.3.1 Manure*.

- Most pathogens in manure are destroyed if exposed to heat, desiccation and/or sunlight
- Mechanical break-up of manure on pastures using a harrow is an effective method of exposing pathogens to sunlight, heat and desiccation
- Composting of routinely removed manure can help curb pathogen spread
- All manure hauling vehicles and equipment from other sites that come onto or return to the premises empty of manure should be cleaned to remove all manure, then disinfected with either heat, or a chemical disinfectant followed by drying, before crossing the Line of Separation.

Livestock Disposal Management

Details found in the FAD PReP Cow-Calf Industry Manual and the FAD PReP SOP: Disposal – *Box 14-2. Disposal Options Checklist*

- Dispose of dead livestock in accordance with documented procedures set out to address the guidelines of the Colorado Department of Public Health Environment (see Appendix K).
- Ship for rendering/disposal or place and cover dead livestock in a pit as soon as possible to eliminate potential problems with feral animal activity.
- Operations may be able to compost mortalities.
- Develop a management plan for mass disposal for livestock.

Vehicles and Equipment

Details found in the Center for Food Security and Public Health's FMD Prevention Checklist and the FAD PReP Cow-Calf Industry Manual

- Minimize traffic to only that essential to the continued operation of your farm
- Do not allow off-farm vehicles to drive onto your farm
- If vehicles must enter the farm, wheels, wheel wells and undercarriage, at minimum, must be cleaned and disinfected prior to entry and exit
- Record any vehicles entering the farm on a log sheet
- If you are allowed to move animals, clean and disinfect the vehicle and trailer both before and after unloading

People Movements

Details found in the Center for Food Security and Public Health's FMD Prevention Checklist.

- Limit employees and visitors to essential personnel – those necessary for the continued operation of the ranch

- Implement strict biosecurity measures for employees and visitors
- Record any visitors onto he farm on a log sheet
- All visitors should be accompanied by an employee at all times.

Feral Animals and Wildlife

Details found in the Center for Food Security and Public Health's FMD Prevention Checklist.

- Prevent contact with free-roaming animals (dogs, cats, wildlife)
- Control of wildlife should be attempted even if difficult.

Trailer Cleaning and Disinfecting Recommendations

The Center for Food Safety and Public Health provides Just in Time Training in Vehicle Cleaning and Disinfection. Major components of Trailer Cleaning and Disinfection include:

- Large-Scale Disinfection Station
- Preparation
- Basic C&D Protocol
- Vehicle Interior
- Safety Concerns
- Environmental Hazards
- Biosecurity Work Zones

Appendix K: CDPHE Animal Carcass Disposal Guidelines

COLORADO
Hazardous Materials
& Waste Management Division
Department of Public Health & Environment

Animal Carcass Disposal
November 2015

All-Hazards Events

Large quantities of animal carcasses that result from an all-hazards event (blizzard, flood, tornado, etc.), any disease-related mass deaths of livestock, or an event in which the state veterinarian determines that depopulation of animals is required, must be managed in a manner that prevents the spread of infection and contamination of soil and ground water. During such events, the Colorado Department of Agriculture is the lead agency and will direct all activities related to management and disposal of carcass wastes. The Memorandum of Understanding (MOU) between the Department of Agriculture and the Colorado Department of Public Health and Environment (we, us, our) called "Regarding Storage, Treatment or Disposal of Livestock Carcasses During Any All-Hazards Event" is available on our website at colorado.gov/cdphe/swguidance. This agreement provides guidance related to the roles and responsibilities associated with a mass mortality or depopulation event. Emergency preparedness and response plans for control and mitigation of livestock disease outbreaks can be found in the Animal Health Division of the Department of Agriculture's website (colorado.gov/aganimals) under the Animals tab.

Other Events

Carcasses that are disposed of due to mortality or disease unrelated to an all hazards event or that cannot be used for their original intended purpose are considered to be a solid waste and must be managed in compliance with the Colorado Solid Waste Act (30-20-100.5 et.seq., C.R.S.) and its implementing regulations (6 CCR 1007-2, Part 1). Be aware that under these regulations, special requirements apply to animals known or suspected of being contaminated with infectious substances contagious to humans.

The local or county governments may also have regulations and ordinances regarding the proper management of carcasses. Therefore, you should contact your local public health department concerning local ordinances for disposal. Inappropriate management of these wastes may spread infection or cause contamination of soil or ground water.

In general, the following best management practices may be used for the safe disposal of carcasses that are not contaminated with infectious substances contagious to humans.

Disposal at a Permitted Landfill

Carcasses may be sent to a permitted solid waste landfill for disposal with the landfill operator's prior approval. You will need to contact the landfill operator first to determine their waste acceptance policies. Many landfills have specific days or times when they will accept carcasses for disposal or may have certain packaging requirements that must be met before they will accept the waste.

Rendering

Carcasses may be sent to a licensed rendering plant with the rendering plant operator's prior approval. You should contact the plant to make arrangements before sending the carcasses. Again, these facilities may have specific preparation and packaging requirements for the carcasses that must be met before they will accept carcasses for disposal.

Off-site Incineration

Carcasses may be sent to an off-site incinerator (for example, a pet crematory) that is permitted and approved by local authorities and/or our Air Pollution Control Division to accept such wastes. You should contact the facility to see if they have any preparation or quantity limitations prior to transporting the carcasses.

Composting

Carcasses may be sent to an off-site composting facility that is permitted to accept such wastes. You will need to contact the composting facility directly and determine their waste acceptance policies prior to shipping the carcasses.

Composting of carcasses may be allowed on your own property. Depending on the specifics of your operation, it may be regulated 1) by the Colorado Department of Agriculture and exempt from Solid Waste regulations; or 2) regulated under dual authority of our Solid Waste Program and the local governing authority in accordance with Section 14 of 6 CCR 1007-2. Under Option 2 above, you will need to have an approved composting plan in place before you may conduct such operations. Composting plan requirements are described in Colorado's solid waste regulations (6 CCR 1007-2, Part 1, Section 14.11). These plans must include, but are not limited to:

- The basis for selecting the composting site, including site conditions that make it appropriate for a composting operation.
- Structures to be used for run-on and runoff controls.
- Odor management.
- A description of the composting operation, including how the compost will be managed and tested, and what will be done with the final product

Pit Incineration

In certain cases, carcasses may be incinerated in an onsite pit. Open burning permits, obtained through our Air Pollution Control Division, are required for this process. Pit incineration is generally used when there are several animal mortalities that resulted from disease and there is a risk for disease transmission if the carcasses are transported for disposal offsite. Additional controls, such as plans for disposition of the ash and other remains, must be specified prior to using this process.

On-Site Burial

Carcasses may be buried on-site once concurrence has been obtained from this department and the appropriate local agencies. If you bury your carcasses on your own property, you should follow these best management practices:

- Layers of lime or quicklime should be applied below and above the carcass to help accelerate decomposition of the waste. Care should be used in applying lime as it is caustic and can cause severe burns to the skin and eyes.
- Burial pits must be covered with a minimum of two feet of soil.
- Carcasses cannot be placed in any body of water, seasonal creek or pond, or in areas that may carry or hold water such as gullies, ditches, blowouts or natural depressions.
- To minimize potential impacts to groundwater, large numbers of bigger carcasses (e.g., more than ten cows) should not be limed and buried together.
- Surface water must be diverted from the burial site through the use of berms or other structures.
- All carcasses must be buried at least 150 feet away from any water supply source.
- All carcasses must be buried downgradient from any groundwater supply sources.
- The bottom of the burial pit must be at least five feet above the high point of the uppermost groundwater table to ensure that carcasses do not come into contact with groundwater.
- Burial sites must be located at least one mile away from any residence of any person.
- Burial sites should not be located in areas with fractured or cavernous rock, high seasonal water tables or highly permeable soils.

Other disposal practices, including alkaline hydrolysis and mobile incineration, may be used with prior approval.

If you have a large number of animal mortalities due to disease, including Avian Flu, contact the Colorado Department of Agriculture or State Veterinarian's Office for further guidance on controlling livestock and poultry disease. The Department of Agriculture will determine if the mortalities should be managed as an all-hazards event.

For more information, contact:

Colorado Department of Public Health and Environment
Hazardous Materials and Waste Management Division
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530

Customer Technical Assistance
303-692-3320
www.colorado.gov/cdphe/hm
comments.hmwmd@state.co.us