National Alliance of State Animal and Agricultural Emergency Programs (NASAAEP)

Current Best Practices in Animal Emergency Management

Disaster Veterinary Medical Response

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Preface

The evolution of disaster response over the last decade was the catalyst for revising animal emergency management practices. The United States Department of Agriculture's (USDA) Animal and Plant Health Inspection Service Animal Care funded a cooperative agreement with the University of Kentucky.

This agreement was to collaborate with the National Alliance of State Animal and Agricultural Emergency Programs (NASAAEP), the National Animal Rescue and Sheltering Coalition (NARSC), the American Veterinary Medical Association (AVMA), and other key stakeholders to update, consolidate, and create animal emergency management best practices.

The 2023 NASAAEP Current Best Practices in Animal Emergency Management documents are the result of extensive work by subject matter experts (SMEs) over a 24-month period. Document topics and content development were guided by the Best Practices Working Group (BPWG) Steering Committee and subjected to a rigorous external peer review process. The documents include:

- Incident Command and Coordination
- Planning and Resource Management
- Community Engagement and Outreach
- Animal Search and Rescue
- Disaster Veterinary Medical Response
- Decontamination
- Household Pet Evacuation and Transportation
- Equine Evacuation and Transportation
- Mass Care and Sheltering

NOTE: Links to external resources are denoted by underlined text.

The core planning team gratefully acknowledges the significant contributions of everyone who provided time, expertise, and resources for the development and review of these documents.

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Executive Summary

This document provides information specifically related to veterinary medical response teams (Veterinary Medical Reserve Corps, etc.). While much of the content may also be relevant to individual veterinary medical personnel responding with another type of response team (e.g., sheltering teams), the focus and flow of the paper is most relevant to a veterinary medical response team. This paper can also be useful for federal; state, tribal, territory (STT); and local emergency management personnel to better understand how a veterinary medical response team functions and some of its core competencies.

The first part (up to and including Pre-Disaster Preparedness) of the document contains material that is important to both audiences but most of the medical specific information is in the second part of the document.

Disaster veterinary medical response is an integral part of almost all disasters. In more limited incidents this need may be absorbed by local private veterinarians, but in large incidents, any local veterinary capacity that is still functioning will quickly become overwhelmed. This may require bringing in outside veterinarians or veterinary teams to provide the needed care.

Veterinary medical response personnel responding to disaster incidents need to be aware of many things that are not generally taught during veterinary medical education. While this document cannot be considered to contain all the information needed, it is a great place to start. There are regulatory issues that veterinarians are not accustomed to in addition to practice environments that may present serious challenges. Additionally, veterinarians may face species of animals that they don't normally deal with so this document presents some information and resource links that should prove helpful.

There is no way this, or any document, can cover all the unique situations that are likely to occur. No two responses are the same. There are areas in this document where general guidance is given but readers should keep in mind that many decisions and procedures will be determined by the jurisdiction in which the disaster has occurred.

Some of the information in the Large/Farm Animal Veterinary Medical Response section may not be relevant for an incident involving only small animals. General information in the Small Animal Veterinary Medical Response section may be pertinent to large animal responders.

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Common Regulatory Authorities

Could include any relevant federal or common STT/local statutes and authorities – including but not limited to:

- STT Veterinary Practice Acts
- STT Veterinary Technician/Nurse Acts
- STT Pharmacy Acts
- STT Environmental Regulations
- Animal Control Regulations and authorities (JHA)
- STT/Local Health Department
- STT Agricultural Regulations/State Animal Health Official
- Federal Veterinary Accreditation and animal health regulations (USDA Animal and Plant Health Inspection Service)
- STT/Federal Emergency Management Agencies
- U.S. Drug Enforcement Administration (DEA) Regulations
- U.S. Food and Drug Administration (FDA) Regulations
- U.S. Centers for Disease Control and Prevention (CDC) Regulations
- U.S. Environmental Protection Administration (EPA) Regulations

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Planning Assumptions

Medical decision-making (triage and level of veterinary medical care) will be driven by the veterinary team leader and the immediate supervisory chain for the veterinary team within the ICS Operations Section. There should be daily (or twice daily) meetings to relay important changes in operation posture and provide veterinary medical teams with guidance on the level of care, available resources (personnel, cache), and ability to transfer animals to higher-level care.

Communication is critical to provide new team members or outside veterinarians with the boundaries of care that will be provided – both to prevent misunderstandings but also to protect capabilities and to respect jurisdictional authority.

Triage and veterinary medical care guidance cannot be dictated in a document. All reading this document must understand that for each deployment, veterinary medical teams' ability and/or authority to provide care may change and it is not always their decision but constrained by decisions by the chain of command.

Availability of nearby established veterinary facilities and transportation to such facilities will also dictate what level of care is provided "in the field." In an ideal situation, existing Memorandums of Understanding (MOUs) will be in place for various established veterinary facilities for the transportation and care of animals during an event.

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Existing FEMA Animal Emergency Response (AER) Resource Types

FEMA resource typing guidelines for Animal Emergency Response (AER) positions are defined in the FEMA Resource Typing Library Tool. Some relevant typed positions/teams for veterinary medical response include:

- Veterinary Medical Team
- Veterinarian
- Veterinary Assistant/Technician/Nurse

The lower the typed number (i.e., type 1) the greater, or more specific, the capability. Veterinary medical response teams that are typed to these standards make themselves more likely to be utilized in intrastate, interstate, and international responses.

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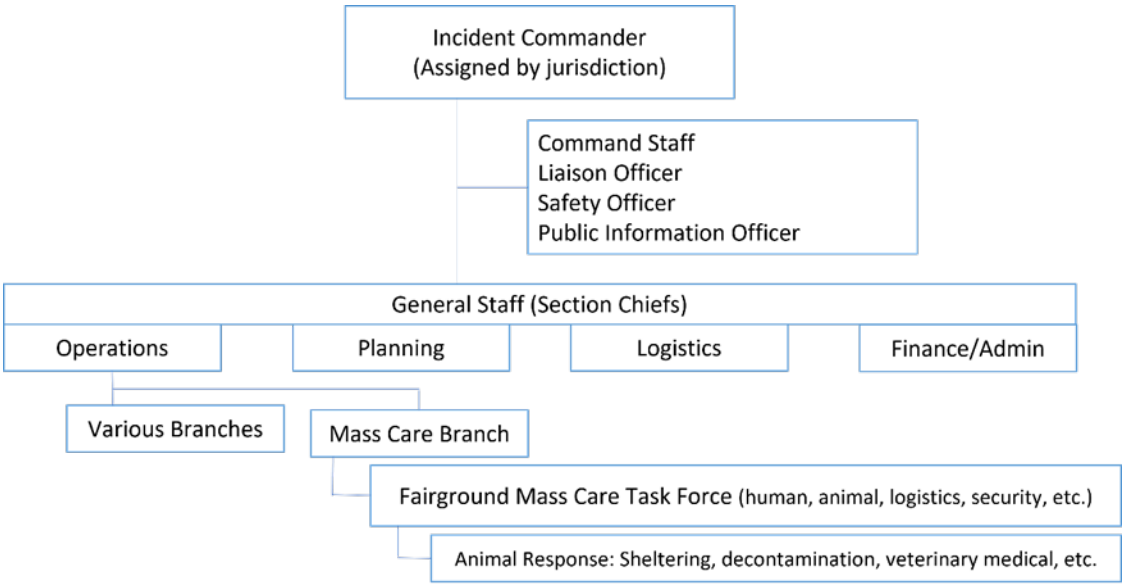
Command and Coordination

Integration of veterinary professionals into the existing Incident Command System (ICS) can occur in multiple ways, depending on the scale/complexity of the incident, the number of veterinary resources needed, and the support needed for veterinary teams. Veterinary medical response most often is integrated into ICS under the Operations Section of the established ICS.

Typically, this would involve placing veterinary resources under an ICS Animal Emergency Response Branch or Group (refer to the *NASAAEP 2023 Current Best Practices in Animal Emergency Management Incident Command and Coordination* document for more information). Multiple veterinary teams under a single chain of supervision would be a veterinary strike team.

Alternatively, veterinary resources might be part of a task force with multiple kinds of resources assigned to a single location, such as the community fairgrounds where people and animals are being sheltered in a collocated manner. There may be a single task force leader with human sheltering, animal sheltering (including a veterinary team), and supporting personnel (facilities, communications, security, etc.) all managed together in a single organizational hierarchy. An example is found in the following figure:



Veterinary first responders need to understand ICS principles and basic application to better assist in jurisdictional planning as well as maximize the effectiveness of the veterinary response when deployed, no matter where they fall in the ICS organization chart. See *Appendix B: ICS Organization Chart Example*.

In a complex incident such as an animal disease emergency response, jurisdictional animal health officials and USDA veterinarians may lead the Incident Command, with many veterinary professionals and others assigned to a wide variety of mission areas within the response. See the USDA APHIS Veterinary Services FADPReP webpage for additional information.

The actual configuration of animal emergency management and veterinary response within the overall ICS structure is usually not determined by veterinary medical team leaders, but typically by jurisdictional animal authorities. In some cases, animal sheltering and supporting mass care services may be managed by the jurisdictional Emergency Operations Center (EOC) instead of the overall incident EOC (e.g., STT EOC). While perhaps not classic ICS, such organizational features may work best for a specific jurisdiction.

Disaster veterinary medical response teams can seek reimbursement for disaster services provided to “household pets” (as defined in *Appendix A: Acronyms, Key Terms, and Definitions*) from local or state emergency management agencies, who receive public assistance grants from FEMA, when appropriate detailed records are kept and a pre-existing MOU with local or state emergency management is in place.

As an alternative to seeking reimbursement, detailed records can also be used to assist local or state emergency management agencies in reaching the federally required cost-share basis for their locale. For additional information about FEMA reimbursements, see the *NASAAEP 2023 Current Best Practices in Animal Emergency Management Planning and Resource Management* document.

Pre-Disaster Preparedness

Team Development and Readiness

Veterinary emergency medical capabilities are a necessary component of a well-rounded preparedness, response, and recovery enterprise. Effective planning, preparation, and resource development are critical for saving lives and offering care to as many people and animals as possible.

Veterinary capabilities can be developed based on the priorities of the jurisdiction and are informed by community risk assessment and after-action reports of previous disaster incidents. The resources to support a response should be understood and augmented to the degree possible given funding opportunities and budget.

It is important to develop good working relationships with local government emergency response agencies and other organizations that are responsible for leadership and coordination of animal care. Local laws and practices will dictate where and how a veterinary response unit will operate in times of need. Each jurisdiction should have a mechanism in place to activate, coordinate, deploy, and deactivate resources.

Several components should be considered when developing a veterinary medical response team. They include doctrine, team organization and capacity, equipment, training, and funding sources.

Authority

Response leadership must develop policies, plans, and procedures governing how they will effectively establish, coordinate, and operationalize veterinary response resources. One of the first steps in developing an emergency response enterprise is to establish the response team's mission and supporting goals.

The mission should be based on previous history and the likelihood of a hazard in the community organizational priorities and available resources. If a jurisdiction is more likely to experience hurricanes, then response planning and resources should be directed toward mitigating and preparing for that type of incident. All hazard preparedness is optimal but may be unrealistic in practice.

Legal and regulatory statutes, memorandum of agreements, and operating procedures must be considered when developing a team and goals. Local laws and ordinances define the authority of the response organization and outline functions and activities.

Structure
Response teams should be organized using the principles of the Incident Command System (ICS) within the National Incident Management System (NIMS). NIMS is a framework that allows first responders (e.g., police, firefighters, or emergency planners) from various jurisdictions (local, state, tribal, government, and non-government organizations) to effectively work together during a response. NIMS adoption within a response system is required for jurisdictions to receive federal assistance.

State animal response teams (SARTs) and county animal response teams (CARTs) can serve as a valuable resource that brings together government agencies and organizations to plan, prepare for, and assist in animal health emergencies. The structure and capabilities of SARTs and CARTs may differ depending on the location, mission, available resources, and types of animals and hazards in the community.

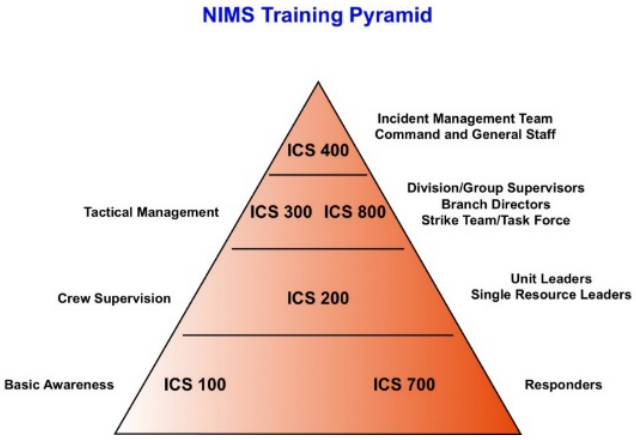
Veterinary medical teams can be organized under the Medical Reserve Corps (MRC) as part of a local MRC program or as a State Veterinary MRC Program. Additionally, some State Animal Health Officials have organized State Veterinary Medical Reserve Programs with a focus on animal disease response.

Mission Ready Packages (MRPs) are described in the Emergency Management Assistance Compact (EMAC) and can be developed to group capabilities into functional units that are organized, trained, and exercised before a disaster or public health emergency.

Capacity
Qualified personnel should be recruited to serve in pre-identified roles on the veterinary response team. The needed subject matter expertise and experience, number of staff, and roles of individuals should be defined.

Basic Training Requirements
The National Incident Management System (NIMS) has set basic Incident Command System (ICS) training levels for all emergency responders. All veterinary medical responders should receive basic awareness training.

Figure 1 – NIMS Training Pyramid



Most animal response organizations require FEMA basic responder training to be completed by responders before deployment, which includes:

- FEMA IS 100: Introduction to Incident Command System: https://training.fema.gov/is/courseoverview.aspx?code=IS-100.c
- FEMA IS 700: An Introduction to the National Incident Management System: https://training.fema.gov/is/courseoverview.aspx?code=IS-700.b

Additional ICS training available online includes:

- FEMA IS 200: Basic Incident Command System for Initial Response: https://training.fema.gov/is/courseoverview.aspx?code=IS-200.c
- FEMA IS 800: National Response Framework, An Introduction: https://training.fema.gov/is/courseoverview.aspx?code=IS-800.d

Response teams should be trained and exercised to prepare them to meet strategic, operational, or tactical requirements considered necessary by organizational leadership to execute their assigned or anticipated missions. Training priorities should be based on hazard assessments of potential threats and historical data on previous incidents.

Questions to be considered when creating an effective training program should include: What will responders be trained on, who will train them, where will they train, how will they train, how often, and how will their training be evaluated? Basic and advanced training on varying types of missions should be developed and rehearsed, and emergency scenarios practiced in a field setting and regularly.

The actual depth of knowledge required will vary considerably, depending on the actual professional role during the incident (e.g., subject matter expert, surgeon, administrative officer, safety officer, response planner, staff at community reception centers, and field

medical stations). While Just-In-Time (JIT) training may be needed for some responders in any response, this guide will focus on training that is taken before an event.
The American Veterinary Medical Association (AVMA), with the help of many other stakeholders, has developed the AVMA Veterinary First Responder Certificate Program (VFRCP) which has set minimal core competencies that a veterinary medical responder should possess. This is the first attempt to create a national standard for veterinary medical responders and the certificate can be used by individual veterinary medical response teams as one means of credentialing their responders. Veterinary medical response teams will likely require further training. See *Appendix C: Examples of Additional Veterinary Training* for more training examples.

Equipment
Resources to support the response missions and volunteers should be identified, procured, and stored in a pre-identified area. Computers, personal protective equipment, medical and surgical equipment, restraining devices, and medication should be purchased based on the organization's priorities and budget. Maintenance and repair contracts for equipment and vehicles should be created and a system should be put in place to monitor and replace used and expired items.

Funding
One of the most important considerations when developing and maintaining a response team is to identify a reliable and recurrent funding stream. Funding sources vary widely. Decreased budgets and unexpected events make it important to find and develop innovative solutions to achieve emergency response proficiency and high levels of readiness.

Table 1: Team Development

Category	
Mission	Prevent or mitigate the spread of disease Provide rescue and shelter for animals Reunite animals with their owners
Authority	Legal and Regulatory Authority (i.e., Non-profit 501(c)(3) organization, Board of Directors Animals in Public Evacuation Shelters Pet Shelter Best Practices Pets Evacuation and Transportation Standards (PETS) Act State legislation regarding animal care in disasters Memorandum of Agreement (i.e., NGOs, EMAC)
Organization/ Structure	Veterinary Medical Reserve Programs SARTS/CARTS

	Partners: • Local SPCAs • Humane societies • Rescue groups • Government operated animal control agencies • National animal welfare organizations • American Humane Association, ASPCA • Humane Society of the U.S. • Extension offices • Farm Bureaus • Health departments • Fire and rescue providers • Veterinary hospitals • American Red Cross (ARC) Multidisciplinary vets (small, medium, large, working, multi-squad, livestock, public health) Multidisciplinary technicians (small, medium, large, working, multi-squad, livestock, public health)
Personnel, Including Recruitment	X amount of vets (large and small) X amount of techs (large and small) X amount of administrative officers X amount of safety officers X amount of team leads X amount of deputy team leads X amount of task forces X amount of task force leaders X amount of logistics officers
Training, Exercises, and Continuing Education	ICS 100, 200, 300, 400, 700, 800 Bioterrorism Animal Decontamination Zoonotic Disease Local and Community Geography Epidemiology Team Leadership
Equipment	PPE Surgical equipment Medications and pharmaceuticals (antibiotics, vaccines, supplements, anti-parasitic) Life-sustaining equipment (intensive care equipment) Food, water, treats/pill packets

	Cages, examination tables Intravenous catheters and line drip sets, blood supply Animal restraints General first-aid supplies (bandages, splints, gauze) Laboratory and diagnostic supplies X-rays Scales, wheelchairs
Funding	Veterinary Medical Reserve Corps American Society for the Prevention of Cruelty to Animals (ASPCA) Red Cross Department of Homeland Security Local grants (Wal-Mart, community foundations)

Jurisdictions must build a sustainable, trained, and ready veterinary medical workforce capable of surging to meet emergency and disaster challenges. Emergency managers, response leaders, and animal care providers that work together can improve a community's recovery from disaster preparedness and response.

Credentialing and Licensure

Credentialing

Credentialing is overseen by the response organization and should be coordinated and consistent with local, STT, and national requirements under which authority the response organization plans to respond. Veterinary medical responders should consider themselves part of the overall disaster response and are subject to the same requirements as other disaster responders.

Some of the considerations in credentialing any responder may include core competencies, education, training, experience, physical and mental health, background checks, licensing, and certifications.

When local/intrastate deployment is required, credentialing and identification will help facilitate a safe and appropriate response and ensure that jurisdictions receive trained, properly credentialed, and properly identified responders. If interstate deployment is to be considered, in addition to proper credentialing and identification, veterinary medical response teams will need to be "typed" in a way that other STTs can request their assistance and know exactly what they will receive.

Many states have a veterinary medical responder code of conduct, which provides ethical guidelines that articulate rules, principles, and behaviors related to the professional standards expected during an animal emergency response. Depending on

jurisdictional or organizational policies, responders may be expected to sign and adhere to code standards during official activation and deployment and should be a part of the credentialing process. An example of a code of conduct can be found in *Appendix D: Code of Conduct.*

Self-deployment of individuals or teams that have not been officially requested through normal channels of requisition during an event is strongly discouraged. Self-deployment can contribute to confusion, increase risk to responders and animals, constitute a significant legal liability for those who self-deploy, reduce animal-owner reunion potential, result in inefficient distribution of veterinary resources, and create conflict with veterinary resources that have deployed upon official request.

Veterinary Personnel Professional Licensure

Professional licensure is an issue for all veterinary responders deployed to an STT in which they do not hold a license. For federal veterinarians:

- Those deployed under the National Disaster Medical System/National Veterinary Response Team will have their current license accepted under an agreement with all STTs and NDMS.
- Other federal veterinarians (USDA, CDC, USPHS) do not need a license for statutory/regulatory duties (such as animal disease response emergencies) but would have to have a current STT license or temporary licensure to treat animals belonging to the public outside of their regulatory role.

Veterinary medical response teams that become recognized as an STT asset may qualify for interstate deployment through the Emergency Management Assistance Compact (EMAC) system. EMAC helps to address licensure issues as a condition of deployment to another STT in addition to other liability issues.

STT veterinary licensing boards have varying methods of providing temporary licensure for veterinary responders who do not fall under a federal or EMAC exemption. This temporary license may be identified as a license specifically for a disaster situation or my fall under regulatory language for other uses of a temporary license.

STT veterinary licensing boards vary significantly in how quickly they can issue a temporary license. Smaller STTs, or STTs involved in an active response may take longer to issue a temporary license, therefore prior agreements are encouraged. Both the AVMA and the American Association of Veterinary State Boards have model language to assist STTs in developing regulatory language on emergency licensure.

Certain Memorandums of Understanding, such as those between a public or private animal health provider and a State Animal Health Official (SAHO), may address these licensing issues as well. Some SAHOs have been given regulatory authority to waive license requirements when a disease emergency or disaster has been declared. Some STTs/jurisdictions license veterinary technicians and veterinary medical responders should be aware of laws and regulations that may impact what non-licensed technicians can do.

No veterinary professional should respond outside their jurisdictional limit without addressing proper licensure first.

DEA Licensure

U.S. Drug Enforcement Administration (DEA) licensure is site- and STT-specific. Some STTs require a separate license to order, store, and prescribe DEA-controlled substances. In general, DEA-controlled substances should be managed by a DEA-licensed veterinarian (and when needed an STT controlled-substance licensed veterinarian) from the affected STT.

Liability and Insurance

Professional Liability

Appropriately deployed federal assets, such as the Department of Health and Human Services National Veterinary Response Team (DHHS NVRT) program, are federally provided with liability coverage while deployed. Some STTs have also legislated liability coverage for responders when deploying with an appropriate STT organization such as a recognized Medical Reserve Corp (MRC) unit. It is the responsibility of each responder to ensure they have appropriate liability coverage for their activities.

Professional liability coverage must be addressed for all veterinary responders; this extends not only to interstate response activities but intrastate and local response as well. Responders must consult with their professional liability coverage provider to determine the extent to which they are protected or covered outside of their normal day-to-day employment.

General Liability

Veterinary medical responders should be aware if the response organization for which they are responding has general liability coverage for the incident. This coverage is separate from professional liability insurance and covers the organization if it is found responsible for causing harm to a third-party person and/or property and helps to cover the cost of the defense.

Medical Insurance
Veterinary responders who are responding out of state should be aware of their medical insurance coverage specifics for out-of-area medical providers. There may be increased costs to the insurance holder when using unapproved medical providers, including medical facilities. The use of veterinary students during disaster response should include an analysis of what insurance coverage will be extended to students.

Workers Compensation Insurance
If veterinary professionals are acting under the scope of their employment and are being paid by their employer during deployment, they should be covered under the employer's worker's compensation coverage. If volunteering/not being paid for time during response, this coverage will not be included.

Responder Physical and Mental Health

Veterinary medical disaster response may involve very austere living and working conditions, depending upon several variables. In extreme cases, responders may be sleeping in tents with limited access to showers, fresh food, and refrigeration. Work shifts may be 12 hours in length, seven days a week.

Responders need to be realistic about what their physical health limitations are and avoid volunteering for deployments that are beyond their physical and mental capabilities.

Veterinary medical disaster medicine can also be extremely taxing due to working in unfamiliar environments under ever-evolving circumstances. Responders should become familiar with strategies that reduce stress and anxiety in such environments:

- Medical protocols may be different from those accustomed to in daily practice. However, they must be followed to ensure team cohesion and continuity of care.
- Resources may be limited. Do the best possible given the situation and understand that some animals may not be saved despite best efforts.
- Stay present: first things first, focus on what is controllable. Expect the unexpected: react and adapt.
- Recognize early signs of burnout and compassion fatigue and practice self-care.
- Know and use support systems: buddy, mental health specialist.
- If it bothers you, talk about it.

Post Deployment Psychological Wellness:

- Stay connected to others on the team who have shared experiences.
- Re-establish routines as soon as possible: mealtimes, sleep/wake times, and other activities.

- It is common to require a period of adjustment to return to normal after deployment. However, pay attention to unusual or long-lasting signs of stress such as irritability, anger, excessive sadness, nervousness, isolation, increased alcohol intake, etc. If these occur, consider discussing them with a healthcare provider or consulting a mental health specialist.

For more information on physical and mental health resources, see *Appendix E: Physical and Mental Health Resources.*

Disaster Response

One Health and Public Health Issues

One Health (OH) is an integrated, unifying approach that aims to sustainably balance and optimize the health of people, animals, and ecosystems.

It recognizes the health of humans, domestic and wild animals, plants, and the wider environment (including ecosystems) are closely linked and inter-dependent.
The approach mobilizes multiple sectors, disciplines, and communities at varying levels of society to work together to foster well-being and tackle threats to health and ecosystems while addressing the collective need for clean water, energy and air, safe and nutritious food, taking action on climate change, and contributing to sustainable development. See One Health High Level Expert Panel (OHHLEP) Joint Tripartite (FAO, OIE, WHO) and UNEP Statement for more information.

Through the lens of animal emergency management, there are multiple elements of OH to consider:

- Zoonotic disease risk is elevated when people and animals are exposed to hazards, displaced, enter congregate sheltering, and/or are under a great deal of physical and emotional stress. All aspects of zoonotic disease risk must be actively managed, including human health, animal health, and the environment.
- Pandemic and emerging zoonotic diseases can create widespread human and animal disease risks that will amplify biological risks for both people and animals within a disaster incident.
- Environmental risks associated with disasters, including toxins, polluted water, radiological contamination, and climate extremes, can all produce risks for both people and animals.
- Many zoological facilities provide species conservation programs for threatened or endangered species. Such facilities could be threatened by disaster or disease outbreaks.
- Critical incident stress arising from emergencies and disasters can impact the mental, behavioral, and physical health of people and animals.

Veterinary professionals deployed in emergency incidents can contribute their expertise, along with other medical and environmental professionals, to addressing these risks and support a collaborative, whole community, OH approach to emergency response.

See *Appendix F: One Health Resources* for more information on One Health.

Diseases with Zoonotic Potential or High Consequences

Zoonotic diseases pose a threat to animal responders. A summary of diseases with zoonotic potential is in *Appendix G: Zoonotic Diseases*. A comprehensive description of zoonotic diseases is at The Center for Food Security and Public Health (CFSPH) – Zoonotic Diseases.

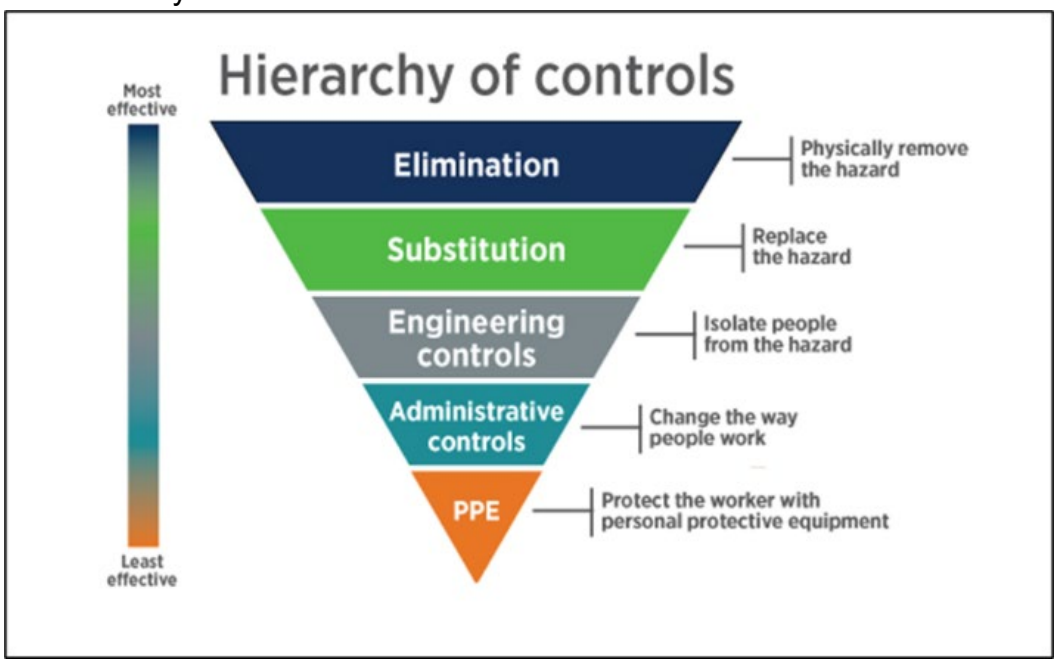
Although Foreign Animal Diseases (FADs) are beyond the scope of this document, it is important to highlight their importance in animal health emergencies. Of note are the following high consequence FADs: African Swine Fever (ASF), Highly Pathogenic Avian Influenza (HPAI), Foot and Mouth Disease (FMD), Virulent Newcastle Disease (vND), New World Screwworm (NWS). The Foreign Animal Disease Preparedness and Response Plan (FAD PReP) has several materials and references that support Animal Health Emergency Management.

Responder Safety and Biosecurity

Responder safety is the top priority in any disaster response. For each incident, the Safety Officer is responsible for identifying safety concerns, providing mitigating recommendations, and writing the safety plan to inform responders.

Safety Officers develop safety plans using the five levels of the Hierarchy of Controls. The levels from most effective to least effective include hazard elimination > substitution > engineering controls > administrative controls > personal protective equipment (see Figure 2).

Figure 2 - Hierarchy of Controls



The National Association of State Public Health Veterinarians: Veterinary Infection Control Committee developed the *Compendium of Veterinary Standard Precautions for Zoonotic Disease Prevention in Veterinary Personnel* that provides a comprehensive safety resource for veterinary personnel in private practice. Many of the mitigations outlined in this resource should be utilized in a disaster response safety plan.
Selection of the appropriate personal protective equipment (PPE) is a complex process that should consider the identification of the hazards (or suspected hazards), the routes of potential hazards to employees (inhalation, skin absorption, ingestion, and eye or skin contact), and the performance of the PPE materials (and seams) in providing a barrier to these hazards. The amount of protection provided by PPE is material-hazard specific.
Protective equipment materials will protect well against some hazardous substances and poorly, or not at all, against others.

In many instances, protective equipment materials that provide continuous protection from a particular hazardous substance are not available. In these cases, the breakthrough time of the protective material should exceed the scheduled work duration. Each disaster poses its own distinct health and safety risks. Therefore, these recommendations are general guidelines only and should not be expected to anticipate or account for all possible dangers.

In addition, because the disaster landscape varies with the region and time of deployment, it is important that the safety officer and command staff closely monitor current conditions at deployment sites so that elements of PPE can be modified, as necessary. See *Appendix H: Personal Protective Equipment and Disinfectant Resources* for National Institute for Occupational Safety & Health (NIOSH) recommended PPE when handling animals.

NIOSH has identified several potential health and safety hazards associated with caring for displaced animals. These include:

- Bites
- Scratches
- Crushing injuries
- Exposure to zoonotic organisms and bodily fluids
- Injuries related to sharp, jagged debris
- Heavy-lifting injuries

Veterinary responders are at increased risk of rabies exposure due to contact with animals of unknown or undocumented rabies vaccination status. All veterinary responders must provide documentation of satisfactory pre-exposure rabies titer and

meet the CDC vaccination guidelines for disaster responders before deployment. Veterinary responders who are responding outside the continental U.S. should follow vaccination guidelines from the CDC Travelers' Health site based on the deployment destination. See *Appendix I: Animal Bite Protocol and Responder Safety* for more information.

Small Animal Veterinary Medical Response

The following section contains information about small animal medical responses. Some of the information shared in this section will also apply to large animal medical responses; however, where information between the two sections is different, the information shared in the large animal medical response section can be used for further clarification.

Triage

The veterinary medical team will assess animals at the disaster site or shelter intake and triage patients in order of medical urgency. Categorize patients into four categories:

- GREEN – Likely to survive whether care is administered
- YELLOW – Likely to survive if appropriate veterinary care and husbandry are administered, but treatment may be delayed
- RED – Critical and may survive if lifesaving measures are administered
- BLACK – Dead or likely to die

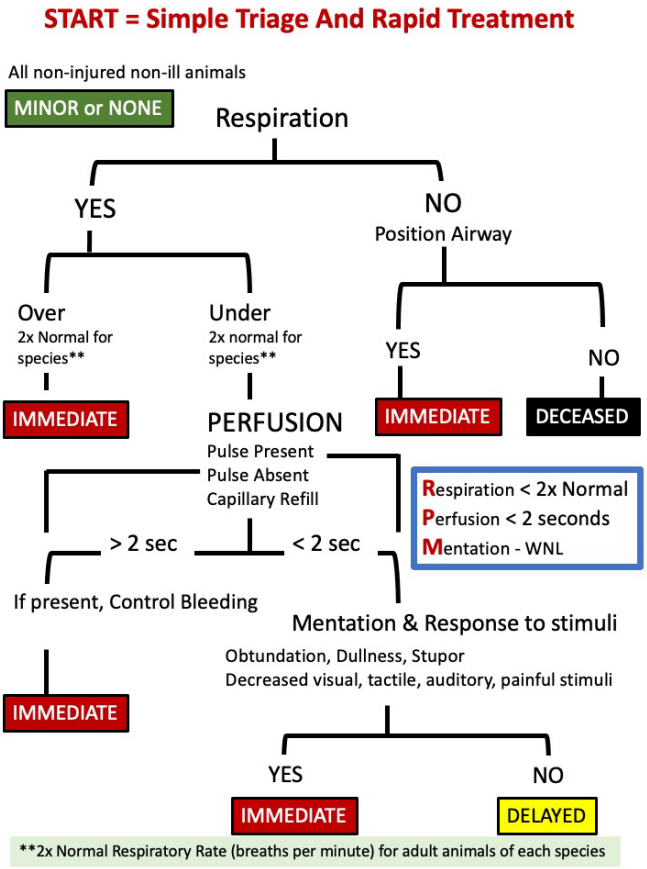
When faced with large numbers of veterinary patients in a disaster, the initial assessment involves an organized, systematic assessment of several important organ systems. Specifically, the triage officer assesses respiration, pulse rate, pulse character, and neurological status. Respiratory distress, abnormal pulse rates, weak pulse character, and abnormal neurological status all require more immediate assessment and possible emergency treatment.

Additionally, abnormalities in these parameters may direct the veterinarian to consider euthanasia and the opinion of two veterinarians is recommended whenever possible. These decisions are based on the patient's physiological status, available resources, and personnel. Field triage is generally an assessment to sort patients and does not routinely administer immediate care. A sample field triage form can be found in *Appendix J: Triage Resources*.

Veterinary medical responders will frequently be presented with animals that require decontamination either before medical care or as part of it. Responders should refer to the safety protocol to ensure proper PPE and safety mitigations are in place before animal care. Refer to the *NASAAEP 2023 Current Best Practices in Animal Emergency*

Management Decontamination document for further information on responder safety and animal decontamination.

Figure 3 – Triage Flow Diagram for Companion / Small Animals using the Simple Triage and Rapid Treatment



**2x Normal Respiratory Rate (RR - breaths per minute) for adult animals of each species, therefore for dogs and cats RR > 60 breaths per minute indicates the need for immediate attention/ intervention. See *Appendix J: Triage Resources* for more for additional triage charts and flow diagrams.

Medical Intake Protocol for Companion Animals

There are several types of emergency animal shelter scenarios that can require the assistance of veterinary medical care. In some situations (e.g., collocated or cohabitated) the owner will have input on the level of care provided and may even be responsible for payment of such services. This may lead to a situation where the owner may need to seek more advanced care from local practitioners. Most of the following sections will assume that care is being provided for animals with unknown or unavailable ownership status.

After an animal has been processed administratively into the system, a medical exam should be performed by a licensed veterinarian to look for illness or injury and identify

any risk factors that could be encountered that would compromise the health and safety of that animal or any person that may be working or caring for that animal.
STT and local jurisdictional regulations may dictate what can and cannot be done to a companion animal displaced by a disaster.

Consult with local animal regulatory agencies to determine allowable practices. The protocol below is a generally accepted standard operating procedure (SOP) that is designed to protect the health and safety of animals entering a congregate care setting.

Objectives:

1. Perform an initial triage assessment to determine if emergency treatment or possible euthanasia is indicated
2. If stable, conduct an initial health assessment to further identify illness or injury and establish treatment plans if warranted
3. Administer prophylactic interventions to minimize the risk of contracting an infectious disease during the shelter stay
4. Implant a permanent identifier
5. Document observed behavior traits
6. Recommend suitable housing within the shelter (e.g., isolation, general population)

Staffing Recommendations per Intake Station:

- 1 Veterinarian
- 1 Veterinary Technician
- 1 Veterinary Assistant or Handler
- 1 Recorder

Intake Area Configuration

To minimize fear, anxiety, and stress, the intake area should be fully enclosed, in a quiet space with visual blockers to avoid predator-prey interaction. Intake areas should be separated by species whenever possible and should be designed to be easy to clean and sanitize. Ensure materials and medical supplies are readily available to maintain efficient and expedient processing.

Facilities should provide an elevated surface for cats, birds, and small pocket pets and keep the cage covered until they can be examined. Animals coming into any disaster shelter are likely to experience high levels of anxiety. Consider using Fear Free™ techniques when handling and examining animals.

Intake Process

- Perform hand hygiene
- Don appropriate PPE
- Review any information that may have been provided by the owner or finder
- Scan thoroughly for a microchip
- Record weight
- Conduct thorough physical exams and document findings in SOAP format.
    - Include woods lamp exam for kittens
    - Estimate age
- Notate body condition score
    - Dogs BCS
    - Cats BCS
- Administer species-appropriate core vaccinations to all animals that have not been vaccinated or lack documentation of current vaccination status.
    - The risk of disease exposure is often high in shelters; animals should be vaccinated at or before intake with core vaccines.
    - Pregnancy and mild illness are not contraindications to administering core vaccines in most shelter settings because the risk from virulent pathogens in an unvaccinated animal would be far greater than the relatively low risk of problems posed by vaccination (AAFP 2009; AAHA 2006; Larson 2009).
    - The Guidelines for Standards for Care in Animal Shelters suggest the use of modified live virus vaccines (MLV) over killed products for core shelter vaccines in cats and dogs, including those that are pregnant, because they provide a faster immune response.
    - Under disaster response conditions it is recommended that all cats and dogs be vaccinated against rabies.
    - See *Appendix K: Vaccination Protocols* for more information.
- Apply topical ectoparasite control
    - University of Wisconsin (UW): Shelter Medicine: Summary of Ectoparasite Treatments
- Provide general purpose de-wormer for intestinal parasite control
    - UC Davis: Koret Shelter Medicine Program - Intestinal Parasite Control Guidelines
    - UW: Shelter Medicine – Diluting Marquis Paste
- Diagnostic testing outside of a laboratory (Point-of-Care Testing (POCT)) has limitations that may result in false negative tests, false positive tests, and discordant results. However, POCT is commonly used in shelters and may be used in the circumstances described in *Appendix L: Point of Care Testing (POCT)*.
- Implant microchip (if none detected) and record microchip number

- Document the animal's behavioral disposition in an objective manner using descriptive rather than conclusionary terminology and use verbs over adjectives or adverbs.
    - Example: Refrain from terms such as aggressive, scared, happy, and afraid.
- Document what you see.
    - Example: tail wagging, attention seeking, lunging, biting, growling, hissing, swatting.

Veterinarians in disaster settings may be asked to help in animal transport and meet interstate import regulations. Veterinarians doing so must not only be licensed in the state of origin but also USDA Accredited in that state. Transport animals must meet recipient STT animal import requirements. Alert the State Animal Health Official (SAHO) of a potential transport into the destination STT.

Monitoring of Animals

Daily Rounds

As part of an overall effective infectious disease prevention plan and to ensure that each animal has its physical, emotional, and medical needs met, daily shelter rounds should be conducted. This process involves members from the medical team, behavior team, and animal care and operations teams going cage-to-cage notating issues that may impact the animal's health or well-being or prevent an animal from moving through the system expediently. They may be conducted separately or simultaneously, and a clear communication plan is implemented to ensure the accurate sharing of information.

Create Standard Operating Procedures (SOPs):

- Information flow
    - How will the team communicate findings?
        - White Board
        - Face-to-face conversation
        - Electronic
- Documentation
- Follow up actions

Medical Rounds:

- Monitoring of animal's health parameters (eating, drinking, urination, defecation, activity level should be manually recorded by the husbandry staff and posted in a place that is readily accessible)
    - Are there any signs of an infectious disease?
    - Any new symptoms of illness, pain, or injury?

- Progress exam on animals currently on treatment plans

Behavior Rounds:

- Is the animal showing signs of fear, anxiety, or stress?
- Are the emotional needs of this animal being met?
    - What intervention strategies do they need?

Animal Care/Population Rounds:

- Who:
    - Does this animal have the correct identification?
- How:
    - Does the daily care team notice anything new medically or behaviorally speaking?
- Where:
    - Is the animal in the right cage in the right area of the shelter?
- What:
    - Vaccines, exams, surgery, behavior intervention
- Documentation of basic health parameters. Is the animal:
    - Eating?
    - Drinking?
    - Urinating normally?
    - Defecating normally?
    - Social, active, and engaged?
    - In pain or distress?

Creation of a Rounds Action List

During rounds, an activity log or action list should be created to capture follow-up steps needed to ensure the health and well-being of the animal. Except in cases of extreme emergencies these actions should not be taken during rounds but assigned afterwards. Ideally, all actions are concluded by the end of the day. See *Appendix N: Tracking Form for Animals Exposed to Infectious Disease* for a Sample Rounds Action List.

Management of Infectious Disease Outbreaks in Small/Companion Animal Shelters

When mass populations of animals are housed in a congregate setting the risk of an infectious disease outbreak is elevated.

An outbreak is defined as a sudden rise in the incidence of disease over what is normally expected and/or a dramatic increase in the severity of clinical signs or duration of illness. Overcrowding, stress, unknown vaccination history, and prevalence of

infectious disease within a community are risk factors that are compounded when a large number of animals are acquired in a shelter setting during a disaster.

Early identification of infectious diseases allows for prompt mitigation that can save lives, time, and money. Daily disease surveillance policies should be implemented so that individual animals are identified, and patterns of population infection rates are recognized. This can be accomplished using the following tools:

- Be sure all staff working with the animals are trained in recognizing symptoms of infectious diseases
- Every animal should be visually assessed during daily rounds for signs of infectious disease

See *Appendix M: Common Causes of Disease Outbreaks in Shelters* for more information.

Provide a clear method of communication so that sick animals are brought to the attention of the medical staff. Many shelters utilize a white board to notate observations.

A good risk management policy involves the following:

1. General knowledge of the most common shelter contagions, their incubation periods, and shedding times (see *Appendix M: Common Causes of Disease Outbreaks in Shelters*).
2. Awareness of disease burden in the community.
3. Risk assessment for infection of susceptible or exposed animals and ability to quarantine if needed.
4. Vaccinating animals on or preferably before they are admitted into the shelter (see *NASAAEP 2023 Current Best Practices in Animal Emergency Management Mass Care and Sheltering* document for more information).
5. Strong biosecurity measures which entail detailed cleaning and sanitation policies (see *NASAAEP 2023 Current Best Practices in Animal Emergency Management Mass Care and Sheltering* document for more information).
6. Rapid identification of sick animals and prompt removal from the general population. This starts with a general intake exam and continues through the implementation of daily rounds.
7. Prompt diagnosis of the contagion.
8. Preventing exposure of any new animals entering the facility.

Diagnosis

Prompt diagnosis is essential to successfully control the spread and ensure the impacted animals receive proper treatment. The veterinarian may develop a list of

differential diagnoses which can initially be acted upon to draft a plan to verify the diagnosis, establish a course of treatment, and review infection control measures.

Isolate the Sick
Once an animal is identified with symptoms suggestive of an infectious disease, it should be separated from the rest of the healthy population until the resolution of signs and the subsequent shedding period passes. Ideally, isolation rooms should be established for each symptom or disease. Ringworm cats should be in a different room than cats with respiratory disease. Animals with gastrointestinal symptoms are separated from animals with respiratory disease.

The isolation area should be established in the building away from susceptible populations. The most vulnerable animals likely to be sheltered are young animals under the age of 5 months who may not yet have protective immunity.

Quarantine the Exposed
After the sick animals have been isolated, a risk assessment should be conducted on the other animals co-housed with the sick or housed in the same room or general area. The purpose of a risk assessment is to identify animals that were exposed and have an increased risk of developing disease, keeping in mind that not all animals exposed will develop disease. The animals identified as having meaningful risk should be quarantined separately from those that are sick.

It is important to develop a tracking system for easy identification of high-risk and low-risk animals. High-risk animals are quarantined for the typical duration of the incubation period or 14 days in an abundance of caution. Low-risk animals are managed as the healthy population. For an example, see *Appendix N: Tracking Form for Animals Exposed to Infectious Disease*.

Risk assessments consider the following:

- Mode of transmission of the pathogen
- Proximity of the exposed animal(s) to the diagnosed. All potential points of contact should be considered
- Shedding tendency of the pathogen (most of the primary infectious diseases of concern are shedding virus before onset of clinical signs)
- Environmental factors such as ventilation, housing arrangements, and cleaning and sanitation processes
- Host related factors
    - Immune status of the animal – the interval between the time of vaccination to exposure. Keep in mind some vaccines like parvovirus and

panleukopenia have a fairly rapid onset of immunity and can infer partial protection. An animal over 5 months which was vaccinated a week or more before exposure is at very low risk of contracting the disease. Animals with evidence of a previous vaccine before entry into the shelter and vaccinated within 3-5 days of exposure also have a lower risk. When in doubt, serology is a very useful means of establishing immune status.

- Age of animal – the most susceptible populations are animals under 5 months of age and are considered high risk for developing disease regardless of vaccination status.
- Stress, poor nutrition, and pre-existing conditions may impact immunity.

A detailed guide on conducting a risk assessment can be found on the University of Wisconsin-Madison Shelter Medicine School of Veterinary Medicine website.

Creating a "Clean Break"

Newly admitted animals need to be housed in a clean, uncontaminated environment. Ideally, a separate room or area should be made to prevent inadvertent exposure to an animal that may be sub-clinically shedding an infectious pathogen.

These animals must be vaccinated immediately upon intake and if possible, kept separate from the general population until sufficient time has passed for the vaccination to confer immunity.

Biosecurity

Once there is a suspicion of an infectious disease outbreak, a prompt review of all biosecurity measures, cleaning and sanitation protocols, and staff training initiatives should be conducted and amended where needed. Enhanced personal protective equipment usage should be established in the quarantine and isolation areas and when interacting with vulnerable populations.

Treatment

Create treatment plans for common shelter diseases before the onset of an outbreak. Diseases with high consequences, like parvovirus, distemper, and panleukopenia may be impossible to manage in a disaster shelter setting. Decisions to treat versus euthanize are dependent upon resources as well as tolerance of the risk of exposure to the population of animals and the consequence of an outbreak occurring.

Euthanasia

The priority in any disaster is responder safety. It is important to establish protocols for euthanasia, including animals with identification for which the owner is unable to be

contacted. The protocol must consider the humane ethics and realities of treating each animal in the disaster.

The protocol should include provisions for when owner contact attempts have been exhausted and the animal's condition and risk to other animals and staff members require timely euthanasia. Thorough written documentation must be generated to support these difficult decisions.

Veterinarians performing the euthanasia must either have a DEA license or be working under the direction of a veterinarian with a DEA license in the STT where the euthanasia is being performed. A record of the controlled substances used must kept on a log sheet with the name of the drug, quantity used, date, time, and location where the drug as used. The choice of euthanasia drugs to be used will depend on availability and veterinarian preference, as well as pretreatment sedatives.

If an animal has a known owner and that owner is reachable, then any decision regarding the care and treatment of that animal including the decision to euthanize will be made in the same way that any decision is made in a normal VCPR (Veterinarian-Client-Patient Relationship). More information about the VCPR can be found on the American Veterinary Medical Association website.

It is recommended that euthanasia be performed in an area separate from the general shelter population, such that no animals will witness the euthanasia of another animal. Trained personnel should be available to provide counseling as appropriate to responders and owners. Euthanasia protocols may be determined by the jurisdictional authority under which the veterinary response is operating.

Euthanasia Decision Making Process

The euthanasia decision-making process during a disaster response is complicated. The decision to euthanize is ideally a consensus decision. Whenever possible, this should be accomplished in one of the following ways:

- Two veterinarians, or
- One veterinarian and an animal control officer, or
- One veterinarian and an animal behavior specialist

There are many factors affecting the decision to euthanize, including:

- Ownership status of animal
    - Owner is known and reachable
    - Owner is known but unreachable
    - No known owner

- Physical and medical condition of the animal (see Triage section earlier in this document)
- Has a contagious or zoonotic disease
- Has been contaminated by a toxic chemical or radiological substance
- Temperament of the animal (the ability to provide care for the pet due to behavior)
- Quarantine status if the animal has bitten a human
- Resources: both personnel and equipment
    - Adequately trained and volunteer staff (vets, techs, volunteers, support staff)
    - Availability of appropriate medical equipment, supplies, and medications
- Physical facility (arena, fairgrounds, school, tent, etc.)
- Number of animals involved
- Species types
- Weather and environmental conditions
- Availability of nearby functional veterinary care facilities for possible transfers and/or referrals
- Jurisdictional considerations (STT and local laws, rules, regulations, state veterinarian, animal control officer)

If an animal is scheduled to be euthanized based on medical issues but has identifiable owner information and attempts to contact the owner have not been exhausted (as determined by the local or STT jurisdictional authority) then:

- If the animal is not suffering or in pain and does not pose a health or safety risk to other animals (or humans) in the shelter, then place a notification hold on the animal and follow normal procedures for owner contact
- If the animal is not in pain or suffering but is scheduled to be euthanized based on medical issues to protect the health of other animals in the shelter (for example, if it has been identified as having an infectious disease), then:
    - Consult with a veterinarian to determine whether any isolation and treatment procedures can be employed while attempts are made to contact the owner and establish what time frame would be humane and appropriate given the circumstances
    - Record all veterinary observations and treatment prescriptions in the animal's log
    - Follow veterinary recommendations regarding isolation and treatment or euthanasia
    - Wear appropriate PPE
    - Continue attempts to contact the owner

- If the animal is suffering or in pain, and an owner is not known or not reachable, then you should continue to try to determine if there is an owner, but at the same time, you should consult with other veterinarians, if possible, to determine if any palliative measures can be taken while trying to reach an owner.
    - Set a time frame that would be humane and appropriate given the animal's status
    - If the patient is at the point of death, or in uncontrollable pain, (again with no known owner), euthanasia is appropriate with the proper signatures.
    - Continue to make efforts to contact the owner (Veterinarian, Manager or Director should make the contact).
- If it was determined by the veterinary team that the animal should be euthanized immediately (before making contact with the owner), the veterinarian, manager, or director should be the one to notify the owner.

Euthanasia Based on Behavioral Pathology

If an animal is so aggressive that responders are unable to care for its general welfare and there is no known owner, then continue attempts to find/contact the owner, set a timetable (in conjunction with the jurisdictional agency), and document the situation. These animals should be isolated away from public areas and other animals. Only authorized individuals should be permitted to care for them.

If care of the animal is impossible and you can't find an owner, then euthanasia may be appropriate, again with proper documentation and signatures.

There are many instances where a pet in the disaster shelter environment is unmanageable due to fear and anxiety. These pets are not necessarily inherently aggressive. Sometimes if you give these pets a few days to acclimate to their new surroundings, their temperament may change and the decision to euthanize due to aggression can be averted.

A local animal control officer (ACO) or preferably an animal behaviorist should assess temperament before a final decision is made to euthanize a pet solely based on behavior and/or temperament. All the data leading up to this decision to euthanize must be documented and recorded in the animal's medical record and all decision makers must sign the patient's euthanasia form.

Euthanasia Documentation

The following information must be included in all euthanized animal files:

- Triage status and progression
- Physical examination

- Any treatments administered
- All laboratory results
- Diagnosis
- Plan
- Photo if available
- Date, time, and location of the euthanasia procedure
- Disposal Protocol
- All individuals involved in the decision to euthanize the animal need to sign the euthanasia form.
- Record efforts to determine if the animal has identifiable owners; and if so, efforts to contact those owners.

Disposition of Animal Carcass
The method of disposition for animal carcasses should be determined by the shelter manager after discussion with appropriate local or STT authorities based on the method of euthanasia. Logistical support for carcass disposition should include refrigeration or freezing of the carcasses until disposal can be performed.

The veterinary and shelter teams should work through the established ICS structure to determine what logistical options are feasible and prioritize work with local cremation businesses. For euthanasia form templates, standard euthanasia guidelines, and euthanasia and bite protocol see *Appendix O: Euthanasia Resources*.

Large/Farm Animal Veterinary Medical Response

Disasters affecting species not covered by the PETS Act, such as equids (horses, donkeys, mules), small ruminants (sheep, goats), cattle, poultry, swine, and camelids (llamas, alpacas), and backyard poultry/ waterfowl, create unique challenges that require advanced planning. In the case of backyard, hobby, and production backyard/ farm animals, several factors complicate evacuation, transportation, and shelter-in-place options.

Evacuation and transportation might be difficult due to the size of the animals and the large number of animals. In these cases, animals are often left to be sheltered-in-place. A field team of large animal veterinary professionals should be assigned to provide a proper assessment of these animals to identify healthy animals that may remain sheltered-in-place and those that need to be evacuated/ rescued. Some complicating factors to consider when animals are sheltered-in-place are feed and water contamination, and structural and fencing damage.

If animals being sheltered in place cannot be provided proper food, water, shelter, and containment, even those deemed healthy must still be evacuated. Evacuation, transportation, and rescue of these animals is beyond the scope of this document, but more information can be found in the following *NASAAEP 2023 Current Best Practices in Animal Emergency Management* documents:

- *Equine Evacuation and Transportation*
- *Household Pet Evacuation and Transportation*
- *Animal Search and Rescue*

Following natural disasters, animals may be exposed to a variety of household or agricultural chemicals, petroleum products, heavy metals, and/or harmful pathogens from disrupted manure pits or septic tanks. Situations involving agricultural or industrial accidents may result in exposure to chemical spills, radiological materials, or gas leaks. First responders, animal care personnel, and veterinary professionals must be aware of contamination concerns.

Additionally, first responders and veterinary professionals must understand current disease outbreak concerns (especially notifiable and reportable diseases) while triaging animals evacuated or rescued following a natural disaster. In these situations, the involvement of the state animal health official is paramount.

Biosecurity

Biosecurity is a series of management practices designed to prevent the introduction and the spread of disease agents into, within, and from the animal facility. A comprehensive list of animal diseases with detailed information for each animal species is available at the following websites: CFSPH – Animal Diseases and USDA-APHIS Animal Disease Information.

When properly implemented, biosecurity precautions (such as personnel assignment, proper levels of PPE, cleaning, sanitation, disinfection protocols, etc.) help reduce the risk of spreading pathogenic agents during the movement of personnel and materials necessary for activities associated with animal care. If the disease agent is zoonotic, biosecurity measures integrated with additional PPE help protect the health of responders and the public.

While risk of disease introduction and spread cannot be eliminated from an emergency animal shelter, several steps can be taken to minimize this risk. Prior to shelter location selection, conduct a risk assessment of the facility and animal management.

- Facilities assessment
    - Animal holding (e.g., stall, cages, pens)

    - Location and access to the isolation area
    - Feed, water, and storage
    - Bedding and disposal of soiled bedding
    - Animal handling and cleaning equipment
    - Management of shared or commingling areas
- Biosecurity policy:
    - Review medical triage documents for signs suggestive of infectious disease
    - Assign appropriate animal holding facilities and maintain health records
    - Daily animal assessments of the shelter population include:
        - Reporting of suspicious illness
        - Review of animal handling
        - Equipment sharing
        - Access restrictions of visitors/ non-shelter personnel
        - Whether or not there is a specific, detailed biosecurity and infectious diseases control plan.
        - Use of appropriate disinfection protocols

See table of Characteristics of Selected Disinfectants in *Appendix H: Personal Protective Equipment and Disinfectant Resources*. Detailed information on disinfection is at The Center for Food Security and Public Health (CFSPH) - Disinfection.

Considerations for Reportable/Notifiable Diseases

Animals in congregate sheltering, particularly livestock and poultry species, present a significant vulnerability to the spread of diseases that are of high consequence and reportable to regulatory authorities. Veterinarians and animal shelter managers must be aware that risks and vulnerabilities may vary between STTs and that reporting requirements may also vary.

Veterinarians should be able to identify the species-specific clinical signs of high consequence and/or reportable diseases in the jurisdiction in which they are responding and take active mitigation measures. Veterinarians should also coordinate with the SAHO to identify any outbreaks or increased risks of state or national reportable animal diseases that could inadvertently be introduced into an emergency animal shelter.

Below are helpful resources that aid in STT and federal coordination of reportable/notifiable diseases.

- USAHA – SAHO List
- USDA National List of Reportable Animal Diseases
- State Public Health Veterinarians and Zoonotic Disease Contacts

Any animal showing signs consistent with a reportable/notifiable disease should be isolated as other animals and increased biosecurity measures implemented. Immediately report to the SAHO and/or USDA APHIS Veterinary Services Area Veterinarian in Charge (AVIC).

If there is a pre-existing risk of a reportable animal disease, animals may need to be examined by STT or federal officials before being admitted to the shelter. During a disease outbreak, special scrutiny should be applied to animals that were moved across STT borders without appropriate certificates of veterinary inspection.

Example: In Colorado, 2003 Pueblo County wildfire in Pueblo County resulted in the need to shelter equids and “backyard” livestock at the State Fairgrounds. Concurrently, there was an outbreak of Vesicular Stomatitis Virus (VSV) in several western states, including Colorado. VSV causes signs similar to foot and mouth disease including oral vesicles (blisters) and is notifiable when detected.

State and federal veterinarians staffed the entry point for the fairgrounds and examined each animal before entry into the State Fairgrounds. Entry of an infected animal into the Fairgrounds would have resulted in quarantine of all animals at the facility for an extended period. Since the State Fair was only a few weeks away, this scenario could have done catastrophic economic damage to the State Fair.

Animal Intake and Identification

Not all animals encountered in a disaster/animal health emergency will have permanent identification. In all cases, the responder needs to find and record all forms of identification including individual descriptions of the animal (species, breed, sex, color, markings) location, date, and time the animal was encountered. If permanent identification is not present, the identification of the animal will rely on the individual animal descriptions. Photographic identification taken by first responders might provide valuable information.

First, all animals must be processed administratively into the system. The accuracy of the information on the animal identification is crucial. Necessary identifiable information includes entering the proper animal species, breed, type, sex, color, markings, estimated age, etc., and any type of identification (ink tattoo, radio frequency microchip (RFID), branding, ear notching, tagging, ear tags, banding, marking sticks/sprays, collar or other). Digital photographs should be included with all records.

Additionally, the point of the origin of the animal should be recorded (e.g., evacuated by the owner, evacuated/rescued by animal responders). If the owner is known, complete

owner information (full name, mobile phone number, email, and mailing address. Physical address or geolocation where animals were found/evacuated/rescued if the owner is unknown – should be recorded. If the animal was rescued or evacuated by others, the location where the animal was found should also be recorded. Training of first responders and intake personnel on the collection of accurate identification information is crucial.

Some forms of permanent identification, such as microchips, are not visible and require a universal microchip device. Careful scanning is essential because microchips can migrate from the site of implantation. If a microchip is found, challenges in locating the owner might still exist if the owner has not kept their information up to date in the registry or if the owner has evacuated. Therefore, multiple methods of identification are encouraged. In a disaster setting, utilizing some forms of individual identification in livestock, such as ear tags that can be linked to a database, is advised. Species-specific identification information can be found in *Appendix P: Large Animal Identification Resources*. Identification and age estimation for all species can be found at the USDA National Veterinary Accreditation Program – Animal Identification.

In disasters and animal health emergencies, permanent animal identification is paramount to ensuring that animals are tracked and if possible, reunited with their owners. A visible form of identification within the emergency shelters facilitates that proper location, care, and treatment are delivered to the animals.

Veterinary Medical Assessment and Triage

The livestock veterinary medical team may perform health status assessments of animals at various settings and various stages of the response depending on when the veterinary team gets involved. Following the assessment, the animal is triaged according to medical urgency.

Medical assessments and triage may occur at various stages of the disaster response and may be performed at different checkpoints, for:

1. Field triage - when animals are encountered at a hazard zone due to the need for evacuation or rescue or assessment of animals sheltered-in-place
2. Medical triage at the emergency animal shelter. The triage categorizes the patients into four categories:
    a. Green = None or minor injuries/ illness - likely to survive whether care is administered or not.
    b. Yellow = Mild to moderate injuries/ illness - require intervention but not urgent, likely to survive if provided appropriate husbandry and non-urgent veterinary care

c. Red = Critical injuries or illness - require immediate medical intervention, or may survive if lifesaving measures are administered, possible stabilization and referral to medical facility
d. Black = Terminal conditions, end-stage injury/illness, or dead - likely to die or be euthanized.

In a disaster, the initial assessment involves an organized, systematic assessment of several important organ systems. Specifically, the triage of large/ farm animals should assess: Respiration, Perfusion (including pulse rate and character and capillary refill time), and Mentation/Neurological status. Respiratory distress, abnormal pulse rates, weak pulse character, poor capillary refill time, recumbency, and abnormal mentation/neurological status all require more immediate further assessment and possible emergency treatment.

Additionally, after further evaluation these abnormalities may direct the veterinarian to pursue euthanasia; the opinion of two veterinarians is recommended. These decisions are based on the patient's physiological status, available resources, and personnel.

Field Triage

For animals sheltered-in-place and those that may require evacuation or rescue by first responders, the field triage is the first triage checkpoint. Recording the address where the animal was encountered and when possible, the geolocation, is crucial and likely to aid notification and reunification with the owner. All efforts should be made to record all animal identification information including proper animal description and photographic documentation.

The first information necessary to identify an animal is entering the proper animal species, making sure the recorded information is accurate (e.g., sheep vs. goats, llamas vs. alpacas, donkeys vs. mules), if in doubt allow for entries such as "small ruminant" or "camelid" or "equid" followed by the breed, sex, color, and markings of the animal. Check for visible unique identifiers, including ear tags, tattoos, brands, ear notching, etc.

The field team of large animal veterinary professionals is encouraged to utilize a field triage form to document the field assessment that accompanies the animal. Ideally, photographic documentation of the animal depicting important markings, lesions, etc. should be obtained.

Field triage should utilize the same four-code/color system (green, yellow, red, and black), despite the fact the animals may or may not be examined individually due to handling challenges. A general assessment can be performed noting respiration

(respiratory rate and effort), behavior, mentation, awareness of the surroundings, body condition score, ambulation/locomotion, interest/ability to drink water and eat appropriate feed, and presence or absence of bleeding, wounds, asymmetries, swellings, or any other evidence of injuries.

If the animal can be restrained safely, a brief examination should be performed to assess heart rate (HR), pulse quality, capillary refill time, and hydration (see Field Triage Form in *Appendix J: Triage Resources*). A decision should be made if the animal can remain sheltered-in-place or need to be evacuated/rescued to an emergency shelter or a medical facility such as a veterinary clinic or hospital.

Medical Triage

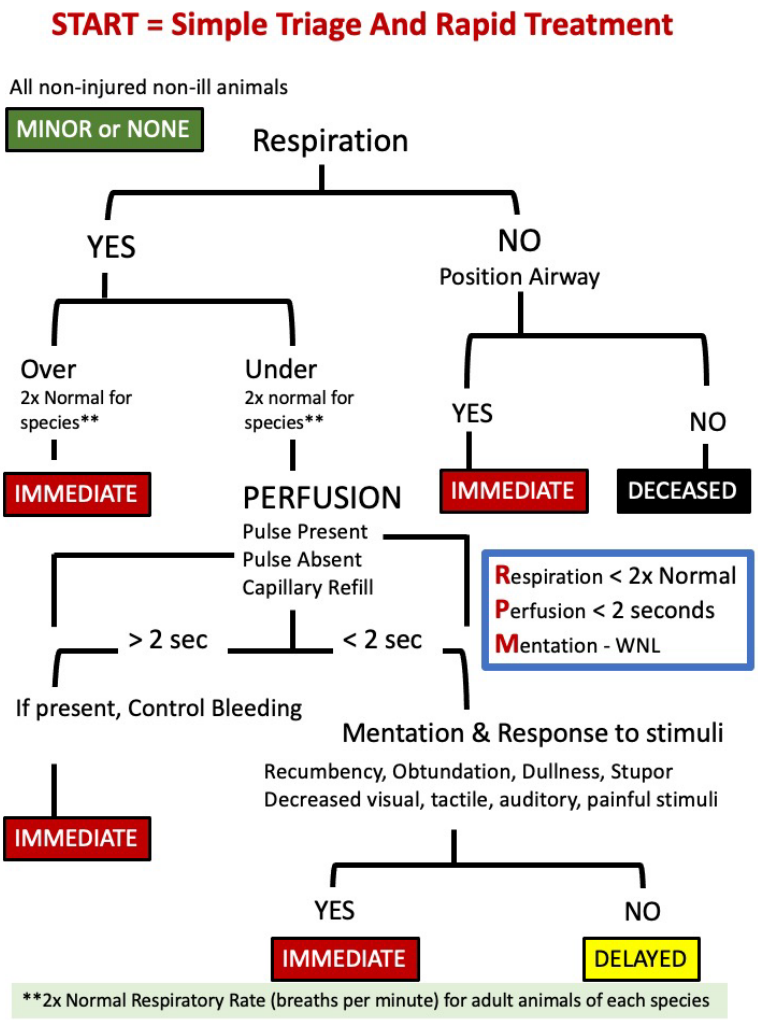
Emergency shelters for large/farm animals are usually for animals only, and not collocated. The location where the animal intake and initial veterinary assessment and triage take place may vary, sometimes these are performed at or near the trailer that transported the animal.

The shelter planners should take into consideration having designated areas for the initial assessment and triage, so animals can be taken to a biosecurity area for quarantine and isolation or brought to a decontamination area as needed before entering the general animal holding areas. These triage areas should be species-specific, providing the appropriate containment to species/taxa groups: Small Ruminants, Pigs/Swine, Equids, Bovine, Avian/Poultry, and Camelids.

Although poultry and waterfowl are often housed in large/farm animal emergency shelters, this document provides limited information on the needs of poultry and waterfowl. In the face of regional, state, and national disease outbreaks, owners must be notified if an animal species will not be accepted in emergency shelters due to a disease outbreak. This notification should be available readily when evacuation warnings are issued.

The triage decision-tree is depicted in Figure 4 below. The patient is reevaluated at each checkpoint by re-applying the triage decision-tree. These guidelines apply to all species of animals, including household pets, backyard animals, equine and food and fiber-producing animals, taking into account the species differences.

Figure 4. Triage Flow Diagram for Large/ Farm Animals using the Simple Triage and Rapid Treatment Simple Triage and Rapid Treatment



**2x Normal Respiratory Rate (breaths per minute) for adult animals of each species. The following RR indicates the need for immediate attention/ intervention: Horses and Cattle RR > 30 breaths per minute, Donkeys, Small ruminants (Sheep and Goats), Swine, Camelids (Llamas and Alpacas) RR> 40 breaths per minute. See *Appendix J: Triage Resources* for additional triage charts and flow diagrams.

Appropriate animal handling and restraint are crucial for the safety of both personnel and the livestock animals. Skilled animal handling and restraint are especially important in emergencies and disasters because animals are often displaced, stressed, injured, or ill. The safety of the animal responders, shelter, and veterinary staff is of paramount importance. A basic understanding of species-specific behaviors and proper handling also ensures animals are treated humanely during emergency response activities.

Animal welfare considerations must not be overlooked, and welfare issues should be continuously evaluated throughout the response and sheltering; additionally, the handling and management procedures may be refined or replaced as necessary.

An initial assessment should:

- Determine the need for decontamination either before medical care or as part of it. Responders should refer to the safety protocol to ensure proper PPE and safety mitigations are in place before animal care. See *Appendix H: Personal Protective Equipment and Disinfectant Resources* and the *NASAAEP 2023 Current Best Practices in Animal Emergency Management Decontamination* document for further information on responder safety and animal decontamination.
- Identify signs of illness that may pose risk or compromise the health and safety of that animal, exposure to other animals, and any person that may be working or caring for that animal.

Animal shelter management, following local jurisdictional regulations, may dictate what can and cannot be done to a farm or large animal displaced by a disaster. Consult with STT and/or local animal regulatory agencies to determine allowable practices. The protocol below is a recommended standard operating guideline (SOG) that protects the health and safety of animals entering a congregate care setting.

Objectives of the medical assessment and triage are:

1. Ensure that animals receive proper evaluation to determine the need for decontamination, quarantine, or isolation
    a. If the animal might have been exposed to hazardous material, decontamination of the animal should take priority over medical triage, unless the animal requires immediate intervention
    b. Recommend suitable housing within the shelter:
        i. Isolation (animals with contagious conditions requiring a high level of biosecurity)
        ii. Quarantine (medium biosecurity risk - animals that will be under observation for signs of illnesses posing risk to other animals or personnel)
        iii. General population (animals with normal biosecurity)
2. Perform an initial medical assessment and triage to determine the need for an emergency treatment, referral to a medical facility, or possible euthanasia
3. If the animal is deemed stable, the health assessment is aimed to further identify illness or injury and establish treatment plans if warranted
4. Document observed behavior traits, dietary needs

Ideally, the staffing would include four people at Intake and Initial Assessment Station:

1. One Veterinarian
2. One Veterinary Technician or Assistant
3. One Animal Handler (skilled for the taxa/species)
4. One person to record the information

After the initial assessment and triage, medical interventions are implemented according to the categorization of the individual animal's medical urgency. Each animal will receive a detailed physical examination to determine its health status and appropriate treatment of medical conditions.

Each step is essential and ensures animals have the best opportunity for a positive outcome. Animals must be processed as soon as possible after arrival to the facility, preferably within one hour, to quickly identify animals with urgent medical needs as well as to protect the shelter population from infectious disease outbreaks. Important steps include:

- Have a qualified and skilled handler for the animal species to ensure minimal stress and safety. Proper handling of the animal and use of adequate restraint is crucial for performing a physical examination.
    - Assessment of the temperament and behavior of each animal is necessary to reduce the likelihood of injury to responders and other animals.
- Perform hand sanitation and use of proper PPE (Remember that the use of gloves does not replace appropriate hand sanitation).
- Verify the animal description and identification, ensuring that visible and not visible permanent identification information is verified.
- Careful examination is crucial to reduce the risk of the spread of contagious and infectious diseases, including those with potential risk to public health and personnel safety.
    - Refer to section One Health / Public Health for infectious diseases of concern as contagious among animals and those with zoonotic potential. Signs of diseases with potential risks to public health and safety must be identified and reported. Diseases of zoonotic potential are listed in *Appendix G: Zoonotic Diseases.*
    - Animals with signs suggestive of potentially transmissible diseases should be quarantined or isolated.
- Conduct a thorough physical exam appropriate for the species and document all findings, even if normal.

- Physical examination should include:
    - Body condition score (BCS)
        - BCS for horses and mules (1 to 9)
        - BCS for donkeys (1 to 5)
        - BCS for small ruminants, sheep and goats (1 to 5)
        - BCS for camelids (1 to 5)
        - BCS for bovine, beef (1 to 9)
        - BCS for bovine, dairy (1 to 5)
        - BCS for swine (1 to 5)
    - Estimation of body weight appropriate for the species
        - For horses, mules – use of appropriate weight tapes is recommended
        - For donkeys, use the Donkey Weight Estimator
        - For small ruminants, a scale might be available
- Vaccines are not normally administered in any of the large/farm animal species at emergency shelters
- Treatment for ectoparasites and internal parasites may be administered on a case-by-case basis
- As mentioned for other species, recumbent animals require specialized attention. The medical triage should be based on the severity of medical need

Clinical Elements for Different Taxa/Specie Groups

It is important to avoid housing animals at risk of intraspecies transmission adjacent to each other, for example, poultry next to swine. Therefore, animal shelters should separate different animal species/taxa to the best degree possible. Separation by age group is also recommended. Lactating dairy animals will require regular milking unless housed with their offspring, regular udder evaluation must be part of daily animal monitoring.

It is important to remember that most animal species housed in livestock shelters are classified as production animals. Governmental regulatory agencies with oversight of animal species have the authority to regulate many aspects of animal uses, medical care, and husbandry depending on the intended use(s) or individual animal species.

In general, production animals, which include cattle, sheep, goats, swine, and poultry for meat or egg-production, and fish used for food are subject to a great degree of governmental regulation and oversight. In contrast, companion animals, which include most species used for human companionship, entertainment, service, psychological support, or other similar purposes are subject to a lesser degree of government regulatory oversight.

All animals considered food-producing animals by the US Food and Drug Administration (FDA) must follow the guidelines of the Food Animal Residue Avoidance Databank (FARAD), which provides scientifically-based recommendations regarding safe withdrawal intervals of drugs and chemicals in food-producing animals. Detailed information for all approved drugs and doses can be found in the Veterinarian's Guide to Residue Avoidance Management (VetGRAM), an informational resource for approved uses, restrictions, and required withdrawal times (WDT) for drugs approved in food animal species. Prohibited drugs are listed at FARAD – Prohibited and Restricted Drugs in Food Animals. For information on extra-label-drug use (ELDU) and requests for extra-label advice can be found at FARAD – ELDU Resources. Even if a food-producing animal is considered a pet, the drug use and withdrawal times appropriate for the taxa of food-producing animal and withdrawal times must be followed and recorded in the medical record.

Ruminants (Sheep and Goats, Cattle, Camelids) and Swine

Triage animals based on the severity of medical needs. Isolate any animal demonstrating potentially transmissible diseases. Triage and handling recommendations include:

- Triage small ruminants, camelids, swine, and cattle into holding areas per herd or premise of origin
- Personnel and examiners need to be familiar with normal behavior and appropriate handling of the animal species
- Using appropriate physical restraint methods for the species when examining and treating small ruminants, camelids, swine, or cattle will prevent injuries
- FAMACHA score should be included in the examination findings of sheep and goats

Regulations:

- Goats, sheep, and cattle are all classified as food-producing animals by the US FDA even if they are kept as companion animals or pets. Among these species, goats and sheep are the most common animal species housed in emergency shelters.
- Emergency animal shelter policies should follow:
    - the FARAD recommendations for small ruminants
    - the FARAD recommendations for dairy animals

Equids (Horses, Donkeys and Mules)

Triage and handling methods:

- Equids require an experienced handler because safety is paramount (including the veterinary professionals performing the exam, the shelter staff, potential

bystanders, and the animals). Injuries to people include being kicked, struck by front limbs or head, stepped or jumped on, knocked down, and bitten.

- Safety risks when handling equids can be minimized if personnel are appropriately trained and communicate appropriately with the team members, and bystanders are kept out of harm's way. Equids should not be tied but rather handled by an experienced handler.
- The handler and examiner must be on the same side of the animal. The handler has a critical role in monitoring any changes in the animal's behavior and communicating it to the examiner. Appropriate physical restraint must be used. In emergency shelters, animals are likely to be stressed, anxious, fearful, and uncooperative. Chemical restraint might be necessary.

Regulations:

- In the US, equids are not considered food-producing animals, therefore FARAD recommendations do not apply to equids. Nonetheless, equids are under the jurisdiction of the State Department of Agriculture of each STT. Emergency managers and animal responders must identify state-specific rules and legislation.
- USDA APHIS has information about equine diseases and the National Animal Health Monitoring System (NAHMS) Equine Studies provides epidemiological reports of infectious diseases of concern. The non-regulatory service Equine Disease Communication Center provides information on specific conditions and real-time alerts to help prevent and mitigate equine infectious diseases.

Avian Species (Poultry/Waterfowl)

- Triage, Handling Measures, and Housing of Birds
    - Triage and housing of birds into separate holding areas per bird species/flock
        - For biosecurity purposes, turkeys, chickens, and ducks from different households should be kept separate, if possible.
    - Use minimal physical restraint when examining and treating birds. Triage birds based on the severity of medical need, isolate any birds demonstrating potentially transmissible diseases. Triage of avian species should be performed when the environmental temperature is not extreme, ideally where there is some degree of climate control, or early in the morning if a climate-controlled area is not available. Respiratory signs of concern include but are not limited to, open-beak breathing, increased respiratory rate, and effort.
    - Important considerations concerning housing birds include:

- Minimize handling and other stressors
- Provide normal photoperiod (subdued lighting if needed)
- Maintain birds in a comfortably warm, quiet, well-ventilated environment with minimal to no disturbance other than treatments
- Supplemental heat may be required since debilitated birds are often hypothermic. The goal is to keep environmental temperature around 30-32 degrees C or 85-90 degrees F.

Regulations:

- All chickens, ducks, and turkeys are considered food-producing animals even if they are kept as pets, therefore emergency animal shelter policies should follow the FARAD recommendations for backyard flocks.
- As guidance may change, always refer to the most current recommendations: FARAD – Poultry.
- Animal Medicinal Drug Use Clarification Act (AMDUCA) suggests that eggs from a hen treated with a drug for which a residue tolerance in eggs has not been established by the FDA is a violation.

Livestock Monitoring

Medical operations for a large/farm animal shelter need to be established in advance or at early stages and standard operating guidelines should provide instructions concerning:

- Biosecurity plans and management measures in disease outbreak
- Shifts of veterinary professional teams, and number of veterinary professionals based on the number of animals needing medical care.
- Daily morning briefing of the shelter leads and veterinary leads to outline goals and address requests. This might be in-person or virtual at an early set time (e.g., at hrs 0700 or 0730).
- Daily morning rounds of veterinary professionals and shelter staff to walk by stalls and pens and discuss the status and concerns of each animal or herd. Veterinary professionals may round separately from shelter staff, and then communicate afterward, if possible, in-person.
- Establish means of communication and transfer of information:
    - Have an accessible contact list for all staff (shelter and medical), and list who are the supervising staff
    - Have a card at each stall/pen with directions concerning water and hay/feed to be provided
    - Establish stall/pen cards where information from shelter/husbandry staff is recorded manually and posted in a place that is readily accessible (note:

goats, horses, and donkeys may destroy cards and clipboards left in front of the stall or pen):
    - How much water and hay/feed were consumed
    - Evidence or observed urination and defecation, amount of manure in the stall or pen
    - Comments on behavior or any sign of discomfort or illness
- Establish a treatment board for each shelter area (for each species/taxa)
- Establish verification that animals have not been moved/ relocated and treatments are administered to the correct animal
- Establish verification that information, including treatment, was recorded in the animal's medical record.
- Medical rounds should address:
    - Daily evaluation of animal's health parameters: eating, drinking, urination, defecation, activity level, and comments recorded by the shelter/husbandry staff
    - Are there concerns of an infectious or contagious disease?
    - Were treatments administered as planned?
    - How is the progress of known signs of illness, pain, discomfort, or injury?
    - Should the case be reassessed, and the treatment plan reevaluated?
    - Are there any new signs of illness, pain, discomfort, or injury?

Management of Outbreaks of Infectious and Contagious Diseases

Emergency shelters for livestock are at risk for disease outbreaks because of the congregation of animals and herds from different origins, the stressful setting of being in an emergency shelter, dietary changes, etc. As the risk of disease outbreaks cannot be eliminated from an emergency animal shelter, several biosecurity steps should be taken to minimize this risk of introduction and spreading pathogenic agents during the movement of personnel and materials necessary for activities associated with animal and veterinary care at the large animal emergency shelter.

The emergency shelter must have protocols and pre-assigned areas for quarantine of animals that show suspicious signs of disease, and isolation of animals that have confirmed contagious diseases. The National Animal Health Emergency Management System (NAHEMS) has guidelines for biosecurity, cleaning and disinfection, and personal protective equipment. A list of infectious and contagious diseases of concern for equids and small ruminants categorized by main clinical signs can be found in *Appendix Q: Common Causes of Disease Outbreaks in Equine Shelters*.

Identification of Potentially Infectious/Contagious Diseases – Prevention of Outbreak

Early identification of infectious contagious diseases allows for prompt mitigation measures that can prevent or halt an outbreak. Upon medical triage, the animals should be assigned/placed in housing according to biosecurity concerns: (1) general population for animals with low biosecurity risk, (2) quarantine area with medium biosecurity for animals that will be under observation for signs of illnesses posing risk to other animals or personnel, (3) isolation area with a high level of biosecurity for animals with contagious conditions. For early identification of infectious diseases/ contagious, a daily disease surveillance system must be implemented as soon as the emergency shelter is set up.

A daily disease surveillance system includes: (1) all animal care staff must be trained to identify suspicious signs of illnesses for the animal species they are handling and providing care, (2) establish daily assessments of individual animals in the shelter for suspicious signs of illness, (3) have a prompt reporting process. The reporting system must be established and stated clearly, and all staff must understand the importance of reporting suspicious signs immediately.

Detection, Diagnosis, and Management of Outbreak

Once it is determined that an animal, or a small group of animals housed together, are showing signs suspicious of infectious/contagious conditions, the appropriate level of biosecurity must be established to prevent the spread of the disease. Establish biosecurity precautions (personnel assignment, PPE, cleaning, sanitation, disinfection protocols, etc.) based on the mode of transmission of the suspected disease. Utilize incubation periods and shedding time to design monitoring and sample collection plans.

Confirm the infectious/contagious condition as soon as possible. Collect the appropriate samples, and ensure that the samples are conditioned, transported, and submitted as soon as possible to obtain confirmation of the diagnosis. In case of reportable/notifiable or zoonotic diseases, appropriate regulatory measures must be taken.

Make plans for treatment, monitoring, and management according to the suspected condition. Evaluate plans upon confirmatory results. Additionally, establish quarantine and monitoring plans for animals and personnel potentially exposed.

New admissions will be handled by a separate team, and new animals/herds placed in uncontaminated areas, distant from the contaminated or suspect areas.

Design plans for monitoring and collection of additional samples from suspected, exposed, and confirmed cases (document if no longer shedding) and environmental sampling. Do not use areas where infected and exposed animals were housed until the cleaning and disinfection are completed and the appropriate downtime has passed and/or proper environmental testing is complete.

Euthanasia of Livestock

This section is limited to listing the methods used for euthanasia. Methods of slaughter and depopulation are not included in this document. In all cases, consult the STT regulatory authorities for euthanasia and carcass disposal.

Always use the AVMA Guidelines for the Euthanasia of Animals. The guidelines state that the handling of animals before euthanasia should be as stress free as possible.

The guidelines also state that regardless of the method of euthanasia used, death must be confirmed before disposal of the animal's remains. The most important indicator of death is the lack of a heartbeat. However, because this may be difficult to evaluate or confirm in some situations, animals can be observed for secondary indicators of death, which might include a lack of movement over a period of time (30 minutes beyond the detection of a heartbeat) or the presence of rigor mortis.

For the decision concerning what euthanasia method is to be used, the AVMA guidelines highlight several considerations:

- Ability to induce loss of consciousness and death with a minimum of pain and distress
- Time required to induce loss of consciousness
- Reliability
- Safety of personnel
- Irreversibility
- Compatibility with intended animal use and purpose
- Documented emotional effect on observers or operators
- Compatibility with subsequent evaluation, examination, or use of tissue
- Drug availability and human abuse potential
- Compatibility with species, age, and health status
- Ability to maintain equipment in proper working order
- Safety for predators or scavengers should the animal's remains be consumed
- Legal requirements
- Environmental impacts of the method or disposition of the animal's remains.

Since animals euthanized with pentobarbital may be refused by rendering plants and landfills, alternate approved methods for euthanasia and/or carcass disposal should be considered. Table 1 provides additional approved methods for euthanasia.

Table 1: Acceptable Means of Euthanasia for Livestock

	Acceptable	Common Acceptable With Conditions	Additional Acceptable With Conditions
Equine	Intravenous barbiturates*	Gunshot Penetrating Captive Bolt	Deep plane anesthesia followed by: 1. intravenous saturated KCl 2. intravenous saturated $MgSO_4$ 3. intra-thecal lidocaine
Cattle	Intravenous barbiturates*	Gunshot Penetrating Captive Bolt	
Small Ruminants	Intravenous barbiturates*	Gunshot Penetrating Captive Bolt	For goat kids: CO2 and Non-Penetrating Captive Bolt
Swine	Intravenous barbiturates*	Gunshot Penetrating Captive Bolt	CO_2, CO, NO, N_2, Ar, electrocution, Non-Penetrating Captive Bolt (piglets), manually applied blunt force trauma
Camelids	Injected barbiturates*	Gunshot Penetrating Captive Bolt	

*While barbiturates are an AVMA-approved euthanasia method, they limit the acceptable options for disposal of the carcass.

Gunshots and penetrating captive bolts to the brain should only be used by well-trained personnel who are regularly monitored to ensure proficiency. In the case of gunshot euthanasia, it is essential to select an appropriate firearm and bullet with sufficient velocity, energy, and size to pass through the skull, enter the brain, and cause massive brain destruction.

Additionally, the firearm must be well maintained. Firearm use (not captive bolt) is generally illegal within city limits. Use should be approved by local law enforcement.

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Post-Disaster Activities

Demobilization and recovery planning begins when deployment is first considered. Safety is the primary concern throughout the entire incident and includes post-disaster operations. The physical and mental safety of the responders, the patients and their families, and the impacted community is vital.

For more information on disaster recovery, see National Disaster Recovery Framework (NRDF), Second Edition – June 2016. For more information on demobilization tactics, see the *NASAAEP 2023 Current Best Practices in Animal Emergency Management Incident Command and Coordination* document.

Animal and Owner Considerations

Provide veterinary recommendations for patient care upon patient release, including disaster-specific concerns and follow-up care needs. A list of operational veterinary clinics in the area should be included in care instructions to the owner.

Check with the supervisor for any specific disaster recovery materials that could be included with the material sent to the patient to aid in recovery coordination. This could include resources for economic recovery, health and social services, housing, infrastructure systems, and natural and cultural resources.

Responder Considerations

Disaster response is a unique experience that can be rewarding and challenging. It is physically and mentally taxing, often in ways that are not typical in everyday life. Responders are exposed to human and animal suffering, life-and-death decisions, personal harm, and intense workloads. These experiences are called “Critical Incidents”. Demobilizing responders from an incident should include physical and mental health support resources.

Responders who suffered physical injury during the response should be provided with healthcare information to properly treat and compensate for their injuries. For more information on Critical Incident Stress Management (CISM) and CISD, see OSHA – Critical Incident Stress Guide.

After Action Report/Improvement Plan (AAR/IP) and After-Action Meeting (AAM)

An AAR/IP is a document drafted by incident leadership that provides and overview of an incident, analysis of capabilities, and a list of corrective actions. An AAR/IP should

be completed for each incident response. This document assesses the incident response strengths and areas for improvement.

The AAM is a forum for the response team to find consensus on strengths and areas for improvements drafted in the AAR/IP. The AAM also serves to draft corrective actions, set concrete deadlines, and assign implementation of corrective actions. For more information on the AAR/IP process, see the Homeland Security Exercise and Evaluation Program (HSEEP) document and refer to the *NASAAEP 2023 Current Best Practices in Animal Emergency Management Incident Command and Coordination* document.

Appendix A: Acronyms, Key Terms, and Definitions

Acronyms

An asterisk indicates the term has a more complete definition in the following section.

AAR	After Action Report
ACO	Animal Control Officer
ADA	Americans with Disabilities Act (defines service animals)
AHJ	Authority Having Jurisdiction
APHIS	Animal and Plant Health Inspection Service (USDA)
ASAR	Animal Search and Rescue
CART	County/Community Animal Response Team*
CBRN or CBRNE	Chemical, biological, radiological, nuclear (explosive)
CERT	Community Emergency Response Team (Citizen Corps program)
CONOPS	Concept of Operations
DHS	Department of Homeland Security
DOD	Department of Defense
DOI	Department of Interior
EIEIO	The chorus from “Old MacDonald Had a Farm”
EMA	Emergency Management Agency
EMAC	Emergency Management Assistance Compact*
EOC	Emergency Operation Center* (also termed Coordination Center)
EOP	Emergency Operations Plan (may be preceded by jurisdictional identifier)
ESF	Emergency Support Function*
ESF6	Emergency Support Function 6 (Mass Care, Emergency Assistance, Housing, and Human Services)
ESF8	Emergency Support Function 8 (Public Health and Medical Services)
ESF9	Emergency Support Function 9 (Search and Rescue, SAR)
ESF11	Emergency Support Function 11 (Agriculture and Natural Resources)
FEMA	Federal Emergency Management Agency
HAZMAT	Hazardous Materials
HHS or DHHS	Health and Human Services (U.S. Department of)
HVAC	Heating, Ventilating, and Air Conditioning
IA	Individual Assistance (FEMA)
IAP	Incident Action Plan*
IC	Incident Commander
ICC	Incident Command and Coordination

ICP	Incident Command Post
ICS	Incident Command System*
IMT	Incident Management Team*
IMAT	Incident Management Assistance Team (FEMA)
IOF	Interim Operating Facility (precursor to Joint Field Office)
IT	Information Technology
JFO	Joint Field Office (FEMA)
JIC	Joint Information Center
JIS	Joint Information System (multiple locations)
MA	Mission Assignment*
MAA	Mutual Aid Agreement
MAC Group	Multi-agency coordination group (policy level)
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MRC	Medical Reserve Corps (a program within Citizen Corps)
NARSC	National Animal Rescue and Sheltering Coalition
NASAAEP	National Alliance of State Animal and Agricultural Emergency Programs
NDMS	National Disaster Medical System
NGO	Non-Governmental Organization
NIMS	National Incident Management System
NRCC	National Response Coordination Center
NRF	National Response Framework
NSS	National Shelter System
NVRT	National Veterinary Response Team
OSHA	Occupational Safety and Health Administration
PA	Public Assistance (FEMA)
PAPPG	Public Assistance Program and Policy Guide (FEMA)
PETS Act	Pets Evacuation and Transportation Standards Act (amendment to the Robert T. Stafford Act of 1974)
PIO	Public Information Officer
POC	Point of contact
PPE	Personal Protective Equipment
RRCC	Regional Response Coordination Center (FEMA)
RRF	Resource Request Form (FEMA)
RSF	Recovery Support Function
SAHO	State Animal Health Official
SAR	Search and Rescue
SART	State Animal/Agricultural Response Team*

SME	Subject matter expert
SOG	Standard Operating Guidelines
SOP	Standard Operation Procedures
STT	State, Tribal and Territorial
STTI	State, Tribal, Territorial and Insular
STTL	State, Tribal, Territorial and Local
THIRA	Threat and Hazard Identification and Risk Assessment
USAR or US&R	Urban Search and Rescue
USDA	United States Department of Agriculture
VOAD AND NVOAD	(National) Voluntary Organizations Active in Disasters
VERT, VRC or VMRC	Veterinary Emergency Response Team, Veterinary (Medical) Reserve Corps
Web EOC	Software platform for EOC management (used by FEMA and many other jurisdictions)
ZAHP	Zoo and Aquarium All Hazards Partnership

Key Terms and Definitions

Legal definitions of different types of animals vary across jurisdictions. To provide consistency across the Animal Emergency Management Best Practice Working Group documents, animal classifications and definitions are provided as common-use definitions.

For a specific legal definition, refer to jurisdictional definitions. These definitions are generally accepted in the US and are sourced from global, state, and/or federal guidelines. Other key terms are used in animal emergency practices. This list addresses some common terms used during emergency response.

- **Animal Definitions**
  - **Animals:** Animals include household pets, service and assistance animals, working dogs, livestock, wildlife, exotic animals, zoo animals, research animals, and animals housed in shelters, rescue organizations, breeding facilities, and sanctuaries (source: National Preparedness Goal).
  - **Assistance animals:** an assistance animal is not a pet. It is an animal that works, provides assistance, or performs tasks for the benefit of a person with a disability or provides emotional support that alleviates one or more identified symptoms or effects of a person's disability (source: Section 504 of the Fair Housing Act).
    - Note – service animal definitions under the Americans with Disabilities Act (ADA) and assistance animal definitions under the Fair Housing

Act only differ by the exclusion of emotional support from the service animal definition.

- **Livestock:** The term livestock may have a specific definition within individual states and Federal programs. In the broadest use, including general ESF #11 use, livestock includes domestic livestock typically kept on farms and such as cattle, sheep, goats, swine, poultry, and other animals raised for food or fiber, as well as horses, donkeys, and mules. “Alternative livestock” may include wild cervids (elk, deer, etc.) as well as bison, ostrich, emu, or other wild species kept for food production. When discussing “livestock,” it is essential for all parties to work from the same definition.
- **Non-commercial livestock or “backyard” livestock:** This is another flexible term that may have a specific definition in local, State, Tribal, Territorial and/or Insular (STTI) emergency plans. In its broadest use, non-commercial livestock would include animals kept at residences for pleasure, companionship, sport (not commercial racing) or household food production which does not generate food or products intended to enter commerce.
- **Pets/Household pets:** Summarizing from the FEMA Public Assistance Policies, household pets are domesticated animals that:
  - Are traditionally kept in the home for pleasure rather than commercial purposes
  - Can travel in common carriers
  - Can be housed in temporary facilities
  - Examples are dogs, cats, birds, rabbits, rodents, hedgehogs, and turtles
  - FEMA Public Assistance excludes these species as household pets: farm animals (including horses), racing animals, reptiles (other than turtles), amphibians, fish, insects, and arachnids
  - *Note: This definition applies to expense eligibility under the FEMA Public Assistance Grant Program and in no way limits STTI, Local, and non-governmental entities from defining and managing all animal types per their own policies.*
- **Service animals:** Under the ADA, a service animal is defined as a dog that has been individually trained to do work or perform tasks for an individual with a disability. The task(s) performed by the dog must be directly related to the person's disability. In addition to the provisions about service dogs, the Department’s ADA regulations have a separate provision about miniature horses that have been individually trained to do work or perform tasks for people with disabilities (U.S. Department of Justice Civil Rights Division, 2020).

    - **Working animals:** The term working animal can vary considerably within the situational context, but within an emergency management context, ESF #11 considers this group to include animals (typically dogs and horses) working in law enforcement (detection, patrol, apprehension, etc.) and animals working in search and rescue (primarily dogs used in search and recovery missions). Working dogs may include dogs used in hunting, guarding and for agriculture tasks.
- **Animal Emergency Management Annex:** A component of a jurisdictional emergency operations plan that provides information on how animals will be managed in disasters, including organizational responsibilities.
- **Biosecurity:** Measures that prevent the spread of disease to, from, or within a premises containing animals.
- **Community or County Animal Response Team (CART):** An organization developed to implement the animal elements of the jurisdictional emergency operations plan. The exact title and format vary considerably (a team of organizations, direct volunteers, etc.) The critical element is that the CART must be under the control of, or have an agreement with, the local government.
- **Coordination Center:** *FEMA EMI ICS Glossary* – A facility that is used for the coordination or agency or jurisdictional resources in support for one or more incidents.
- **Emergency Management Assistance Compact (EMAC):** EMAC is a national interstate mutual aid agreement that enables states to share resources during times of disaster. The thirteen (13) articles of the Compact sets the foundation for sharing resources from state to state that have been adopted by all 50 states, the District of Columbia, the U.S. Virgin Islands, Puerto Rico, and has been ratified by Congress (PL-104-321).
- **Emergency Operations Center (EOC):** See Coordination Center definition above.
- **Emergency Support Function (ESF) (Federal):** Some states, but not all, use ESF terminology. Some states use more than 15 ESFs and do not necessarily align with Federal ESFs.
- **Disaster Declaration:** A Disaster Declaration is a formal statement by a jurisdiction that a disaster or emergency exceeds the response and/or recovery capabilities.
- **Disaster/emergency**: An occurrence of a natural catastrophe, technological accident, or human-caused event that has resulted in severe property damage, deaths, and/or multiple injuries. Except for use in certain declarations, the terms are commonly used interchangeably.
- **Emergency manager:** The jurisdictionally appointed position that conducts analysis, planning, decision-making, and assignment of available resources to prevent/mitigate, prepare for, respond to, and recover from the effects of all hazards.

- **Emergency Operations Plan (EOP)**: A document maintained by various jurisdictional levels describing the plan for responding to a wide variety of potential hazards.
- **Incident Action Plan (IAP):** *From the FEMA ICS Glossary* – An oral or written plan containing incident objectives which reflect the overall strategy for managing the incident. It may include the identification of operational resources and assignments. It may also include attachments that provide direction and important information for management of the incident during one or more operational periods.
- **Incident Command System (ICS):** *From the FEMA ICS Glossary* – A standardized on-scene emergency management construct specifically designed to provide for the adoption of an integrated organizational structure that reflects the complexity and demands of single or multiple incidents, without being hindered by jurisdictional boundaries. ICS is the combination of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure, designed to aid in the management of resources during incidents. It is used for all kinds of emergencies and is applicable to small as well as large and complex incidents. ICS is used by various jurisdictions and functional agencies, both public and private, to organize field-level incident management operations.
- **ICS forms:** Nationally standardized forms used to manage or document incident response under the Incident Command System. Forms can be found on FEMA's website.
- **Incident Management Team (IMT):** The Incident Commander and appropriate Command and General Staff personnel assigned to an incident. Key IMT positions include (source: FEMA ICS Glossary):
    - **Incident Commander (IC)** – assigned by jurisdictional authorities to oversee all aspects of the incident response
    - **Command Staff:** Safety Officer (SOFR), Liaison Officer (LOFR), Public Information Officer (PIO)
    - **General Staff:** Operations Section Chief (OSC), Planning Section Chief (PSC), Logistics Section Chief (LSC) and Finance and Administration Section Chief (FASC)
- **Isolation:** Segregation of animals to prevent disease exposure or spread.
- **Mission Assignment (MA):** A work order issued by FEMA to another Federal agency directing the completion of a specific task, and citing funding, other managerial controls, and guidance. There are two general types of MAs:
    - **Federal Operations Support (FOS)—**Requested by a Federal agency to support Federal operations.
    - **Direct Federal Assistance (DFA)—**Resources requested by and provided to affected State and local jurisdictions when they lack the resources to provide specific types of disaster assistance.

- **Mutual aid:** emergency assistance provided from one jurisdiction or organization to a peer (local-local, state-state, NGO-NGO, etc.).
- **Quarantine**: Isolation of animals that may have an infectious disease for a specified period to allow for testing or extended observation.
- **Resource typing and credentialing**: Resource typing is defining and categorizing, by capability, the resources requested, deployed, and used in incidents. Resource typing definitions establish a common language and defines a resource's (for equipment, teams, and units) minimum capabilities.
- **State Animal/Agricultural Response Team (SART):** SART organizations vary considerably in their structure, mission, and nomenclature (many don't use the SART name). In general, SART-type organizations provide a framework for State stakeholders to support the State animal emergency management plan. SART-type organizations generally are under the control of the state or have an agreement with the state.
- **State veterinarian/animal health officials (SAHO)**: The veterinary officer/official for a particular State or territory of the U.S. in charge of animal health activities (exact title varies).
- **Zoonoses:** Disease that can be transmitted between animals and humans.

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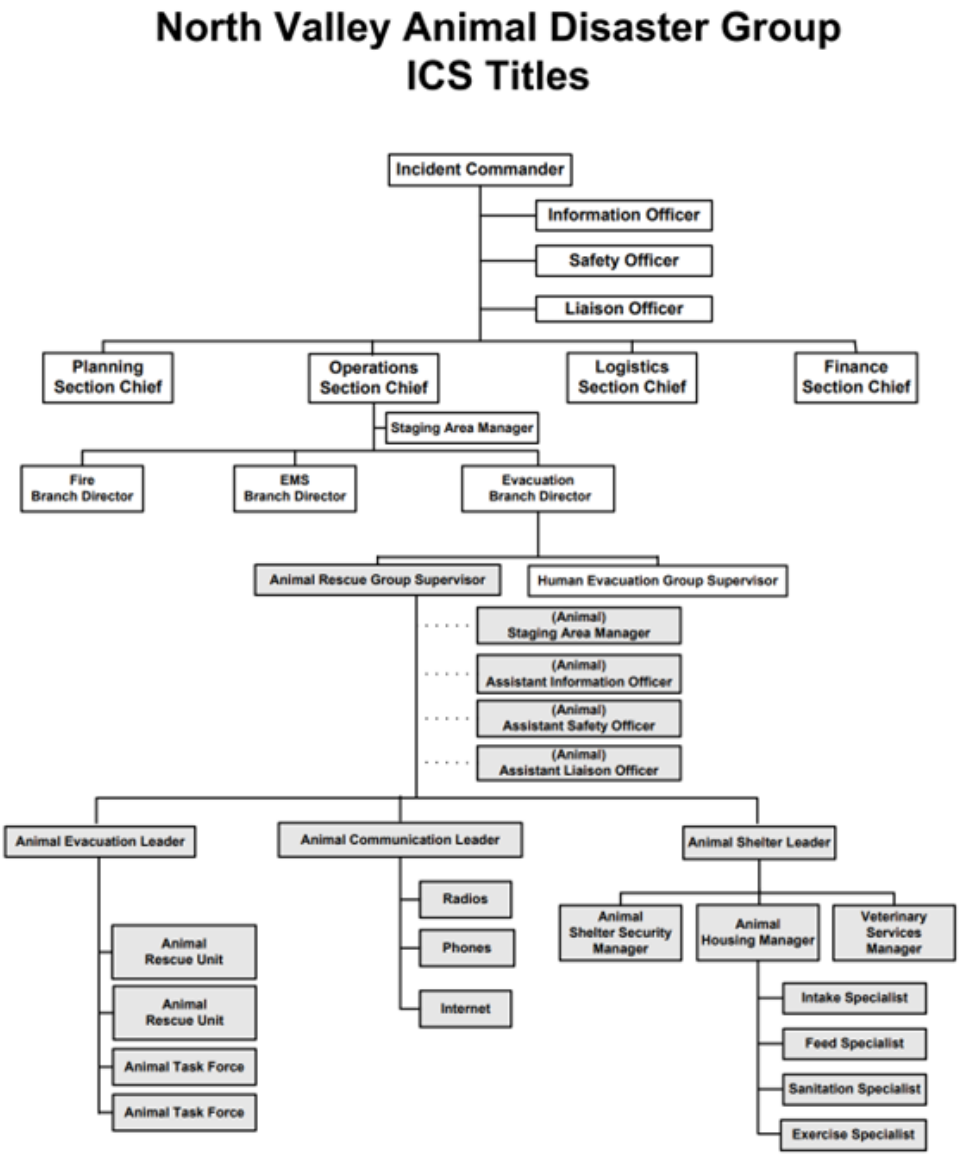
Appendix B: ICS Organization Chart Example

This example ICS organizational chart is from the North Valley Animal Disaster Group (NVADG) of California.



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Appendix C: Examples of Additional Veterinary Disaster Training

- FEMA IS-5: An Introduction to Hazardous Materials
- FEMA IS-10: Animals in Disasters: Awareness and Preparedness
- FEMA IS-11: Animals in Disasters: Community Planning
- FEMA IS-111: Livestock in Disasters
- FEMA IS-800: National Response Framework, An Introduction (required for FEMA resource types)
- Human First Aid and CPR (American Red Cross, American Heart Association, or equivalent course)
- AVMA Veterinary First Responder Certificate Program
- USDA National Veterinary Accreditation Program (NVAP) Training Modules
- Appropriate courses available at Train.org
- USDA\APHIS\VS Training and Exercise Program (VSTEP)
- Iowa State Center for Food Security and Public Health
    - Animal Disease Emergencies: Understanding the Response
    - Just-In-Time Training for Animal Health Emergencies
- Emergency/Field Euthanasia
- Psychological First Aid
- Other higher skilled courses (Centers of Advanced Training – CATs) such as Large Animal Technical Rescue

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Appendix D: Code of Conduct

STATE OF MISSISSIPPI
BOARD OF ANIMAL HEALTH
Code of Conduct

Personnel working for or representing MART, under the authority of the State Veterinarian, shall adhere to the following policies. All volunteers responding to animals in disasters (whether from Mississippi or other states) will be working for MART during their duty time, will become members of MART, and subject to the following policies.

All MART members will sign this document to indicate that they understand and agree to abide by the codes identified within this document. Incident Commanders will have the authority to deactivate any activated MART representative for behavior(s) that is contrary to the code of conduct based on their discretion:

1. Individuals shall project a professional manner and appearance while participating in any MART- related activities. The following will not be tolerated while on-site at a disaster, conference, or other MART activity:
    a. Consumption of alcoholic beverages while on duty or any display of public drunkenness
    b. Possession, use, or selling of any illegal drugs
    c. Violation of any laws
    d. Public outbursts, public derogatory remarks about other organizations or individuals
    e. Illegal use or display of a firearm
2. Individuals shall identify operations that are beyond their capabilities based on their experience, training, and knowledge, and will provide and carry professional credentials during activation. Individuals shall observe all safety rules and regulations and be familiar with the proper usage and operation of all equipment.
3. Individuals shall be expected to accept assignments and/or orders as directed by the supervising authority (ICS Incident Commander), or if required, make discretionary decisions based on appropriate intent and good judgment.
4. Individuals while representing MART will not participate otherwise in operations that serve to promote personal gains or ideologies.
5. Individuals shall not enter private properties to perform search and rescue duties without permission from the owner, supervising authority, or without a law enforcement escort.
6. Individuals shall remain in contact with the appropriate supervisor and confine their activities to the stated mission and directives.

7. All individuals shall wear current identification, preferably an ESF-11 badge, while on site for a disaster. All individuals will wear MART/MVMRC/MBAH shirts while on site.
8. Individuals will be required to document or participate in documentation promptly and submit documentation as directed or required.
9. Individuals shall not transport animals to facilities other than the ones that have been assigned by the supervising authority without permission from the supervising authority.
10. Individuals shall refrain from taking photographs out of respect for the privacy of the owner. Any photos that are made will not be used for public display without the expressed written permission of the owner and/or the State Veterinarian
11. In situations in which an animal(s) is rescued and transported from a property without prior permission, individuals participating in such rescue must leave notification of the removal of the animal or disturbance of the property on the property in the most visible area possible.
12. Individuals shall not accept personal gratuities. All personal donations shall be directed to the Mississippi Animal Disaster Relief Fund.
13. Responders will not remove any items from the site.
14. Animals will not be adopted from this incident. Unauthorized removal of animals from MART premises will constitute theft.
15. Individuals will adhere to established standard operating procedures for the incident unless directed to do otherwise by the Incident Commander.

If you are unable to sign the MART Code of Conduct because you are replying electronically and you are willing to adhere to its polices, please type “YES” in the blank below and type your name and date on the Responder line:

_____ I have read the Mississippi Animal Response Team Code of Conduct and will adhere to its policies.

Responder (Print Name) **Date**

Signature of Responder **Date**

Signature of Witness **Date**

Appendix E: Physical and Mental Health Resources

- 988 Suicide & Crisis Lifeline
- Substance Abuse and Mental Health Services Administration (SAMHSA)The Disaster Distress Helpline
    - 1-800-985-599 is a 24/7, 365-day-a-year, national hotline dedicated to providing immediate crisis counseling for people who are experiencing emotional distress related to any natural or human-caused disaster. This toll-free, multilingual, and confidential crisis support service is available to all residents in the United States and its territories. Stress, anxiety, and other depression-like symptoms are common reactions after a disaster. Call or text 1-800-985-5990 to connect with a trained crisis counselor.
    - Text “TalkWithUS” to 66746
- U.S. Department of Health and Human Services: Disaster Behavioral Health – Public Health Emergency
- American Physiological Association – Disaster Mental Health Training Courses

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Appendix F: One Health Resources

Many One Health (OH) resources exist. Some examples include:

- CDC OH Basics page: https://www.cdc.gov/onehealth/basics/index.html
- APHIS Veterinary Services OH page: https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/SA_One_Health
- American Veterinary Medical Association, OH Page: https://www.avma.org/resources-tools/one-health
- World Organisation for Animal Health: https://www.woah.org/en/what-we-do/global-initiatives/one-health/
- OH Initiative at the University of California Davis: https://ohi.vetmed.ucdavis.edu/
- University of Minnesota Global OH Initiative: https://vetmed.umn.edu/centers-programs/global-one-health-initiative

Examples of One Health in the Real World

Example 1: Global Scale

In late 2019, SARS-CoV-2 was identified in China as an emerging zoonotic disease. By the spring of 2020, the World Health Organization (WHO) had declared a global pandemic, with millions of lives lost in an incident that continued during the writing of this document.

- The virus emerged from an animal source, most probably bats
- Public health and medical systems world-wide were overwhelmed with cases and the logistical challenges of providing catastrophic levels of emergency care for infected people.
- While human infections have dominated, spread into multiple animal species, including dogs, cats, mink, big cats, mustelids (including farmed mink), non-human primates, white-tail deer, and many more. Fortunately, transmission from animals back to people has rarely been documented.
- Veterinarians in private practice had to adapt their practices to both the risk from human contact in the workplace as well as potential for animal contacts. Veterinarians had to implement respiratory protection programs, social distancing, curb-side intake of animals, and other actions to reduce risk to staff, clients, and animals.
- The emergency management community had to adapt response strategies to find ways to shelter people and animals in such a way to reduce the spread of COVID-19 (the disease that SARS-CoV-2 causes in humans). For example, see the CDC Guidance for Emergency Animal Sheltering during the COVID-19 pandemic.
- CDC established the COVID-19 One-Health Federal Interagency Coordinating Committee to address trans-disciplinary issues among the US government.

Example 2: Radiological Incident
A release secondary to a nuclear power plant accident necessitates the evacuation of 15,000 people and their pets/animals. While most people and pets were able to evacuate before the actual release, some people and pets needed decontamination at a community reception center and a few people and pets have been found to have internal contamination. While medical staff are addressing human internal contamination, veterinary personnel have been asked to support the treatment of these pets.

A much larger area than the evacuation zone has been placed into an initial agricultural control zone. Livestock, poultry, crops, and other agricultural products are not allowed to leave the control zone. Extensive testing in ongoing to determine the exact limits of the areas within that zone that are unsafe for the various forms of agriculture. Significant numbers of livestock and poultry will have to be condemned and destroyed.

Environmental health officials, agricultural officials, and emergency managers are working to develop a plan for safe depopulation and disposal of livestock, poultry, and any unsafe agricultural products. Agricultural producers effected by the release are in dire financial situations as well as emotionally devastated by potentially not being able to produce on their land for the foreseeable future.

One affected producer has committed suicide. Emergency management has established a task force including animal health, public health, environmental health, and mental health professionals to help guide the response strategies within the agricultural control zone in a One-Health collaboration.

Example 3: Isolated Issue
During a disaster response, a stray dog is brought in by an animal search and rescue team, having bitten one of the ASAR team members and causing substantial injury. The dog had no tags, no microchip, and was running astray in the disaster area.

- The team member needs emergency medical care.
- Local public health and animal control will open a case report and ensure the bite incident is managed according to local policy, which complies with the Compendium on Rabies Prevention and Control from the NASPHV (see link above).
- Animal Control ensures a veterinary examination of the dog and then places the animal in isolation in the animal control facility for daily observation.
- Should the animal show signs potentially consistent with rabies infection, the dog would be tested and, if positive, any exposed persons would undergo rabies post-exposure prophylaxis.

- If positive, general warnings will be issued to the responders and the public about the potential increased risk of additional wildlife or domestic animal rabies cases.
- If additional cases are found in wildlife, baits containing oral rabies vaccine could be used to mitigate potential spread in wildlife.

These examples demonstrate how public health, animal health, and environmental health all depend on collaboration and support among the various disciplines. One-Health principles encourage professionals in many disciplines to actively engage with each other in addressing complex emergency management challenges.

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Appendix G: Zoonotic Diseases

Disease in Animals	Animals Species and Clinical Signs	Disease in Humans	Causative Agent	Routes of Transmission	Comments and Links
Coxiellosis	Primarily small ruminants and cattle – infected animal may appear healthy or show signs. Goats: Poor appetite and lethargy before abortion, Sheep: no signs, only abortion stillbirth, retained placenta, and endometritis	Q Fever: infected humans may be asymptomatic or develop a self-limiting flu-like illness; that occasionally causes pneumonia and reproductive loss.	*Coxiella burnetiid, an obligate intracellular coccobacillus*	Aerosol; Direct contact w/ infected reproductive tissues (placenta, birth fluids); oral/ingestion contaminated dairy product, meat; contact with blood of infected animal	https://www.cdc.gov/qfever/qfever-factsheet.html https://www.cfsph.iastate.edu/Factsheets/pdfs/q_fever.pdf
Brucellosis	Many species: sheep, cattle, goats, pigs, and dogs. Abortion, stillbirth, birth of weak offspring, decreased milk production, mastitis, orchitis, arthritis	Fever, sweating, malaise, anorexia, headache, muscle, joint and back pain, fatigue	Brucella genus: B. *abortus*; *B. melitensis*; *B. suis*	Direct contact with infected animal fluids, oral / ingestion, mechanical transmission	Other names for Brucellosis: Undulant fever, Malta fever, Mediterranean fever, Contagious Abortion, and Bang's disease. https://www.cdc.gov/brucellosis/index.html https://www.cdc.gov/brucellosis/veterinarians/index.html https://www.cdc.gov/brucellosis/veterinarians/host-animals.html https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/animal-disease-information/cattle-disease-information/tuberculosis-brucellosis-monthly-report/facts-about-brucellosis

Dermatophytosis or Ringworm	Many species: cats, dogs, goats, sheep, cows, horses, pigs. Signs: Alopecia often circular, irregularly shaped areas of scaling, crusting, and redness, pruritus may be present. If long hair dogs and cats, lesions may not be obvious.	Ring-like rash on the skin, itching, rash may be scaly, reddened, circular; ringworm on the scalp usually makes a bald patch of scaly skin. Onset 4 to 14 days after exposure.	Pathogenic, keratin-digesting fungi in the genera: *Microsporum*, *Trichophyton* and *Epidermophyton*	Transmission via contact with spores (conidia)	Other names for ringworm: Dermatophytosis, Club lamb fungus (in lambs) https://www.cdc.gov/healthypets/diseases/ringworm.html https://www.cfsph.iastate.edu/Factsheets/pdfs/dermatophytosis.pdf https://medlineplus.gov/ency/article/001439.htm https://www.cfsph.iastate.edu/Factsheets/pdfs/dermatophytosis.pdf
Rabies	Any mammal. Initially, nonspecific signs: lethargy, fever, anorexia, dehydration, vomiting in small animals. Signs progress within days to cerebral dysfunction manifesting by fearfulness, restlessness, temperament changes such as unusual aggressiveness or uncharacteristic affection, dilation of the pupils, hyperreactive to stimuli. Neurologic signs tend to develop into one of two forms: (1) paralytic ("dumb") form - cranial nerve	First flu-like symptoms, including weakness, discomfort, fever, headache, also discomfort, prickling or an itching at the site of the bite. Symptoms then progress to cerebral dysfunction, anxiety, confusion, and agitation, eventually progressing to delirium, abnormal	Neurotropic virus in the genus *Lyssavirus*, family Rhabdoviridae; Virus is maintained in reservoir hosts; mostly members of the families Canidae (dogs, jackals, coyotes, wolves, foxes, raccoon dogs), Mustelidae (various skunks, ferret badgers), Viverridae (mongooses, genets), and	Most commonly via bites or scratches by a rabid animal, mostly dogs, also cats and wild animals (e.g., bats, raccoons, skunks, and foxes). Contact with infectious saliva or neurological tissues through mucous membranes or breaks in the skin. Rabies virus does not pass	Other names: hydrophobia or lyssa https://www.cdc.gov/rabies/index.html https://www.cfsph.iastate.edu/diseaseinfo/disease/?disease=rabies&lang=en https://www.cfsph.iastate.edu/Factsheets/pdfs/rabies.pdf https://www.cdc.gov/rabies/index.html

	dysfunction with paralysis of the throat and masseter muscles (inability to swallow and salivation follows), abnormal vocalization, facial paralysis, ascending spinal paralysis or paresis, ataxia, weakness, somnolence and obtundation and respiratory failure; (2) Furious form - infection of the limbic system, characterized by restlessness, wandering, howling, polypnea, drooling and unprovoked attacks on other animals, people or inanimate objects, abnormal behavior: animals swallow foreign objects, unusually alert, loss of their fear of humans in wild animals, activity during day light in nocturnal animals, convulsions, especially during the terminal stages, and death may occur during a seizure, or after ascending paralysis.	behavior, hallucinations, hydrophobia, and insomnia. Once clinical signs of rabies appear, the disease is nearly always fatal.	Procyonidae (raccoons), and the order Chiroptera (bats).	through intact skin. Incubation period from 2 – 3 weeks up to 3 months. Clinical course: after infection, virus replicates outside the nervous system, e.g., in muscle, with no clinical signs (eclipse phase). After days to months, virus travels via peripheral nerves to the CNS, where it replicates. The highest concentrations of virus at this time are in nervous tissue, cerebrospinal fluid, salivary glands and saliva.	

Avian / Zoonotic Influenza	Many animal species, e.g., chickens, ducks, pigs, horses, cats, rarely dogs. Production birds: (1) low pathogenic- ruffled feathers, drop in egg production; (2) highly pathogenic - multiple internal organs affected, mortality 90% to 100%. All mammal species may have fever and respiratory signs: cough, nasal and ocular discharge, sneezing, ocular inflammation, breathing difficulties. Pigs: variable severity, some may not show signs. Cats: usually mild signs, except if HPAI from ingestion of sick bird Horses: Mild to severe, secondary bacterial pneumonia may occur.	Varying severity; symptoms may include fever and respiratory signs: cough, nasal and ocular discharge, sneezing, ocular inflammation, breathing difficulties.	Influenza A virus causes highly contagious diseases among susceptible animal species. Some strains of Influenza A viruses have zoonotic potential.	Seasonal and Pandemic Flu – transmission via aerosol from person-to-person via droplets Zoonotic Flu – direct contact with infected bird (bird feces, body secretions) or water contaminated by feces of infected bird or inhalation of droplets containing virus from infected birds.	https://www.cdc.gov/flu/other/animal-flu.html https://www.cdc.gov/ncird/index.html https://www.avma.org/avian-influenza-companion-animals https://www.cdc.gov/flu/avianflu/avian-in-birds.htm https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/animal-disease-information/avian/avian-influenza/ai http://nasphv.org/documentsCompendiaZoonoticInfluenza.html https://www.cfsph.iastate.edu/Factsheets/pdfs/influenza.pdf

Salmonellosis	All Species show: Fever, diarrhea, lethargy, loss of appetite, abdominal pain. Cats, Dogs: Vomiting; diarrhea (possibly bloody) Horses: Severe colic	Nausea, diarrhea, fever, vomiting, abdominal cramps. Onset 6 hours to 6 days after infection. Duration 4 to 7 days	Samonellosis is caused by most types of *Salmonella* (except *Salmonella* serotype *Typhi* and *Salmonella* serotype *Paratyphi*)	Fecal-oral route: (1) Eating contaminated food or drinking contaminated water. (2) Touching infected animals, their feces, or their environment	https://www.cdc.gov/salmonella/index.html https://www.cdc.gov/salmonella/general/index.html https://www.fda.gov/animal-veterinary/animal-health-literacy/get-facts-about-salmonella
Anthrax	All mammals, with wide variation in susceptibility (Birds highly resistant, but can be affected). Signs may be (1) peracute: Staggering, trembling, dyspnea from oropharyngeal swelling, collapse and terminal convulsions; (2) acute: Fever and excitement followed by depression, stupor and anorexia, disorientation, muscle tremors, dyspnea, hematuria, diarrhea, congested mucous membranes, small scattered hemorrhages on the skin and mucous membranes, bloody discharges from orifices (nose, mouth and anus), (3) subacute or chronic disease: localized	Symptoms of anthrax depend on route of infection. Onset can range from 1 day to more than 2 months. Anthrax if untreated has the potential to spread through the body, causes severe illness and death. (1) Cutaneous anthrax: small blisters or bumps that may itch, sores/ulcers with a black center after the small blisters or bumps, swelling around the sore, location is most often	*Bacillus anthracis*, a spore-forming, Gram positive aerobic rod in the family *Bacillaceae*.	Main routes are through ingestion and inhalation of spores; entry through skin lesions is possible. In an animal shelter situation, the inhalation and cutaneous routes are most likely.	https://www.cfsph.iastate.edu/diseaseinfo/disease/?disease=anthrax&lang=en https://www.cdc.gov/anthrax/index.html https://www.cdc.gov/anthrax/symptoms/index.html

	swelling, fever and enlarged lymph nodes, difficulty swallowing, can become dyspneic, anorexia, vomiting, diarrhea (which may be bloody) or constipation.	face, neck, arms, or hand; (2) Inhalation anthrax: Fever, chills, drenching sweats, chest discomfort, shortness of breath, cough, headache, confusion or dizziness, nausea, vomiting, abdominal pain, body aches, extreme tiredness; (3) Gastrointestinal anthrax - Fever, chills, swelling of neck or neck glands, sore throat, painful swallowing, hoarseness, nausea, vomiting and diarrhea (often bloody), abdominal pain, headache, fainting.			

Appendix H: Personal Protective Equipment and Disinfectant Resources

Factors to consider are matching the PPE to the employee's work requirements and task-specific conditions. The tear resistance and seam strength of the PPE materials should be considered concerning the employee's tasks.

The effects of PPE on heat stress and task duration should also be considered. In some cases, multiple layers of PPE may be necessary to provide sufficient protection to the wearer or to protect PPE inner garments, suits, or equipment.

Specific knowledge of the hazards at the site or the animals being transported from a site will aid in appropriate PPE selection. As more information about the hazards and site conditions becomes available, the ICS Safety Officer should adjust the level of PPE protection accordingly.

Other factors to consider when selecting protective clothing include the mobility of the user and the susceptibility of the user to heat stress while working. AVMA has assembled a webpage regarding PPE for animal response.

Characteristics of Selected Disinfectants

This table provides general information for each disinfectant chemical class.
Antimicrobial activity may vary with formulation and concentration.
Always read and follow the product label for proper preparation and application directions.

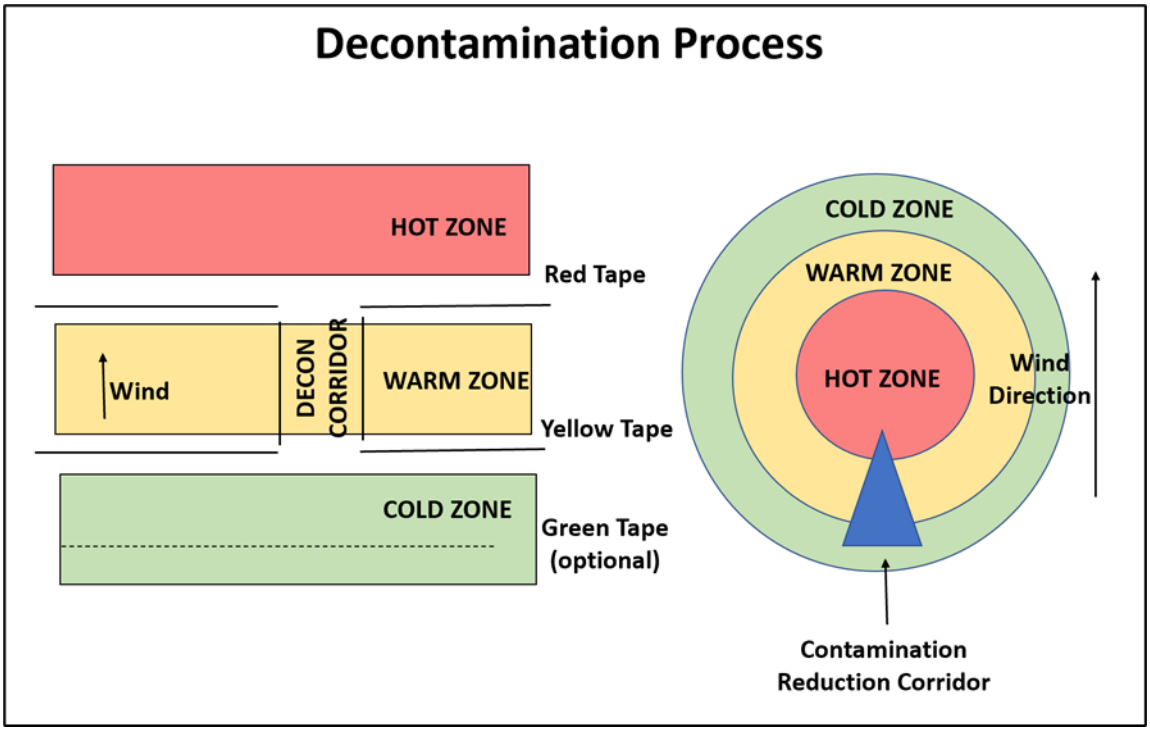
Disinfectant Category	Alcohols	Alkalis	Aldehydes	Oxidizing Agents			Phenols	Quaternary Ammonium Compounds
				Halogens: Chlorine	Halogens: Iodine	Peroxygen Compounds		
Common Active Ingredients	ethanol, isopropanol	calcium hydroxide, sodium carbonate, calcium oxide	formaldehyde, glutaraldehyde, ortho-phthalaldehyde,	sodium hypochlorite (bleach), calcium hypochlorite, chlorine dioxide	povidone-iodine	hydrogen peroxide/ accelerated HP, peracetic acid, potassium peroxymonosulfate	ortho-phenylphenol, orthobenzylpara-chlorophenol	benzalkonium chloride, alkyldimethyl ammonium chloride
Mechanism of Action	Precipitates proteins; denatures lipids	Alters pH through hydroxyl ions; fat saponification	Denatures proteins; alkylates nucleic acids	Denatures proteins	Denatures proteins	Denature proteins and lipids	Denatures proteins; disrupts cell wall	Denatures proteins; binds phospholipids of cell membrane
Characteristics	• Fast acting • Rapid evaporation • Leaves no residue • Can swell or harden rubber and plastics	• Slow acting • Affected by pH • Best at high temps • Corrosive to metals • Severe skin burns; mucous membrane irritation • Environmental hazard	• Slow acting • Affected by pH and temperature • Irritation of skin/ mucous membrane • Only use in well ventilated areas • Pungent odor • Noncorrosive	• Fast acting • Affected by pH • Frequent application • Inactivated by UV radiation • Corrodes metals, rubber, fabrics, • Mucous membrane irritation	• Stable in storage • Affected by pH • Requires frequent application • Corrosive • Stains clothes and treated surfaces	• Fast acting • May damage some metals (e.g., lead, copper, brass, zinc) • Powdered form may cause mucous membrane irritation • Low toxicity at lower concentrations • Environmentally friendly	• Can leave residual film on surfaces • Can damage rubber, plastic; non-corrosive • Stable in storage • Irritation to skin and eyes	• Stable in storage • Best at neutral or alkaline pH • Effective at high temps • High concentrations corrosive to metals • Irritation to skin, eyes, and respiratory tract
Precautions	Flammable	Very caustic	Formaldehyde has carcinogenic potential	Toxic gas released if mixed with strong acids or ammonia			May be toxic to animals, especially cats and pigs	
Bactericidal	+	+	+	+	+	+	+	+
Virucidal	±[a]	+	±	+	+	+	+	+ Enveloped
Fungicidal	+	+	+	+	+	±	+	+
Tuberculocidal	+	±	+	+	+	±	+	–
Sporicidal	–	+	+	+	±	+	–	+
Factors Affecting Effectiveness	Inactivated by organic matter	Variable	Inactivated by organic matter, hard water, soaps and detergents	Rapidly inactivated by organic matter	Rapidly inactivated by organic matter	Effective in presence of organic matter, hard water, soaps, and detergents	Effective in presence of organic matter, hard water, soaps,and detergents	Inactivated by organic matter, hard water, soaps and anionic detergents

+ = effective; ± = variable or limited activity; – = not effective

a - slow acting against nonenveloped viruses (e.g., norovirus)

References: Fraise AP, Lambert PA et al. (eds). *Russell, Hugo & Ayliffe's Principles and Practice of Disinfection, Preservation and Sterilization*, 5th ed. 2013. Ames, IA: Wiley-Blackwell; McDonnell GE. *Antisepsis, Disinfection, and Sterilization: Types, Action, and Resistance*. 2007. ASM Press, Washington DC. Rutala WA, Weber DJ, Healthcare Infection Control Practices Advisory Committee (HICPAC). 2008. Guideline for disinfection and sterilization in healthcare facilities. Available at: *http://www.cdc.gov/hicpac/Disinfection_Sterilization/toc.html*; Quinn PJ, Markey FC et al. (eds). *Veterinary Microbiology and Microbial Disease*. 2nd ed. 2011. West Sussex, UK: Wiley-Blackwell, pp 851-889.

The Center for Food Security & Public Health
Iowa State University College of Veterinary Medicine



Appendix I: Animal Bite Protocol and Responder Safety

During response operations, both animals and humans are operating in a high-stress environment which may increase fearful behavior and animal bites. All precautions should be taken to avoid potential stressors or causes for bite incidents such as fear-free handling, and restraint devices (muzzles, leashes, e-collars, rabies poles, etc.).

If an animal is showing signs of fear or aggression, the veterinary team members should work together, in coordination with the safety officer, to treat the animal while also reducing the risk of a bite wound as much as possible. If an animal bite wound does occur, the Safety Officer should be notified immediately, and all bite wound protocols and procedures should be followed per local authority rules and regulations.

Animal bites must be reported to the Safety Officer on duty immediately. The Safety Officer will notify the Shelter Manager as needed. Bites and some scratches will be considered a risk for rabies exposure regardless of whether an animal's rabies vaccination is up to date. All exposures by dogs, cats, and domestic animals must be reported to the local health department and Animal Control Officer (ACO) for the town where the animal will be quarantined.

If the ACO and health department are not immediately available, a bite report should be completed by the Safety Officer.

- Initiate proper wound care: Apply pressure to stop bleeding as needed. Immediately wash well with soap and water and apply disinfectant. Direct the person bitten to a first aid facility, hospital, or their choice of physician with any known information about the owner of the animal and the status of the animal's rabies vaccination.
- Until directed otherwise by Animal Control the animal should be placed in a marked isolation area without direct contact with people or other animals. Highlight the vaccination status and bite history of the animal on the cage card. No one is to handle this animal except professional staff who are specifically authorized to do so.
- STT laws may require that all dogs and cats that are exposed to humans must be quarantined for 10 days. The local ACO, when available, will determine the location and enforcement of the quarantine. The animal must remain under observation for 10 full days. Any illness noted in the animal during the 10 days must be reported to Animal Control and a veterinarian and attending physician immediately. If there is no vaccination history, the animal should NOT be vaccinated until after the 10-day observation period.

Other options, such as euthanasia and Rabies testing, or release to the owner must follow the protocol established by the state Department of Public Health.

A bite report should be completed and provided to the safety officer as well as any other required authority, depending on local regulations. At a minimum, a report should contain the following information:

- Date and time of bite
- Name address and contact number(s) of the pet owner
- Name address and contact number(s) of the person with a bite wound
- Location of bite on the body
- Circumstances under which the bite occurred; was the exposure provoked?
- Rabies immunization status of the human and the animal
- Name/Breed/Age of animal
- Unique ID #
- Cage/Kennel #
- Quarantine Location
- Dates quarantine starts and ends

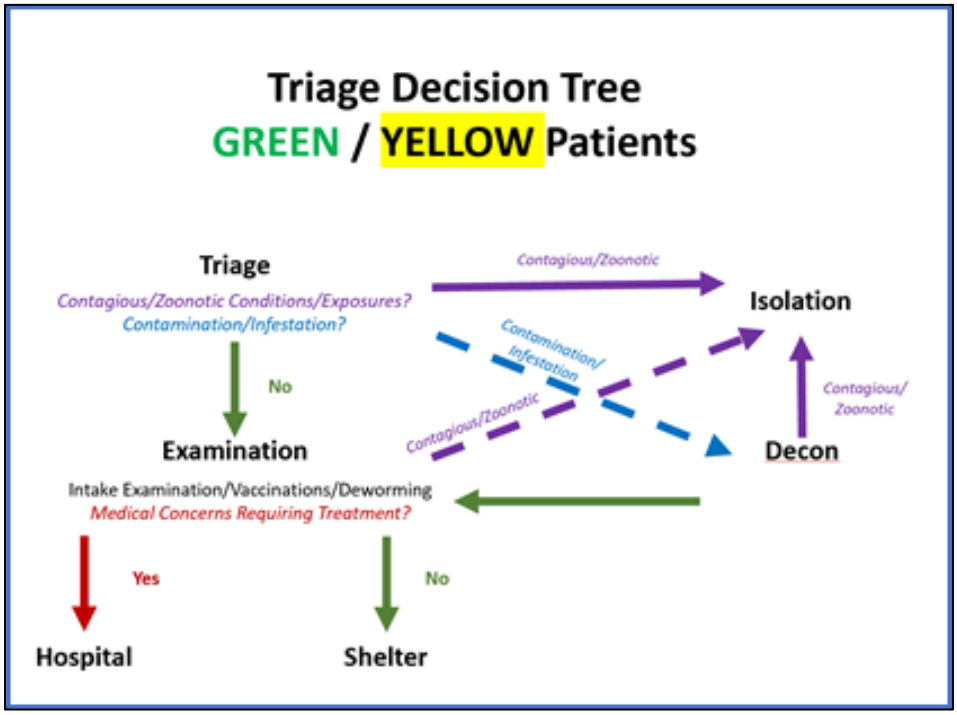
More information on best practices in managing community rabies risk and post-exposure protocols can be found at:

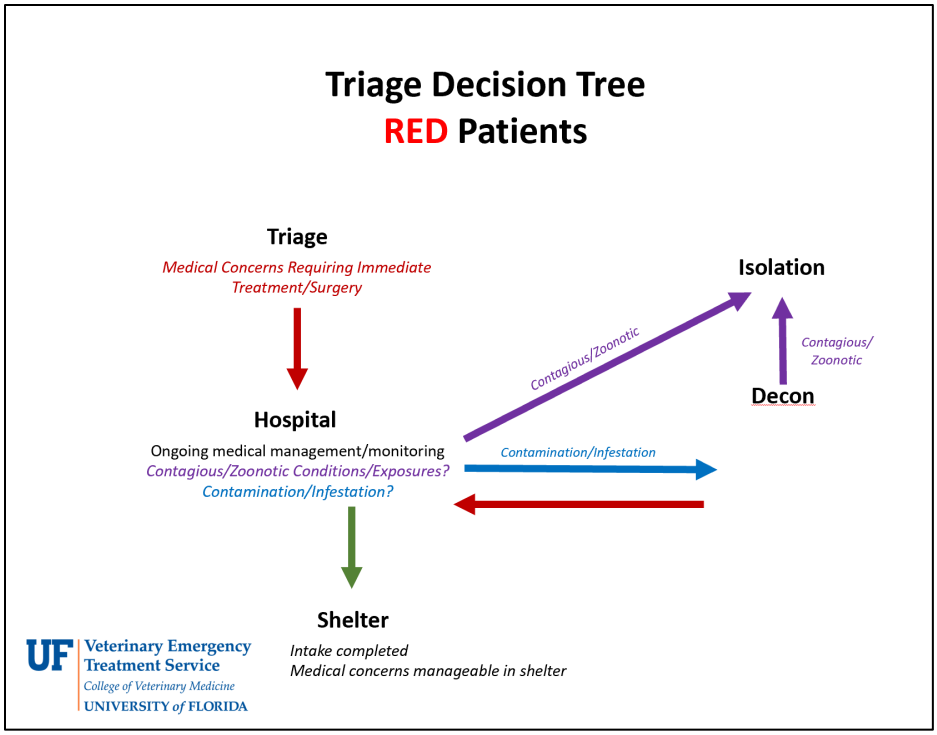
- National Association of State Public Health Veterinarians (NASPHV) – Compendia on various topics including Rabies Prevention and Control, Zoonotic Disease Control, and more.

Appendix J: Triage Resources

Triage Categories

RED	YELLOW	GREEN	BLACK	Decon
Requires immediate evaluation by veterinarian	**Requires evaluation but currently stable**	**No obvious medical concerns**	**Terminal condition or injury/DOA**	**Contamination/ Infestation**
Significant bleeding Respiratory distress Poor perfusion Severe injuries - Large lacerations - Severe fractures - Penetrating eye injury Seizures Unresponsive Non-ambulatory	Mild to moderate injuries - Small lacerations - Mild fracture - Non-penetrating eye injury Minor bleeding Dehydration Contagious/zoonotic	Apparently heathy Resolving medical issue	Terminal health conditions Terminal injuries Dead on arrival	Toxic substance contamination Ectoparasite infestation Ectoparasite infestation on contagious/ zoonotic individuals
All categories may require decontamination prior to handling				




Triage Decision Tree
RED Patients
Triage
Medical Concerns Requiring Immediate Treatment/Surgery
Isolation
Contagious/Zoonotic
Contagious/ Zoonotic
Decon
Hospital
Ongoing medical management/monitoring
Contagious/Zoonotic Conditions/Exposures?
Contamination/Infestation?
Contamination/Infestation
Shelter
Intake completed
Medical concerns manageable in shelter
UF Veterinary Emergency Treatment Service
College of Veterinary Medicine
UNIVERSITY of FLORIDA

Field Assessment and Triage Form

Animal Encountered in Hazardous Zone and Sheltered-in Place

Date:_____Time:_____Address or Geolocation:_____
Assigned Animal Identification Number:_____
Permanent Identification: Tag # _____ Microchip # _____
Brand_____ Tattoo _____ Other: _____
Species: _____ Breed: _____
Individual Animals: Color: _____ Markings: _____
Sex: ▢ Male, intact ▢ Female ▢ Male, castrated
If more than one animal in the premise, Number of Animals: _____

ASSESSMENT:

Mentation: _____ Comments: _____
Attitude: _____ Comments: _____
Ambulatory? ▢ N ▢ Y
Reluctant to move? ▢ N ▢ Y
Recumbent? ▢ N ▢ Y
Painful? ▢ N ▢ Y
Wounds? ▢ N ▢ Y
Swellings? ▢ N ▢ Y Comments: _____
Bleeding? ▢ N ▢ Y Comments: _____
Lameness? ▢ None ▢ Mild ▢ Moderate ▢ Severe _____
BCS: _____
Interest/Ability to: ▢ drink water ▢ eat appropriate foodstuff
Respiration Rate: _____ Respiration Effort: _____
Nasal Discharge: ▢ N ▢ Y
Comments: _____

If possible, obtain:

Heart rate (HR) _____ Pulse quality _____ Capillary Refill Time _____
Estimated Dehydration _____

Recommendation:
▢ Evacuate ▢ Rescue to shelter ▢ Rescue to medical facility ▢ Remain SIP

Care provided:
▢ None ▢ Water ▢ Food Other: _____

Treatment provided:
▢ None ▢ Yes - Describe: _____

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Appendix K: Vaccination Protocols

Sample Vaccination Protocol

Canine	Puppies (4 – 20 weeks)	Adult Dogs > 20 Weeks	Where to administer	Booster
DAPP (Canine Distemper, Adenovirus2 and Parvovirus	At the time of intake for all dogs 4 weeks and older.	At the time of intake	Subcutaneous Right forelimb	After initial series, revaccination is recommended at 1 year and at subsequent 3-year intervals
	Administer additional doses every 2-3 weeks until 18-20 weeks of age	Administer 1 additional dose 2-3 weeks post		
Intranasal Bordetella bronchiseptica & Canine parainfluenza virus	At the time of intake, for dogs 3-4 weeks or older, administer a single dose of an intranasal vaccine	At the time of intake, administer a single, intranasal dose	Intranasal	Administer a single dose annually
Rabies* (killed)	Administer a single dose for all animals determined to be 12 weeks of age or older		Subcutaneous, Right Hind Limb	Administer a single dose within 1 year post initial dose.
*Note: Be sure to follow all local and STT laws regarding rabies vaccination. STT specific information can be found here: http://rabiesaware.org				

Feline	Kittens (4-20 weeks)	Cats > 20 weeks	Where to Administer	Booster
FVRCP (Feline Herpesvirus 1, Calicivirus, Panleukopenia) attenuated live	At 4 weeks or later administer one dose at intake.	Administer one dose at intake.	Subcutaneous Right Fore Limb or Tail	2020 AAFP recommendations are to consider at 6 months of age rather than 1 year of age to decrease the potential window of susceptibility if the kitten had MDA at the last kitten booster Revaccinate every 3 years thereafter
	Administer additional doses every 2 weeks until 16-20 weeks of age	Administer second dose 2-3 weeks later.		
Rabies* (killed)	Administer a single dose for all animals determined to be 12 weeks of age or older		Subcutaneous, Right Hind Limb	Administer a single dose within 1 year post initial dose.

Sources:

American Animal Hospital Association - Vaccination of Shelter Dogs and Puppies

American Animal Hospital Association - Core Vaccines for Shelter Cats

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Appendix L: Point of Care Testing (POCT)

POCT Recommendations

Conduct POCT when:

- Animals show clinical signs of:
  - Parvovirus
  - Panleukopenia
  - Heartworm
  - Feline Leukemia Virus
  - Feline Immunodeficiency Virus
- Group housing cats show clinical signs of:
  - FeLV/FIV
- Interstate transport requires a negative test for:
  - Heartworm
  - FeLV/FIV
  - Tick borne disease
- Animals originate from heartworm endemic areas:
  - Heartworm or 4DX

For information on FeLV/FIV:
https://journals.sagepub.com/doi/pdf/10.1177/1098612X19895940

For information on heartworm:
https://www.heartwormsociety.org/veterinary-resources/veterinary-education/ahs-board-speaks-out/281-managing-heartworm-disease-in-shelter-animals

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Appendix M: Common Causes of Disease Outbreaks in Shelters

Average Incubation and Shedding Times

CANINE	Average Incubation	Average Shedding	Reference
Parvovirus	3-7 days	14 days	https://www.uwsheltermedicine.com/library/resources/canine-parvovirus-cpv
Distemper	1-2 Weeks as long as 4-5 weeks	As long as 4 months	https://www.uwsheltermedicine.com/library/resources/canine-distemper-cdv
CIRDC	2-3 days	5-10 days	https://www.uwsheltermedicine.com/library/resources/canine-infectious-respiratory-disease-complex-cirdc-a-k-a-kennel-cough
Influenza	2-5 days	7 days	https://www.uwsheltermedicine.com/library/resources/canine-influenza
Strep zoo	1 week	Weeks w/o antibiotics	https://sheltermedicine.vetmed.ufl.edu/2018/05/31/pima-strep-zoo/

FELINE	Average Incubation	Average Shedding	Reference
Feline URI	< 1 week	1-3 weeks	https://www.uwsheltermedicine.com/library/resources/feline-upper-respiratory-infection-aka-uri
Panleukopenia	2-14 days	Up to 14 days post infection	https://www.sheltermedicine.com/library/resources/?r=feline-panleukopenia
M. canis	4 days to 4 weeks	Until cured	https://www.uwsheltermedicine.com/library/guidebooks/ringworm/ringworm-dermatophytosis

Parvovirus and Panleukopenia can be diagnosed using point of care antigen (snap) tests and review of a complete blood count (CBC). Any cat that dies suddenly in their enclosure should be tested for panleukopenia.

Dermatophytosis (ringworm) may most expediently be diagnosed with a Wood's lamp and a microscopic evaluation of glowing hair bulbs (referred to as a trichogram) and then confirmed with a PCR or fungal culture but those typically have a longer turnaround time.

Suspicion of Canine Distemper needs to be confirmed by a reference laboratory. Ideally, relationships with outside reference labs should be established during the planning phase and are useful for running bloodwork and other diagnostic testing. Isolated cases of upper respiratory infections in dogs and cats don't always need to have the exact pathogen identified, but if very large numbers of animals are impacted it

is important to ascertain the causative agent. These tests are run in a reference laboratory.

For more information: https://www.uwsheltermedicine.com/library/guidebooks/canine-parvovirus/risk-assessment-how-do-you-decide-how-much-to-worry-about-exposed-animals.

Appendix N: Tracking Form for Animals Exposed to Infectious Disease

Patient Zero - Shedding for 3 days prior
Date (3 days prior to diagnosis):_____

ID#	Name	Sex	Intact (Y/N)	Age	Date in Shelter	Date of First Da2pp Vaccine	Date of Second Da2pp Vaccine	Medical Diagnosis (if any)	Days from Vaccination to Exposure	Date Diagnosed with Parvo	Notes	Vaccination Check Requested/ Results	Risk Assessment Results

Animals Exposed to Patient

ID#	Name	Sex	Intact (Y/N)	Age	Date in Shelter	Date of First Da2pp Vaccine	Date of Second Da2pp Vaccine	Medical Diagnosis (if any)	Days from Vaccination to Exposure	Date Diagnosed with Parvo	Notes	Vaccination Check Requested/ Results	Risk Assessment Results

Daily Rounds Action List

Date	Animal ID	Location	Reason or Diagnosis	Action Required	Date Action Required	Requested by (initials)	Examined by (Initials)	Recorded by (initials)

Source: https://www.sheltermedicine.com/library/resources/?r=daily-shelter-rounds

Appendix O: Euthanasia Resources

Euthanasia must be done humanely. Refer to the AVMA Guidelines for the Euthanasia of Animals and just-in-time training Euthanasia and Mass Depopulation fact sheet for current recommendations.

Euthanasia equipment may include (not a complete list):

- Muzzles
- Rabies pole
- PPE
- Cadaver bags
- Euthanasia solution
- Other sedative drugs
- Needles
- Syringes
- Cotton and alcohol
- Tape
- Clippers
- Tourniquet

Euthanasia of Patients Quarantined after Biting a Human

Depending on the vaccination status of the animal and the local entity in which operations are taking place, rabies quarantine requirements following a bite incident may differ with each situation. For animals that qualify for “home quarantine,” efforts should be coordinated with local shelters or foster organizations for potential quarantine options.

For those animals that must be quarantined at a medical facility, local or surrounding veterinary facilities should be contacted and coordinated with, when possible. For those animals where euthanasia and further rabies testing are required, the veterinarians involved will need to coordinate with the Safety Officer and STT or local public health officials to determine the appropriate procedures and protocols to follow.

Keep in mind that the protocol in this situation is determined by jurisdictional authority based on local and STT laws. Therefore, no animal in quarantine should be euthanized without the permission and knowledge of the local ACO and/or the state veterinarian (jurisdictional authority).

A bite report should accompany any quarantined animal and this report should be attached to the euthanasia report form.

That bite report should include the following information:

- Date and time of bite
- Name, address, and contact information of pet owner (if available)
- Name, address, and contact number of the person with a bite wound
- Location of bite on the body
- Circumstances under which the bite occurred; Was the exposure provoked?
- Rabies immunization status of the human and the animal (if known)
- Date quarantine starts and ends.

Appendix P: Large Animal Identification Resources

Sheep and Goat

Because of the Scrapie Eradication Program, sheep and goats generally have official Individual IDs including official ear tags, registry or flock ID tattoos, or official Electronic Implantable ID ear tags. Corresponding ear tags may vary in type or color and are either plastic, metal, or radio-frequency identification (RFID) tags.

Given the urgency of a disaster or animal health emergency, if a sheep or goat is without identification, a plastic ear tag can be applied. The State Animal Health Official can assist in identifying appropriate tags.

Horses, Mules, and Donkeys

Equids are often identified by their color, markings, brands (hot iron or freeze branding), lip tattoos, or microchips. Tags attached temporarily to the mane (mane tags) or collars may be used in disasters and animal health emergencies. Other temporary means of identifying equids involve paint or other temporary markings on different areas of the animal such as the sides, hind quarters, and hooves.

Cattle

Cattle are identified by ear tags (plastic, metal, or RFID), brands, tattoos, or backtags. Dairy cattle may also have neck bands or leg bands. Depending on the availability of facilities and the animals' demeanor, identification may or may not be provided in a disaster situation. Oftentimes it will be least stressful to leave the animal(s) isolated and in a secure location, noting the other types of aforementioned information.

Plastic ear tags or state-approved backtags can be issued in an emergency. Microchips are not approved in food animals and should not be implanted in any food animal species.

Pigs

Depending on the type, pigs are identified in several ways. Commercial swine may not have any identification, may have a "slap tag" on their hide, a plastic ear tag, or be ear notched using the Universal Ear Notching System. Breeding or exhibition swine may also utilize RFIDs. Ink may also be used to paint temporary numbers on back.

Plastic ear tags or back paint can be used for swine identification in an emergency.

Camelids

Identification of camelids includes a complete physical description. Metal or plastic ear tags, tattoos, and microchips may also be present. While not permanent or ideal, ID tags can be applied to halters.

Poultry

Non-commercial poultry may have a leg band or wing tattoo. Temporary identification is best placed on the cage or housing. Species, estimated age (adult vs. chick), and color markings should be recorded.

Appendix Q: Common Causes of Disease Outbreaks in Equine Shelters

Early signs of infectious and contagious diseases are often unspecific signs as fever, anorexia, and lethargy. Clinical signs other than these will point to potential agents. The tables below list diseases for different taxa/species groups.

- ND = Notifiable disease
- RD = Reportable disease
- C = contagious diseases
- HC = High Contagious
- Z = Zoonotic
- TDC = transmission by direct contact
- TF = Transmission by fomites (equipment, personnel, etc.)
- d = days
- wk = weeks

Clinical Signs	Potential Agents	Transmission Mode	Average Incubation	Average Shedding	Comments	References
Respiratory: nasal discharge, coughing, etc.	Eq Herpesvirus 1 and 4	Aerosol TDC and TF	4 - 10 d (As short as 1 d)	7 d after post recovery	HC between equids only, Require high level of Biosecurity	https://aaep.org/sites/default/files/2021-04/EHV_1-4_Guidelines_2021.pdf https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/animal-disease-information/equine/ehv/equine-herpesvirus
	Equine Influenza Virus	Aerosol TDC and TF	1 – 3 d	7 – 10 d post recovery	HC between equids only, Require high level of Biosecurity	https://www.equinediseasecc.org/equine-influenza
	Streptococcus equi [Strangles]	Aerosol TDC and TF	3 – 14 d	2 – 3 wk post recovery	HC between equids only, Require high level of Biosecurity	https://www.equinediseasecc.org/strangles
Digestive: Colic, diarrhea	Eq Coronavirus	Fecal-oral	2 – 4 d	3 – 15 d post recovery	C between equids only, Require high level of Biosecurity	https://www.equinediseasecc.org/equine-coronavirus
	Samonella spp.	Fecal-oral	1 – 5 d	Days up to > 30d	C, Z, Require high level of Biosecurity	https://www.equinediseasecc.org/salmonellosis
	Clostridium spp.	Fecal-oral	As short as 1 d	Unknown	C, Z, Require high level of Biosecurity	https://www.equinediseasecc.org/clostridial-entertis

Clinical Signs	Potential Agents	Transmission Mode	Average Incubation	Average Shedding	Comments	References
Ulcerations: ulcerative stomatitis, coronitis, crusting muzzle and nares	Vesicular Stomatitis Virus	Insect vectors, TDC, TF	2 – 8 d	At the time of recovery	Arbovirus, C to equids, cattle swine, sheep, goats, llamas, and alpacas, Z, R	https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/animal-disease-information/equine/vsv/vesicular-stomatitis https://www.equinediseasecc.org/vesicular-stomatitis
Neurologic: ataxia, tremors, recumbency	Eq Herpesvirus [Myeloencephalopathy]	Aerosol TDC and TF	4 - 10 d	21 d	HC between equids only, RD, Require high level of Biosecurity	https://equinediseasecc.org/Content/ContentDocs/EHM_Guidance_Document_Revised_2018.pd.pdf https://aaep.org/sites/default/files/Documents/EHV1_4_Final.pdf
	Rabies Virus	Exposure to saliva (bite wound) or neuronal tissue and fluid	2 – 6 wk or longer	During clinical signs, Fatal disease	Insidious onset of signs, often dumb form, furious form possible; Fatal at 5 - 7 d post signs, Require isolation of animal, Z, R	https://www.equinediseasecc.org/rabies
Alopecia and skin eruptions	Dermatophytosis [Ringworm]	TDC			C, Z, Require isolation of animal	https://www.merckvetmanual.com/horse-owners/skin-disorders-of-horses/ringworm-dermatophytosis-in-horses