सत्यमेव जयते

पशुपालन एवं डेयरी विभाग, भारत सरकार

Department of Animal Husbandry and Dairying
Government of India

CRISIS MANAGEMENT PLAN FOR LIVESTOCK DISEASES

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Disclaimer

The Crisis Management Plan (CMP) for Livestock Diseases, prepared by the Department of Animal Husbandry and Dairying (DAHD), serves as a guiding document for the effective management of livestock health crises. While the CMP outlines strategies and protocols aimed at minimizing risks associated with livestock diseases, it is important for stakeholders to consult relevant laws, regulations, and guidelines applicable to their specific situations.

The CMP is a living document that may be subject to updates and revisions based on emerging scientific evidence, changes in disease patterns, or shifts in regulatory requirements. Successful implementation of the CMP requires collaboration and coordination among various stakeholders, including governmental agencies, veterinary professionals, livestock owners, and the community. The DAHD encourages active participation and feedback from all parties involved

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ABBREVIATIONS

ADS	Animal Disease Surveillance
AHD	Animal Husbandry Department
A-HELP	Accredited Agent for Health and Extension of Livestock Production
AHO	Animal Husbandry Officer
AHS	African Horse Sickness
AI	Avian Influenza
AICRP	All India Coordinated Research Projects
APHCA	Animal Production and Health Commission for Asia and the Pacific
AQCS	Animal Quarantine and Certification Services
ARIMA	Auto Regressive Integrated Moving Average
AS	Additional Secretary
ASCAD	Assistance to States for Control of Animal Diseases
ASF	African Swine Fever
AWBI	Animal Welfare Board of India
BSE	Bovine Spongiform Encephalopathy
CADCP	Critical Animal Disease Control Programme
CADRAD	Centre for Animal Disease Research and Diagnosis
CBPP	Contagious Bovine Pleuro-Pneumonia
CCHF	Crimean Congo Hemorrhagic Fever
CDD	Cattle & Dairy Division
CDDL	Central Disease Diagnostic Laboratory
CDMC	Crisis and Disaster Management Cell
CDSCO	Central Drug Standard Control Organization
CEAH	Center for Epidemiology and Animal Health
CMP	Crisis Management Plan
CPDO	Central Poultry Development Organization
CPMF	Central Para Military Forces
CSF	Classical Swine Fever
DAHD	Department of Animal Husbandry and Dairying
DCGI	Drugs Controller General of India
EAD	Emergency animal diseases
ERDDL	Eastern Regional Disease Diagnostic Laboratory, Pune
ESVHD	Establishment and strengthening of Veterinary Hospitals
FAO	Food and Animal Organisation
FETP	Field Epidemiology Training Program
FMD	Foot and Mouth Disease
GOI	Government of India
HPAI	Highly Pathogenic Avian Influenza

ICAR	Indian Council of Agricultural Research
IDF	International Dairy Federation
KVKs	Krishi Vigyan Kendras
LH	Livestock Health
LH & DCP	Livestock Health & Disease Control Programme
MoEFCC	Ministry of Environment, Forest and Climate Change
MoFAHD	Ministry of Fisheries, Animal Husbandry and Dairying
MoHFW	Ministry of Health and Family Welfare
MoRD	Ministry of Rural Development
MVU	Mobile Veterinary Units/ Clinics
NADRES	National Animal Disease Referral Expert System
NCCM- LS	National Committee for Crisis Management for Livestock Sector
NCDC	National Centre for Disease Control
NDDB	National Dairy Development Board
NDLM	National Digital Livestock Mission
NDMA	National Disaster Management Authority
NDRF	National Disaster Response Force
NERDDL	Northeastern Regional Disease Diagnostic Laboratory
NGO	Non-Governmental Organisations
NIDM	National Institute of Disaster Management
NIFMD	National Institute of Foot and Mouth Disease
NIHSAD	National Institute of High Security Animal Diseases
NIVEDI	National Institute of Veterinary Epidemiology and Disease Informatics
NJORT	National Joint Outbreak Response Team
NLM	National Livestock Mission
NRCE	National Research Centre on Equines
NRDDL	Northern Regional Disease Diagnostic Laboratory, Pune
PPE	Personal Protective Equipment
PPR	Peste des Petits Ruminants
RDDL	Regional Disease Diagnostic Laboratories
RVC	Remount & Veterinary Corps
SDMA	State Disaster Management Authority
SDRF	State Disaster Response Force
SHG	Self Help Groups
SRDDL	Southern Regional Disease Diagnostic Laboratory
TAD	Transboundary Animal Diseases
TI	Training Institute
WAHIS	World Animal Health Information System
WOAH	World Organisation for Animal Health
WRDDL	Western Regional Disease Diagnostic Laboratory, Pune

राजीव रंजन सिंह उर्फ ललन सिंह
RAJIV RANJAN SINGH ALIAS LALAN SINGH

सत्यमेव जयते

पंचायती राज मंत्री
एवं मत्स्यपालन, पशुपालन एवं डेयरी मंत्री
भारत सरकार
Minister of Panchayati Raj and
Minister of Fisheries, Animal Husbandry and Dairying
Government of India

Do No. .....MIN PR&FAHD/20.....

MESSAGE

India's livestock sector is a cornerstone of its agricultural economy, supporting over two-thirds of the rural population. As the world's largest milk producer, India contributes significantly to rural development and food security, with strong output in meat and animal products. This thriving sector plays a critical role in enhancing livelihoods and ensuring nutritional security across the nation.

To sustain this growth, protecting livestock from diseases is critical. The Crisis Management Plan for Livestock Disease focuses on preparedness, early detection, vaccination, and biosecurity to safeguard livelihoods and ensure animal welfare.

The Crisis Management Plan for Livestock Disease focuses on preparedness, early detection, vaccination, and biosecurity, enhancing disease management. By adopting a comprehensive, multi- tiered approach, the plan strengthens our national and local capabilities in disease management, fostering resilience within the livestock sector.

The successful implementation of this action plan requires the cooperation of all stakeholders, including farmers, veterinarians, industry professionals, and policymakers. I urge everyone to collaborate closely and act diligently to protect our livestock assets. Together, we can build a resilient livestock sector that continues to thrive and contribute to the well-being and prosperity of our nation.

(Rajiv Ranjan Singh)

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एवं
पंचायती राज मंत्रालय
भारत सरकार

सत्यमेव जयते

Prof. S. P. Singh Baghel
Minister of State
Fisheries Animal Husbandry & Dairying
and
Ministry of Panchayati Raj
Government of india

MESSAGE

India's livestock sector is vital to rural economies, providing income, nutrition and employment to millions. As the world's largest milk producer and significant meat producer, ensuring livestock health and productivity is crucial for food security and economic growth.

Disease outbreaks pose significant threats, leading to economic losses, disrupted supply chains and public health risks. The Crisis Management Plan addresses these challenges through preventive measures, robust biosecurity protocols and effective stakeholder coordination. Key strategies include strengthening surveillance, improving vaccination coverage and enhancing rapid response mechanisms.

Success relies on collective efforts among farmers, veterinarians, industry partners and government agencies, supported by cooperation, commitment, regular training, capacity building, infrastructure development and public awareness campaigns. Effective implementation will mitigate disease risks, protect livestock, ensure food security, support rural communities and enhance India's livestock sector competitiveness.

The Crisis Management Plan contributes to India's economic stability, livestock health and productivity, preventing significant losses, protecting human and animal health, ensuring sustainable growth and maintaining export competitiveness, while safeguarding millions of farmers' livelihoods. Together, we can secure India's livestock future, ensuring the well-being of those dependent on this critical sector..

(Prof. S. P. Singh Baghel)

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Government of India
Ministry of Fisheries Animal Husbandry & Dairying
Department of Animal Husbandry and Dairying
Krishi Bhawan, New Delhi-110001

24th October, 2024

MESSAGE

The livestock sector is a crucial component of India's agricultural economy. However, it faces significant challenges from livestock diseases that threaten stability and lead to considerable economic losses. Addressing these issues requires timely and coordinated actions to protect animal health, secure farmers' livelihoods, and safeguard public health.

The Crisis Management Plan for Livestock Diseases, developed by the Department of Animal Husbandry and Dairying, provides a strategic framework for disease prevention, early detection, and effective response. By prioritizing biosecurity, vaccination, and enhanced coordination, the plan aims to reduce the impact of outbreaks and ensure the well-being of our livestock population.

This plan underscores our commitment to protecting animal health and ensuring the sustainability of the livestock sector. It also aligns with the One Health approach, acknowledging the interconnections between animal, human, and environmental health. Through this initiative, we aim to enhance the resilience of our livestock sector and establish rapid response mechanisms to effectively manage disease crises.

I would like to express my gratitude to everyone who contributed to the development of this plan. Together, we can work towards safeguarding our livestock resources and securing the livelihoods of millions of farmers across India.

(Alka Upadhyaya)

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PREFACE

The Crisis Management Plan for Livestock Diseases is a vital framework that addresses the significant threats posed by disease outbreaks to India's vast livestock population. Livestock diseases can severely impact animal health, disrupt trade, limit market access, and, in the case of zoonotic diseases, pose serious public health risks. Recognizing these challenges, the Ministry of Fisheries. Animal Husbandry, and Dairying has developed this comprehensive plan to protect the livestock sector, which is crucial to the livelihoods of millions of farmers and the nation's economy.

India's livestock sector is a cornerstone of the rural economy, providing food security and contributing to foreign exchange through exports of animal products. However, disease outbreaks can cause substantial economic losses, reduce productivity, and damage the long- term well-being of farmers. The Crisis Management Plan (CMP) offers a structured approach to managing these risks, with a focus on prevention, preparedness, and response.

Key elements of the CMP include disease surveillance for early detection, early warning systems to predict outbreaks, and coordinated response strategies to manage crises effectively. It emphasizes the need for rapid action and continuous monitoring to minimize the impact of diseases. Additionally, the plan highlights capacity-building initiatives, such as training veterinarians and farm staff, to ensure quick and informed decision-making during disease outbreaks.

The plan underscores the importance of prevention as the most cost-effective strategy. incorporating biosecurity measures, vaccination programs, and public awareness campaigns, It also ensures that stakeholders, from national to local levels, are involved in management and recovery efforts, fostering collaboration across government departments, veterinary services. and local communities.

Through this plan. the government demonstrates its commitment to safeguarding livestock health, protecting farmers livelihoods, and maintaining food security. By fostering collaboration and preparedness, the Crisis Management Plan is designed to ensure India's livestock sector remains resilient in the face of future disease challenges.

I would like to extend sincere appreciation to all the stakeholders, including ICAR, NCDC, the Ministry of Health, NDMA, and the dedicated technical officers of the Department of Animal Husbandry & Dairying (DAHD), for their invaluable contributions. Special thanks are due to the Secretary. AHID for continuously pushing us forward, providing leadership, and encouraging the team over the past year to ensure the successful formulation of this critical document.

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CHAPTER 1

PREPAREDNESS

Preparedness is the foundation of an effective Crisis Management Plan (CMP) in the context of livestock disease control. It involves strategic planning, resource allocation, and coordinated efforts to prevent, detect, and respond to potential disease outbreaks. A well-prepared system can significantly mitigate the impact of diseases on the livestock industry, food security, economic stability, and public health. The key components of preparedness include surveillance, early warning systems, legislative frameworks, capacity building, mock drills, stockpiling essential supplies, raising awareness among stakeholders, and proper carcass disposal. By establishing robust preparedness measures, CMP aims to create a resilient infrastructure capable of handling emergencies efficiently and minimizing the risks associated with livestock diseases.

1.1. Disease Surveillance and Reporting

Disease surveillance and reporting are essential components of a robust livestock disease crisis management plan. Early detection of diseases is critical as it aids in assessing the effectiveness of national control and eradication measures. Effective surveillance measures and control programs in India have led to the attainment of World Organisation for Animal Health (WOAH) disease-free status for several diseases, including Contagious Bovine Pleuro-Pneumonia (CBPP), Bovine Spongiform Encephalopathy (BSE), and African Horse Sickness (AHS). The global eradication of Rinderpest was also achieved through continuous efforts in disease surveillance, monitoring, and vaccination.

India hosts four WOAH reference laboratories: ICAR-National Institute of High Security Animal Diseases (NIHSAD, Bhopal) for Avian Influenza, the Veterinary College Bangalore for Rabies, and the PPR and Leptospirosis laboratory at ICAR-NIVEDI, Bangalore. These institutions have been instrumental in monitoring and controlling four major diseases of global concern. Additional national reference laboratories specialize in specific diseases, such as ICAR-NIFMD in Bhubaneswar for Foot and Mouth Disease (FMD), ICAR-NRCE in Hisar for equine diseases, and ICAR-NIVEDI in Bangalore for surveillance and epidemiology.

1.1.1. Active and Passive Surveillance

The Department of Animal Husbandry and Dairying (DAHD) conducts active surveillance for diseases such as Foot and Mouth Disease, Brucellosis, *Peste des Petits* Ruminants (PPR), and Highly Pathogenic Avian Influenza. A robust network of laboratories supports the timely diagnosis of both livestock and wildlife diseases. Coordination and data sharing between these sectors are vital, as the Department of Animal Husbandry and Dairying (DAHD) serves as the nodal agency for reporting data to the WOAH.

The disease diagnostic laboratories at the State and district levels, along with one Central Disease Diagnostic Laboratory (CDDL) and six Regional Disease Diagnostic Laboratories (RDDLs) for diagnostic services are pivotal in the country's animal disease diagnosis and control activities. Furthermore, private animal disease diagnostic laboratories also operate across the country besides the government-run diagnostic laboratories. Currently, the diseases monitored on priority include Foot and Mouth Disease, Peste des

Petits Ruminants, Brucellosis, Avian Influenza, Lumpy Skin Disease, Africa Swine Fever and Bovine Spongiform Encephalopathy (BSE).

Emergency response is supported by specialist laboratories such as ICAR-NIHSAD Bhopal, which have contributed significantly to the early detection of exotic animal diseases.

Passive surveillance detects unusual mortality events, guided by the Animal Disease Surveillance Report (ADSR), which includes all notifiable diseases listed under the Prevention and Control of Infectious & Contagious Diseases in Animals Act, 2009. States and Union Territories submit monthly ADS reports, enabling the department to evaluate the national disease scenario and devise effective control strategies. Contact details of WOAH reference laboratories are available in Annexure I.

1.1.2. Early Warning

The Indian Council of Agricultural Research – National Institute of Veterinary Epidemiology and Disease Informatics (ICAR–NIVEDI) has an early warning system (NADRES- National Animal Disease Referral Expert System) for important livestock diseases (15 endemic diseases) and has the capacity for surveillance through the AICRP (All India Coordinated Research Projects) centers. These centers collect monthly animal disease information, which is collated and updated regularly. The meteorological & remote sensing parameters are extracted and forecasted using the Auto Regressive Integrated Moving Average (ARIMA) models. The disease outbreaks are further modelled through an Artificial Intelligence system of algorithms to predict the risk of diseases with reasonable accuracy and a lead time of 2 months in advance to enable stakeholders for better preparedness and response. The predicted risks are classified as no risk, very low risk, low risk, moderate risk, high risk, and very high risk. The predicted risk maps of the disease are regularly communicated to the central and state governments. Forewarning of the disease is based on the concept that it can help prevent possible disease outbreaks through precautionary measures.

1.1.3. National Digital Livestock Mission (NDLM)

The NDLM is a transformative initiative aimed at building a robust digital ecosystem for India's animal husbandry sector, strengthening animal health surveillance and preparedness. This mission is a crucial pillar for the proposed Crisis Management Plan, featuring:

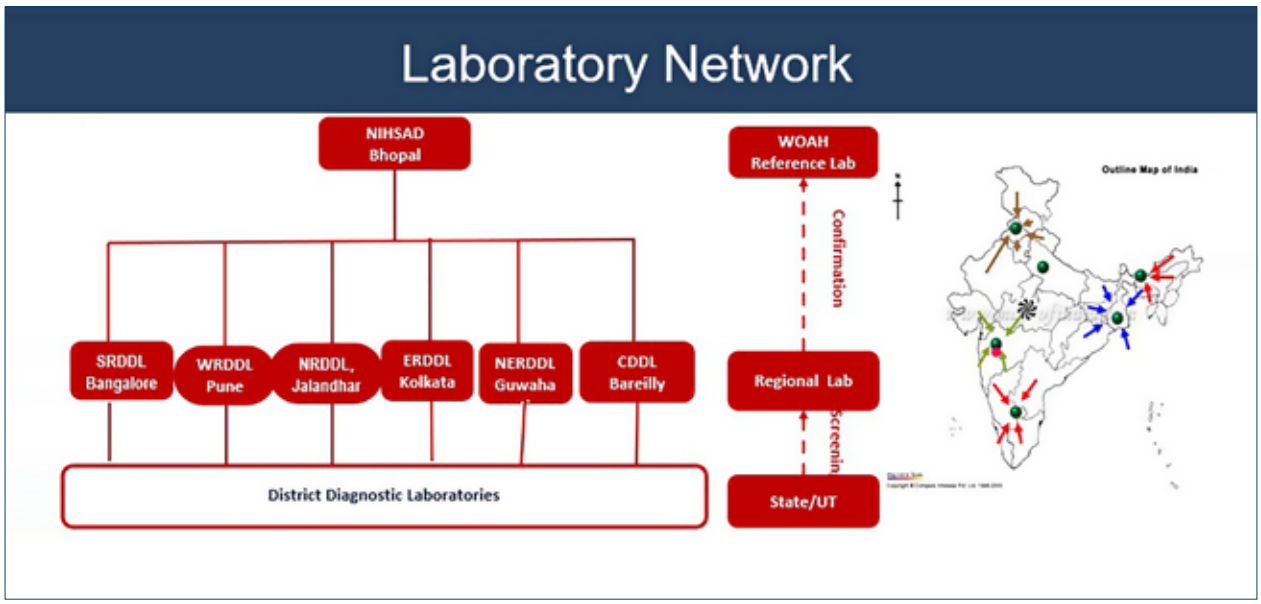


Figure 1: Laboratory Network for Diseases (AI, LSD, ASF, Exotic disease etc)

- **Unique Animal Identification:** Each animal receives a unique ID linked to the farmer's ID, creating a centralized database for tracking individual animals, their movements, and health records. This real-time data allows for immediate identification and isolation of diseased animals, preventing disease outbreaks.
- **Data-Driven Decision Making:** NDLM's comprehensive data analysis provides insights into disease patterns, animal movements, and market trends. This empowers policymakers to make informed decisions on disease prevention, resource allocation, and market interventions.

Incorporating the NDLM into the Crisis Management Plan will ensure early identification of disease outbreaks, effective mitigation strategies, and continuous surveillance and monitoring to prevent pandemics.

1.2. Legislative Framework

The Government of India has enacted an Act namely "The Prevention and Control of Infectious and Contagious Diseases in Animals Act, 2009". The list of notifiable diseases by the states is given in the schedule of the Act. (http://www.dahd.nic.in/sites/default/files/Gazette_20-03-09.pdf). The states have been empowered to take necessary action to appropriately deal with disease situations.

The provisions of the Act strengthen the power of the State Governments to effectively tackle, control and eradicate animal diseases.

This Act aims to prevent the spread of economically important infectious and contagious diseases from one part of the country to another, to control animal diseases of public health significance on a national basis, and to promote the import and export of animals and animal products by meeting India's international obligations.

The Act also specifies the roles of government officers in times of disease outbreak, for animal segregation, identification of controlled areas, prohibition of movement, providing vaccination, and undertaking other precautionary measures.

Under provisions of the Act, livestock owners or any other government or private personnel functioning in the area having knowledge about an outbreak of an infectious disease in the livestock have to inform the nearest Veterinary Dispensary/Hospital/ Veterinary Aid Centre, which is further communicated to the Veterinary Officer/ Surgeon and the information further flows to the Director of Veterinary Services/Chief Veterinarian of the State.

In case of noncompliance with the Prevention and Control of Infectious and Contagious Diseases in Animals Act, 2009, provisions for penalties are listed under chapter five (5) of the Act.

The Act includes provisions for:

- **Prevention and Control:** Measures to prevent the introduction and spread of infectious and contagious diseases among animals.
- **Surveillance and Reporting:** Obligations for timely detection and reporting of disease outbreaks.
- **Quarantine and Movement Control:** Regulations for quarantine and restriction of movement of animals to control disease spread.
- **Vaccination and Treatment:** Guidelines for the vaccination and treatment of animals to prevent disease outbreaks.
- **Euthanasia and Disposal:** Procedures for the humane euthanasia and disposal of infected animals to prevent further spread.

1.3. Capacity Building

In the Crisis Management Plan (CMP), the emphasis lies on training personnel on disease prevention, detection, and response procedures, with a particular focus on veterinarians and animal health professionals. Boost training programs for veterinarians and animal health professionals to enhance their crisis response skills. Training is provided under the ASCAD, Continuous Veterinary Education including the Field Epidemiology Training Program (FETP) for outbreak investigation and response, as well as Sector Connect initiatives. These are also planned under the Pandemic Fund to strengthen capacities further. Investment in professional development aims to bolster preparedness to manage livestock disease outbreaks swiftly and effectively. Training personnel on disease prevention, detection, and response procedures is essential.

1.4. Mock Drills

Prioritizing mock drills and exercises is imperative, especially considering the provisions available under the ASCAD, a component of LH & DCP. Through ASCAD, states can avail themselves of resources and support to enhance their preparedness for disease outbreaks. These provisions can include funding assistance, technical expertise, and guidance in conducting mock drills tailored to regional needs. By leveraging the resources provided under ASCAD, states can strengthen their capacity for response planning, training, and evaluation, ultimately improving their ability to effectively manage livestock disease outbreaks.

1.5. Stockpile Essential Supplies

To ensure an effective response to livestock disease outbreaks, it is crucial to stockpile essential supplies including vaccines, diagnostic kits, Personal Protective Equipment (PPE), and treatment medications. Establishing procurement protocols, maintaining secure storage facilities, and implementing inventory management systems are essential for ensuring the availability and integrity of these supplies. Regular training and capacity-building exercises should be conducted to familiarize personnel with proper handling and deployment procedures. Periodic reviews and updates of stockpile inventories and procurement plans are necessary to adapt to evolving disease threats and optimize response readiness.

1.6. Vaccine Quality and Vaccine Delivery

A vaccine quality ensures the purity, safety, potency and efficacy of veterinary vaccines. Such programs provide a standardized, harmonized approach to quality control, production, testing and regulation of veterinary vaccines used in the country

Vaccine delivery ensures effective delivery of vaccine, including maintenance of the cold chain and proper administration is essential for achieving an adequate level of population immunity. This requires the implementation of governmental and/or private schemes that include quality assurance controls of vaccine distribution.

1.7. Awareness, Dissemination of Information and Preventive Measures

Awareness is critical for the timely control of infectious disease without further spreading and avoiding mortality. It helps strengthen biosecurity, disinfection, vaccination, sero-monitoring and surveillance to secure optimum animal health. The training programs and awareness programs conducted with well monitored coordination between Government of India and the State governments in view of the multi benefits of disease control, the surveillance programs conducted by the veterinary services are effective.

Accredited Agent for Health and Extension of Livestock Production (A-HELP) create awareness and provide information to the animal owners/community on scientific health management of Livestock, basic sanitation

& hygienic practices which will keep herself/ himself and their animals healthy, other information on existing Veterinary health services in their area of operation. A-HELP will share their telephone numbers with Mobile Veterinary Units/ Mobile Veterinary Clinics (MVUs/MVCs), if active in their area, they can coordinate with the call center as and when required. This model will be implemented across the Country. A-HELP worker will be the first port of call for any health-related demands of livestock population of that village, especially those who find it difficult to access the Veterinary health services. A number of institutes under Indian Council of Agricultural Research and States provide continuing education and awareness programs on animal diseases to different categories of personnel in the country.

CHAPTER 2

PREVENTION STRATEGIES

Effective prevention strategies are essential for mitigating the risk and impact of livestock disease outbreaks. By implementing proactive measures, we can safeguard animal health, ensure food security, and maintain economic stability. These strategies encompass biosecurity measures, vaccination programs, quarantine procedures, regulatory compliance, international coordination, research and innovation. A well-rounded prevention approach not only reduces the likelihood of disease introduction but also enhances our preparedness to respond swiftly and efficiently to potential threats.

2.1 Biosecurity Measures

The implementation of stringent biosecurity measures stands as a fundamental component. This involves the enforcement of rigorous biosecurity protocols across farms and agricultural facilities aimed at preventing the introduction and spread of diseases among livestock populations. Biosecurity is an integrated approach encompassing policy and regulatory frameworks to analyze and manage risks in the areas of animal health and food safety, including associated environmental risk. These measures include Biosecurity measures such as controlled entry into farms, adherence to hygienic practices (i.e., cleaning and disinfection of premises, hands, shoes and attire of the farm workers), quarantine of sick and newly purchased animals and movement restrictions, efficient provision of veterinary services, proper disposal of carcasses (Detailed guidelines for carcass disposal are provided in Annexure IV), evaluation of ethno-therapeutic options, health monitoring and screening of animals for suspected diseases, vaccination against existing endemic and epizootic diseases, training of livestock handlers and veterinary staff, and careful planning of day to day events can help to prevent the spread of diseases.

2.2 Vaccination Programs

2.2.1 Livestock Health & Disease Control Programme

The Department of Animal Husbandry and Dairying (DAHD) is committed to support states in maintaining livestock health and managing diseases through various control programs and an animal disease reporting system. National control programs focus on diseases such as Foot and Mouth Disease (FMD), Brucellosis, Classical Swine Fever (CSF), and Peste des Petits Ruminants (PPR), implemented regionally to address specific disease threats.

2.2.2 National Animal Disease Control Programme (NADCP)

Launched in September 2019, the National Animal Disease Control Programme (NADCP) is a flagship initiative aimed at controlling and eventually eradicating FMD and Brucellosis. This program involves vaccinating 100% of cattle, buffalo, sheep, goat, and pig populations against FMD, and all bovine female calves aged 4-8 months against Brucellosis. The goal is to control FMD by 2025 through widespread vaccination, leading to its eradication by 2030. This effort is expected to boost domestic production and enhance exports of milk and livestock products. Additionally, the Intensive Brucellosis Control Programme aims to manage and reduce Brucellosis in both animals and humans.

2.2.3 Critical Animal Disease Control Programme

The Critical Animal Disease Control Programme focuses on eradicating PPR by 2030 through the vaccination of all sheep and goats and controlling Classical Swine Fever (CSF) by vaccinating the entire pig population. These targeted vaccination efforts are crucial for managing and eventually eliminating these diseases.

2.2.4 Mobile Veterinary Units (MVUs)

To meet farmers' demand for accessible veterinary services, the DAHD provides funds to States/UTs for Mobile Veterinary Units (MVUs) at a ratio of one MVU per one lakh livestock population. These customized vehicles are equipped for veterinary healthcare, including diagnosis, treatment, minor surgery, and educational outreach. MVUs deliver veterinary services directly to farmers at their doorsteps based on calls received at state call centres, ensuring timely and effective animal healthcare at last mile.

2.2.5 Assistance to States for Control of Animal Diseases (ASCAD)

The ASCAD component supports state-prioritized vaccination against economically important livestock and poultry diseases, with an emphasis on zoonotic diseases like anthrax and rabies. The 'Control of Emergent and Exotic Diseases' activity includes surveillance and measures to prevent the spread of diseases like Avian Influenza, Glanders, African Swine Fever, and Nipah virus. Assistance for ring vaccination during outbreaks and compensation for culling of infected animals, birds, and destruction of infected feed/eggs are also provided. Additionally, the ASCAD component provides funds for research, innovation, training, capacity building, crisis management, and mock drills through collaborations with recognized institutions and other government departments.

2.3 Quarantine Procedures

Robust Quarantine Procedures are established to effectively prevent the spread of infectious diseases through the establishment of protocols for the quarantine and isolation of sick animals. The central legislation governing livestock importation, "The Livestock Importation Act of 1898," amended in 2001, regulates all import and export activities of livestock and livestock products within the country. Section 3A of this Act grants the Central Government authority to regulate, restrict, or prohibit the entry of livestock and livestock products that pose a risk to human and animal health. Importation from countries experiencing deadly infectious disease outbreaks exotic to India is strictly regulated, with total bans or restrictions imposed accordingly.

To enforce these regulations, quarantine stations are strategically located at major international airports and seaports in Delhi, Mumbai, Chennai, Kolkata, Hyderabad, and Bengaluru. Livestock and livestock products are permitted entry only through these designated stations, where they undergo thorough quarantine inspection, testing, laboratory examination, and decontamination procedures before being permitted to interact with local stock. These stringent measures ensure adequate safeguards to prevent the introduction of exotic diseases from abroad into India.

Detailed Standard Operating Procedures (SOPs) outlining these quarantine procedures are available on the official website of the Animal Quarantine and Certification Services (AQCS) at www.aqcsindia.gov.in. These SOPs serve as comprehensive guidelines for stakeholders involved in livestock importation and quarantine activities, further reinforcing the efficacy of our quarantine protocols in safeguarding animal and human health.

2.4 Regulatory Compliance

Regulatory compliance is paramount to ensure adherence to relevant regulations and guidelines concerning animal health and disease control. Priority is placed on ensuring access to high-quality vaccines with regulations aligned to the Drugs and Cosmetics Act of 1940 and its 1945 Rules. Oversight of import, manufacturing, and marketing of veterinary products falls under the purview of the Central Drug Standard Control Organization (CDSCO) under the Ministry of Health & Family Welfare. Proposals from CDSCO undergo thorough evaluation by specialized committees within the DAHD to ensure stringent standards are met.

Through the implementation of these comprehensive vaccination programs and the establishment of supporting infrastructure, the DAHD aims to bolster livestock health, mitigate the risk of disease outbreaks, and safeguard the safety and productivity of the livestock sector.

2.5 International Coordination

International coordination is key to combating Transboundary Animal Diseases (TADs). By working closely with global partners like the World Organization for Animal Health (WOAH), the International Dairy Federation (IDF), and the Animal Production and Health Commission for Asia and the Pacific (APHCA), an Organization under the Food and Agriculture Organization (FAO), we strengthen our efforts. This collaboration allows us to share vital information, resources, and strategies, enabling us to effectively tackle shared challenges and prevent the spread of diseases across borders. To prevent TADs, there is a need to collaborate on illegal trade in animals and their production, vaccination, and quarantine.

2.6 Research and Innovation

Research and Innovation play a crucial role in advancing our ability to prevent and control livestock diseases. These efforts are essential for staying ahead of emerging threats and ensuring the health and productivity of our livestock populations.

The Department supports research and innovation activities through various schemes, including the Livestock Health & Disease Control Programme (LH & DCP), National Livestock Mission (NLM), and others. These schemes provide funding and resources to support research projects focused on improving animal health, enhancing disease surveillance, and developing innovative solutions for disease prevention and control.

2.7 Compensation

Compensation fund serves as a financial safety net, specifically earmarked to compensate for the loss of livestock, including the market value of culled animals, and other associated costs such as disposal, cleaning, and disinfection of infected premises. By providing timely compensation, the fund not only alleviates the immediate financial burden on affected livestock owners but also facilitates swift and effective disease control and containment measures. Under the Assistance to States for Control of Animal Disease (ASCAD) component of the Livestock Health and Disease Control Programme (LH&DC), a structured compensation mechanism is established for diseases such as Avian Influenza (AI), African Swine Fever (ASF), Glanders, and others. This compensation is disbursed based on a 50:50 sharing basis between the central and state governments, emphasizing the shared responsibility and commitment to safeguarding livestock health, ensuring fair compensation for losses incurred, and promoting resilient and sustainable livestock farming practices across the country.

2.8 Sustaining Surveillance

Maintaining robust surveillance networks is imperative even after the immediate crisis

has passed. Sustained surveillance efforts are essential to promptly detect any resurgence of diseases or emerging threats, allowing for timely intervention and containment measures. Continued surveillance enables monitoring of disease trends, identification of potential hotspots, and assessment of the effectiveness of control measures implemented during the crisis. By sustaining surveillance efforts, livestock health can be safeguarded, future outbreaks prevented, and the resilience of the livestock sector against emerging threats maintained.

These additions strengthen the CMP by emphasizing proactive measures for economic recovery and ongoing vigilance in disease prevention and control. They underscore the importance of preparedness and resilience in safeguarding both animal health and the livelihoods of livestock owners.

CHAPTER 3

RESPONSE TO THE CRISIS

The response to livestock disease outbreaks requires a well-coordinated and swift action plan to mitigate the spread of diseases and safeguard animal and human health. This chapter outlines the response mechanisms in place, including resource mobilization, rapid response teams, National Joint Outbreak Response Team (NJORT), MoHFW created to handle zoonotic diseases with focus on one health initiatives, movement restrictions, border control, communication protocols, and disposal strategies. The effective application of these strategies ensures that outbreaks are managed efficiently, reducing the risk to livestock and human populations and maintaining economic stability in the agricultural sector.

A veterinary aid centre is the first disease information unit at the grassroots level. Under the provisions of the Disease Control Act, livestock owners or any other government/ private personnel having knowledge about an infectious disease outbreak in livestock must inform the nearest Veterinary Dispensary/Hospital/Veterinary Aid Centre. This information is further communicated to the Veterinary Officer/Surgeons and then to the Director of Veterinary Services/ Chief Veterinarian of the State. The State Director sends report to the DAHD, MoFAHD, Government of India. Accordingly, the department communicates the information to WOAH through WAHIS portal after laboratory confirmation.

The State Government will declare an outbreak in the area as per the provisions of the Prevention and Control of Infectious and Contagious Diseases in Animals Act, 2009. Control and containment operations will be initiated immediately, including movement restrictions. An effective chain of command exists for emergency response from the national level (DAHD) to the states, divisions/ districts, blocks, and the field.

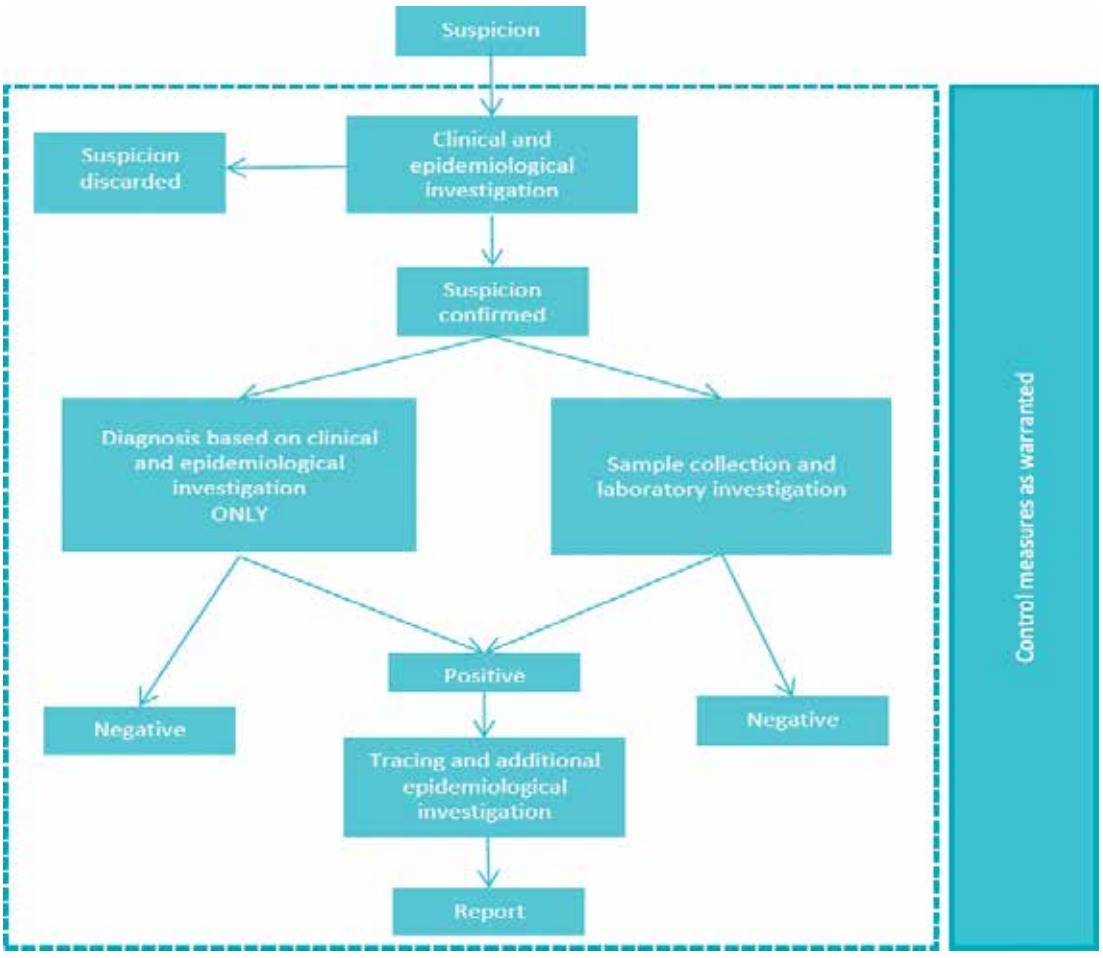
An effective response mechanism is crucial for managing livestock disease outbreaks promptly and effectively. By mobilizing resources, deploying rapid response teams, implementing movement restrictions, strengthening border control, and establishing clear communication protocols, we can contain outbreaks, minimize transmission risks, and protect animal and human health. Continuous coordination and collaboration among stakeholders are essential for the success of response efforts in safeguarding the livestock industry and public health.

3.1 Action in Case of Suspected Cases

- **Reporting Suspicion:** Any person who suspects an animal may have a notifiable disease must report to the veterinary authority. Livestock owners, veterinarians, or other stakeholders report suspected cases to the nearest veterinary clinic or district animal husbandry officer.
- **Initial Assessment:** The district animal husbandry officer conducts an initial assessment and collects relevant information about the suspected case. The suspected case report is transmitted to the State and DAHD office through designated reporting channels.
- **Verification:** The State office verifies

the reported case by coordinating with district officers and conducting further investigations if necessary.

- **Quarantine Measures:** Quarantine measures are imposed on establishments with suspected cases, pending final diagnosis. Movement of susceptible animals in and out of the infected area is restricted. In farms or backyard premises, entry of persons and vehicles is allowed only by following bio-security measures. All zoo-sanitary measures are undertaken at the site by the owner under the supervision/ advice of the veterinarian.
- **Laboratory Testing:** Samples collected from suspected cases are sent to designated laboratories for diagnostic testing and confirmation of the disease, with intimation to DAHD. The State/DAHD office coordinates with the laboratory to expedite testing and communicate test results to relevant stakeholders.
- **Resource Allocation:** The State Animal Husbandry Department ensures resources, including personnel, equipment, and supplies, to support response efforts are in place.
- **Coordination with Departments:** The State/DAHD office coordinates with other concerned departments, including the Department of Health, Department of Forest/Wildlife, and Disaster Management Authorities, to ensure a cohesive response.



*Central expert field visits to affected area support state on ground and to frame operational strategies based on local risk parameters

Figure 2: Flowchart of the outbreak investigation process

- **Contact Information:** Updated telephone contacts of the concerned DAHD and State Director/CVO, the deputy veterinary officer, and appropriate senior public servants, as well as a list of the senior national veterinary staff and their addresses, telephone numbers and emergency contacts, should be maintained.

3.2. Action in Case of Confirmed Cases

3.2.1. Disease Notification

- **Notification:** The Director must notify the Directors of neighbouring states about the occurrence of scheduled disease for taking preventive measures, as per the Act. Control and containment operations, including movement restrictions, will be initiated immediately.
- **International Notification:** Notify trading partners in other countries about the outbreaks and infected areas through The World Animal Health Information System (WAHIS) portal.

3.2.2. Resource Mobilization

- **Resource Allocation:** Allocate resources for personnel, equipment, and supplies to support response efforts.
- **National and International Support:** Coordinate with national and international partners for additional support, if needed.
- **Emergency Funding:** Emergency funding arrangements are well established under ASCAD.
- **Mobile Veterinary Units:** Mobile Veterinary Units (MVUs) support the government mechanism to react to a disease outbreak emergency.

3.2.3. Rapid Response Teams

- **Activation:** Activate response teams to promptly investigate suspected cases and confirm diagnoses through laboratory testing.
- **Deployment:** Deploy Mobile Veterinary Units to conduct field assessments and provide immediate support to affected areas.
- **Operations:** State Animal Husbandry Rapid Response Teams (RRTs) are responsible for operations like vaccination, supervision, and undertaking disinfection.

The National Joint Outbreak Response Team (NJORT) has been established, bringing together experts from the Ministry of Health and Family Welfare, ICMR, the Department of Animal Husbandry & Dairying, ICAR, and the Ministry of Environment, Forest and Climate Change. The primary objective of NJORT is to collaborate on outbreak investigations for zoonotic diseases, enabling the rapid detection of emerging infection hotspots, conducting timely investigations, and implementing effective measures for prevention and control.

3.2.4. Movement Restrictions

- **Quarantine:** Implement quarantine and movementrestrictionstopreventthespread of the disease by quarantining affected focal areas and restricting the movement of livestock/poultry and products from the affected area to unaffected areas within the country temporarily until the case is confirmed negative.
- **Border Control:** Strengthen border control and import regulations to prevent the introduction of diseases from foreign countries.

3.2.5. Response and Containment

- **Containment Measures:** Implement rapid containment measures, such as movement restrictions, culling infected animals (if the policy permits, e.g., HPAI, ASF as per GOI action plan), and disinfection of affected areas.
- **Clean-up and Disinfection:** Clean and disinfect affected areas and implement strict bio-security measures.

- **Check Posts and Quarantine Camps:** Check Posts and Quarantine Camps play a crucial role in enforcing disease control measures, including detention, inspection, vaccination, and issuance of permits for animal movement.
- **Inspection and Detention at Check Posts and Quarantine Camps:** Personnel at Check Posts and Quarantine Camps conduct inspections and detain animals as per state regulations to ensure compliance with disease control measures.

3.2.6. Emergency Communication

- **Public Awareness:** Gram Pradhan/ Panchayat initiates necessary public awareness campaigns in rural areas soon after reporting the outbreak.
- **Communication Channels:** Establish clear communication channels for disseminating information to stakeholders. The State AHD office engages with livestock owners, veterinary professionals, government agencies, and community leaders to provide information, address concerns, and solicit feedback.
- **Regular Updates:** Provide regular updates on the status of outbreaks, response efforts, and preventive measures to maintain public trust and confidence.
- **Misinformation:** Address misinformation and rumours promptly with factual information from authentic sources.

3.2.7. Intensifying Surveillance

- **Surveillance:** Conduct contact tracing and surveillance to identify and isolate infected animals. Share surveillance data on zoonotic diseases between DAHD and MoHFW to ensure timely exchange of critical information and foster collaboration through regular reporting and joint investigations. This coordinated effort enhances disease monitoring, enables targeted control measures, and safeguards public health. Establish a clear coordination mechanism between DAHD and MoEFCC for detecting wildlife-related disease threats, detailing respective nodal officers. This aims to enhance early outbreak detection from wildlife, enabling proactive measures to protect livestock and public health. Surveillance data should be uploaded in NDLM Portal.

3.2.8. Vaccination

- Implement ring vaccination, carpet/ preventive vaccination strategies tailored to specific diseases and their epidemiology.
- Establish buffer zones around outbreak areas through targeted vaccination efforts to prevent disease spread and protect susceptible populations.
- Vaccination data should be uploaded in NDLM porta.

3.2.9. Establishment of a Control Room

- **Control Room:** Set up a 24-hour Control Room within the infected area, equipped with telephones, STD-facility, fax machines, computers with internet access, and secretarial assistance. Personnel in the Control Room should receive and disseminate comprehensive information clearly. The Control Room may be contacted by several news agencies/media. .

3.2.10. Disposal

- **Infected Material:** Dispose of infected animal material in a bio-secure manner to minimize transmission risk.
- **Contingency Strategies:** Formulate contingency strategies for animal disposal and disinfection procedures, adhering to established guidelines to halt disease spread.
- **Disposal Guidelines:** Follow annexed guidelines for the disposal of animal carcasses and disinfection procedures (**Annexure IV).**

3.3 Restocking

Restocking of premises following disease outbreaks is a carefully managed process to ensure the safety and health of livestock populations. After thorough cleansing and disinfection, controlled restocking may be permitted with a limited number of sentinel animals. These animals are closely monitored to ensure the absence of disease, with samples often taken for laboratory testing to confirm disease eradication. Complete lifting of restrictions and full restocking is contingent upon conclusive laboratory results confirming the absence of disease on the premises. For diseases with prolonged outbreaks or inadequate secondary disinfection, restocking may be delayed for several months. Detailed guidelines specific to each disease control strategy outline the requirements and procedures necessary for safe restocking.

3.4 Restoration of Disease Freedom and Recovery

Once a disease outbreak is contained, the focus shifts to promptly restoring disease-free status, crucial for resuming normal trade activities without delay. Achieving disease-free status can be a lengthy process, especially concerning trade with other countries. Therefore, collaboration is imperative from the onset of an outbreak between government authorities and stakeholders to minimize its impact on trade. Additionally, concerted efforts are needed to mitigate the broader economic impacts on rural areas and the domestic economy as a whole. Effective disease outbreak management, economic loss mitigation, and expedited return to normal trade and economic activities can be achieved through proactive collaboration.

Further detail can be found in the disease control strategies for each disease about specific requirements.

- National Action Plan- Preparedness, Control and Containment of Avian Influenza-2021 (https://dahd.nic.in/sites/default/filess/Revised%20AI%20Action%20Plan%202021_1.pdf)
- National Action Plan for Control, containment and eradication of African Swine Fever (https://dahd.nic.in/sites/default/filess/ASF_NAP_Booklet_0.pdf)
- Action Plan for Control and Containment of Glanders (https://www.dahd.nic.in/sites/default/filess/Action%20Plan%20for%20control%20&%20Containment%20of%20Glanders%20in%20Equines%2006032018.pdf)
- Advisory on Lumpy Skin Disease (https://www.dahd.nic.in/division/advisory-lumpy-skin-disease)
- Operational Guidelines for NADCP (https://dahd.nic.in/sites/default/filess/NADCP%20Operational%20Guidelines%2031.12.2019.pdf)
- Advisory on Heat wave situation https://dahd.nic.in/sites/default/filess/HeatwaveAdvisoryLivestock_1.pdf

CHAPTER 4

SAFEGUARDING ANIMALS DURING DISASTER

In India millions of people depending on animals for their livelihoods and is very important sector for the development of India. It is necessary to ensure that the animals are included in disaster management plans, to help animals, communities, and local people survive and thrive after disasters. Department of Animal Husbandry & Dairying also released the Disaster Management Plan during 2016. The plan for the first time ensures that animals are included in disaster preparations, potentially saving millions of animals lives and building the resilience of the communities that depend on them. The State have mandate to develop their action plan as per state condition and requirements taking into account factors like prevailing socio-economic conditions, climatic conditions, geographical status and type of animal population in consultation with various line department and SDMA. Department is regularly cooperating with NDMA in respect to technical inputs related to risk mitigation strategies in respect to livestock sector. Department has also formulated advisories/ guidelines on disasters like Monsoon/Flood, Drought/Heat, Thunderstorm and Cold wave to the states for taking advance action and preparedness. Department has also advised all the states regarding risk consideration and promoting disaster resilient infrastructure

During CoVID-19 pandemic, Department issued the advisory to all the states to include Veterinary Services as essential service and formulated the CoVID-19/related guidelines in respect to animals sector in line with one health and zoonosis.

Further, Department implements the Livestock Health and Disease Control Programme (LHDCP), a Central Sector Scheme in all states with the aim of reducing risk to animal health by prophylactic vaccination against diseases of animals, capacity building of veterinary services, disease surveillance and strengthening veterinary infrastructure. The major activities supported are vaccination against Foot and Mouth Disease (FMD), Brucellosis, *Peste des Petits Ruminants* (PPR) and Classical Swine Fever (CSF); Establishment and Strengthening of Veterinary Hospitals and Dispensaries-Mobile Veterinary Units (ESVHD-MVU); and Assistance to States for Control of Animal Disease (ASCAD) for control of state prioritized economically important, exotic, emergent and zoonotic animal diseases. The funding pattern is 100% central assistance for the NADCP and the non-recurring components of ESVHD and 60:40 between Central and State for the other components as well as for ASCAD, with 90:10 for hilly and NE States and 100% for UTs.

4.1 Prevention and Preparedness

DAHD DMP 2016 support State AHDs on advisories related to identification of vulnerability amongst livestock Farms, preparedness and various risk mitigation strategies as under:

- State Animal Husbandry and Fisheries Departments have to assess and review the impact of different disasters on livestock, develop surveillance and control strategies using epidemiological information and tools, Geographic Information Systems (GIS) and risk assessment and risk mapping methodology.
- For identification of resources for rescue

and treatment of animals during disasters, States/UTs will take the following measures:

» Assess available manpower i.e. Veterinary doctors, Para veterinarian staff, and ancillary staff.

» Review disaster management preparedness of Veterinary medical facilities such as veterinary hospitals, mobile veterinary units etc.

» Provision of adequate storage of Medicine, Vaccines, Surgical and Veterinary Appliances, Diagnostics, Personal Protective Equipments (PPEs), life saving equipments etc.

» Ensure the logistical requirements such as fuels, lighting equipment, tents, sheds, bedding, trolleys, and material for sanitation, storage of feed and fodder and water.

» Arrangements for ambulance and outreach facility for sick and injured animals.

» Identification of disease diagnostic and control measures for animal diseases.

» Assessment of existing animal handling search and rescue capacity, equipment, infrastructure facilities and related resources available at State and District levels.

4.2 Preparedness Steps

4.2.1 Capacity Building for Disaster Management

- Designating state as well as district departments as nodal agency for each specific activity during disasters by the State Governments.
- Training requirement analysis and development of training modules for veterinary professionals in collaboration with NOMA and NIDM, NDRF, veterinary Colleges & NGOs by the State Governments.
- Training of veterinary personnel, paravets, attendants, SDRF and civil defence personnel etc. in livestock disaster management.
- Animal owners to be trained by District Administration, NDRF. SDRF regarding handling of animals during such disasters.
- Animal health awareness for animal owners, social workers, volunteers.
- Conduct of mock exercises on regular basis as per state specific needs based on their OM plan by State Governments.
- Establishing emergency communication channels, alternate channels like Ham radios.
- Inclusion of training module on disaster management under the training and capacity building component of the on-going schemes of the DAHD for training of officers, trainers, farmers and cattle owners on mitigation of risk of disaster on livestock and fodder.
- A module or section on Disaster Management may be incorporated in the relevant trainings of trainers at Central Poultry Development Organization & Training Institute (CPDO& TI), Hessarghatta and at other CPDOs for basic disaster-time handling by small and marginal farmers as per disaster profile of the region.

4.2.2 Strengthening Veterinary Extension Services

- Veterinary extension services must go beyond routine health care and focus on proactive disaster preparedness. This includes educating communities about animal care during natural calamities such as floods, droughts, and cyclones.
- By equipping them with skills in disaster response, disease control, and biosecurity, the plan ensures that these workers can effectively manage livestock emergencies

and provide critical support to affected communities.

- During a crisis, Veterinary Extension Services play a key role in providing on-the-ground support, ensuring that farmers and local authorities receive timely updates on disease outbreaks, vaccination schedules, and response protocols. Extension workers can act as first responders by educating communities on how to implement emergency measures to control the spread of diseases.
- During disasters, Veterinary Extension Services can serve as a critical conduit for disseminating timely information about evacuation procedures, emergency animal healthcare, and vaccination campaigns. Extension workers can also coordinate with local veterinarians and emergency responders to ensure rapid mobilization of resources.

4.2.3 Animal Population Profile

- State and District-wise animal population profile and distribution should be prepared and integrate vulnerability map with livestock profile for better disaster management.

4.3 Response Actions During a Disaster

4.3.1 Effective and Prompt Response

- The Animal Husbandry Departments at State/UTs will take requisite measure to constitute, train and equip veterinary emergency response units at state and district levels for prompt response to any emergency situation along with SDRF and NDRF. These Veterinary Emergency Response Units may be trained by NDRF and resource persons from state level veterinary colleges.
- Community being the first responder, the state level veterinary emergency response unit along with SDRF and NDRF will conduct community capacity building and awareness generation programme in the vulnerable areas.
- Assistance of Civil Defence, NGOs, Veterinary College, SDRF, NDRF, Veterinary wing of CPMFs (Central Paramilitary Forces) and Remount & Veterinary Corps (RVC) in rescue of livestock.
- State/UTs will organise cattle shed/shelter for livestock to save them from adverse climatic conditions depending on the nature of disaster like earthquake, cyclone and Tsunami etc.,
- Fluid therapy and treatment of sick/injured animals along with availability of adequate vaccine against prevailing animal diseases and due to impacts of earthquake, flood, tsunami, and drought etc.

4.3.2 Rescue of Animals

- SDRF, NDRF, Veterinary wing of CPMFs, RVC and other specialised agencies/ organizations/institutes shall assist State AHDs in livestock rescue and management during different disasters.
- State/District AHO (Animal husbandry Officer) will constitute Animal Rescue Teams and provide requisite training to team members.
- Training of animal owners for rescue of livestock during disaster should be imparted by District Authorities by involving NDRF, SDRF, NGOs and specialised agencies/ organisations in rescue and handling of animals.
- Arrangements for provision of life saving equipments and rescue of animals, transportation of feed, fodder, medicine and vaccine.
- Animals to be carefully shifted to suitable safer locations. Poultry birds are shifted with the help of bamboo cages to temporary pen. The dead birds should be segregated from the live ones.

- As far as possible the animal camps should be organized near human relief camps so that owners can take care of their animals and manage them better.

4.3.3 Treatment of Injured/Sick Animals

- Arrangement for treatment injured/sick animals and including ad lib fluid therapy, preventive vaccination in healthy animals against prevailing disease preventive vaccinations.
- Shifting of animals from flooded and devastated areas to safer places to save them from diseases.
- Post disaster, animals like cattle, buffalo, sheep, goat, pig dog and poultry need to be de-wormed with suitable broad spectrum anthelmintic to enable animals to regain proper health.

4.3.4 Arrangement of Drinking Water for Animals

- Ensuring availability of safe and clean drinking water for animals and poultry.
- Adequate water supply will be ensured by efficient use of available water resources, rejuvenation of existing water resources and transporting of water from outside, if required. Fish farmers to be allowed to draw intake water from the irrigation channel during drought situation.

4.3.5 Measures Against Epidemics and Diseases During Disaster

- The most common diseases during drought and flood periods are Foot and Mouth disease, Hemorrhagic Septicaemia, Black Quarter, Anthrax, Enterotoxaemia, Colibacillosis, Surra/ Trypanosomiasis, Babesiosis, Anaplasmosis, Pox disease, Mastitis, Brucellosis, Ring worm, Ascariasis, Fascioliasis, Microfilariasis, Tick infestation and mange etc. To control and prevent these diseases, following measures are to be adopted:
- **Vaccination:** In disaster conditions animals become more susceptible to diseases due to stress and thus all vaccination schedules should be followed.
- **Deworming:** To check the parasitic infestation, regular deworming to be followed.
- **Disinfection of animal sheds by insecticidal spray:** Disinfection of animal sheds to be done with the compounds like lime powder, alum, formalin, sodium bicarbonate, bleaching powder, copper sulphate, phenol gases like HCN, formaldehyde etc. For control of ticks, flies, mosquitoes, lice etc. various insecticides like Methrin, Melathion, Fenvalarate, Amitraz, etc. may be used.
- Follow disease specific action plan and guidelines in risk areas

4.3.6 Disease Surveillance

- Visit of Disease Surveillance Teams to disaster affected areas to make active surveillance about any disease occurrence in livestock.
- Collection, testing and confirmation of samples and taking necessary steps for preventing spread of infection.
- States to compile epidemiological and statistical information collected before, during and after disaster and to take preventive actions and to monitor preparedness constantly.

4.3.7 Disposal of Carcass

- Identification of equipments, logistics, manpower and possible sites for safe disposal of carcass by following zoo sanitary measures as per National Carcass and Disinfection Guidelines.

4.4 Mitigation Measures

4.4.1 Advisories on Cattle camps

- Identification of sites for cattle camps and

sheds with basic facilities like feed, fodder, water and medicines etc.

- Promotional herd health care such as nutrition, pregnant animal care, care of new-born and young animal etc.
- Arrangements for rehabilitation of animals to recover from any trauma or fear.
- Provision of dry bedding for all the animals including new borns.
- The identified locations should be safe and easy to access by all species of animals.
- The cattle camps should also take care of other animals like sheep, goat, camel, horse etc. at the time of natural calamities.
- Only management ration should be provided for the animals kept in the cattle camps.

4.4.2 Feed and Fodder Supply

- DAHD issued advisory to all the States/ UTs for taking necessary measures for increasing the availability of fodder based on latest knowledge and technical knowhow in the field of fodder.
- List of forage grasses, legumes, shrubs and trees for grassland/ grazing land improvement on agro-ecological basis which can be grown in different agro-climatic zones of the country prepared by DAHD and shared with States.
- Regional Fodder Stations located in different agro-climatic zones of the country to provide seeds produced by them to States for growing fodder crops.
- States to prepare Contingency Plan for adequate supply of fodder and fodder seeds in the affected areas and to monitor fodder prices so that appropriate interventions at the ground level can be made to ensure availability of fodder for livestock.
- States/ UTs should take appropriate measures for safe stocking of the feed and fodder for emergency supply.
- Establishment of fodder banks at strategic locations using improved fodder/feed storage methods for supply of fodder to deficit areas. Community lands / river canals may be identified for fodder production.
- To ensure availability of the desired seeds a plan for production or sourcing of desirable fodder seed varieties needs to implement well in advance. Seed Bank can be set up at the most strategically advantageous locations.
- Ensuring supply of minerals, vitamins etc. for maintaining the general health of the animals.

4.4.3 Availability of Drinking Water

Ensuring adequate drinking water supply for animals

4.4.4 Efforts for Community Participation and Mass Mobilisation of Resources in DM:

- Public awareness programme to be organized with participation villagers along with Panchayati Raj Institution (PRI) members to spread awareness about management of animal resources during disasters through poster, leaflets, pamphlets etc.
- Farmers should be organized into community-based groups or cooperatives focused on livestock management during emergencies. These groups can lead in disseminating knowledge and coordinating local-level efforts.
- Empowerment programs should train farmers in basic veterinary care and disaster management strategies, ensuring quick response times when formal assistance might be delayed.

- States to ensure better and close coordination between various departments involved in DM and Programme Implementation Agency for different central and state livestock development schemes in disaster prone areas.
- Participation of local people and PRI in assessment, design and implementation of State DM Plan.
- Participation of Veterinary Colleges, NGOs, media, Goshalas, animal welfare organizations and SHGs in disaster management.
- Veterinary professionals should be at the forefront of offering guidance on preventive measures for safeguarding animals in disaster-prone areas. This includes creating awareness on sheltering, food reserves, and disease prevention during disasters. They can provide hands-on training in first-aid for animals, management of injured livestock, and vaccination drives in anticipation of disease outbreaks post-disaster.
- Regular workshops, drills, and simulations on disaster preparedness for farmers and community leaders should be organized to ensure the community is well-prepared.
- Veterinary hospitals and clinics should be mandated to assist communities with emergency plans tailored to local conditions. They can help farmers establish designated shelters, manage animal evacuation, and ensure medical supplies are available.
- During disasters, veterinary services must work alongside local government bodies to coordinate animal rescue operations, ensuring affected animals receive prompt medical care.
- In case of drought-prone areas the plan for drought preparedness and response should form part of ongoing livestock development schemes with the assumption that periodic droughts will occur during the project cycle.
- Streamlining/simplification of the procedure for release of assistance in case of emergency.

4.4.5 Maintenance of Sanitation

- Disinfection of premises of temporary sheds with bleaching powder, phenol, carbolic acid etc. on regular basis.
- Carcass/ cadaver should not come in contact with healthy animals.
- Disinfection and treatment of intake waters and effluent water in animal farms.

The State / UT may follow the checklist / preparedness / responsibility as per their climatic and geographical conditions and may develop their own Disaster Management Plan.

CHAPTER 5

MONITORING AND EVALUATION

The National Committee for Crisis Management for Livestock Disease (NCCM-LD) is established to provide strategic planning, coordination, and monitoring for the prevention, control, and eradication of livestock diseases. The Committee will operate under the chairmanship of the Secretary of Animal Husbandry and Dairying (AHD). Similarly, state and district level committees will be formed to ensure effective implementation and coordination at regional levels.

Objectives:

- Strategic Planning for prevention, control and containment of the disease
- Monitor and evaluate the effectiveness of disease control measures.
- Coordinate efforts among various stakeholders at the national and state levels.
- Provide timely responses to livestock disease outbreaks and crises.

5.1 Constitution of National Level Committee

S No.	Designation	Constitution of committee
1.	Secretary, Department of AnimalHusbandry and Dairying (AHD), MoFAHD, GOI	Chairperson
2.	Additional Secretary (AH)	Member
3.	Animal Husbandry Commissioner,DAHD, GOI	Member
4.	Deputy Director General (AS),ICAR	Member
5	Joint Secretary (Public Health)	Member
6.	Joint Secretary (LH), DAHD	Member
7.	Joint Secretary (NLM)	Member
9.	DCGI, CDSCO	Member
10.	Director, National Centre forDisease Control (NCDC)	Member
11.	Representative from MoEFCC (notbelow the level of Joint Secretary)	Member
12.	Principal Secretary of theConcerned States	Member
13.	Representative from NDMA not below the level of Joint Secretary	Member
14	Secretary, AWBI, DAHD	Member
15.	Joint Director from concernedRDDLs/CDDL	Member
14.	Joint Commissioner (LH)	Member Secretary

Meetings and Reporting

- **Frequency**: Meet six monthly and during emergencies.
- **Emergency Meetings:** Convene as required during outbreaks or crises.

5.2 State Level Committee for Monitoring and Evaluation

S No.	Designation	Constitution of Committee
1	Chief Secretary, State	Chairperson
2	Principal Secretary/Secretary, Department of AHD	Member
3	Principal Secretary/Secretary from State Department of Health	Member
4	Principal Secretary/Secretary from State Department of Wildlife	Member
5	Director of State Disease Investigation Laboratory	Member
6	Director of State Veterinary University or College	Member
7	State Disaster Management Authority representative	Member
8	State Animal Husbandry Commissioner or Director	Member Secretary

5.2.1 Meetings and Reporting:

- **Frequency:** Quarterly and during emergencies.
- **Emergency Meetings:** Convene as required during outbreaks or crises.

5.3 District Level Committee for Monitoring and Evaluation

S No.	Designation	Constitution of Committee
1.	District Collector	Chairperson
2.	District Animal Husbandry Officer/ Chief Veterinary Doctor of the district	Member
3.	District Disease Investigation Lab in-charge	Member
4.	District Health Officer	Member
5.	District Wildlife Officer	Member
6.	Representative from local veterinary clinics	Member
7.	Local Panchayat or Municipal Corporation rep.	Member
8.	Veterinary Officer/ Veterinary Assistant Surgeon/Livestock Development Officer	Member Secretary

5.3.1 Meetings and Reporting:

- **Frequency:** Bi-monthly and during emergencies.
- **Emergency Meetings:** Convene as required during outbreaks or crises.

These committees are structured to ensure effective coordination, monitoring, and local-level response capabilities during livestock disease outbreaks, contributing to the overall objectives of disease prevention and control at both state and district levels.

5.3.2 Crises and Disaster Management Cell:

There should be CDMC involving experts for awareness, communication, alertness, control room etc and for better coordination with states and stakeholders.

5.4 Focal Points

Focal points are designated officials within DAHD and State AHDs responsible for coordinating specific aspects of the disease management process. These focal points ensure timely communication and coordination between various stakeholders, including veterinary services, health departments, and local administrations.

5.4.1 State Focal Points

The Director of Animal Husbandry in each state serves as the state focal point. They are responsible for implementing national policies at the state level, conducting disease surveillance, overseeing vaccination programs, and coordinating response measures during outbreaks.

5.4.2 District Nodal Officers

District Animal Husbandry Officers serve as the nodal officers at the district level. They conduct initial assessments of suspected disease outbreaks, implement local disease control measures, and coordinate with state and national authorities. They ensure timely reporting of disease incidents to the state focal points and DAHD.

CHAPTER 6

ROLE OF DIFFERENT DEPARTMENTS

Comprehensive crisis management plan for livestock animal diseases involves the coordinated efforts of various departments and administrations. Here's a detailed plan outlining the roles of different concerned departments and administrations:

Preparing for an exotic disease emergency should involve a systematic approach as applied in other emergency preparedness situations, best summarised as the Prevention Preparedness Response Recovery approach:

Actions	Lead Institution	Involved Institutions
Preparedness		
Disease Surveillance	DAHD/State AHD/ ICAR	Veterinary University, WOAH
Create awareness and early warning in communities	DAHD/State AHD	A-Help, MoRD, ICAR, NDDB, KVKs, Dairy Cooperatives, NGOs
Strengthening diagnostic capabilities for all high-threat diseases. Linkages of National labs shall be established with world and regional reference laboratories.	DAHD/State AHD/ ICAR	Veterinary University, WOAH
Preparation of legislative and administrative frameworks to permit all necessary disease control actions to be implemented without delay	DAHD and State AHD	State Administration
Ensured access to quality-assured vaccines	CDSCO/DAHD/ State AHD	ICAR, Vaccine Manufactures
Harmonization of disease control programmes and cooperation with neighbouring countries to ensure a regional approach	DAHD/ICAR	State AHD/International organization like WOAH, FAO
To provide early detection of diseases that could have a major impact on animal	DAHD, ICAR, State AHD/CDDL/RDDLs	DAHD, ICAR, State Govt/NDDB
Implementation of an emergency disease information system including emergency disease-reporting mechanisms	DAHD, State Govt	DAHD, State Govt, ICAR, CDDL/ RDDLs, MoHFW, MoEFCC, WOAH
Training of Scientist, veterinary officers and veterinary auxiliary staff in the clinical and gross pathological recognition of serious epidemic livestock diseases;	DAHD, State Govt	DAHD, CEAH, State Govt, CDDL/ RDDLs, ICAR, Veterinary Colleges
Public awareness programmes for high-threat epidemic livestock diseases that involve improving the veterinary/farmer interface and awareness about early reporting	DAHD, State Govt	DAHD, ICAR, State Government, A-Help, NGOs, KVKs
Regular health surveillance of domestic animal herds and flocks	DAHD, ICAR, State AHD	CDDL/RDDLs

Actions	Lead Institution	Involved Institutions
Conduct regular mock drills and exercises to test the effectiveness of response mechanisms.	DAHD/State AHD/ NDMA	DAHD, ICAR, State Government/ NDMA
Establish a centralized database for real-time data sharing and analysis among relevant stakeholders.	DAHD	DAHD/State Govt, ICAR, ICAR, MoHFW, WOAH
Strengthen international collaborations and information-sharing networks for early detection of transboundary diseases.	DAHD	DAHD, ICAR, State Govt, WOAH
Conduct research to identify emerging pathogens and assess their potential impact on animal health and productivity.	ICAR	DAHD, ICAR, Veterinary Colleges, Research Institutes
Enhance capacity building programs for veterinarians and animal health workers to improve their response capabilities during crises.	DAHD/State AHD	DAHD, State Govt, Veterinary Colleges, ICAR
Regularly review and update the crisis management plan in accordance with changing disease dynamics and technological advancements.	DAHD/State AHD	DAHD, State Govt, IT Institutions, Veterinary Colleges
Prevention		
Increase awareness in community for Animal Biosecurity and good animal husbandry practices	State AHD	DAHD/NDDB/NGO/ICAR
Ensure immunization of animals	DAHD/ State AHD	DAHD/ State AHD
Strengthen customs and Quarantine Control staff to apply on import and export of livestock	DAHD	DAHD/Customs
Response		
Implement a system for rapid deployment of veterinary teams to affected areas during outbreaks.	State AHD	DAHD, State Govt, Veterinary Colleges
Resource Mobilization (resources for personnel, equipment, and supplies PPE kits etc)	State AHD	DAHD/State Govt
Enforce regulations on movement of animals	State AHD	DAHD/State
Sustained active disease surveillance to supplement passive monitoring	DAHD/State/ICAR	DAHD/State/ICAR
Establishment of reliable livestock identification systems for enhancement of disease-tracking capabilities	DAHD/State/ICAR	DAHD/State/ICAR
Develop contingency plans for the disposal of infected animals and contaminated materials to prevent further spread of diseases.	DAHD	DAHD, State Govt, ICAR, Veterinary Colleges
Setting up a public communications plan to deal with fear and social disruption of the population	DAHD/State AHD	Veterinary Colleges, NGO, Private Industry
Recovery		
Activate any disaster recovery fund provided to compensate for the loss of livestock, and other costs of the incident.	DAHD/State/NDMA	DAHD/State/NDMA
Technical assistance for farms and businesses and build prevention into the recovery operation by investing in biosecurity	DAHD/State	ICAR/Private Industry

Actions	Lead Institution	Involved Institutions
Continue to support surveillance systems as they are the best protection against a re-introduction of the disease.	DAHD/State AHD/ ICAR	Veterinary Colleges, Private Industry
Opening of ban/movement restriction	State AHD	DAHD/State AHD
Monitoring		
Establishment of a National Committee for Crisis Management for Livestock Diseases Planning and Monitoring under the chairmanship of the Secretary (AHD)	DAHD	ICAR, State AHD, ICAR, NCDC, MoEFCC

6.1 Role of Different Departments

Department/Agency	Role in Crisis Management for Livestock Animal Diseases
Department of Animal Husbandry and Dairying (DAHD)	Formulates national policies and strategies for livestock disease prevention and control. Coordinates national-level responses during outbreaks. Provides financial and technical support to states.
Ministry of Environment, Forests and Climate Change (MoEFCC)	Ensures environmental compliance and regulations, especially concerning disposal of infected animals and biosecurity measures. Collaborates on wildlife disease surveillance.
Ministry of Health and Family Welfare (MoHFW)	Monitors zoonotic diseases and provides guidelines for disease surveillance, control, and public health measures. Collaborates with animal health authorities during zoonotic outbreaks.
Department of Agriculture	Collaborates on disease surveillance, especially for vector-borne diseases affecting livestock. Provides expertise in crop-livestock interactions and integrated pest management.
Central Drugs Standard Control Organization (CDSCO)	Regulates veterinary drugs and vaccines, ensures their safety and efficacy, and facilitates their availability during disease outbreaks.
National Disaster Management Authority (NDMA)	Provides guidelines and support for disaster preparedness and response during livestock disease outbreaks, especially in the context of natural disasters.
State Animal Husbandry Departments/Veterinary Services	Implement national policies at the state level. Conduct disease surveillance, vaccination programs, and response measures during outbreaks. Manage state-level crisis management committees.
State Departments of Health	Monitors zoonotic diseases and collaborates with veterinary services for joint disease surveillance, control, and public health interventions.
District Administration (Collector/ Deputy Commissioner)	Implements movement restrictions, quarantine measures, and facilitates local response efforts. Coordinates with veterinary and health authorities during outbreaks.
District Animal Husbandry Officers	Conduct initial assessments of suspected disease outbreaks. Implement local disease control measures and coordinate with state and national authorities.
State Disaster Management Authorities	Coordinate disaster response efforts and provide logistical support during livestock disease outbreaks, especially in case of natural disasters or large-scale emergencies.

Department/Agency	Role in Crisis Management for Livestock Animal Diseases
National and State Veterinary Universities	Conduct research on livestock diseases, provide training to veterinary professionals, and contribute expertise to disease control strategies.
Indian Council of Agricultural Research (ICAR)	Conducts research on livestock health, genetics, and nutrition. Develops technologies and practices for disease prevention and management. Collaborates with state agricultural universities and veterinary institutions for capacity building and extension services.
Animal Welfare Board of India (AWBI)	Ensures that animal welfare measures are integrated into crisis management plans. Coordinates with veterinary and animal husbandry departments to safeguard animal welfare during disease outbreaks.

Each entity plays a crucial role in policy formulation, disease surveillance, research, regulatory oversight, and emergency response to safeguard livestock health and mitigate disease impacts.

Annexure I

CONTACT DETAILS

S. No.	Name/ Designation & Telephone Number of the Member
1.	**Ms. Alka Upadhyaya** Secretary (AHD) Room No:- 218 Krishi Bhawan, New Delhi Tel:-Off-23382608 Intercom- 4631 Email:- secyahd@nic.in
2.	**Dr. Abhijit Mitra** Animal Husbandry Commissioner 2nd Floor Chanderlok Building, Janpath New Delhi Tel:- Off- 21401453 Intercom-247 Email:- ahc-dadf@nic.in
3.	**Ms Sarita Chauhan** Joint Secretary (LH) Room No:-190-A Krishi Bhawan, New Delhi Tel:- Off – 23382354 Intercom- 4789 Email:- jslh-dadf@gov.in

Annexure II

REFERENCE LABORATORIES

1. WOAH Reference Laboratories

The WOAH Reference Laboratory serves as a pivotal institution in global animal health, providing authoritative expertise and support for the surveillance, diagnosis, and control of animal diseases. Designated by the World Organization for Animal Health (formerly OIE), these laboratories are crucial in standardizing diagnostic techniques, providing diagnostic and epidemiological expertise, consultancy, and training; storage and provision of relevant reference materials; and coordinating scientific and technical studies.

Reference Laboratories of the WOAH are mandated to:

- Function as a centre of expertise and standardization for designated disease(s) or topics.
- Store and distribute to national laboratories biological reference products and any other reagents used in the diagnosis and control of the designated disease(s) or topics.
- Develop new procedures for diagnosis and control of the designated disease(s) or topics.
- Gather, process, analyze, and disseminate epizootiological data relevant to their specialty.
- Place expert consultants at the disposal of the WOAH.

With their specialized knowledge and resources, WOAH Reference Laboratories contribute significantly to safeguarding animal welfare, public health, and international trade. Their collaborative efforts foster a coordinated response to emerging threats and ensure the implementation of effective disease control measures worldwide.

WOAH Reference Laboratory			
Disease-specific	**Name of Laboratory**	**Contact Number/ Email**	**Address**
Rabies	WOAH Twinned KVAFSU-CVA Rabies Diagnostic Laboratory	**Telephone:** +91-8029532287 +91-9449992287 **Email:** rdlkvafsucva@gmail.com kisloor@gmail.com	Department of Microbiology Veterinary College, Karnataka Veterinary, Animal and Fisheries Science University (KVAFSU), Hebbal, Bangalore-560024 (Karnataka)
Avian Influenza	ICAR-National Institute of High Security Animal Disease (NIHSAD)	**Telephone (**Office): 0755-2759204, +91-7552759204 **EPABX :** +91 755 2754674-75 **Fax :** +91 755 2758842 **Email:** director.nihsad@icar.gov.in director1nihsad@gmail.com Website-www.nihsad.nic.in	National Institute of High Security Animal Disease (NIHSAD) Anand Nagar, Bhopal-462021 (Madhya Pradesh)

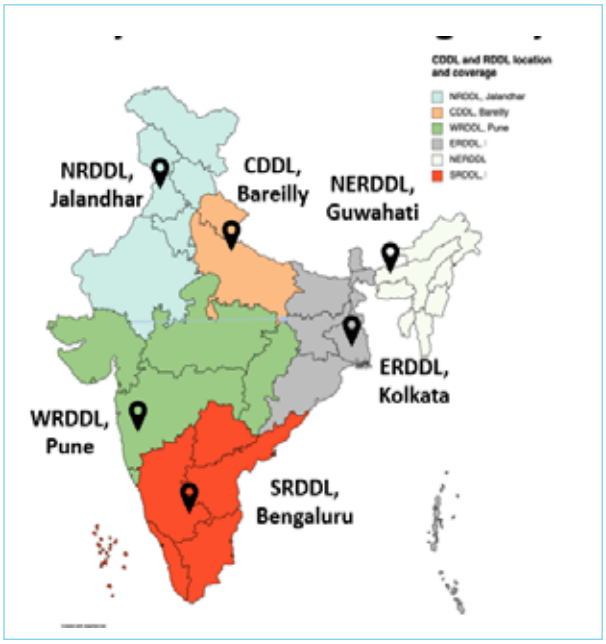
WOAH Reference Laboratory			
Disease-specific	**Name of Laboratory**	**Contact Number/ Email**	**Address**
White Tail Disease in Aquatic Animals	Aquatic Animal Health Laboratory, C. Abdul Hakeem College	**Telephone:** +91-4172269487 **Email:** Cah_sahul@hotmail.com	Aquaculture Biotechnology Division-Department of Zoology Melvisharam-632509, Vellore District, Tamil Nadu
Peste des Petits Ruminants (PPR)	Livestock Disease Diagnosis Laboratory, ICAR-NIVEDI **(NABL Accredited Lab)**	**Telephone:** 080 23093100/110/111 **E-mail:** director.nivedi@icar.gov. in	ICAR - National Institute of Veterinary Epidemiology and Disease Informatics (NIVEDI) Ramagondanahalli, Post Box No. 6450 Yelahanka, Bengaluru-560064 Karnataka
Foot & Mouth Disease (FMD)	ICAR- National Institute of Foot and Mouth Disease.	**Telephone:** +91-674-2601101 (O) +91-674-2916062 (R) **Email:** Rabindra.Singh@icar. gov.in Director.dfmd@icar.gov. in **Website** http://www.pdfmd.ernet.in	National Institute of Foot and Mouth Disease, Arugul, Jatni, Bhubaneswar-752050, Odisha,

2. CDDL & RDDL Veterinary Laboratory Network

The Central and Regional Disease Diagnostic Veterinary Laboratory Network in India plays a pivotal role in rapid diagnosis and disease surveillance in the veterinary sector.

The main responsibilities of these labs are:

- To serve as a regional referral laboratory for economically important livestock diseases (bacterial, viral, parasitic, etc.) and study of effects of any drugs/pesticide residue/toxicants in the livestock products by providing diagnostic services (both primary and confirmatory) to the states of the region.
- To maintain a data bank on the epidemiology of the economically important diseases of the region and circulate to all the states periodically.
- Be responsible for collecting and transmitting all isolates of viral, bacterial, and parasitic agents to the National Repository to be maintained at the National Reference Laboratory.
- To follow the approved standard reagents and techniques for the generation of the diagnostic results.



- To train scientists/officers from State Disease Diagnostic Laboratories of the region to update different technologies for the diagnosis of animal diseases and provide consultancy and expert services to the states of the region.
- To undertake special program for disease surveillance/diagnosis as per the direction of Govt. of India from time to time in view of the epidemiological significance and importance etc.

The table provides information about the different states catered by the Central and Regional Disease Diagnostic Laboratories:

(C/R) DDL	States Catered
CDDL, Bareilly	Uttar Pradesh and Uttarakhand.
NRDDL, Jalandhar	Ladakh, Delhi, Chandigarh, Punjab, Jammu & Kashmir, Himachal Pradesh, Rajasthan and Haryana.
WRDDL, Pune	Madhya Pradesh, Gujarat, Chhattisgarh, Goa, Maharashtra, Diu-Daman.
NERDDL, Guwahati	Meghalaya, Nagaland, Mizoram, Manipur, Arunachal Pradesh, Sikkim, and Tripura.
ERDDL, Kolkata	Andaman and Nicobar Islands, Bihar, Jharkhand, Odisha, Sikkim, and West Bengal.
SRDDL, Bangalore	Andhra Pradesh, Karnataka, Kerala, Lakshadweep, Pondicherry, Telangana, and Tamil Nadu.

CDDL & RDDL VETERINARY LABORATORY NETWORK

Name of Laboratory	Contact Number/Email.	Address
CDDL-Central Disease Diagnostic Laboratory Centre for Animal Disease Research and Diagnosis (CADRAD)	**Telephone:** 0581-2302188/2310074 **Email:** jdcadrad@ivri.res.in jd_cadrad@rediffmail.com	Central Disease Diagnostic Laboratory, Centre for Animal Disease Research and Diagnosis (CADRAD) 'Indian Veterinary Research Institute (IVRI) Izatnagar-243122 (U.P.)
SRDDL-Southern Regional Disease Diagnostic Laboratory	**Telephone (**Office): 080-23515882 **Email:** jdsrddlbangalore@gmail.com	Regional Disease Diagnostic Laboratory Institute of Animal Health & Veterinary Biological (IAH&VB) Govt. of Karnataka, Hebbal, Bangalore-560024
WRDDL-Western Regional Disease Diagnostic Laboratory, Pune	**Telephone (**Office): 020-25692135 **Email:** dis.pune7@gmail.com	Regional Disease Diagnostic Laboratory Disease Investigation Section Department of Animal Husbandry, Govt. of Maharashtra, Aundh, Pune-411007
NRDDL-Northern Regional Disease Diagnostic Laboratory	**Telephone (**Office): 0181-2242335 **Email:** nrddl2001@gmail.com	Regional Disease Diagnostic Laboratory Animal Health Institute, Ladowali Road, Jallandhar-144001
ERDDL-Eastern Regional Disease Diagnostic Laboratory	**Telephone (**Office): 033-25328033 **Email:** erddl_kolkata@yahoo.co.in	Regional Disease Diagnostic Laboratory Institute of Animal Health & Veterinary Biological (IAH&VB),37, Belgachia Road, Govt. of West Bengal, Kolkata-700037
NERDDL-Northeastern Regional Disease Diagnostic Laboratory	Office: 0361-2334177 T/F: 0361-2611596 **Email:** nerddlguwahati@gmail.com	Animal Health Centre, Northeastern Regional Disease Diagnostic Laboratory, Animal Husbandry & Veterinary Department, Khanapara, Guwahati-781022

3. Animal Disease-Specific Laboratories

Animal Disease Specific Laboratories play a pivotal role in safeguarding both animal and human health by diagnosing and monitoring diseases that affect livestock and wildlife. These specialized facilities utilize advanced diagnostic techniques, including molecular biology, serology, and pathology, to identify and characterize pathogens. By providing timely and accurate information, these laboratories contribute significantly to disease surveillance, control, and prevention strategies, thereby ensuring the well-being of animal populations and minimizing the risks of zoonotic outbreaks. Animal Disease Specific Laboratories serve as essential resources for veterinarians, researchers, and policymakers alike, enabling informed decision-making and targeted intervention measures.

Animal Disease-Specific Laboratory			
Disease	**Name of Lab**	**Contact Number/Email.**	**Address**
FMD	ICAR-National Institute of Foot and Mouth Disease	**Telephone**: +91-674-2601101 (O) +91-674-2916062 (R) **Website-**http://www.pdfmd.ernet.in **Email**: Rabindra.Singh@icar.gov.in Director.dfmd@icar.gov.in hoa.dfmd@icar.gov.in ankush.mishra@icar.gov.in	National Institute of Foot and Mouth Disease, Arugul, Jatni, Bhubaneswar-752050, Odisha,
	ICAR-Project Directorate on FMD	**Telephone**: +91-674-2601109/674-2601104	Project Directorate on FMD, IVRI Campus, Mukteshwar -263138, Nainital, Uttarakhand.
Rabies	WOAH Reference KVAFSU-CVA Rabies Diagnostic Laboratory	**Telephone**: +91-8029532287, 080-23410509 Tel: +91-8482- 245241 **Email:** rdlkvafsucva@gmail.com kisloor@gmail.com	Department of Microbiology Veterinary College, Karnataka Veterinary, Animal and Fisheries Science University (KVAFSU), Hebbal, Bangalore-560024, India
Avian Influenza	ICAR-National Institute of High Security Animal Disease (NIHSAD)	**Telephone (**Office): 0755-2759204, +91-7552759204 **EPABX :** +91 755 2754674-75 **Fax :** +91 755 2758842 **Email:** director.nihsad@icar.gov.in director1nihsad@gmail.com **Website-** www.nihsad.nic.in	National Institute of High Security Animal Disease, (OIE reference laboratory for Avian Influenza), Anand Nagar, Bhopal-462021 (Madhya Pradesh)
Glanders	*Indian Council of Agriculture Research –National Research Centre on Equines (ICAR-NRCE)	**Telephone:** +91-1662-275787, 282501,282502 **E-mail:** nrcequine@nic.in	National Research Centre on Equines Sirsa Road, Hisar-125 001(Haryana) India
Equine Trypanosomiasis	Indian Council of Agriculture Research –National Research Centre on Equines (ICAR-NRCE)	**Telephone** – +91-1662-275787, 282501,282502 **E-mail –** nrcequine@nic.in	National Research Centre on Equines Sirsa Road, Hisar-125 001 (Haryana) India

Animal Disease-Specific Laboratory			
Disease	**Name of Lab**	**Contact Number/Email.**	**Address**
Leptospirosis (National reference Laboratory)	Livestock Disease Diagnosis Laboratory, ICAR-NIVEDI (NABL Accredited Lab)	**Telephone-** 080 23093100/110/111 **E-mail:** director.nivedi@icar.gov.in	ICAR - National Institute of Veterinary Epidemiology And Disease Informatics Ramagondanahalli Post Box No. 6450 Yelahanka, Bengaluru-560064 Karnataka, India
Crimean Congo Hemorrhagic Fever (CCHF)	ICAR-National Institute of High Security Animal Disease (NIHSAD)	**Telephone (**Office): 0755-2759204, +91-7552759204 **EPABX :** +91 755 2754674-75 **Fax :** +91 755 2758842 **Email:** director.nihsad@icar.gov.in director1nihsad@gmail.com Website-www.nihsad.nic.in	National Institute of High Security Animal Disease, Anand Nagar, Bhopal-462021 (Madhya Pradesh)
Exotic viruses	ICAR-National Institute of High Security Animal Disease (NIHSAD)	**Telephone (**Office): 0755-2759204, +91-7552759204 **EPABX :** +91 755 2754674-75 **Fax :** +91 755 2758842 **Email:** director.nihsad@icar.gov.in director1nihsad@gmail.com **Website-**www.nihsad.nic.in	National Institute of High Security Animal Disease, Anand Nagar, Bhopal-462021 (Madhya Pradesh)

*In addition, for the other equine diseases as enumerated below, National Research Centre on Equines is recognized as the testing facility.

1. Equine Infectious Anemia. 2. Equine Influenza 3. Equine Rhinopneumonitis 4. Equine Piroplasmosis 5. Contagious Equine Metritis 6. Equine Viral Arteritis7. Salmonella Abortus Equine Infection 8. Dourine 9. Equine Trypanosomias

Annexure III

STATE ANIMAL HUSBANDRY CONTACT INFORMATION

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Shri Michael Achom Secretary, Manipur	**Office:** 385-2450224 michael.achom@gov.in
Shri. S. C. Sadhu, IAS Secretary, Meghalaya	**Office:** 080145-68222 sibhi.sadhu@gov.in
Shri Lalzarmawii IAS Secretary, Mizoram	**Office:** 0389-2322671 Zarmawii09@gmail.com
Shri Vikeyie Kenya, IAS Commissioner & Secretary, Nagaland	**Office:** 0370-2271060 dirvety-ngl@nic.in
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Contact Details of State Director

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Dr Pradeep Kr. Sharma Director, Himachal Pradesh	**Office:** 0177- 2830089 **Fax:** 0177- 2830170 dir-ah-hp@nic.in
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Director, Uttarakhand	**Office:** 0135-2532809 **Fax:** 0135-2532909 dirahuk@gmail.com dir-ah-uk@gov.in
Dr Yograj Tamang Director, West Bengal	**Office:** 033-23351145 **Fax:** 033-23351187 dahvswb@darahwb.org dahvswb@rediffmail.com
Shri Gyan Prakash Director, Manipur	**Office:** 0385-2452204 2450224 **Fax:** 0385 - 2454928 vety.manipur@gmail.com
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Annexure IV

GUIDELINES ON DISPOSAL OF ANIMAL CARCASS AND DISINFECTION

Good planning for timely and safe disposal of animal carcasses and related materials along with disinfection of premises is necessary to prevent the spread of disease and to ensure the safety of the community, other stock and environment. Improper disposal of carcasses can result in public outrage, site contamination, ground water contamination, environment contamination, public health issues, and the disease spread through scavengers, mosquitoes and vermin. The overall goal of any animal carcass disposal and management plan is to ensure clean and safe disposal of all materials in a manner that protects human, animal, and environmental health.

These guidelines in brief can be used as ready reckoner and will help the states/UTs and other stake holders for safe and secure disposal of animal carcass, animal waste including the disinfection procedures and hygienic measures.

1. Disposal of Dead animals and related materials

Arrangement for safe disposal of carcass and related materials by following zoo sanitary measures are to be made by respective State/UT AH Departments. State/UT AHDs shall constitute Animal Carcass Retrieval Teams and provide requisite training to team members with awareness to all stakeholders.

1.1 Regulations and Jurisdiction

The requirements for disposal of carcasses and other potentially contaminated fomites in case of infectious and contagious diseases are provided in the Prevention and Control of Infectious and

Contagious Diseases in Animals Act, 2009' and Prevention and Control of Infectious and Contagious Diseases in Animals (Form of Vaccination Certificate, Manner of Post Mortem Examination and Disposal of Carcass) Rules, 2010. Proper disposal of the carcass is mandatory as per Act and the destruction and disposal of the animals and material shall be documented by the Animal Husbandry Department officials. States may also follow the provisions of India Code Disposal of Dead animals and may involve NGOs and cooperatives. Advance cooperation between the Veterinary Service and other relevant government bodies is necessary for proper disposal of dead animals. State AHDs should identify the disposal sites in advance and develop them scientifically with buffer zones.

Department of Animal Husbandry & Dairying vide Order no. 2023-24 dated 12.12.2023, issued direction under Section 39 of the Prevention and Control of Infectious and Contagious Diseases in Animals Act, 2009. As per the order all the birth and death details shall be registered mandatorily on Bharat Pashudhan App/web portal. State government shall also designate the village level nodal person to ensure recording of animal birth and animal death within his/her jurisdiction and within the specified time period (the animal owner shall report the death of animal within 24 hours of the death of animal to the designated village level nodal person, nearest veterinary health centre, call centre etc. indicating unique Tag ID of the dead animal along-with date and time of death) on the NDLM portal.

1.2 Preparedness

The disposal of animals in the event of a disease outbreak or disposal of animals in the event of natural disasters such as floods should proceed with the minimum delay. The success is determined by the structures, policies and infrastructure established in advance including financial preparedness (means a compensation or insurance mechanism, an access to emergency funding). Standard operating procedures should be developed (including documented decision-making processes, training of staff). A well-informed spokesperson should be available at all times to answer enquiries.

The management of resources should address items like personnel and PPE, transport, storage facilities, equipment (such as mobile handling facilities for animals, disinfection equipment), fuel, protective and disposable material and logistical support. Special equipment such as trucks, tractors, bulldozers, and front-end loaders should be available. Early detection of new infections, pathogen inactivation, immediate and safe culling and disposal of infected animals (wherever required as per policy and plan) and rapid removal of the dead animals are important.

Disposal should be organized in such a way that the workers are safeguarded against the risks of handling decomposing dead animals. Special attention should be given to zoonotic aspects. Workers should receive appropriate training and be sufficiently protected against infection with protective clothing, gloves, face masks, effective respirators, goggles, vaccination, and effective anti-viral medicines. Workers should also receive regular health checks. Animal carcass and animal waste shall not be allowed to move out of the infected area and shall be disposed in the infected area/premises itself. In case of exceptions where the carcass disposal is not possible, the transport of carcasses should be undertaken by agencies under the control of District Veterinary/Administrative authority following strict biosecurity protocols and using leak proof vehicles.

State/UT AH Department shall organize and ensure proper awareness and sensitization to all stakeholders, other authorities, farmers/ animal owners in respect to effective biosecurity measures, scientific disposal and management, disinfection, vector management and safety measures taken to prevent spread of the disease by disposal method. Adequate compensation of owners for the loss of animals along with awareness will increase the acceptability of farmers.

1.2.1 Liaison with Wildlife authorities, Administration, Local Municipal and Panchayat Authorities to ensure effective awareness/sensitization, biosecurity measures, scientific disposal and management, disinfection and vector management

As advised in disease control advisories, carcasses shall be destroyed under official veterinary supervision ONLY as per National guidelines on carcass disposal and disinfection. Disinfection and vector management of the premises/area should be carried out regularly under the direction and control of Veterinary Authority and at Government's expense in cooperation with Administration/local Municipal and Panchayat Authorities. The recovery and carriage process may be ensured as per the National disposal guidelines and by activating the helpline/LH. State/UT AH Departments shall have effective cooperation with administration and local municipal and panchayat bodies to ensure the proper carcass disposal, biosecurity and disinfection measures in respect to unorganized sectors, gaushalas and stray animals and their areas at all times. Proper records of unorganized sectors shall be maintained with proper checks and monitoring regularly.

State/UT AHDs shall also establish necessary liaison with wildlife authorities, other stakeholders and animal owners to avoid any possible threat to wild and other animals from carcass and waste disposal of domestic animal species. A field inspection/survey may also be undertaken along with forest authorities to check and avoid any possible contact of wild animals and other susceptible animals with domestic dead animal disposal sites and entry of wild animals in disposal areas. State/UT AHDs shall ensure the implementation of the biosecurity measures including maintaining proper buffer zones in cooperation with wildlife authorities to prevent any possible threat to the wild and other animals. Steps shall be taken to minimize the risks posed by wildlife and to the wildlife. The dead animals and related materials including the burial sites shall be protected from wild animals and scavengers at all times.

1.3 Disposal methods

There are different methods for disposal of dead animals and related materials which also depends on factors like site (Soil topography, area, subsequent use of site and site security with warning signs), animal species, number of animals, space and equipment needed, pathogen and its ability to persist or spread, environmental issues (water source contamination, air quality, local weather conditions, scavengers and vector problem etc.), biosecurity and public health issues (PPE including physical and psychological issues, movement control, cleaning and disinfection), transport of infected material and carcass.

General precautions

- Unauthorized and unrestricted access of disposal sites to humans, pets, wild animals, domestic animals, birds shall be prevented.
- Rodent and insect control measures should be considered to prevent disease transmission risk from disposal sites.
- In case of delay disposal, the carcass and related material should be disinfected, covered and kept in cold condition.
- Disposal site should be selected in consultation with local bodies and pollution control board.
- Proper biosecurity measures including PPE to persons handling the carcass and involved in disposal and disinfection measures shall be ensured at all times.
- In case of infectious diseases, the carcass disposal should be divided into high risk (animals died of infectious diseases like Highly Pathogenic Avian influenza, Foot and mouth Disease, Lumpy Skin Disease, Classical Swine Fever, African Swine Fever, New castle Disease, Glanders and killed to eradicate epizootics) and low risk categories based on zoonotic importance and transmissibility to other animals. High risk category carcass and material should be disinfected and preferably incinerated, otherwise burned in pits or buried.
- The carcass transport vehicle should be leak proof, clean and disinfected (before loading and unloading) and carcass should not be sliced before loading.
- The vehicle should not be overloaded and driven slowly.
- Staff should carry approved disinfectant and equipment to handle spills during journey.
- Small carcasses (if required) may be placed in a plastic trash bag (industrial strength bags with 3mm thick plastic) or water-tight barrel for transport to disposal area. In case of delay disposal, carcasses may be stored in a top-loading chest freezer.
- Disposal should be done under the supervision of State AHD and local bodies and disposal sites should be maintained and monitored for eventual rehabilitation.

- For mass burial, the site shall be at least two hundred fifty meters away from human habitat.
- Equipment used to handle carcasses or compost should not be used to handle feed unless cleaned and disinfected.
- Steps should be taken to prevent wildlife, rodents, pets, and other scavengers from contacting carcasses and spreading disease or becoming ill.

2. Different methods for disposal of dead animals and related materials are as under

2.1 Burial

From a biosecurity point of view, burial is a viable option, but groundwater contamination needs to be checked. Burial site selection should be away from water courses, drainage etc. The record of all burial pits shall be maintained.

2.2 Burial sites and process

- The site should not be in a drinking water catchment area and near to coast and should be away from towns, dwellings, roads and free from underground pipelines, power and telephone lines (local bodies and pollution authority should be consulted). For proper management, pits should be dug on a common land within the infected zone in limited numbers.
- The site should be on soils of low permeability with significant clay content (lining pits with clay soil may be considered). The pits should not be on a slope greater than 6% and digging of 5 meter depth is possible.
- The groundwater table level should be minimum of 6 meters below the lower level of deep burial pit.
- The watercourse should be away from the burial sites such as lakes (1000 ft), rivers (400 ft), tube well (200 ft)
- Pit should be 2 meter deep and half filled with waste, then covered with lime within 50 cm of the surface, before filling the rest of pit with soil. On each occasion when waste is added to the pit, a layer of 10 cm soil shall be added to cover the waste.
- Burial pit/trench should be at least 2.3 meter (not more than 3 meter) wide and 3 meter deep (7x9 ft). The length should be as per the number of carcasses.
- A floor space of 1.3 m^2(15 ft^2): May accommodate mature bovine/equine carcass, 5 mature pigs/sheep, 100 mature chickens/40 mature turkeys. For each additional meter (3 ft) in depth, the number of animals per 1.3 m^2 of floor space may be doubled. The weight of dead animals in the pit should not exceed 2500 kg.
- Land requirement of 1.5 cubic meters for adult cattle carcass, 0.3 cubic meter for pig/sheep carcass and 1.0 cubic meter for 200 chickens may be considered.
- The carcasses should be covered with at least 400 mm soil with unbroken layer of slaked lime -$Ca(OH)_2$ (avoid lime in Anthrax carcass). Lime should not be placed directly on carcasses, because in wet conditions it slows and may prevent decomposition.
- Burial pit should be covered with at least 2 m (6 ft) soil. Soil should not be compact. During closing the pit surplus soil should be heaped over it as overfill. Lime should be added to pits, to prevent earthworms from bringing contaminated material to the surface after pit closure.
- No person should enter the trench more than 1.5 meters deep without stabilizing the sides.
- All the remnant feed and soil upto 2 inches deep must be disposed off along with the carcass
- The buffer zone with green belt should

be maintained in consultation with local bodies and pollution authorities.

- The pit sites should be fenced and permanent warning signboard should be fixed in all the pit sites. The pits should be monitored at regular intervals to check any sinking, water accumulation etc. and if necessary, steps be taken as mentioned above.
- There should be no accumulation of water during rainy season at the disposal site.
- No crop should be grown further for at least one year on the pit site.
- All the pits should be dug one day in advance of the disposal and while digging pits, it should be ensured that no water is oozing out of the pit.
- After the operation clean and disinfect all equipment and area.
- Stabilize the surface of the excavated area in accordance with local requirements and ensure regular inspections for maintenance.
- Monitor ground water quality and fence the area with visible sign of restricted entry.

2.3 Post-care of landfill/burial site

- Maintenance of integrity and effectiveness of final cover, making repairs and preventing damage to final cover.
- Proper marking and security should be ensured.
- Monitoring leachate collection system following the requirement.
- Monitoring of groundwater in and around the landfill.
- Maintaining and operating the landfill gas collection system to meet the standards.

2.3.1 Landfills/Subsurface disposal

This is similar to burial. Carcasses are layered between compacted soil and solid waste materials. Established sites should have minimal potential risks to groundwater, surface water and other environmentally sensitive areas. Landfill design incorporates liners, leachate containment systems and gas collections systems to minimize environmental impacts. May require 3-5 cubic yards of cover materials per 1000 carcass. The recommended height for a pile is 5-7 feet.

Considerations

- Monitor frequently and the initial core temperature should be between 135-140^0 F.
- On-site biosecurity risks associated with transport should be controlled.
- Affected by weather and ambient temperature and therefore need to be protect from wind, rain, drying conditions and scavengers.

2.4 Incineration

Incineration is thermal destruction of carcass by using high-temperature (>850^{0}C) combustion (by using fuels like diesel, natural gas, electric energy) to convert carcasses to inert gases and sterile ash as well as deactivate pathogens. Incineration shall be practiced only onsite by agencies and institutes that have adequate trained manpower in operating the rendering plant. The site identified for incineration shall be at least two hundred fifty meters away from human habitat. Three methods used are fixed whole carcass incineration, mobile air curtain whole carcass incineration, municipal incinerators. Gasoline or other highly explosive accelerants should NEVER be used. Fire fighting officials should be notified and involved in planning and procedure. Fire retardant equipment and protective gear should be available to personnel. Air pollution control devices should be installed under the approval of pollution authority/CPCB.

2.4.1 Advantage of Incineration

- Complete reduction of volume with rapid oxidation to carbon and water

- Environmentally safe (pollution norms to be followed)
- No problem related to insect and rodent

2.5 Burning

Burning of carcasses within a farm on pyres is also a common waste treatment practice that involves combustion of organic substances contained in waste material. It is not suitable for large volume of material.

2.5.1 Burning Sites and Process

- Should be approved by appropriate authorities.
- Burning should be away from public view and on flat, open ground with legal approvals.
- Fire bed burning should be at a right angle to the prevailing wind.
- Remove all vehicles, personnel, and other equipment well away from the fire bed
- **Burning space:** 8x3 ft. for each mature cattle/horse, 5 mature pigs/sheep, 100 mature chickens and 40 mature turkeys. Also at least 1 meter fire bed length may be assumed for 1 adult cattle carcass/5 swine/ sheep carcass/200 chickens.
- **In pyre burning:** Place carcasses on top of solid fuel with sufficient airflow, on their backs lower and alternating head to tail. (Approximately one cord of wood (128 cubic feet or 3.4 meter^3) is required per 500 kg of carcass)
- **Burn pit:** The pit should be 0.5 m deep and extended 0.75 m beyond each end of pyre. The pit should be 25 cm wider than the pyre on each side. The bottom of the pit should be covered with accelerant (diesel, kerosene etc. in less quantity to avoid contamination), soaked wood, hay, straw etc. Solid fuels should be used to maintain combustion. Pieces of heavy timber are placed across the pit to support the pyre.
- Two goats, sheep or swine carcass may be placed on top of each bovine carcass.
- The trench should be filled with mud after entire carcass is burnt.
- Do not use tyres, rubber, plastic and similar materials for burning.
- Handlers and supervisor should use PPE
- Fire fighting equipment should be readily available.
- After the operation clean and disinfect all equipment.
- Dispose ash in accordance with legal requirements.
- Anthrax carcass can also be disposed by burning (if incinerator is not available). All vessels, instruments should be disinfected with 3% solution of sodium carbonate.

2.6 Composting

Composting is a natural biological process that transforms organic material in a predominantly aerobic environment into a useful and biological end product. It destroys nearly all pathogenic virus, bacteria, fungi, protozoa and helminth except endospore forming bacteria (B. anthracis) and prions (including BSE).

2.6.1 Composting process

- Composting should be at least 100 meters away from water sources and residence and 300 meter away from roads.
- It involves layering/mixing carcass with co-compost material (sawdust, silage etc) with at least 60 cm covering of composting material.
- Material should be removed from the compost pile after the carcass/related material is completely composted with minimum odours.
- Compost piles kill most pathogens in 10-14 days in case of small carcasses, longer in large carcasses.

- Assume land area as 17 square meter for cattle carcass, 3.5 square meter for pig/ sheep carcass and 8.7 square meter for 100 chickens. The site should be 120 cm above seasonal high-water level and at least 1 meter above bed rock. The site should not be located on flood plains.
- On the base of litter, the carcass and related material along with bulking agent are added in layers so that the carbon-to-nitrogen ratio is in the range of 15:1 to 35:1 (optimal 23:1).
- Necessary measures should be taken to minimize odour, flies, rodents, bird menace and fire hazard.
- Leachate should be re-circulated in the compost plant for moisture maintenance.
- Turning piles may increase the rate of decomposition. First stage of composting normally completed within about 3 weeks for poultry, 12 weeks for large animals. Second stage composting takes additional 3 weeks for poultry and up to about 8 months for large animals
- The volume of dead animal(s) in the compost pile must not exceed 25% of the total volume of the compost pile.
- Break eggs prior to composting.
- Finished product can be recycled, stored or added to the land as a soil amendment subject to the fulfilment of standards prescribed by Fertilized Control Orders.
- Clean and disinfect all the equipment and area.
- The operation should be under expert care for proper composting.

2.7 Rendering

Rendering is process that uses heat to convert animal carcasses into safe, pathogen free feed protein, meat and bone meal, fat or tallow and other final products and byproducts. Some facilities can efficiently transport and process one million or more pounds of raw animal per day. Not recommended for anthrax carcass.

2.7.1 Rendering process

- Rendering is done in a dry (yield 20% more) or wet process.
- Carcass should be processed immediately before putrefaction.
- Carcass cooker with operating pressure of 35-40 psi and a capacity of 250 kg is preferred.
- Chlorination should be adopted for the treatment of effluent before discharge.
- Hides should be salted for 14 days before delivery to the tannery.
- Proper pollution control measures as per pollution control norms should be adopted for chimney gases, liquid and solid waste disposal.
- Workers should have proper dress and follow the SOPs in this regard.
- Rendering should be under veterinary supervision under official checks.

Considerations

- Facilities should have established procedures for handling biosecurity, wastewater and by-products.
- Rendering shall be practiced only on-site by agencies and institutes that have adequate trained manpower in operating the rendering plant.
- The agency or the institute using rendering as a method of infected animal carcass disposal shall maintain proper records of each rendering cycle.
- Rendering should not be used if barbiturates are used for chemical euthanasia.
- Rendering facilities should be regulated to maintain environmental safety
- Carcass transport should be biosecured in leak-proof, clean and disinfected transport trucks.

- Temporary storage may be needed if carcasses cannot be rendered right away
- The rendered product shall not be used as ingredient of animal feed.

2.8 Natural Disposal

Natural disposal means disposing of dead animal(s) in a manner that allows for scavenging.

2.8 .1 Natural Disposal Process

- Dead animal should not be suspected to have had an infectious or contagious disease.
- Animal should not be euthanized with drugs or other chemical substances.
- Total weight of animal disposed at one site should not exceed 1000 kg.

Consideration

This practice should be avoided as it is difficult to monitor the carcass of diseased animal(s) and animal(s) treated with non-steroidal anti-inflammatory drugs (NSAIDs) like diclofenac, carprofen, flunixin, ketoprofen. NSAIDs have potential risk for vultures and may be risky to other animals and birds.

3. Commonly used disposal methods and disinfectants for animal diseases

Sl. No.	Name of the disease	Preferred Disposal Method	Preferred Disinfectants for farm structures, equipment, animal houses etc.
1.	**Anthrax**	Burial or Burning Burn. If incineration or cremation is not possible, burying the carcass deep (at least 6 feet) is acceptable. • Carcass should be decontaminated • Ensure sealing of all body openings (anus, mouth, nose etc.) of carcass with absorbent material to prevent leakage of exudates. • Ensure that the head of carcass is covered with heavy duty plastic bag. • There should be 1 m clay at the base of the pit and also carcass should be covered with minimum 1 m clay	10% formaldehyde, 4% glutaraldehyde, 3% hydrogen peroxide, and 1% peracetic acid. *Hydrogen proxide and peracetic acid will not work in the presence blood.* • Soil from areas of anthrax contamination should be removed for incineration or soaked with 5% formaldehyde. • Contaminated materials should be incinerated, and nondisposable items should be soaked with 4% formaldehyde or 2% glutaraldehyde. Avoid using lime and other calcium products on carcass or contaminated ground.

2	**Avian influenza / Newcastle Disease**	Burial or Burning
		• Approximately 5 quintals of wood would be required to burn 100 kg of dead birds.
		• For burial, cover with calcium hydroxide followed by at least 40 cm layer of soil. More layers of lime and soil can be applied to level the pit. A pit of 2x2x2 meters will accommodate around 1800 birds (fowls) and about 450 turkeys.
		• Prior to the commencement of operations, briefing must be given to all involved on the importance of kit, its use and disposal etc.
		• PPE must be used by RRTs and all persons having direct and active exposure to infected poultry.
			5-6% sodium hypochlorite, 5% calcium hypochlorite, 2-4% glutaraldehyde solution, 250-500 ppm Dioctyl dimethl ammonium chloride, 4% formalin.
			• Disinfect the walls, floors and ceilings of the sheds in the premises to remove organic material with either or a combination of the following:
			  • 3% calcium-hydroxide solution
			  • Sprinkling of bleaching powder and lime on the floors of the sheds
			  • White-washing of concrete areas with lime
			  • Fumigation of closed chambers and sheds with Potassiumpermanganate ($KMnO_4$) and formalin
			  • Treating all the equipment with 2% sodium-hypochlorite solution for 48hrs
			  • Cages and other large metal structures may be decontaminated by heat treatment (flame gun)

Sl. No.	Name of the disease	Preferred Disposal Method	Preferred Disinfectants for farm structures, equipment, animal houses etc.
		• Operations should not be started without the use of PPE and filter (N-95). *National Action Plan should be referred*	• Feathers spread around the farm or attached to metal net, if any, should be burnt with the flame gun • All units and items which are physically or functionally connected to the establishment (e.g. hatchery, egg store rooms, packaging rooms, egg trolleys and egg product plants etc.) must also be properly disinfected. Vehicles used for transporting live birds, eggs and feed must also be disinfected. • Water-reservoirs must also be emptied, washed and disinfected • Feed tanks (silos) need to be emptied, washed with a hot waterpressure pump and subsequently fumigated • After washing and disinfecting, all units must be fumigated twice with at least two weeks between the fumigations • Use 2% solution of NaOH should be used at the entrance on foot mats to clean the shoes gumboots and other items *National Action Plan should be referred*
3	**FMD / Swine vesicular disease**	Burial or Burning	• Virkon® (2%), 2-4% Glutaraldehyde, Citric acid, Sodium carbonate, 0.5% sodium hypochlorite solution (5000 ppm available chlorine)
4	**Lumpy Skin Disease**	Burial or Burning	• Ether (20%), Chloroform (20%), formalin (1%), phenol 2% in 15min. sodium hypochlorite 2-3%, iodine compounds (1:33) dilution, Virkon® (2%) and quaternary ammonium compounds (0.5%) • Affected Premises, vehicles plying through the affected animal holdings should be carried out with appropriate chemicals / disinfectants
5	**African Swine Fever**	Burial or Burning or Rendering • Carcasses shall not be allowed to move out of the area and shall be disposed in the Infected premises itself. In case of exceptions where the carcass disposal is not possible, the transport of carcasses should be undertaken by agencies under the control of District Veterinary/ Administrative authority following strict biosecurity protocols and using leak proof vehicles. Carcasses shall be destroyed under official veterinary supervision ONLY. *National Action Plan should be referred*	Appropriate disinfectants for ASF include 2% sodium hydroxide, hypochlorite (0.5% available chlorine for 30 minutes), detergents and phenol substitutes, sodium or calcium hypochlorite (2-3% available chlorine), Ortho-phenylphenol 3% for 30 minutes, formalin 0.3 % for 30 minutes, iodine compounds and Virkon® (2%). Disinfection has to be made in three steps – **Pre-disinfection :** This is to prevent spreading of virus in the room. Clean the surface with a broom, spray the disinfectant keeping a distance of approximately 50 cm, on the surface and let the agent react for 30 minutes **Cleaning :** This will eliminate more than 90% of the present virus in the area. Hence, after pre-disinfection, brush the surface with water and soap and let it dry **Disinfection:** The remaining virus will be destroyed during the step of disinfection. Spray the disinfectant on the surface and let it react during 2 hours *National Action Plan should be referred*

Sl. No.	Name of the disease	Preferred Disposal Method	Preferred Disinfectants for farm structures, equipment, animal houses etc.
6	**Classical Swine fever**	Burial or Burning	B-propiolactone (0.4%). Cresol (5%), sodium hydroxide (2%), formalin (1%), sodium carbonate (4%) anhydrous or 10% crystalline), ionic and non-ionic detergents as well as strong iodophors (1%) in phosphoric acid, Virkon® (2%)
7	**Bluetongue disease**	Burial or Burning	0.5-1% dodium hypochlorite, 3% sodium hydroxide.
8	**Rabies**	Burial or Burning	0.5-1% sodium hypochlorite solution, Phenolic compounds and 70% ethanol, Virkon® (2%)
9	**Hemorrhagic Septicemia**	Burial or Burning	3% hydrogen peroxide, 5% acetic acid, Virkon® (1%)
10	**Peste des Petits Ruminants (PPR)**	Burial or Burning	70% ethanol, phenol, and 5% sodium hydroxide, Virkon®(2%)
11	**Glanders**	Burial or Burning • A pit of minimum 8 ft. deep is to be made. The area requirement is about 3 sq. yards per carcass • The dead animal is put into the pit with feet upwards. The carcass is covered with quick lime followed by filling of the pit. • Personnel in close contact with the diseased animal should follow high standards of personal hygiene and strict antiseptic measures. *National Action Plan should be referred*	*B. mallei* is susceptible to sodium hypochlorite (500 ppm), 70% ethanol, 2% glutaraldehyde, iodine, benzalkonium chloride (1/2000), mercuric chloride in alcohol and potassium permanganate. It is less susceptible to phenolic disinfectants. This organism can be destroyed by heating to 55°C (131°F) for 10 minutes, or exposure to ultraviolet irradiation. In the environment, *B. mallei* is susceptible to drying and sunlight. *National Action Plan should be referred*
12	**Other common bacterial and viral diseases**	Burial or Burning	• Quaternary Ammonium Compounds, 5% Sodium hypchlorite, 5% calcium hypochlorite, 5% acetic acid, 5% • Sodium hydroxide, Sodium carbonate, 2-4% Glutaraldehyde, Formalin, Formaldehyde gas. • Some of the commercially available disinfectants such as Virkon® (1%), AlkaSept™ Active, PowerCull™ Extra, CombiSept, Bactrex Plus, Germitol, Germisol, Potassium permanganate (1-2 grams / litre of water) and Lysol (500 ml of Lysol in 9.5 lit of water) can also be used to sanitize the premises depending on type of disease organisms and related factors.

3.1 Clean-up and Disinfection of infected premises

Thorough cleaning and disinfection help in decreasing the pathogen level and prevent or break the disease cycle. One unique disinfectant cannot match all the different sources of contamination existing at farm level or at infected sites. The infected premises should be disinfected after the animals and infected materials have been disposed-off. Disinfectants should not to be applied to animals directly, unless labeled for such use.

Various categories of disinfectants are as under:

- Bactericide - kills or inactivates bacteria.
- Virucide - kills or inactivates viruses.
- Fungicide - kills or inactivates fungi.
- Tuberculocidal - kills Mycobacterium tuberculosis, an acid-fast bacterium which is generally more difficult to kill than most bacteria.
- Sporicide - kills all microorganisms including bacterial endospores, a very resistant form of certain microorganisms.

Clean-up and disinfection protocols after disposal of carcass and related material should include as below:

- Removal and safe disposal of manure, feed, and debris by burial or burning, followed by thorough scraping and cleaning of all buildings and equipment, must precede the application of a chemical disinfectant. Bedding straw, manure, etc., should be buried, burnt, or disinfected by mixing with slaked lime. A 3% solution of washing soda (sodium carbonate) or trisodium phosphate dissolved in hot water may facilitate cleaning
- Liquids such as blood urine, etc. should be disinfected with a 30% suspension of chloride of lime. Walls, floors, doors, and tools may be cleansed with a suspension of bleaching powder (1:20). Metal tools or instruments of the abattoir may be disinfected by immersion in boiling water.
- Ensure complete disposal of feed, bedding, faecal material, and slurry etc. The infected premises/area should be disinfected by spraying disinfectants like 2% Sodium Hypochlorite or 4% formalin prior to reduce the virus load. Floors, ceilings, walls of the sheds should be washed to remove organic matter and disinfected using 3% calciumhydroxide solution/ bleaching powder and apply lime on the floors. Concrete areas must be whitewashed with lime; closed sheds and rooms should be fumigated using Potassium-permanganate ($KMnO_4$) and formalin.
- All the equipment's, materials, should be treated with 2% sodium-hypochlorite solution for 48 h and other metal structures should be disinfected using flame gun.
- Water-reservoirs must also be emptied, washed, and disinfected farm workers and the visiting officials should wash their hands and feet with soap and disinfectant with approved detergent or rectified spirit.
- Use Quaternary-ammonium salts for the treatment of walls, floors, ceilings, and equipment etc., Cresolic-acid 2.2% solution or Synthetic phenols 2% solution for the treatment of floors, Vircon-, D-125 and Trilocid concentrate for surface decontamination.
- Disinfection of disease infected/suspected premises, vehicles plying through the affected animal holdings should be carried out with appropriate chemicals / disinfectants [Ether (20%), chloroform, formalin (1%), phenol (2% /15 minutes), sodium hypochlorite (2-3%), iodine compounds (1:33 dilution) and quaternary ammonium compounds (0.5%)].

- All traces of the cleaning agent must be rinsed away with clear water before the disinfectant is applied because some may inactivate the disinfectant. Provision must be made to contain and safely dispose of cleaning solutions, rinse water, and disinfectant.
- Disinfectants recommended for general use on surfaces free of organic matter are sodium or calcium hypochlorite (1,200 ppm available chlorine), iodine, phenol, and quaternary ammonium compounds.

General provisions

- The choice of disinfectants and of procedures for disinfection should be made taking into account the causal agents of infection and the nature of the premises, vehicles and objects which are to be treated.
- Disinfectants and insecticides should be authorised only after thorough tests have been carried out under field condition. Whereas hypochlorite, which is very often used, may be regarded as a universal disinfectant, its effectiveness is diminished by prolonged storage and it is therefore necessary to check its activity before use, a concentration of 0.5% active chlorine is satisfactory for disinfection.
- No matter what substances are used, disinfection techniques should comprise the following:
  - » thorough soaking of bedding and litter as well as faecal matter with the disinfectant;
  - » washing and cleaning by careful brushing and scrubbing of the ground, floors and walls;
  - » then further washing with the disinfectant;
  - » washing and disinfecting the outside of vehicles should be carried out, if possible, with liquids applied under pressure and the washing, disinfecting or destroying of articles used for tying up the animals (ropes, reins, etc.) should not be omitted.

Pathogen-specific disinfection

- Foot and mouth disease virus is easily destroyed by a high or low pH but the disinfectants used may be caustic or corrosive in concentrated form.
- Mycobacteria are very resistant to disinfectants and a high concentration is required to destroy the organisms, as well as prolonged action.

4. Bacillus anthracis (Anthrax)

In situations in which manure, dung or bedding may be contaminated with Bacillus anthracis(B. anthracis) spores, the following are recommended:

- Small volumes by incineration or
- Chemothermal treatment by composting as follows:
  - » Mix with one of the following at a rate of 1–1.5 litre/m^3:
  - » 10% formaldehyde (approximately 30% formalin)
  - » 4% glutaraldehyde (pH 8.0–8.5)
- Turn the material after five weeks and leave for a further five weeks.
  - » In situations in which liquid manure (slurry) may be contaminated with anthracis spores, disinfection with formalin (35% aqueous solution of formaldehyde) with stirring for one hour daily is recommended:
    - » For slurry up to 5% dry matter, 50 kg formalin per m^3 for 4 days
    - » For slurry >5% and <10% dry matter, 100 kg formalin per m^3 for 4 days.

[Note: Formalin is a dangerous chemical and as such the appropriate personal protective equipment should be used and safety training on the handling of this chemical should be provided.]

In situations in which surfaces in animal houses, stables, vehicles, etc. may be contaminated with B. anthracis spores, the following three-step approach is recommended:

- A preliminary disinfection should be carried out using one of the following disinfectants at a rate of 1–1.5 litres/m^3 for 2 hours:
  - » 10% formaldehyde (approximately 30% formalin), or
  - » 4% glutaraldehyde (pH 8.0–8.5) ii. all surfaces should be washed and scrubbed using ample hot water and, when cleaned and waste water is free from dirt particles, dried,
- A final disinfection step should be carried out using one of the following disinfectants applied at a rate of 0.4 litre/m^3 for 2 hours:
  - » 10% formaldehyde (approximately 30% formalin), repeated after one hour, or
  - » 4% glutaraldehyde (pH 8.0–8.5), repeated after one hour, or
  - » 3% hydrogen peroxide, or
  - » 1% peracetic acid, repeated after one hour, or
  - » 5–10% sodium hypochloride solution.

[**Note:** Formaldehyde and glutaraldehyde should not be used at temperatures below 10°C. Hydrogen peroxide and peracetic acid are not suitable in the presence of blood. As with all chemicals the appropriate personal protective equipment should be worn and appropriate safety training should be provided to staff handling dangerous chemicals.]

- Contaminated rooms which cannot be cleared before cleaning and disinfection can be fumigated to eliminate B. anthracis spores. The following procedure is recommended:
  - » All windows, doors and vents to the outside should be sealed with heavy adhesive tape; and
  - » For rooms up to 30 m^3, 4 litres of water containing 400 ml of concentrated formalin (37% w/v formaldehyde) in an electric kettle (with a timing switch to turn it off) should be boiled away and the room left overnight. Room temperature should be >15°C.

[**Note:** Formaldehyde fumigation is hazardous and proper respirators should be on hand for operator safety.

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