FAD PReP/NAHEMS Tactical Topics:
Surveillance, Epidemiology, and Tracing

Information is based on the **Foreign Animal Disease Preparedness and Response Plan (FAD PReP)/National Animal Health Emergency Management System (NAHEMS) Guidelines: Surveillance, Epidemiology, and Tracing (2014)** to be used in training or during an animal health emergency. References to the Guidelines sections are provided in parenthesis for more detail.

Introduction/Overview: Once a foreign animal disease (FAD) is identified, surveillance, epidemiology, and tracing:

- Provide a real-time understanding of the scope, characteristics, and risk factors of the outbreak;
- Guide decisions on design and early implementation of appropriate intervention strategies; and
- Evaluate the effectiveness of control measures.

FOR QUESTIONS REGARDING SURVEILLANCE, EPIDEMIOLOGY, AND TRACING: Contact your immediate supervisor. Follow chain of command.

Responsibilities within the ICS – Surveillance, Epidemiology, and Tracing (2)

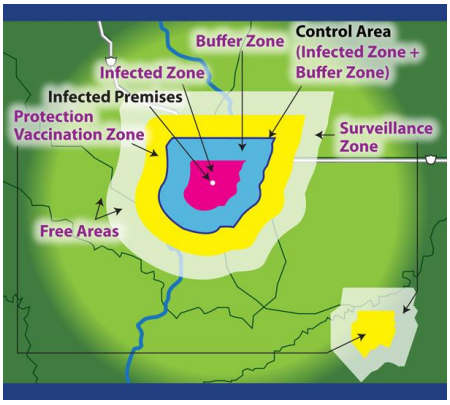
- Planning Section/Situation Unit: Administrative components of surveillance and associated activities.
  - Disease Reporting Cell: Formulates daily surveillance activities and analyzes surveillance data.
  - Epidemiology Cell: Utilizes surveillance reports and other data to plan outbreak response.
- Operations Section/Disease Surveillance Branch: Field duties involving surveillance and associated activities.
  - Disease Survey Group: Determines which premises within the Control Area have susceptible species.
  - Diagnosis and Inspection Group: Conducts investigations and sampling surveys for presence of a disease agent.
  - Mortality Surveillance Group: Collects and samples dead animals to identify presence of the disease.
  - Tactical Epidemiology Group: Conducts field investigations and tracing activities.

Terminology (1)

- Surveillance: Data recording encompassing gathering, documenting, and analyzing data.
- Epidemiology: Study of the distribution of disease in populations and of factors that determine its occurrence.
- Tracing: Collection of information regarding recent movements of animals, personnel, vehicles, and fomites to and from affected premises to identify the potential spread of disease and to detect a source of infection.
- Use the following case definitions to describe an outbreak of disease in question:
  - Suspect Case: Animal showing clinical signs compatible with the disease.
  - Presumptive Positive Case: Animal with clinical signs consistent with the disease and positive test results supporting current infection or exposure to the disease.
  - Confirmed Positive Case: Animal from which the disease agent that has been isolated and identified using approved tests performed at a laboratory designated by the U.S. Secretary of Agriculture.

Designating Zones and Areas (3)

- Disease Surveillance Branch and the Situation Unit are responsible for identifying Disease Control Zones in an FAD event.
- Designate the following Disease Zones in the case of an FAD:
  - Infected Zone: Area immediately surrounding Infected Premises.
  - Buffer Zone: Area immediately surrounding an Infected Zone.
  - Control Area: Region including the Infected Zone and the Buffer Zone.
  - Surveillance Zone: Area outside and along the border of a Control Area.
  - Free Area: Any expanse considered to be absent of the disease.
  - Vaccination Zone: Area includes premises where emergency vaccination is performed.



- Use the following factors to determine the size of a Control Area:
  - Jurisdictional considerations, physical boundaries, disease epidemiology, infected, contact, or contagious premises characteristics, environment, climate, general area, region or agricultural sector biosecurity, number of backyard or transitional premises, and continuity of business.

Developing a Surveillance Plan (5)

- A surveillance plan is a documented framework that systematically describes the components of a surveillance system that will be put into place during an FAD response.
- The purpose of the surveillance plan may change over time (e.g., detecting existing or newly infected populations, evaluating disease control strategies, and/or providing evidence of disease-free areas).
- Include the following elements in a surveillance plan:
  - Disease description, surveillance objectives, stakeholders and responsible parties, population description, case definitions, data sources, sampling methods, and diagnostic tests.
- Define methods to be used in summarizing, analyzing, and interpreting data in the surveillance plan.
- Surveillance personnel will need to determine the number and type of diagnostic specimens to be collected.
  - The following are examples of diagnostic specimens to be collected:
    - Blood and/or serum, tissues, skin or vesicular lesions, swabs (nasal, oral, oropharyngeal, tracheal, rectal, cloacal, genital tract, or fecal), semen, nasal discharge, saliva, tears, milk, or environmental samples.

Epidemiological Response (6, 7)

- Use these epidemiological principles for response strategies to contain, control, and/or eradicate an FAD:
  - Prevent contact between the FAD agent and susceptible species: Quarantine infected animals and implement movement controls and biosecurity procedures.
  - Stop the production of the FAD agent by infected or exposed animals: Use slaughter or mass depopulation of infected and potentially infected animals.
  - Increase the disease resistance of susceptible animals to the FAD agent or reduce the shedding of the FAD agent in infected or exposed animals: Implement strategic emergency vaccination procedures.
- Investigate disease outbreaks using the following three phases:
  - Descriptive Phase: Collect information on case chronology, geography, and demography, to develop a case definition.
  - Analytic Phase: Identify disease risk factors based on descriptive data and corresponding lab results.
  - Intervention Phase: Address disease control measures, consider preventive options, and assess economic benefits and consequences of control measures:
    - Consider quarantine and movement control, enhanced biosecurity practices, vaccination, and mass euthanasia and disposal, for this phase.

Tracing (8)

- Collect tracing information for a minimum of two maximum incubation periods before the appearance of clinical signs in an infected animal.
- Use the two following tracing procedures:
  - Trace-Back: Identify the origin of all animals, animal products, fomites, people, vehicles, equipment, and possible vectors that have been moved onto an Infected Premises to establish the original source of the agent/hazard.
  - Trace-Forward: Trace all animals, animal products, fomites, people, vehicles, equipment, and possible vectors that have left the infected premises and could have possibly carried the agent to other animals.
    - Animals located on exposed premises should be investigated and kept under surveillance and/or quarantine until additional data suggest they have remained unaffected.

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