



United States  
Department of  
Agriculture

# Virulent Newcastle Disease Virus Response

## *Surveillance Sampling Commercial Premises in Surveillance Zone and Free Area*

Please note: These procedures may be revised as the situation develops.

June 5, 2018

### DEFINITIONS

**Infected Zone:** Zone that immediately surrounds an Infected Premises.

**Buffer Zone:** Zone that immediately surrounds an Infected Zone or a Contact Premises.

**Control Area:** Consists of an Infected Zone and a Buffer Zone.

**Surveillance Zone:** Zone outside and along the border of a Control Area. The Surveillance Zone is part of the Free Area.

**Foreign Animal Disease Investigation:** An investigation conducted according to *VS Guidance Document 12001* (Ready Reference Guide for investigations is [here](#)).

### INTRODUCTION

An Infected Zone and Buffer Zone (Control Area) will be created around an Infected Premises. This document provides surveillance guidance for commercial poultry<sup>1</sup> premises outside a Control Area in the Surveillance Zone. Surveillance activities and associated testing should be based on recommendations of the Unified (State-Federal) Incident Command; this guidance may require further modification based on epidemiological and situational information.

Newcastle disease, caused by vNDV, is endemic in a number of countries in Asia, the Middle East, Africa, and the Americas. Newcastle disease was detected in backyard poultry in California in 2018. Previous Newcastle disease outbreaks in poultry in the United States occurred in the States of California (2002–2003), Nevada (2003), Arizona (2003), and Texas (2003). Virulent NDV is endemic in wild cormorants and non-virulent forms of ND are endemic in poultry. There are non-virulent strains of NDV endemic in poultry. This document reflects the epidemiological information known about the behavior of vNDV from knowledge gained in the 2003–2004 U.S. outbreak.

### COMMUNICATION

It is critical to ensure that disease information, as well as recommended biosecurity measures, is clearly communicated to all commercial premises in a Surveillance Zone. APHIS and State/Tribal

<sup>1</sup> For this document, *poultry* is defined as any domesticated bird raised for food or fiber; this excludes the poultry displayed in a licensed exhibition or zoo.

officials must ensure that instructions are provided to owners/producers to report clinical signs and abnormal mortality. Transparent procedures should be used to manage reports of clinical signs or unusual mortality from commercial producers (also known as sick bird calls).

## VISITING PREMISES

While it is important to locate commercial poultry premises within a Surveillance Zone, responders should not enter premises unless instructed to do so by the Incident Management Team (IMT). It is critical to remember that any real or perceived belief that responders are spreading disease is incredibly detrimental to the response effort. As with any premises, if a visit is necessary, responders should observe appropriate biosecurity and cleaning and disinfection measures and follow all guidance provided by Incident Command.

## SURVEILLANCE PLAN

### Passive Surveillance

Passive surveillance is conducted at all times in the United States through foreign animal disease investigations (per *VS Guidance Document 12001*). In the event of a foreign animal disease detection, passive surveillance should be intensified through rapid and clear communication to all producers in the Surveillance Zone, following IMT procedures.

Mortality threshold levels that signal the need for investigation have been established for the different commercial poultry sectors. Commercial flocks that exceed the mortality thresholds listed below are investigated and sampled as rapidly as possible for virulent ND.

- ◆ Commercial broilers: mortality exceeding 3.5 birds/1,000 per day.
- ◆ Commercial layers: mortality exceeding 3 times the normal daily mortality (normal: 0.13 birds/1,000 per day for layers from 2 to 50 weeks, and 0.43 birds/1,000 per day for layers over 50 weeks); OR 5 percent drop in egg production for 3 consecutive days.
- ◆ Commercial turkeys: mortality exceeding 2 birds/1,000 per day.
- ◆ Broiler breeders: mortality exceeding 2 birds/1,000 per day.
- ◆ Layer breeders: mortality exceeding 3 times the normal daily mortality (normal: 0.2 birds/1,000 per day up to 50 weeks, and 0.37 birds/1,000 per day after 50 weeks).
- ◆ Turkey breeders: mortality exceeding 2 birds/1,000 per day; OR a decrease in egg production of 15 percent occurring over a 2-day period.
- ◆ Small-volume high-value commercial poultry flocks and other commercial flocks not listed here: any sudden and significant mortality event or sudden drop in egg production should be investigated.

At the State's discretion, investigation and sampling of flocks that exceed the mortality thresholds can be performed by a company veterinarian, a Foreign Animal Disease Diagnostician, or other IMT-designated response personnel. Schedule an appointment to collect samples as quickly as possible and conduct sampling according to the recommended sampling scheme below. Submit samples to the designated National Animal Health Laboratory Network (NAHLN) lab as indicated by the IMT.

### Active Surveillance

In addition to passive surveillance, active surveillance is conducted to find cases and provide evidence that the pathogen is not present. Active surveillance in commercial premises during an outbreak is

composed of two components: response surveillance and surveillance for permitted movements of poultry and poultry products, referred to as pre-movement surveillance. This document describes response surveillance activities only.

These strategies regarding sampling sizes and sampling frequencies pertain to commercial premises located in the Surveillance Zone.

## RECOMMENDED SAMPLING SCHEME

### Premises Level

1. Select the appropriate number of premises to sample following guidance in Table 1 below. Prioritize commercial premises that are closest to the presumptive or confirmed vND premises. Sampling the indicated number of premises will result in 0.95 probability that at least one positive premises will be detected if the prevalence of vNDV among additional premises in the Surveillance Zone is 1 percent or greater.
2. Collect samples from each barn every 5-7 days for 28 days, or use similar sampling frequency depending on the resources available and guidance provided by the IMT.
3. Continue sampling commercial premises every 28 days for 3 months after the last detected vND premises<sup>2</sup>.

### Bird Level

Select birds to sample as follows for detection of vNDV at a 10 percent prevalence with 0.95 probability of detection, and collect samples in line with the current version of Recommendations for Collecting Specimens from Poultry for Viral Diagnostic Testing (WI-AV-0020 available [here](#)). Prioritize sampling of sick and dead birds; conduct pooling per WI-AV-0020. Random sampling of apparently healthy birds provides minimal detection benefit unless you are targeting poultry with a high risk of exposure to vNDV. Oropharyngeal or tracheal swabs are preferred for gallinaceous birds<sup>3</sup> and cloacal swabs for domestic waterfowl. Do not combine swabs from different species or different sampling routes.

1. Sample at least 30 sick and dead birds per barn using 5- or 11-swab pools.
  - a. If there are more than 30 sick and dead birds, sample an additional 5- or 11- swab pool for each 50 sick and dead birds observed.
  - b. If there are less than 30 sick and dead birds, sample the apparently healthy birds near doorways, vents, and any area with a high potential for exposure to vNDV to obtain a total sample size of 30 birds.
2. Prepare, package, and process swabs for laboratory submission according to the guidance found in the Veterinary Services Guidance Document 12001, which provides guidance for the investigation of potential foreign animal disease/emerging disease incidents. VS Guidance Document 12001 is [available here](#).

---

<sup>2</sup> OIE 2017 Terrestrial Animal Health Code Chapter 10.9 Infection with Newcastle disease virus.

<sup>3</sup> Gallinaceous birds include chickens, turkeys, pheasants, partridges, grouse, quail, guinea fowl, and peafowl.

Table 1. Number of premises to be sampled in the Surveillance Zone if the total number of premises in the Surveillance Zone cannot be visited.\*

No. of Premises	Minimum No. of Premises to be Sampled for 1% prevalence	Minimum No. of Premises to be Sampled for 3% prevalence
less than 40	Sample all	39
80	Sample all	60
100	Sample all	66
150	136	76
200	163	82
400	221	92
600	247	96
1,000	271	99
1,500	285	100
2,000	292	101
3,000	299	102
5,000	305	103
10,000	309	103
infinite	314	104

<sup>1</sup> Sample sizes computed using Cannon, 2001.

\* Assuming a 95% herd-level sensitivity, sampling the indicated number of premises will result in 0.95 probability that at least one positive premises will be detected if the prevalence of virulent Newcastle disease virus is at least 1% or 3% in the population of premises at the time of sample collection.

## DOCUMENTATION

As with all surveillance activities, documentation is critically important. EMRS2 is the system of record for all virulent ND outbreaks in the United States. Relevant data regarding surveillance activities must be entered into EMRS2 in as close to real time as possible. This data may be reported internally and externally through situation or close-out reports or other means.

At a minimum, the following items are important to maintain and report:

- ◆ Number of commercial premises in Surveillance Zone
- ◆ Number premises visited and sampled (including dates) for active surveillance
- ◆ Total birds sampled at each premises and visit
- ◆ Laboratory results for all submissions

## FOR MORE INFORMATION

USDA APHIS VS. Draft August 2014. *Newcastle Disease Response Plan*: [The Red Book](#).

*Recommendations for Collecting Specimens from Poultry for Viral Diagnostic Testing* ([NVSL WI-AV-0020](#))

USDA APHIS VS. 2018. FAD Prep Materials and References. [www.aphis.usda.gov/fadprep](http://www.aphis.usda.gov/fadprep).