



Virulent Newcastle Disease Virus Response

Surveillance Sampling Backyard Premises in Control Area

Please note: These procedures may be revised as the situation develops. June 5, 2018

DEFINITIONS

Infected Premises: Premises where a presumptive positive case or confirmed positive case exists based on laboratory results, compatible clinical signs, virulent Newcastle disease (ND) case definition, and international standards.

Contact Premises: Premises with susceptible poultry¹ that may have been exposed to virulent Newcastle disease virus (vNDV), either directly or indirectly, including but not limited to exposure to animals, animal products, fomites, or people from Infected Premises.

Infected Zone: Zone that immediately surrounds an Infected Premises.

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

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

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 non-commercial backyard poultry¹ premises within a Control Area. 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 ND outbreaks in poultry 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.

¹ For this document, 'poultry' is defined as any domesticated bird raised for food, eggs, or fiber and used in exhibitions or shows. This includes chickens, turkeys, ducks, geese, swans, pheasants, partridges, grouse, quail, guinea fowl, pea fowl, pigeons, doves, ostriches, emus, rheas, and cassowaries.

PRIORITIES FOR SURVEILLANCE ACTIVITIES IN THE CONTROL AREA

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 Control Area.

Reports of clinical signs or unusual mortality and morbidity from backyard producers (sick bird calls) are investigated as rapidly as possible. However, sick bird calls may overwhelm available resources, particularly when investigation and/or management of Infected and Contact Premises are not complete. In this case, the IMT may recommend triaging disease investigations on backyard premises using criteria such as morbidity and mortality, clinical signs for ND and risk factors for exposure to vNDV. These parameters should be based on the best information available, and should be developed in coordination with IMT, State/Tribal officials, and subject matter experts. Premises in the Infected Zone should be prioritized over those in the Buffer Zone.

For sick bird calls on backyard premises, a Foreign Animal Disease Diagnostician (or individual designated by the IMT) should:

1. Immediately investigate each sick bird call, if resources allow.
2. If necessary, prioritize the premises in the Infected Zone and prioritize the premises meeting the criteria for further investigation.
3. Schedule an appointment to collect samples as quickly as possible.
4. Conduct diagnostic testing according to sampling recommendations, submit samples to designated National Animal Health Laboratory Network (NAHLN) lab as indicated by the IMT (provided in “Sampling Scheme for Poultry” below).

Active Surveillance

1. Create an inventory of the bird² populations in the Control Area.
 - a. Identify all the premises with birds in the Control Area. This can be done by phone or house visits.
 - b. Identify any auctions, markets, or exhibitions of birds in the Control Area and consider sampling at these events following the sampling scheme below.
2. Interview the owner of the premises about any birds residing on the premises.
 - a. If birds are present, determine if the premises is high-risk for exposure to vNDV (see Table 1).
 - b. Record contact with owner and risk-status of birds on the premises.
3. Conduct a surveillance visit to the high-risk premises identified in item 2 above.
 - a. Visually inspect the birds and sample following the “Recommended Bird Sampling Scheme” below.
 - b. Prioritize visits to premises with sick or dead birds. **All premises with sick or dead birds should be visited.**
 - c. Aim to also visit all remaining high-risk premises. However, if resources are limited,

² ‘Birds’ includes ‘poultry’ as described above, as well as the birds in the Orders *Psittaciformes* (parrots, parakeets, macaws, conures, cockatoos) and *Columbiformes* (pigeons, doves).

select a minimum number of remaining premises to visit according to Table 2. 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 Control Area is 0.5 percent or greater.

Guidance for risk based surveillance to detect infected premises in the Control Area



^a Follow sample size guidelines described in next section

RECOMMENDED BIRD SAMPLING SIZE AND SCHEME

Select birds to sample and follow the Recommendations for Collecting Specimens from Poultry for Viral Diagnostic Testing (WI-AV-0020 available [here](#)) for detection of vNDV. Oropharyngeal or tracheal swabs are preferred for gallinaceous birds and cloacal swabs for non-gallinaceous birds³. Do not combine swabs from different species or different sample types.

1. Select birds to sample. If there are multiple houses or flocks on the premises, sample each separately according to the guidelines below. **Prioritize sampling of sick and dead birds regardless of vaccination status.**
 - a. For unvaccinated populations, sample two 5- or 11- swab pools. Sampling two 5- or 11- swab bird pools is sufficient to detect vNDV with 95 percent confidence if prevalence across birds is 40 percent (using an estimated test sensitivity of 91 percent).
 - If there are fewer than 5 birds, sample all the birds.
 - b. For vaccinated populations, sample 30 birds using 5- or 11- swab pools. A 30-bird sample can detect vNDV with approximately 95 percent confidence if within-flock prevalence among birds considered high-risk of exposure is 10 percent (using an estimated test sensitivity 91 percent).
 - If there are fewer than 30 birds, sample all the birds.
2. Prepare, package, and process swabs for laboratory submission according to the guidance found in the FAD Investigation Manual.
3. Repeat visits and sampling on premises are not necessary, unless clinical signs continue or escalate.
4. Encourage owner to call if clinical signs, morbidity, and/or mortality are observed.

Table 1. Risk factors leading to birds to be classified as high-risk, a higher probability exposure to virulent Newcastle disease.

Sick and dead birds and/or history of sick and dead birds.
Close geographic proximity to other premises containing outdoor birds.
Other demographic characteristics in common with known virulent ND infected premises.
Newly arrived birds and young birds and/or a high likelihood/reported history of birds moving onto or off of the premises.
Birds from multiple owners on a single premises.
Similar farm or bird level risk factors as other cases (identified by IMT).
Birds used for exhibition or commingled for any purpose.
Any number of birds with access to the outdoors.
Premises with gamefowl

³ Gallinaceous birds are chickens, turkeys, pheasants, partridges, grouse, quail, guinea fowl, and pea fowl, as well as all other birds are non-gallinaceous birds.

Table 2. Number of premises to be sampled in the Control Area if the total number of premises in the Control Area cannot be visited.*

No. of Premises	Minimum No. of Premises to be Sampled for 0.5% prevalence	Minimum No. of Premises to be Sampled for 1% prevalence
less than 100	Sample all	Sample all
200	Sample all	163
400	327	221
600	398	247
1,000	474	271
1,500	519	285
2,000	544	292
3,000	570	299
5,000	593	305
10,000	611	309
infinite	629	314

¹ 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 0.5% or 1% 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 backyard 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. Refer to IMT guidance for how to appropriately record these and other data:

- Number of backyard premises in Control Area.
- Number contacted, and means of contact, for passive surveillance.
- Number of visited and sampled premises for passive surveillance.
- Number of premises contacted by phone for active surveillance.
- Number of premises visited and sampled for active surveillance.
- Total birds sampled per premises.
- 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.