



UNIVERSITY
of Prince Edward
ISLAND



APMV-1/Newcastle Disease Sample Collection Guidelines

Avian Paramyxovirus-1 (Newcastle Disease)

Newcastle disease (ND) is caused by virulent strains of avian paramyxovirus 1 (APMV-1). APMV-1 viruses belong to the genus Orthoavulavirus, subfamily Avulavirinae, and family Paramyxoviridae. The Orthoavulavirus genus contains 7 additional APMVs designated as APMV-9, APMV-12, APMV-13, APMV-16 to APMV-19. APMV-1 is further divided into classes I and II, each containing defined genotypes and subgenotypes. Avirulent as well as the virulent genotypes that cause Newcastle disease are classified within class II, whereas class I contains mostly avirulent viruses and is commonly found in waterfowl and shorebirds. Viruses belonging to the Avulavirinae subfamily have been isolated from wild, captive, caged and domestic birds.

The distribution of these viruses appears to be worldwide. Although they may be responsible for acute disease associated with high mortality in other avian species, viruses in the Avulavirinae subfamily, other than APMV-1 do not generally produce fatal disease in domestic poultry.

Strains of APMV-1 vary widely in the severity of disease they produce. The most virulent forms produce Newcastle disease and are referred to as Newcastle disease virus (NDV). The clinical signs observed with APMV-1 infection vary widely, depending on the pathotype of the virus. APMV-1 viruses have been classified into five pathotypes based on the clinical signs induced in infected chickens:

1. **Viscerotropic velogenic:** high mortality with intestinal lesions.
2. **Neurotropic velogenic:** high mortality following nervous signs.
3. **Mesogenic:** low mortality with respiratory and nervous signs.
4. **Lentogenic or respiratory:** mild or unapparent respiratory infections.
5. **Asymptomatic enteric:** subclinical unapparent enteric infection.

Even under constant controlled laboratory conditions these groupings may not be obvious, but they give an indication of the variable nature of the disease and serve as a guide to clinical signs which are suspicious of Newcastle disease.

The ability to rapidly identify poultry infected with APMV-1, particularly Newcastle disease virus, can significantly reduce the economic damage that is associated with these infections. Delay in diagnosis in domestic poultry may result in the undetected spread of the virus to neighboring flocks which can have negative consequences on control and eradication measures.

Submission Instructions

Only veterinarians or agents acting on their behalf are permitted to submit samples to the Atlantic Veterinary College (AVC) for APMV-1 Virus/Newcastle Disease testing. We **do not** provide services to the general public.

If there is a high suspicion of an FAD agent causing mortality on a premise, please contact the Canadian Food Inspection Agency (CFIA) directly. CFIA will determine if samples/carcasses will be submitted to AVC for FAD testing.

Sample submissions for APMV-1 testing **cannot** be dropped off directly to the FAD laboratory. Samples should **never** be dropped off and left unattended at AVC. Please call the Regional Diagnostic Virology Services (RDVS) laboratory at 902-566-0877 for assistance.

Sample Selection Guidelines for Suspected APMV-1 Infection

APMV-1 is best detected from specimens collected from respiratory or gastrointestinal tracts. When APMV-1 is suspected, the following samples may be submitted for laboratory diagnosis:

Swabs: Tracheal or oropharyngeal swabs and cloacal swabs in viral transport media

Clean Tissues: Trachea, lung, spleen, kidney, and brain

Dirty Tissues: A section of gut, cecal tonsils, and proventriculus

Collecting Swabs in Viral Transport Media (VTM)

Swabs for APMV-1 RT-rtPCR testing **must** be submitted in viral transport media (VTM). Gel-based swabs typically submitted for Bacteriology testing are **not** suitable for PCR testing and will be rejected by the FAD laboratory.

VTM vials may be purchased from VWR (Catalog # CA73270-008) or from the Regional Diagnostic Virology Services Laboratory (subject to availability). Please contact RDVS by phone (902-566-0877) or email (rdvsavcds@upei.ca) for purchase inquiries.

To collect the swab(s):

1. Label each vial of VTM with a unique identifier.
2. Use a sterile swab (synthetic fiber swabs only) to collect the sample(s).
3. After swabbing the specimen(s) to collect the sample, gently agitate the swab(s) in the VTM for ~5-10 seconds.
4. Carefully lift the swab(s) out of the VTM and gently press the swab(s) on the inside of the VTM vial to squeeze out any fluid from the swab(s).
5. Remove the swab(s) from the VTM vial and discard the swab(s) through the appropriate disposal methods. Please **do not** leave the swab(s) in the VTM.
6. Vials of VTM may be stored at 2-8°C for up to 24 hours after sample collection. For longer storage (>24 hours), vials of VTM should be stored at -70°C or colder.

7. Please refer to the “FAD Sample Submission Guidelines” for further information on packaging and shipping FAD samples to the laboratory.

Avian Wildlife

Single animal:

Oropharyngeal/tracheal and cloacal swabs may be pooled together in a single vial of VTM.

Multiple animals:

The appropriateness of pooling multiple avian wildlife samples will be discussed between the FAD laboratory and the applicable wildlife authority or surveillance program. If you have any questions regarding pooling multiple avian wildlife samples, please contact the FAD laboratory to discuss.

Domestic Poultry

Single animal:

- Oropharyngeal/tracheal swabs may be pooled together in a single vial of VTM.
- Cloacal swabs must be submitted in a separate vial of VTM.
- Do **not** pool oropharyngeal/tracheal and cloacal together in the same vial of VTM.

Multiple animals (up to 10 animals of the same species):

- Oropharyngeal/tracheal swabs may be pooled together in a single vial of VTM.
- Cloacal swabs may be pooled together in a separate vial of VTM.
- Do **not** pool oropharyngeal/tracheal and cloacal together in the same vial of VTM.

Collecting Tissues

Clean Tissues: Trachea, lung, spleen, kidney, and brain, collected aseptically.

Dirty Tissues: A section of gut, cecal tonsils, and proventriculus. Collect the “dirty” tissues after the clean tissues and keep separate.

- All “clean” tissues from an *individual animal* are placed in one leak-proof container.
- All “dirty” tissues from an *individual animal* are placed in a separate leak-proof container.
- **Always** keep “clean” and “dirty” tissues in separate containers.
- The leak-proof containers containing the “clean” and “dirty” tissues are placed inside an overpack to keep the tissues from the *individual animal* together.
- Tissues may be stored at 2-8°C for up to 24 hours after sample collection. For longer storage (>24 hours), tissues should be stored at -70°C or colder.
- Please refer to the “FAD Sample Submission Guidelines” for further information on packaging and shipping FAD samples to the laboratory.