



TECHNICAL BULLETIN

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Newcastle Disease (Ranikhet)

Background

Newcastle disease (ND) is a highly contagious disease of birds caused by a para-myxo virus. Birds affected by this disease are fowls, turkeys, geese, ducks, pheasants, partridges, guinea fowl and other wild and captive birds. The disease is caused by **Newcastle disease virus (NDV)**, an avulavirus.

NDV strains can be categorized as

Velogenic

- highly virulent viscerotropic
- highly virulent neurotropic

Mesogenic

- intermediate virulence

Lentogenic

- nonvirulent
- asymptomatic

Velogenic strains produce severe nervous and respiratory signs, spread rapidly, and cause up to 90% mortality. Mesogenic strains cause coughing, affect egg quality and production, and result in up to 10% mortality. Lentogenic strains produce mild signs with negligible mortality.

ND is transmitted most often by direct contact with diseased or carrier birds. Infected birds may shed the virus in their feces, contaminating the environment. Transmission can then occur by direct contact with feces and respiratory discharges or by contaminated food, water, equipment, and human clothing. Newcastle disease viruses can survive for several weeks in the environment, especially in cool weather.

Signs of infection with NDV vary greatly depending on factors such as the strain of virus and the health, age and species of the host. The incubation period for the disease ranges from 4 to 6 days. An infected bird may exhibit several signs, including respiratory signs (gasping, coughing), nervous signs (depression, inappetence, muscular tremors, drooping wings, twisting of head and neck, circling, complete paralysis), swelling of the tissues around the eyes and neck, greenish, watery diarrhea, misshapen, rough- or thin-shelled eggs and reduced egg production.

In acute cases, the death is very sudden, and, in the beginning of the outbreak, the remaining birds do not seem to be sick. In flocks with good immunity, however, the signs (respiratory and digestive) are mild and progressive, and are followed after 7 days by nervous symptoms, especially twisted heads.

Generally, virus is shed during the incubation period and for a short time during recovery. Birds in the pigeon family can shed the virus intermittently for a year or more.

Prophylactic vaccination is practised in all but a few of the countries that produce poultry on a commercial scale. In order for a country to demonstrate that it is free of ND, surveillance is necessary following the guidelines the OIE *Terrestrial Animal Health Code*. Finally, poultry producers must implement effective biosecurity procedures to prevent incursion of the disease as described in the OIE *Terrestrial*

According to Animal Health Code (OIE, when the disease appears in a previously disease free area, a stamping out policy is practiced in most countries.

Recent vvND outbreak in Nepal

Unlike to previous years, an array of very virulent form of ND outbreaks has been encountered throughout the country during this FY 2077/78. Below, here we have discussed the ND cases in poultry species brought in the Central Veterinary Laboratory (CVL), Tripureswor, Kathmandu. Of the different types of avian species brought at CVL for the disease diagnosis, ND was mostly observed in backyard chickens such as local, kuroiler and giriraj breeds. Total number of ND cases of this FY has been presented in Table 1.

Table 1: Number of PM vs ND Positive Cases

Type of poultry	Total cases	ND Positive	ND Positive %
Broiler	705	83	11.8
Layers	266	17	6.4
Backyard*	614	235	38.3
Turkey	58	3	5.2
Pheasant	40	9	22.5
Quail	25	3	12.0
Total	1728	349	20.2

*Backyard: Local, Kuroiler, Giriraj, Kadaknath

Similarly, the data shows that ND cases are higher in grower and adult stages of poultry compared to chicks as presented in Table 2.

Table 2: Age Wise ND Cases

Type of poultry	Chicks	Grower	Adult
Broiler	3	44	31
Layers	8	4	9
Backyard	77	77	60
Turkey	0	0	3
Pheasant	4	0	5
Quail	0	0	2

Note:

- Broiler (Chicks:1-14 days; Grower: 15-28 days; Adult: Above 29 days)
- Layers/Local/Turkey/Pheasant (Chicks: 1-8 weeks; Grower: 9-18 weeks; Adult: Above 18 weeks)
- Quail (Chicks: 1-14 days; Growers: 14-35 days; Adult: Above 35 days)

Symptoms

Most of the symptoms observed in the birds affected with NDV were neurotropic and viscerotropic. Tortocolis, circling and ataxia were major nervous signs and coughing, nasal discharge and drooling of saliva were major respiratory signs. Similarly other signs were whitish or greenish diarrhoea, reduced feed and water intake and reduced egg production.

Morbidity and Mortality

Morbidity was found to be up to 100% in most of the infected farms. Mortality was varied depending upon the immune status of poultry. Being unvaccinated in backyard chickens such as Sakini, Kuroiler and Giriraj, mortality was found to be up to 80-90 percent. Mortality was found to be up to 95 percent in commercial broilers. Relatively mortality was found to be less in commercial layers breeds. This may be due to timely and proper vaccination in commercial laying birds.

Diagnosis

Diagnosis was made through post mortem examination in support with Rapid Diagnostic Test kits (RDT) and Polymerase Chain Reaction (PCR).



Fig 1: RDT positive for NDV

Gross Lesions



Fig 2. Haemorrhagic tracheitis



Fig 3. Ulcerative hemorrhage in intestine



Fig 4. Haemorrhagic nephritis



Fig 5. Pin point hemorrhage in tip of proventricular gland

Photo source: Dr. Nabaraj Shrestha, CVL

Month Wise ND Cases

Recent outbreak of ND was surged from the month of Mangsir and highest level of ND cases was observed during the month of Magh, Falgun and Chaitra. However, due to decreased number of cases of poultry at CVL, ND positive cases was also found to be declined. Detail presentation of month wise ND cases is presented in Figure 6.

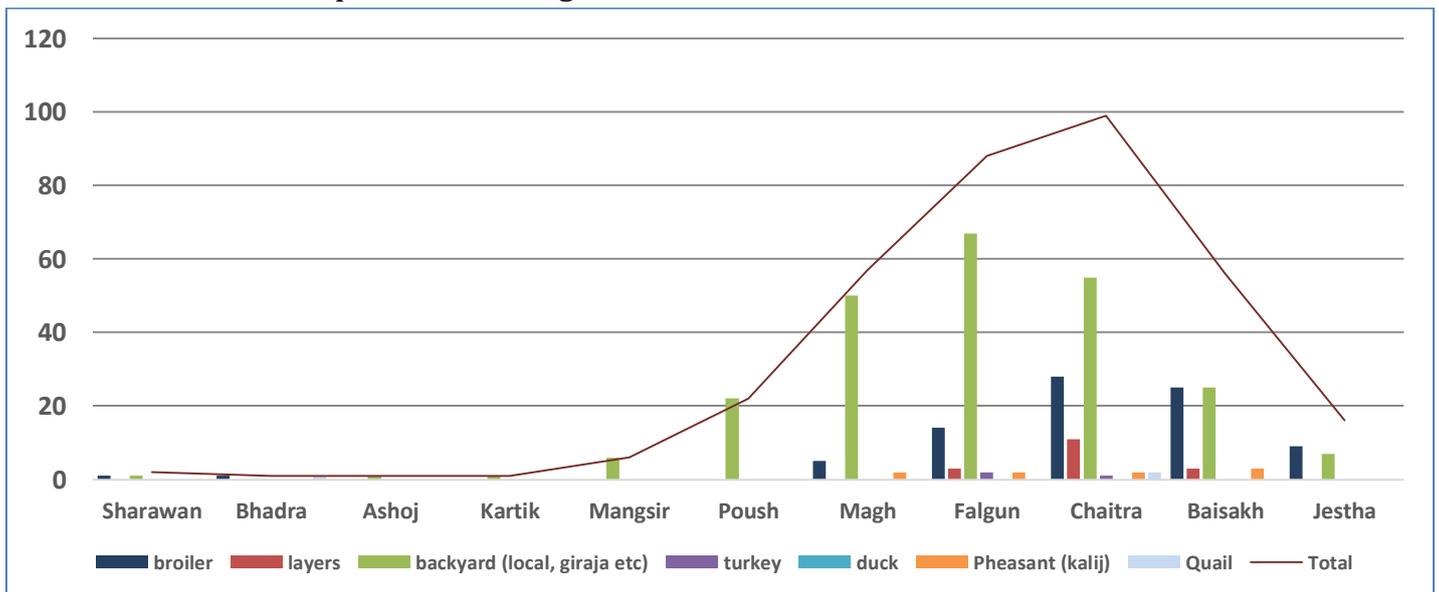


Figure 6: Month wise ND cases brought at CVL.

Recommendations

- Strict vaccination against ND virus.
- Movement control of farmers and technical personels.
- Strict isolation or quarantine during outbreaks.
- Thorough cleaning and disinfection of premises.
- Proper carcass disposal.

Conclusion

We can conclude the following major points;

- Revision of ND vaccination schedule.
- Identification of genotypes of NDV prevalent in field.
- Regular monitoring of quality of vaccines imported in Nepal.
- Awareness to farmers.

रानीखेत रोगबाट पन्धीलाई कसरी बचाउने ?

रानीखेत रोग पन्धीहरूमा विषाणुबाट लाग्ने एक गम्भिर प्रकारको सरुवा रोग हो । यो रोगको कुनै पनि ठोस उपचार छैन र यो रोग लागेमा कुखुराहरू शत प्रतिशतसम्म मर्न सक्ने भएको हुँदा रोकथाम नै एक मात्र उत्तम उपाय हो ।

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