



# An Overview of Exotic Newcastle Disease (END)

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# Exotic Newcastle Disease (END)

## Definition

- **Highly contagious disease of birds caused by a VIRUS**
- **The most serious disease of chicken, turkeys, and most other birds throughout the world**
- **The most severe form of Newcastle Disease, (NDV) synonymous with Avian Paramyxovirus serotype 1 (APMV-1)**
- **Morbidity and Mortality in domestic poultry may reach 100%**
- **Attacks the nervous system, Respiratory system and GI system**

# END – Different Forms of the Disease

- **Velogenic (virulent form now called END)**
  - **Viscerotropic (GI) velogenic (VVND)**
  - **Neurotropic (nervous) velogenic (NVND)**
- **Mesogenic (intermediate form)**
- **Lentogenic (mild form used for vaccines)**

# Exotic Newcastle Disease (END)

- **Distribution:**
  - **Worldwide (except for Canada and other European countries)**
- **Host: (species affected)**
  - **All birds, both domestic and wild**
  - **Chicken are the most susceptible**
  - **Ducks and geese are the least susceptible**
  - **Amazon parrots will shed END virus intermittently in excess of 1 year**
- **Etiology:**
  - **Family: Paramyxoviridae**

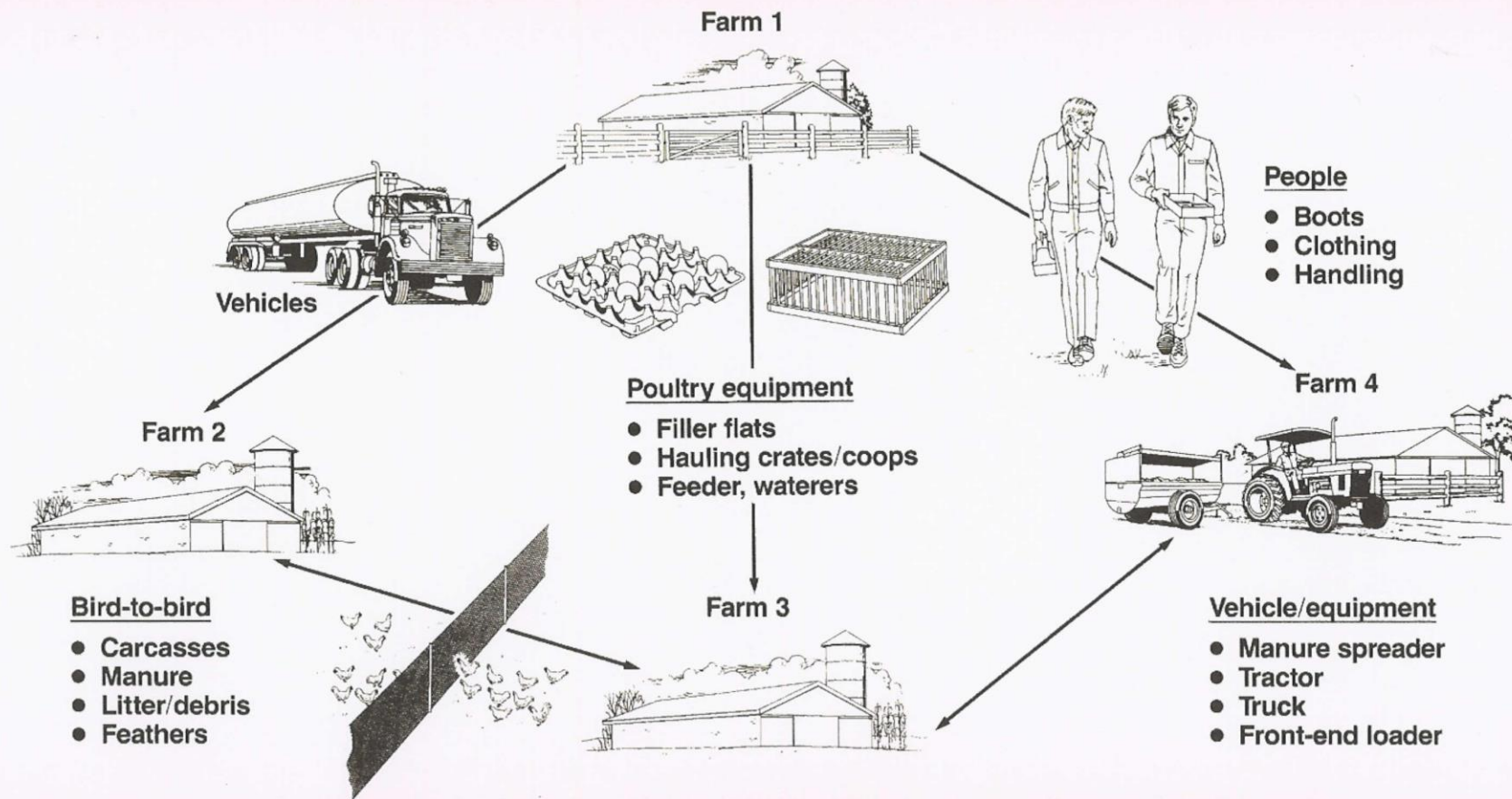
# Exotic Newcastle Disease (END)

## ➤ **Transmission:**

- **Contaminated objects: shoes, clothing, lawn and garden equipment, boots, egg trays, crates, flies, mice, people, vehicle, etc.**
- **Direct contact between healthy birds and infected birds**
- **Droppings and fluids from the nose, mouth and eyes**
- **Movement between farms by infected birds and people**
- **Spreads rapidly among birds kept in close quarters**
- **Tropics: disease is recurrent-? Wild birds a reservoir**



# How Poultry Disease Spreads



# Clinical Signs

- **Sudden Death**
- **High mortality (up to 100%)**
- **Marked decrease in egg production/egg quality**
- **Depression**
- **Torticollis and ataxia**
- **Respiratory distress**
- **Drooping wings**
- **Swelling around the eyes**
- **Bile staining greenish diarrhea**
  
- **Clinical signs will vary depending on age, immunity, susceptibility & virulence of the virus strain**















**Depression**

**Torticollis  
(twisted neck)**



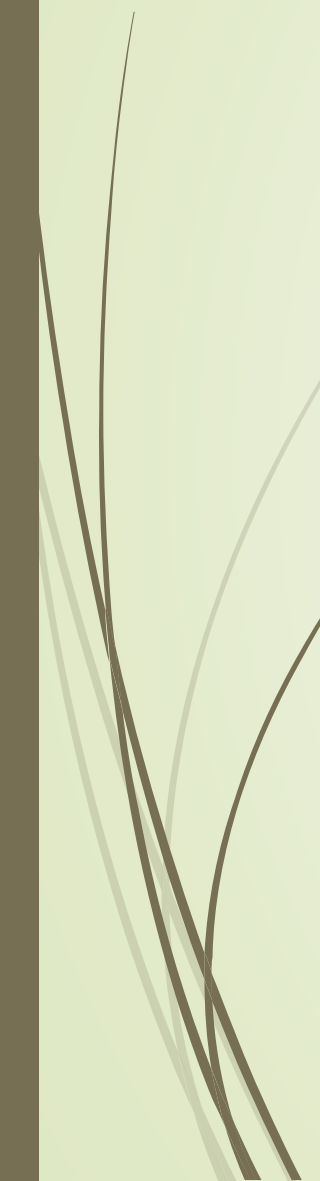


**Respiratory distress,  
Difficult breathing**





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# END - Clinical Signs (in poultry)



**Excessive fluids in respiratory tract**



**Normal chicken with a pale comb**



**Conjunctivitis & edema of the eyelids**



**Salivation -Respiratory sign**

# END - Clinical Signs in pheasants



**Depression and  
Ruffled feathers**



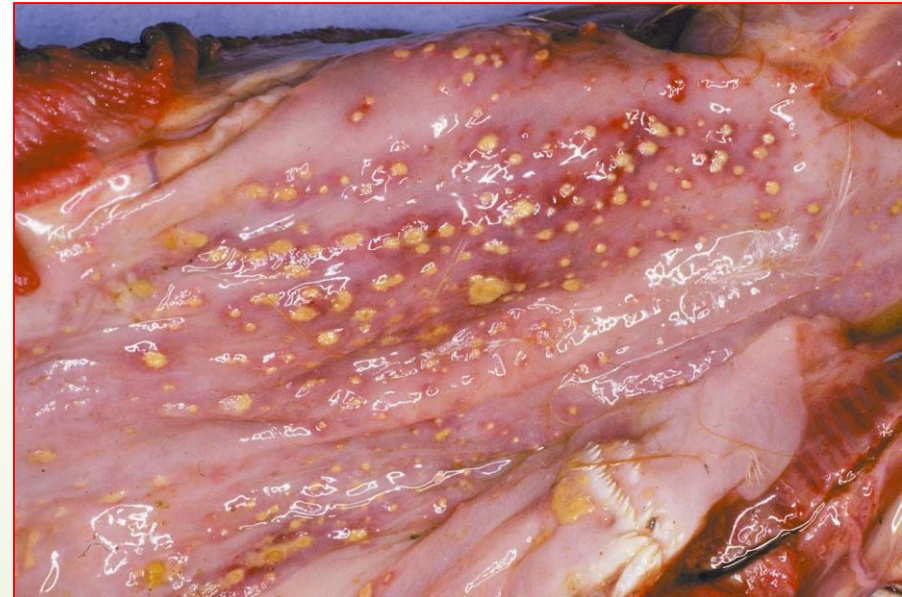


# END - Gross Lesions

Hemorrhagic conjunctivitis  
(bleeding and inflammation  
under the eyelids)



(dead spots in the esophagus)





# END - Gross Lesions



**Hemorrhage in  
esophagus**

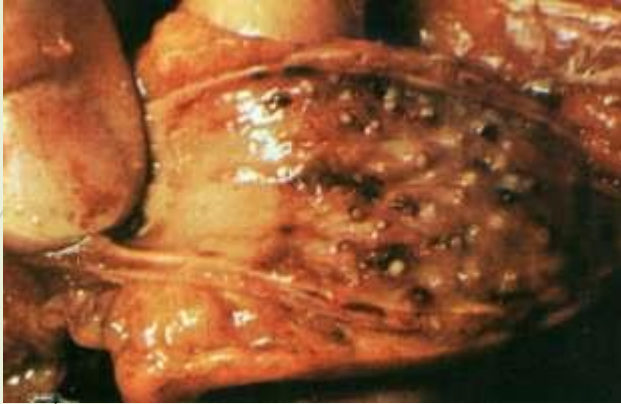


**Hemorrhage in trachea**



**Hemorrhage in proventriculus**

# END - Gross Lesions



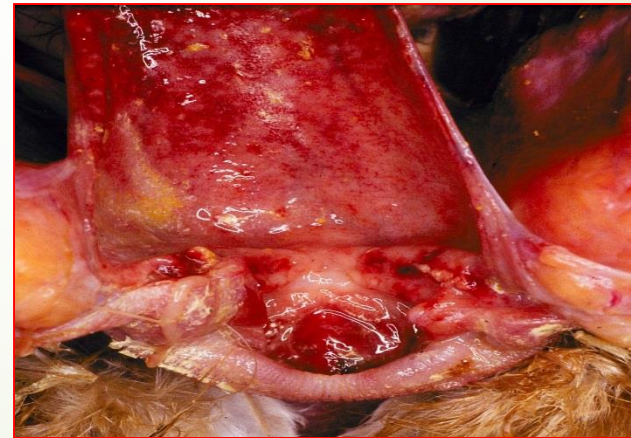
**Hemorrhage in lining of proventriculus**



**Hemorrhage in the small intestine**



**Hemorrhage in the GI Tract**



**Hemorrhage in the rectum**

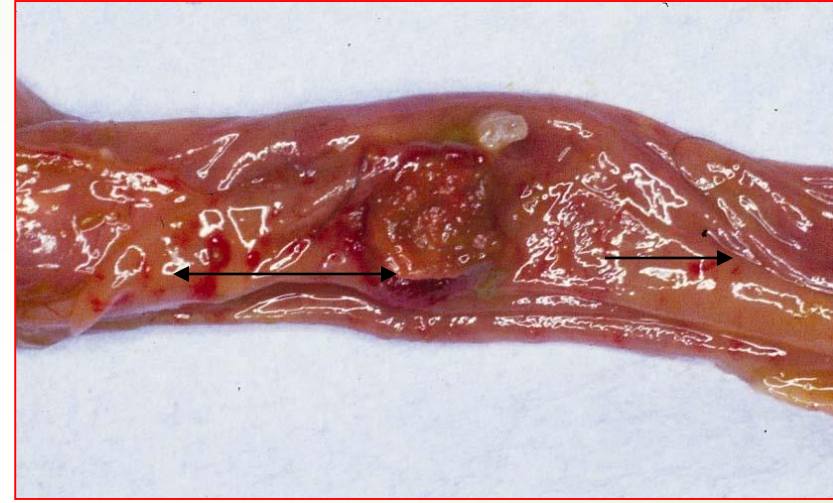


# END - Gross Lesions

## Hemorrhage in the stomach



# END - Gross Lesions



**Hemorrhage in the small intestine**



# Diagnosis

- ▶ **History/Clinical signs**
- ▶ **Typical Gross Lesions**
- ▶ **Microscopic Lesions (Histopathology)**
- ▶ **Virus Isolation/Identification**
  - ▶ **Lung, trachea, spleen, brain, GI.**
  - ▶ **Embryonating chicken eggs – 5-12 days**
- ▶ **Serology**
  - ▶ **HI, ELISA – same day**
- ▶ **RT-PCR – hours**



# Treatment

➤ **NO TREATMENT**



# END – Prevention/Control

## ➤ Vaccination

### ➤ Live virus

- Lentogenic strains (B1, La Sota)
- Administered by spray or in water
- Multiple exposures needed

### ➤ Killed virus

- Oil-emulsion, administered SQ
- Used in layers, breeder (after live virus)



# END – Prevention/Control

- **Biosecurity – prevent the introduction**
  - **Single age farms**
  - **Control human traffic and movement**
  - **Bird-proof houses**
- **Control – During an outbreak**
  - **Stamping out/depopulate infected premises**
  - **Proper cleaning and disinfection**
  - **At least 30 day down time before restocking**



# END – Prevention/ Control

**BIOSECURITY IS  
THE BEST  
DEFENSE**

## Good Neighbors Protect Poultry



### 6 Ways To Keep Poultry Diseases “Cooped Up”

#### **1** Clean and disinfect vehicles and equipment.

Clean manure spreaders, tractors, truck tires, and undercarriages with a strong detergent—then apply disinfectant to kill avian influenza and other viruses that can linger on surfaces.



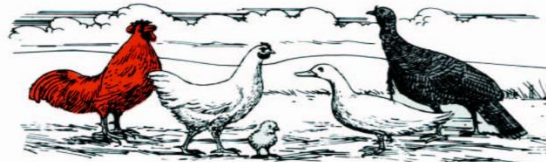
#### **2** Wear sanitized coveralls and boots.

Make sure everyone who enters your premises wears them too! Poultry disease viruses can be spread by clothing and shoes of people who come into contact with infected flocks.



#### **3** Practice “all in—all out” poultry management.

Avoid skimming flocks—birds left behind are exposed to work crews and equipment that may carry poultry disease viruses. Process each lot of birds separately, and clean and disinfect poultry houses between flocks.



#### **4** Keep out unnecessary visitors and equipment.

Allow only essential personnel onto your farm. Secure entry gates and lock all poultry buildings. Avoid lending or borrowing equipment—it can carry avian disease viruses. Don't visit other poultry farms.



#### **5** Avoid contact with game birds and migratory waterfowl.

Don't raise, keep, or allow contact with pet birds, ducks, geese, or other game birds. They are suspected carriers of poultry diseases. If possible, avoid visiting duck ponds and hunting waterfowl.



#### **6** Know the warning signs of major avian diseases.

Higher death losses; sudden drop in egg production; swelling of head, eyelids, combs, and hocks; diarrhea; purplish-blue coloring of wattles and combs; bloody nostril discharge; loss of appetite; incoordination.

**Report Suspicious Cases To Your Extension Service Or State Or Local Veterinarian**



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# END - Concerns of the Commercial Poultry Industry

- **Trade Issues and embargoes**
  - **High morbidity and mortality**
  - **Prognosis is mostly unfavorable**
  - **Increased Production cost (margin of profit is small)**
- 















# Exotic Newcastle Disease in Chickens in Southern California (2002)


















# END - Concerns of the Commercial Poultry Industry





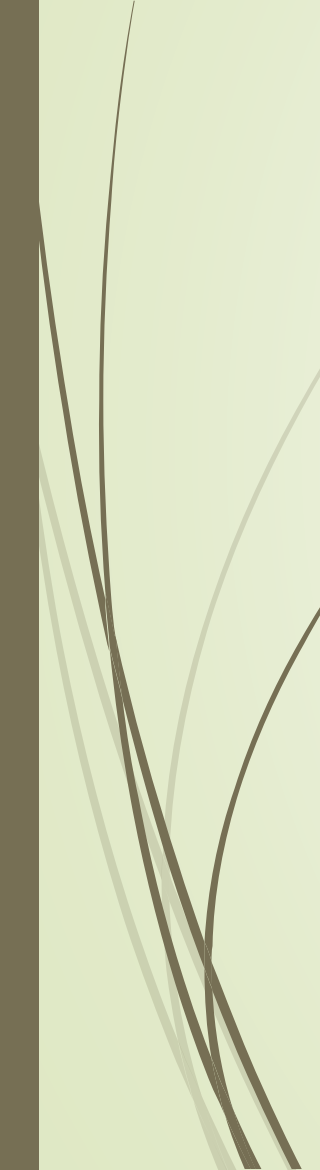


## END - Threat

- ▶ **In past years, VVND virus has been isolated from domestic pet birds (smuggled) or from birds in quarantine facilities**







# END – Public Health

- ▶ **Only a disease of birds**
- ▶ **Not a significant treat to Human Health**
- ▶ **Occasionally a mild inflammation inside the eyelid (conjunctivitis) for several days if heavily exposed to infected birds.**





# END – Economic Impact

- ▶ **California 2002-2003:**
  - ▶ >4 million birds had to be euthanized
  - ▶ Cost 168+ million
- ▶ **Mexico 2000:**
  - ▶ 13.6 million chickens died or had to be euthanized
- ▶ **Florida 1980:**
  - ▶ 8,000 cage birds died
  - ▶ 30,307 birds were depopulated in 23 states
- ▶ **California 1971-1973:**
  - ▶ **11.9 million birds had to be euthanized**
  - ▶ **Cost 56 million dollars**



# END - CONCLUSION

- **The most important viral disease of poultry worldwide**
- **LOOK for signs**
  - **Domestic poultry – high mortality, hemorrhagic GI lesions and CNS signs**
  - **Pet birds – respiratory, CNS signs**
- **REPORT sick birds**
- **PRACTICE good “backyard” biosecurity**



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