

## **Marek's Disease Overview for Backyard Poultry Owners**

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Neoplastic (i.e. cancer causing) diseases of the immune system can be of infectious or non-infectious etiology. Marek's Disease virus (MDV), a highly contagious herpes virus is considered endemic in the global 'poultry environment'. Marek's disease (MD) results in thickening of peripheral nerves and/or tumors or lesions in multiple tissues and organs including liver, kidney, spleen, gonads, peripheral nerves, skin, eye, etc. In addition, MD can infiltrate the immune system which results in immunosuppression making the birds more susceptible to other diseases.

### **How does Marek's Virus infect a chicken?**

The virus infects cells of the feather follicle and can remain viable in feather dander for several months. The viable virus can be inhaled by susceptible chickens from the dusty environment

### **Example Case:**

The Sander's family has a backyard chicken flock of 10 birds of varying breeds and mixed ages. The chickens have been acquired over the years from various sources including feedstores, mail order hatcheries, and from a neighbor down the street. The Sander's collect eggs daily and share them with neighbors and friends. Recently, they noticed that a 10-week-old pullet named 'Beaker' had paralysis (i.e. unable to move) in one leg, weakened or dropped wings, and appeared to have severe weight loss followed by death. Approximately 2 weeks later, a 5 month only hen named 'Fryer' also appeared to have some paralysis coupled with difficulty breathing before dying. In order to protect the remaining 8 birds in their flock the owners brought the most recent dead chicken to their small animal veterinarian. The veterinarian sent the bird to a state diagnostic laboratory for necropsy. (Note: Many states including California offer free or

heavily discounted necropsy services for backyard poultry as part of the states Avian Influenza and Exotic Newcastle Disease surveillance programs). Per the owner, the remainder of the flock appeared normal.

The veterinary pathologist identified Marek's Disease as the most likely cause of the death.

### **Treatment**

There is no treatment of MD. Therefore, prevention is essential for the health of individual birds and the flock health as a whole.

### **Control/Prevention of MD:**

Vaccination of MD constitutes an outstanding example of successful disease control in veterinary medicine. However, because the virus is so ubiquitous in the environment (e.g. infection of chicks can occur almost immediately after hatching) the ideal times for vaccination are *in ovo* administration on the 18<sup>th</sup> day of incubation or by subcutaneous administration of vaccine at one day of age. This recommendation coupled with the need to store the cell associated vaccines in liquid nitrogen make vaccination for backyard breeders challenging. Therefore, for backyard operations that produce chicks, the lyophilized Herpes Virus of Turkey (HVT) vaccine, which is closely related to MDV, can be easily obtained from many feed stores, reconstituted and given subcutaneously at one day of age. While this is the only viable vaccine option for producers who hatch their own eggs, unfortunately the lyophilized HVT vaccine is the least effective of the MDV vaccines and will not offer protection against more virulent strains of MDV. In addition, due to the 'neutralizing effect' of maternal antibody on HVT, this vaccine can be ineffective in chicks depending on the vaccine status of the hen, or in situations of severe MDV field exposure.

Regardless of vaccine status it is essential to place day old chicks in houses which have been thoroughly decontaminated to allow vaccinated birds time to develop immunity. Immunity typically develops in two weeks (1). In addition, to reduce the risk of transmission, backyard 'farms' should be operated in an all-in-all-out cycle in order to allow thorough cleaning and disinfection of the poultry environment from MDV before placement of a new flock. While this

may not be possible veterinarians should work with their clients in order to set up a reasonable alternative with the goal being to reduce the viral load of MDV in the housing environment.

### Questions

1. The owner of the flock wants to know what she can do to protect the remainder of her current flock.
2. The owner is considering buying some new chicks from a hatchery or feedstore. What advice can you give the owner when purchasing these birds.
3. Describe the route of infection and how the virus typically causes disease.
4. If an owner has hens that were vaccinated using the HVT vaccine what vaccine recommendation can you give for hatching eggs from that hen?

### Answers

1. At this point there is not much the owner can do. If the birds were vaccinated in ovo or at day one with one of the cell associated vaccines they most likely will have some protection. The chickens are latently infected from virus in the environment. The incidence of disease decreases dramatically after approximately 20 weeks of age.
2. They should contact their feedstore and or hatchery and make sure that the hatchery vaccinates against MD in ovo or at day one with one of the cell associated vaccines.
3. MDV preferentially infects cells of the feather follicle and can remain viable in feather dander for several months. The viable virus can be inhaled by susceptible chickens from desquamated epithelium in poultry house dust shed from feather follicle epithelium
4. If the hen was vaccinated then neutralization of maternal antibodies in the chick will most likely occur resulting in an ineffective vaccination. Maternal antibodies persist for up to 3 weeks in chicks.