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Control of Some Mink Diseases (30 Mar 2000)

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It is not uncommon to have four or five thousand mink raised on two or three acres of land. The potential for the spread of an infectious agent is great. Newly purchased mink should be tested for Aleutian disease (AD) and held in isolation for at least one month and retested for AD. Dogs carrying the canine distemper (CD) virus and raccoons infected with CD and AD are a hazard to farm raised mink. The clinical diagnosis of mink diseases should always be confirmed by laboratory procedures.

Mink Distemper

Etiology

(see Canine Distemper, M.J.G. Appel, In: Recent Advances in Canine Infectious Diseases, L.E. Carmichael (Ed.), IVIS, Ithaca, NY - Doc. No. A0103.1199)

Clinical Signs

Nine to fifteen days after exposure in typical cases, infected mink have a watery discharge from its eyes and nose. As the signs progress, the discharge becomes thicker and it accumulates as brown granular material, which glues the eyes and closes the nose. About a week after ocular signs appear, the feet may occasionally become swollen. Many times after the signs mentioned above have subsided, the mink die of so-called "screaming fits" or neurotropic distemper. When mink die following a neurotropic episode, external signs of CD are usually absent.

Diagnosis

The hallmark of mink distemper diagnosis is the demonstration of inclusion bodies in the urinary bladder, trachea, or other epithelial tissues by conventional trichrome or H and E stains. Immunohistochemistry, immunofluorescence, and other procedures may be employed (see [Canine Distemper](#), M.J.G. Appel). CD susceptible ferrets can be used for the inoculation of suspected infectious material but due to the length of time required for ferrets to show signs of CD, the procedure is rarely done.

Vaccination

Mink distemper can only be controlled by vaccination, either by injection or as a spray with a modified-live virus vaccine propagated in cell cultures. Young mink from CD-vaccinated females are vaccinated after they reach 10 weeks of age to preclude the blocking effect of maternal antibody. A single effective distemper vaccination should immunize almost all mink for about 2½ to 3 years which is the economic life of a farm raised mink. Mink distemper vaccine is used as a single component, but it is commonly employed with mink virus enteritis, botulism, and pseudomonas in a "4-way" vaccine or together with botulism and mink virus enteritis in a "3-way" vaccine. These vaccines also should be given after the kits are 10 weeks of age or older.

Other Control Measures

The pens that housed CD infected mink should be steam cleaned and disinfected. Distemper virus is present in

nasal and conjunctival exudates, urine and feces. In contrast to the mink virus enteritis parvovirus and the Aleutian disease parvovirus, the distemper virus is susceptible to most disinfectants.

Mink Virus Enteritis

Mink virus enteritis (MVE) is a member of the parvovirus family and has been found in all mink-producing countries. The malady was first called Fort Williams disease because the disease was first recognized in that area of Ontario, Canada. It is closely related to feline panleukopenia virus (FPLV). FPLV can infect mink but only causes a subclinical infection and will cross-protect against MVE. Outbreaks of MVE occur in the kits in July, August and September, but can occur as late as December. In older mink, MVE produces a mild or subclinical infection. Transmission occurs by the fecal-oral route. MVE is difficult to eradicate on a ranch since the virus persists in contaminated pens for a year or longer. In kits, the mortality can be as high as 75 percent. Clinical signs appear four to nine days post-exposure and begin with depression, lethargy, anorexia and vomiting. Watery diarrhea develops and often includes mucofibrinous casts that are yellow, green, pink or grey, depending on the amount of bile present. Currently, only inactivated MVE vaccines are available commercially. Maternal antibodies prevent effective immunization and the immune status of the mother must be considered when vaccinating kits. If mothers were vaccinated with inactivated MVE the previous year and are not subsequently exposed, kits can be vaccinated as early as ten weeks of age using a four-way vaccine (see above). However, if wintertime vaccination or exposure to live pathogenic virus of older mink have occurred, vaccination will probably not be effective until 12-13 weeks of age. Annual vaccination is recommended for mink kept as breeders.

Aleutian Disease

In addition to high mortality rates, Aleutian disease (AD) causes severe economic losses in both reproduction and fur value. It was first recognized in farm-raised mink of the Aleutian genotype, but it was later found that all genetic types were susceptible. The cause is a parvovirus (not related to mink virus enteritis) that infects mink for their life. AD is characterized by hypergammaglobulinemia and immune complex mediated vasculitis, glomerulonephritis and interstitial pneumonitis in young mink.

Signs include gradual weight loss, thirst, anorexia, blood at the mouth and uremia. At autopsy, the kidneys may be hemorrhagic, or swollen and pale with petechia, or shrunken and pitted. The spleen and lymph nodes are usually enlarged. Encephalitis rarely occurs. AD can only be eradicated from a farm by using a counterimmunoelectrophoresis (CIEP) test and pelting the reactors. This blood test for specific AD antibody can be obtained from United Vaccine (800-283-6465). All mink should be tested twice each year. Mink kept for breeding stock should be tested in late fall and in January or February, before the breeding season in March. All newly purchased mink should be tested on arrival and one month later. In addition to blood, the virus has been found in the saliva, urine and feces. The AD parvovirus is very stable; contaminated pens should be washed, steam cleaned and sprayed or dipped in 2% sodium hydroxide. There are no vaccines or treatments.

Hemorrhagic Pneumonia

Hemorrhagic pneumonia is caused by the bacterium *Pseudomonas aeruginosa*. Outbreaks have occurred wherever mink are raised. Mink of all ages are affected, particularly in the warm humid days of fall. *P. aeruginosa* is often present in the water supply which may be the source, but most infections are due to aerosolization of bacteria within the mink sheds. Disease progression is rapid and often initially unnoticed. Clinical signs may include lethargy and anorexia, progressing to dyspnea, convulsions, and the expulsion of a sanguineous nasal exudate just prior to death. The autopsy findings reveal consolidated lungs and generalized hyperemia and hemorrhage. The losses are very high in mink affected with Aleutian disease or mink fed poor diets.

Successful prophylactic vaccination requires protection against all pathogenic serotypes. The inactivated bacterin of subtypes 5, 6, 7, 8 and, sometimes, 9 is the most commonly available vaccine commercially. Maternal antibodies may interfere with successful vaccination. Vaccines should be administered at ten weeks or older in a "4-way" vaccine. Protection occurs in about one week after vaccination. Revaccinate adults yearly at the time the kits are vaccinated.

Botulism

The most common cause is *Clostridium botulinum* type C toxin. Large quantities of toxin are produced when

the temperature of feed products is over 15°C and anaerobic growth can occur. Subsequent refrigeration of stored feed will not affect the toxin. During an outbreak, many mink will die within 24-72 hours of exposure to the toxin, while others show varying degrees of paralysis and dyspnea. Losses as high as 100% can occur rapidly. Antitoxin therapy is of little benefit. Recovered mink are not immune to further toxin challenge. Vaccination with type C botulism toxoid is protective. Maternal antibodies do not interfere with successful vaccination; therefore, kits can be vaccinated at 6-7 weeks of age or older. Full protection takes three weeks to develop; yearly vaccination is suggested. Multivalent vaccines should include the bacterium *C. botulinum* type C toxoid as a component.

Epizootic Catarrhal Gastroenteritis

Epizootic catarrhal gastroenteritis is characterized by a transient diarrhea of a mucoid nature and anorexia. While the morbidity rate is high, very few mink die. Since affected mink recover in 3 to 4 days, it has been called "3 day disease." Young mink, older than 3-4 months of age, are usually infected during the molting period and to the time of pelting in the fall. If an outbreak occurs at the time the females are lactating, the losses in many nursing kits may be high because of the failure of affected females to give milk. If males are infected during the breeding season, they will show no interest in the females. While the disease is highly infectious, the cause is unknown. It is highly likely that a coronavirus, along with *E. coli*, rotavirus, and other enteric pathogens may be involved. There is no vaccine or effective treatment.

References

Hunter DB and Lemieux N. Mink biology, health and disease. Canada Mink Breeders Association, Rexdale, Ontario, Canada M9W6C7.

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