



The American Ferret Association, Inc.

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ALEUTIAN MINK DISEASE A Hidden Danger to Your Ferret

What is Aleutian Mink Disease Virus?

Aleutian Mink Disease Virus, or ADV, is a type of parvovirus that infects mink, ferrets, raccoons, skunks, and possibly other Mustelidae. Currently, there is no evidence that it can infect other mammals outside the Mustelidae family, such as cats or dogs, though. Although at one time there may have been only one ADV virus, it is now thought that there are different ADV viruses that are species specific. Because it is a parvovirus, it is very hardy, and can live outside the body of a host for a long time. To kill the virus, you must use a parvocide or a 10% bleach solution within 30 minutes of contact time.

Because it is a virus, ADV can mutate. Currently it is known that there are at least 5 strains of ADV that can infect mink. It is believed that there are also multiple strains of ADV that can affect ferrets, although so far, only one strain has been positively identified. Like different strains of the flu in humans, some strains of ADV may be more contagious and more deadly.

Why is ADV a danger to my ferret?

The greatest danger of ADV is that an animal can have the disease and be spreading it without showing any symptoms. Also, there has not been a lot of research done on how the disease acts in ferrets. Therefore, at this time, it is unknown what the incubation period is (how long after exposure before symptoms develop) or what the shedding period is (when the infected animal can spread the disease). ADV can be either clinical (symptoms are apparent) or non-clinical (the animal tests positive for ADV, but appears healthy).

How is ADV spread?

ADV is passed via urine, saliva, feces and is probably passed through the placenta as well. Some studies in Europe have indicated the virus may also be airborne. The most likely means of spread of the disease is by contact with contaminated surfaces, though. One study of ADV in mink had mink that tested positive for ADV housed in cages near the cages of mink that tested negative for ADV. The virus was not transmitted to the mink that had tested negative. In another study in the US, three ferrets that tested positive for ADV were housed in a cage with a ferret that tested negative. After four months, the one ferret still tested negative. It is possible that infected ferrets only shed (pass on) the disease during brief intervals. While research is ongoing, there are no definite answers yet.

What are the symptoms of ADV?

In ferrets, the symptoms of ADV can mimic many other ailments. Classic symptoms can include a chronic progressive wasting, progressive hind end paralysis, muscle wasting, tremors, urinary incontinence, lethargy, pallor, enlarged spleen, tarry feces, and death. While the immune system of an infected ferret does produce antibodies to fight the virus, these antibodies are unable to kill the virus. As the body produces more and more of these non-neutralizing antibodies, massive amounts of antigen-antibody complexes form. Organ failure occurs due to the accumulation of these complexes within the blood vessels feeding the various organs. Most ferrets with active ADV die of liver or kidney failure at the end of the disease.

While most cases of ADV infection involves chronic wasting, a different form occurred during an outbreak in 1998. These ferrets showed more acute signs such as coughing, sneezing, labored breathing and paralysis (beginning in the rear limbs.)

How can my ferret be tested for ADV?

Most ferrets with ADV will have elevated total protein and globulin levels. Since other conditions can cause this, more specific testing is required.

Currently, there are several tests available that test for the presence of antibodies to ADV. The most widely used test is the counterimmunoelectrophoresis, or CIEP test. This test is fast, easy and relatively inexpensive. The test is offered commercially by Blue Cross Animal Hospital (401 N. Miller Ave., Burley, ID 83318; 208-678-5553.) The test requires a small blood sample that can actually be obtained by clipping a claw too short, and sent in by the ferret owner. This test has been around for many years, and is very reliable in ferrets over six months of age.

Avecon Diagnostics, Inc. (501 Grouse Dr., Bath, PA 18014; www.avecon.com, 800-249-5875) offers a few tests. The Quick-Chek ADV test is run on saliva and can be performed in-home or at your veterinarian's clinic. This test may miss early infections and for this reason is not accepted by the AFA for sanctioned shows. Avecon does offer an acceptable test for these shows – the ADV Antibody ELISA Test, which requires a saliva-impregnated swab to be mailed directly to Avecon.

The Infectious Disease Laboratory at the University of Georgia College of Veterinary Medicine (706-542-2912) has been doing research on ADV in ferrets and offers a variety of tests. They have an improved CIEP test that actually measures titer levels and is considered to be very accurate. (The titer level can be rechecked in 3 to 4 weeks to see if it is getting higher, which would imply an active infection and progression of the disease.) A highly accurate PCR test ("DNA in situ hybridization test") can actually detect for the presence of virus and requires tissue biopsies or necropsy samples (rather than blood or saliva.) An ELISA test is also under development.

In Canada, the University of Guelph College of Veterinary Medicine is expected to offer CIEP testing.

If your ferret should test positive on a saliva or ELISA test, it is advisable to confirm the diagnosis with a PCR or CIEP test. (False positive tests results can happen!)

It should be noted that none of these tests can predict whether or not your ferret will actually become sick with ADV, or if it will even spread the disease. With the exception of the PCR test (which detects actual viral presence), these tests only show the presence of antibodies to ADV. Antibodies are what the immune system builds to fight a virus, so a positive test only shows

exposure to the disease. In fact, studies run 10 years ago showed that only a small percentage of ferrets that tested positive for ADV actually become clinically sick from the disease. More recent studies indicate that the virus is becoming more deadly, though. There have been several outbreaks of ADV in recent years with very high death rates. So, it is a good idea to test your ferrets, especially if your ferrets attend shows and/or fun matches. Ferrets that do test positive for antibodies should **NOT** be exposed to other ferrets, to avoid spreading the disease.

How can I avoid exposing my ferrets to ADV?

ADV is not a new disease. It has been around for over 50 years. In the past, there have been sporadic increases in the active cases reported, which are usually followed by several years of ferret owners taking extra precautions to avoid spread of the disease. Recently, there has again been an increase of active ADV cases, and so it is wise for ferret owners to be more careful.

To help avoid exposure of your animals, you mostly need to use common sense. Do not turn your ferrets loose around other ferrets you do not know are negative for ADV. Do not allow strangers to handle your ferrets, and do not handle stranger's ferrets. At your vet's office, keep your ferrets in their carrier except in the examination room. When attending ferret shows or frolics with your ferrets, make sure the organizers are following sensible sanitation procedures.

When getting a new ferret, find out if it has been tested for ADV. Since it may take several months for the antibodies to show up in kits, find out if the parents have been tested and are negative. Breeders should test all their breeding stock before the beginning of the breeding season. If you get a new ferret and are not able to determine ahead of time if it has come from an ADV-free environment, keep it separate from your other ferrets until you can have it tested.

By taking a few precautions, you can limit problems down the road. But remember, quarantining a ferret with an unknown ADV status in a negative home increases the risk of ADV exposure.

Why is more research needed, and what can I do to help?

There are many unanswered questions regarding ADV in pet ferrets. How long is the virus shed by an infected ferret? Which infected ferrets are likely to come down with clinical illness? Which test is the best screening test? How accurate are saliva tests?

Currently, there is no treatment, vaccine, or cure known for ADV. The hope is that with additional research some or all of these might be found.

The University of Georgia, College of Veterinary Medicine has a group of researchers that are currently working on ADV in ferrets. They hope to learn more about the disease, and possibly develop a vaccine that could protect our pets from this virus. To make a donation to this project, send a check or money order made out to "University Foundation" to:

M.A. Stevenson, DVM. PhD, DACVS
209A Vet Med Building
Dept. of Small Animal Medicine
UGA College of Veterinary Medicine
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In the memo section of the check note "for ADV Research". All money donated to the University of Georgia for ADV research is tax deductible.

For additional information visit the following websites:

<http://www.egroups.com/group/advferret/>

<http://www.avecon.com/AveconADV.htm>

<http://www.geocities.com/russiansmom/index.html>

<http://www.geocities.com/wolfysluv/adv-straight.html>

<http://www.ferret.org/read/aleutian.htm>