

## The status of the Aleutian disease virus infection of mink ranches in Nova Scotia

**Eradication of the Aleutian disease virus from ranches, in areas with a high concentration of infected ranches, is a difficult task. Yet, quite a few ranches in these areas are free of the virus. A practical alternative to the test-and-removal strategy does not exist at the present time.**

We analyzed 2,964,920 CIEP (counterimmunoelectrophoresis) test results from 82 Nova Scotia ranches over an eight year period, between 1998 and 2005. This survey included approximately 60% of the active ranchers in the province, who gave us permission to use their results from CIEP testing. Our objective was to evaluate the success of the test-and-removal strategy for Aleutian disease (AD) virus control in Nova Scotia.

The average proportion of CIEP-positive mink, over all ranches and years, was 3.34%, and varied between 5.22% in 1999 and 1.35% in 2005. The proportion of infected ranches, however, ranged between 23.8% in 1998 and 70.7% in 2003. The overall trend was for a smaller proportion of infected animals but a larger proportion of infected ranches during this time period. This means that many ranchers had infected herds, but each only had a small number of infected mink.

Of the 82 ranches, 24 (29.3%) had negative CIEP in all tests, 15 (18.3%) had CIEP positive animals in every year of testing, and 43 (52.4%) had a mixture of positive and negative results in different years. These results show that infection by the AD virus remains a problem for many Nova Scotia mink ranchers.

Of the 24 ranches with negative CIEP results in all tests, only a few had more than four years of data. Most AD-free ranchers test their herds sporadically. These ranches had less than 1% of all samples tested.

We had information on 9 ranches located in central NS, and all were CIEP negative, despite the fact that a high proportion of feral mink in this region are infected with the virus. The low concentration of mink ranches in this area may be a factor in enabling ranchers to keep their herds free of the AD virus.

There were 15 clean ranches in western NS. This is an indication that a ranch can be kept free of the virus, at least for a few years, even in those areas with a large number

of infected ranches. How long these ranches remain free of the AD virus remains to be seen. We are studying biosecurity systems of a few of these ranches.

Two ranches, one in the eastern and one in the western part of the province, never used the CIEP as a means of controlling the AD virus. We tested 6,066 mink from the ranch in western NS in 2003, and tested 59, 746 and 785 mink in 2000, 2004 and 2005, respectively, from the ranch in eastern NS. The proportion of infected animals was 73.6% on the western ranch and 82.4% on the eastern ranch.

There were 23 infected ranches with 8 years of uninterrupted testing. These provided 75.8% of the total samples tested (2,246,711), implying that they have diligently been trying to eradicate the virus. Infection persisted on three of these ranches for the entire 8 year period, and only two of the ranches became CIEP negative for longer than four years. The average proportion of CIEP-positive mink on these ranches was 2.2%, which was lower than 6.4% for the 33 infected ranches with occasional testing.

These results show that while the test-and-removal strategy has been effective in reducing the prevalence of infected animals, it has failed to eradicate the virus from the region, even from many of those ranches that followed the test-and-removal strategy without interruption. **In other words, it is possible to rapidly bring down the incidence of positive animals from around 80% to as low as 2% by regular test-and-removal, but complete elimination of the virus is difficult.**

The exact reasons for the persistence of the AD virus on mink ranches, or re-infection of clean ranches, are not known. Many factors may contribute to this situation. For example:

- Some infected mink do not produce detectable levels of antibodies and are CIEP negative when tested (false negative),
- The AD virus is harbored by water and soil on ranches for several years,
- A considerable number of feral mink and other wild animals carry the virus,
- Biosecurity failures, cause transfer of the virus from infected premises by cars, feed trucks, visitors, etc.

The long-term success of the test-and-removal strategy or of depopulation-repopulation in eliminating the virus may be doubtful unless the sources of repeated reappearance of the virus on cleaned ranches are clearly understood.

In addition to testing and elimination of CIEP-positive animals, management practices and the design of infrastructure and bio-security systems need to be revisited.

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