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Assessment of Diflubenzuron as a Feed-through Larvicide in Mink

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Larvadex® and Rabon® are the two feed-through larvicides most commonly used in the mink industry to control flies. Rabon® is specifically approved for use with mink. Recently, there has been interest in a product containing the active ingredient diflubenzuron (currently used in cattle and marketed as ClariFly®) that is thought to be more effective than Larvadex or Rabon.

The active ingredient of Rabon is tetrachlorvinphos, which is an organophosphorus chemical that inhibits the nervous system enzyme acetylcholinesterase. Cyromazine, the active ingredient of Larvadex®, is a triazine insect growth regulator that interferes with the synthesis of chitin, which is a component of the cuticle of fly larvae. Larvae exposed to cyromazine are unable to molt to the next developmental stage and thus die. First instar larva (the smallest larval stage of flies) are the most susceptible to the effects of cyromazine. Diflubenzuron, which is the active ingredient of ClariFly®, also prevents chitin formation, thus disrupting the normal molting process of fly larvae. Neither Larvadex® or ClariFly® is effective against adult flies. Both products are relatively safe for humans and mammals, which don't synthesize chitin. Care must be taken to avoid water contamination because these products are toxic to aquatic invertebrates.

The present report presents data from a trial designed to compare the efficacy of ClariFly® containing diflubenzene to that of Larvadex® containing cyromazine. If diflubenzuron can be shown to be an effective larvicide in mink, the rancher could have an additional choice for fly control. Complete study is posted on www.FurResearch.org

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Causes of mortality in farmed mink in the Intermountain West, North America

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Abstract. The primary causes of mortality were identified in postmortem examination of 339 (90.9%) of 373 farmed mink (*Neovison vison*; syn. *Mustela vison*) from January 2009 through June 2014 at the Utah Veterinary Diagnostic Laboratory (Logan, Utah). Mink were raised under farm conditions in the Intermountain West in North America, except for 1 submission of mink from Wisconsin. In the 339 mink where cause(s) of death were established, 311 (91.7%) died from a single disease or condition, whereas 28 (8.3%) had 2 diseases or conditions contributing to death. Where cause(s) of death were evident, 11diseases accounted for 321 (94.7%) of the diagnoses: bacterial pneumonia (67, 18.8%), Aleutian mink disease (61, 17.7%),mink viral enteritis (56, 16.2%), hepatic lipidosis (28, 8.1%), nutritional myopathy (24, 7%), bacterial enterocolitis (17, 4.9%),bacterial septicemia (16, 4.6%), starvation (15, 4.3%), epizootic catarrhal gastroenteritis of mink (14, 4.1%), pancreatitis (13,3.8%), and bacterial metritis (10, 2.9%). In 34 (9.1%) animals, a cause of death was not evident. In an additional 16 (4.3%) of the mink, botulism was suspected from clinical history but could not be confirmed by laboratory testing. Control measures for the most common causes of death in farmed mink include testing and removal of positive animals (Aleutian mink disease), vaccination (*Pseudomonas aeruginosa* pneumonia, mink viral enteritis), avoidance of obesity in mink (hepatic lipidosis), and environmental management, including maintaining clean water cups, floors, feed troughs, cages, feed silos, feed truck tires, workers' shoes, dining areas for farm personnel, leather mink handling gloves, street clothes, and coveralls. Complete study is posted on www.FurResearch.org

Genome-wide Association Mapping of Response to Infection by the Aleutian Mink Disease Virus

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ABSTRACT: Aleutian mink disease virus (AMDV) causes the most important health issue for the mink industry worldwide. With no treatment or vaccine, and failure of viral eradication attempts from most regions of the world, genetic selection for tolerance is a possibility. The genomes of 95 black mink that were inoculated with AMDV and showed varying degrees of response to infection were analyzed using next generation sequencing. A total of 1713 high quality single nucleotide polymorphisms (SNPs) were identified and analyzed for their associations with response to infection. Some SNPs were significantly associated with severity of

disease symptoms in kidneys and presence of AMDV in blood and organs. Only weak associations were discovered for antibody titre (0 to 1024) and severity of the disease symptoms in liver and lung. These findings provide the first step towards marker-assisted breeding for mink tolerant of AMDV. Complete study is posted on www.FurResearch.org

Detection of the Aleutian mink disease virus in soil and water

We identified the best method for detecting the AD virus in water and soil samples, but it is a lengthy process

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A method for the detection of the AD virus, or even similar viruses, in the environment has not been previously developed. The techniques that were evaluated in this study for capturing AD virus, concentrating the virus and DNA extraction are useful for monitoring the movement of this virus in the environment and can be used by ranchers and environmental agencies. It was concluded that type of water has a great effect on the success of the AD virus detection in environmental samples, and the 1MDS filter method was generally superior over the other methods. Complete study is posted on www.FurResearch.org

Composting of mink manure: How high can the temperature go?

Hossain Farid

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Conclusions:

- Surprise, surprise! Compost bins looked alike but behaved differently.

- Temperatures were not uniform in different layers of each bin in either trial.

- The middle layer was the hottest in trial 1, but the top layer was the hottest in trial 2, possibly because the densities between bins were different.

- The bottom layer was the coolest in both trials. Air draft was possibly the reason.

- Maximum temperature in Trial 1 was reached earlier than in Trial 2, possibly as a result of material density.

This is necessary information in order to see if these temperatures will kill the AD virus. The virus will be added to compost, separated from the compost materials, purified and tested for viability. Complete study is posted on www.FurResearch.org

Does composting kill Aleutian disease virus in mink manure?

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Conclusions:

- Composting did not completely kill the AD virus even at the hottest spots of thecompost bins.

- A composting temperature above 65oC partially inactivated the AD virus.

- Since temperatures above 65oC were not reached in all sections of the compost bins, not all the AD viruses will have been exposed to a high enough temperature.

This is the first experiment to investigate the inactivation of the AD virus by composting. Further work is needed to achieve enhanced and sustained thermal activity in all layers of a bin during composting and to determine if the AD virus can be killed. Complete study is posted on www.FurResearch.org

Killing Aleutian disease virus by heat - A progress report

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Samples of the spleen homogenate were heated at 45oC, 55oC and 65oC for 3 days and three different amounts of each were injected into groups of 4 mink. Positive and negative controls were also used (51 mink in total). Animals were killed on day 21 after injection, to give the mink enough time for the virus to replicate. Samples of blood were tested by CIEP and PCR and tissues were tested by PCR. The results indicated that the 65oC temperature for 3 days completely killed the virus. However, the 55oC temperature resulted in partial inactivation and 45oC did not kill the virus at all.

Conclusions

The AD virus is quite resistant to heat and cannot be easily destroyed. Heating the virus in spleen suspensions at 65oC for 3 days kills AD virus. Complete study is posted on www.FurResearch.org