

AFA Distemper Titer Study

By Dr. Ruth Heller, AFA Health Affairs Committee

With the recent tragic deaths of ferrets due to distemper outbreaks, it is clear that canine distemper continues to be a devastating and deadly disease for pet ferrets. Vaccination prior to exposure is the only measure known to protect ferrets from infection with canine distemper, and it is highly recommended that every pet ferret be given that protection.

However, it is also true that ferrets have a high rate of reaction to the vaccine itself, and that that reaction can in some cases prove fatal. Because of that, it is important to be aware of the mechanisms involved in protection, and of ways in which reactions might be avoided.

One of the best ways to avoid an allergic reaction is, of course, to avoid exposure to the thing causing the reaction. With vaccine reactions, that means to minimize the number and frequency of vaccinations. However, the currently available licensed vaccine is only labeled for a one-year duration of immunity, meaning that in order to be protected according to the label direction, ferrets must be vaccinated annually.

It has been proven in dogs that vaccination against canine distemper virus produces immunity in excess of three years, and possibly lifelong. It has also been proven that a serum neutralization antibody titer of 32 or higher will protect dogs against infection. Knowing that, the Mongo Memorial Canine Distemper Study was established to collect data on the extent and duration of antibody titers developed in ferrets in response to vaccination.

Data is still being collated and analyzed, but preliminary findings are very promising. In excess of 90 per-



cent of vaccinated ferrets develop titers equaling or over 64 (the protective cut-off point for ferrets has yet to be established by a challenge study, but doubling the canine protective level should allow for species variation). Some of these ferrets have titers in the thousands. Those titers, in ferrets for which we have data extending over multiple years, remained equal to or over 64 in all ferrets developing those titer levels, despite no further vaccination. Many of the ferrets were vaccinated only as kits, and maintained high antibody levels with no adult vaccination.

A small percentage of ferrets did not develop titer levels above the cut-off, with the majority of them failing to develop titer levels over eight, even with repeated vaccination. These ferrets may be protected against illness via the cell-mediated pathway of immunity. Unfortunately, there is no way to measure that, and ferrets with a low antibody titer cannot be assumed to be protected.

Vaccinating ferrets properly against canine distemper requires an under-

standing of how the vaccine stimulates immunity. When a vaccine is injected into an animal, it triggers the immune system to produce both antibodies and the cells which provide cell-mediated immunity. The initial vaccine given to an animal "primes the pump," allowing the body to begin the immune response, while the follow-up vaccine, given approximately three weeks later, induces a more powerful response. Since maternal antibodies can interfere with the recognition of the antigen in the vaccine, it is important that in a kit, the last vaccine be given after all chance of maternal antibody interference is gone, meaning at or after 16 weeks of age. In adults that have not been vaccinated (or when the vaccination status is unknown), the initial "prime" must be done, just as if the ferret were a kit.

My current policy is to vaccinate all kits with an appropriate vaccination series, with the last vaccine at or above 16 weeks of age. The first vaccine should be given at an age consistent with the likelihood of exposure to the disease. For example, my own kits, where the chance of

exposure to canine distemper is low, receive two vaccines starting at 13 weeks of age. If exposure is more likely, such as in kits sold via a pet store or in the face of a known outbreak, then the vaccine series should be started earlier, at 6 to 8 weeks of age, and continued every 3 weeks until 16 weeks of age. This has the drawback of additional vaccine exposure, but may confer earlier protection in a situation where that is important.

Following that, I recommend annual antibody titers, with booster vaccines done only in those ferrets with a low titer. Ferrets vaccinated as kits may require no additional vaccination, or may require only one annual booster, and running a titer allows for the lowest vaccine use and, therefore, the lowest likelihood of vaccine reaction. For adults with an unknown vaccination history, I recommend a titer prior to vaccinating, as I have seen several that had high titer levels. If titers cannot be done in adults with an unknown history, I recommend two vaccines three weeks apart to ensure the development of a good level of immunity should the ferret truly be unprotected, followed by a recommendation for annual titers rather than automatic booster vaccines.

Titers can be done fairly inexpensively if they are submitted directly to the lab performing the test, rather than via a middleman. I recommend the New York State Diagnostic Laboratory at Cornell University. This lab requires sample submission by a veterinarian, not by the ferret's owner.

Ferret owners and veterinarians should discuss the risks and benefits of annual vaccination. The results of this study, however, provide evidence that part of that discussion should be based on whether an individual ferret already has protection, and that many of them, in fact, will. Antibody titers have been shown to be well developed and long lasting in the majority of ferrets, and should be used as a tool to help make the decision of whether or not to administer a potentially life-threatening vaccine. It is heartbreaking to give a medication for the sole purpose of protecting an animal, only to harm it instead. With a study showing that most ferrets develop good and long-lasting antibodies in response to vaccination, it becomes more possible to avoid such an occurrence.

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