

# Vaccination of Ferrets for Rabies and Distemper



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## KEYWORDS

• Ferret • Rabies • Distemper • Virus • Vaccine

## KEY POINTS

- Companion ferrets need to be vaccinated against 2 viral diseases that cause neurologic illness: canine distemper and rabies.
- Both viruses are fatal in ferrets, and rabies virus is fatal in humans.
- All ferrets that are used for hunting, take walks in public places, or are taken to shows should be vaccinated for distemper. Distemper virus does not live long outside the host and is transmitted by close contact with an infected animal.

Companion ferrets need to be vaccinated against 2 viral diseases that cause neurologic illness: canine distemper and rabies. Although not common in ferrets, both viruses are fatal in ferrets, and rabies virus is fatal in humans.

An excellent review of these and other viral diseases in ferrets was published in a previous edition of *Veterinary Clinics of North America: Exotic Animal Practice* and the latest edition of *Biology and Diseases of the Ferret*.<sup>1,2</sup> Readers can review diseases of the central nervous system, including rabies and distemper, in recent texts.<sup>3–6</sup> In this article, we provide a basic review of the 2 diseases and update current vaccine concerns from a practitioner's perspective. Additional information regarding vaccine wellness can be found in current textbooks.<sup>7–9</sup>

## DISTEMPER

Canine distemper virus (CDV) is an RNA virus in the genus *Morbillivirus* in the Paramyxoviridae family. It displays one of the highest incidences of central nervous system involvement within the *Morbillivirus* genus. CDV is closely related to measles virus (MV) that infects humans, although ferrets cannot be infected with MV. Spread by aerosolization, ferrets infected with CDV typically develop a clinical course comparable to measles, which includes upper respiratory signs and fever, followed by a fatal neurotropic phase. Affected ferrets develop a severe leukopenia (lymphopenia), which

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The author has nothing to disclose.

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is the hallmark of *Morbillivirus* infections. Some ferrets will develop loss of appetite and diarrhea.

Similar to dogs, ferrets develop a more serious course of cutaneous lesions, such as an erythematous, pruritic papular rash that begins on the chin and spreads to the inguinal area. Inconsistently, they also may develop hyperkeratosis of the planum nasale and footpad. Affected ferrets also may develop oculonasal discharge associated with rhinitis and lower airway disease, such as pneumonia. Several references show excellent pictures of these external lesions.<sup>10,11</sup> The neurotropic phase includes hyperexcitability, muscle tremors, hypersalivation, paresis, coma, and death. Ferrets that die within 2 weeks of sepsis and multiorgan failure do not typically develop neurologic signs. In contrast, neurotropic strains cause disease lasting 3 to 5 weeks with the classic chewing gum seizures and head pressing. Disease duration is the main neurovirulence determinant, and when infected with a neurovirulent strain, most ferrets will develop neurologic signs that increase with disease progression.<sup>12</sup> The classic presentation of CDV in ferrets has its exceptions, however: there is a report of a previously vaccinated ferret that presented for dermatologic lesions and prolonged course (3 weeks) with the absence of respiratory and neurologic signs.<sup>13</sup> The investigators note that CDV should remain a clinical suspicion for ferrets with skin lesions that do not respond to appropriate therapy, even in animals that were previously vaccinated.

Distemper is nearly 100% fatal in ferrets that become infected and there is no effective treatment.<sup>14</sup> Sources of infection are usually pet dogs in the house, foxes (ferrets that go outside), and other ferrets. All ferrets that are used for hunting, take walks in public places, or are taken to shows should be vaccinated for distemper. Distemper virus does not live long outside the host and is transmitted by close contact with an infected animal; however, vaccination before exposure is the only way to protect ferrets from infection.

Ferrets are excellent models for evaluating the ability of CDV vaccines to protect against symptomatic infection.<sup>14</sup> In the past decade, available approved and “off-label” vaccines for ferrets have been lost and gained. Currently, the only vaccine licensed for ferrets is Merial’s Purevax (Table 1). Since 2001, this nonadjuvanted, lyophilized vaccine of a recombinant canary pox vector that expresses glycoproteins

**Table 1**  
**Vaccines available for use in ferrets in the United States**

<b>Virus</b>	<b>Vaccine</b>	<b>Manufacturer</b>	<b>Virus Viability</b>	<b>Licensed for Ferrets</b>	<b>Label Schedule</b>	<b>Booster</b>
Rabies	IMRAB 3	Merial, Inc	Killed	YES	>12 wk	Annual
	IMRAB 3 TF <sup>a</sup>	(Duluth, GA)				
	Defensor 1	Zoetis Inc	Killed	YES	>3 mo	Annual
	Defensor 3	(Parsippany, NJ)				
	Nobivac 1	Zoetis Inc	Killed	YES (except CA)	>3 mo	Annual
	Nobivac 3	(Parsippany, NJ)				
Distemper	PUREVAX <sup>a</sup>	Merial, Inc	Live Canarypox Vector Recombinant	YES	>8 wk	3 and 6 wk, then annual
	Nobivac Puppy-DPv <sup>a</sup>	Intervet/Merck Animal Health (Madison, NJ)	Modified live vaccine	NO	See text	See text

<sup>a</sup> Thimersol-free.

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