



May 25, 2001 / Vol. 50 / No. RR-8

**MMWR**<sup>TM</sup>  
MORBIDITY AND MORTALITY  
WEEKLY REPORT

---

***Recommendations  
and  
Reports***

**Compendium of Animal Rabies  
Prevention and Control, 2001**

**National Association of State  
Public Health Veterinarians, Inc.**

**U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES**  
Centers for Disease Control and Prevention  
Atlanta, Georgia 30333



The *MMWR* series of publications is published by the Epidemiology Program Office, Centers for Disease Control and Prevention (CDC), U.S. Department of Health and Human Services, Atlanta, GA 30333.

**SUGGESTED CITATION**

Centers for Disease Control and Prevention. Compendium of animal rabies prevention and control, 2001: National Association of State Public Health Veterinarians, Inc. *MMWR* 2001;50(No. RR-8):[inclusive page numbers].

Centers for Disease Control and Prevention ..... Jeffrey P. Koplan, M.D., M.P.H.  
*Director*

The material in this report was prepared for publication by  
National Center for Infectious Diseases ..... James M. Hughes, M.D.  
*Director*

Division of Viral and Rickettsial Diseases ..... James W. Le Duc, Ph.D.  
*Acting Director*

The production of this report as an *MMWR* serial publication was coordinated in  
Epidemiology Program Office ..... Stephen B. Thacker, M.D., M.Sc.  
*Director*

Office of Scientific and Health Communications ..... John W. Ward, M.D.  
*Director*  
*Editor, MMWR Series*

*Recommendations and Reports* ..... Suzanne M. Hewitt, M.P.A.  
*Managing Editor*

C. Kay Smith-Akin, M.Ed.  
*Project Editor*

Lynda G. Cupell  
*Visual Information Specialist*

Michele D. Renshaw  
Erica R. Shaver  
*Information Technology Specialists*

## Contents

<b>Compendium of Animal Rabies Prevention and Control, 2001: National Association of State Public Health Veterinarians, Inc.</b> .....	<b>1</b>
Part I: Recommendations for Parenteral Vaccination Procedures .....	1
A. Vaccine Administration .....	1
B. Vaccine Selection .....	1
C. Route of Inoculation .....	2
D. Wildlife and Hybrid Animal Vaccination .....	2
E. Accidental Human Exposure to Vaccine .....	2
F. Identification of Vaccinated Animals .....	2
Part II: Rabies Vaccines Licensed and Marketed in the United States and NASPHV Recommendations, 2001 .....	3
A. Monovalent (Inactivated) .....	3
B. Monovalent (Rabies glycoprotein, live canary pox vector) .....	4
C. Combination (Inactivated rabies) .....	4
D. Combination (Rabies glycoprotein, live canary pox vector) .....	4
E. Oral (Rabies glycoprotein, live vaccinia vector) .....	4
Part III: Rabies Control .....	5
A. Principles of Rabies Control .....	5
B. Control Methods Among Domestic and Confined Animals .....	5
C. Control Methods Among Wildlife .....	8

## NOTICE

This report is being published as a courtesy to both the National Association of State Public Health Veterinarians, Inc., and to the *MMWR* readership. Its publication does not imply endorsement by CDC.

# **Compendium of Animal Rabies Prevention and Control, 2001**

## **National Association of State Public Health Veterinarians, Inc.\***

The purpose of this compendium is to provide rabies information to veterinarians, public health officials, and others concerned with rabies prevention and control. These recommendations serve as the basis for animal rabies-control programs throughout the United States and facilitate standardization of procedures among jurisdictions, thereby contributing to an effective national rabies-control program. This document is reviewed annually and revised as necessary. Vaccination procedure recommendations are contained in Part I; all animal rabies vaccines licensed by the United States Department of Agriculture (USDA) and marketed in the United States are listed in Part II; Part III details the principles of rabies control.

### **Part I: Recommendations for Parenteral Vaccination Procedures**

#### **A. Vaccine Administration**

All animal rabies vaccines should be restricted to use by, or under the direct supervision of, a veterinarian.

#### **B. Vaccine Selection**

Part II lists all vaccines licensed by USDA and marketed in the United States at the time of publication. New vaccine approvals or changes in label specifications made subsequent to publication should be considered as part of this list. Vaccines used in state and local rabies-control programs should have a 3-year duration of immunity. This constitutes the most effective method of increasing the proportion of immunized dogs and cats in any population.

---

\*THE NASPHV COMMITTEE: Suzanne R. Jenkins, VMD, MPH, Chair; Michael Auslander, DVM, MSPH; Lisa Conti, DVM, MPH; Robert H. Johnson, DVM; Mira J. Leslie, DVM; Faye E. Sorhage, VMD, MPH. CONSULTANTS TO THE COMMITTEE: Deborah J. Briggs, PhD; Kansas State University Rabies Laboratory; James E. Childs, ScD, CDC; Mary Currier, MD, MPH, Council of State and Territorial Epidemiologists (CSTE); Nancy Frank, DVM, MPH, American Veterinary Medical Association (AVMA), Council on Public Health and Regulatory Veterinary Medicine; Ernie Peters, MS, Animal Health Institute; Donna M. Gatewood, DVM, MS, Animal and Plant Health Inspection Service, United States Department of Agriculture; Charles E. Rupprecht, VMD, PhD, CDC; Charles V. Trimarchi, MS, New York State Health Department. ENDORSED BY: AVMA and CSTE.

Address all correspondence to Suzanne R. Jenkins, VMD, MPH, Virginia Department of Health, Office of Epidemiology, P.O. Box 2448, Room 113, Richmond, VA 23218.

### C. Route of Inoculation

All vaccines must be administered in accordance with the specifications of the product label or package insert. Adverse reactions and vaccine failures should be reported to USDA, Animal and Plant Health Inspection Service, Center for Veterinary Biologics at (800) 752-6255 or by e-mail at CVB@usda.gov.

### D. Wildlife and Hybrid Animal Vaccination

The efficacy of parenteral rabies vaccination of wildlife and hybrids (the offspring of wild animals crossbred to domestic dogs and cats) has not been established, and no such vaccine is licensed for these animals. Zoos or research institutions may establish vaccination programs that attempt to protect valuable animals, but these programs should not replace appropriate public health activities that protect humans.

### E. Accidental Human Exposure to Vaccine

Human exposure to parenteral animal rabies vaccines listed in Part II does not constitute a risk for rabies infection. However, human exposure to vaccinia-vectored oral rabies vaccines should be reported to state health officials.

### F. Identification of Vaccinated Animals

Agencies and veterinarians may adopt the standard tag system to aid in the administration of animal rabies control procedures.

#### 1. Rabies Tags.

Calendar year	Color	Shape
2001	Blue	Rosette
2002	Orange	Oval
2003	Green	Bell

2. **Rabies Certificate.** All agencies and veterinarians should use the National Association of State Public Health Veterinarians, Inc. Form 51, Rabies Vaccination Certificate, which can be obtained from vaccine manufacturers. Computer-generated forms containing the same information are acceptable.

**Part II: Rabies vaccines licensed and marketed in the United States and NASPHV\* recommendations, 2001**

Product name	Produced by	Marketed by	For use in	Dosage (mL)	Age at primary vaccination <sup>†</sup>	Booster recommended	Route of inoculation
<b>A) MONOVALENT (Inactivated)</b>							
TRIMUNE	Fort Dodge Animal Health License No. 112	Fort Dodge Animal Health	Dogs	1	3 mos	1 yr later and triennially	IM <sup>§</sup>
			Cats	1	3 mos	1 yr later and triennially	IM
ANNUMUNE	Fort Dodge Animal Health License No. 112	Fort Dodge Animal Health	Dogs	1	3 mos	Annually	IM
			Cats	1	3 mos	Annually	IM
DEFENSOR 1	Pfizer, Inc. License No. 189	Pfizer, Inc.	Dogs	1	3 mos	Annually	IM or SC <sup>¶</sup>
			Cats	1	3 mos	Annually	SC
DEFENSOR 3	Pfizer, Inc. License No. 189	Pfizer, Inc.	Dogs	1	3 mos	1 yr later and triennially	IM or SC
			Cats	1	3 mos	1 yr later and triennially	SC
			Sheep	2	3 mos	Annually	IM
			Cattle	2	3 mos	Annually	IM
RABDOMUN	Pfizer, Inc. License No. 189	Schering-Plough	Dogs	1	3 mos	1 yr later and triennially	IM or SC
			Cats	1	3 mos	1 yr later and triennially	SC
			Sheep	2	3 mos	Annually	IM
			Cattle	2	3 mos	Annually	IM
RABDOMUN 1	Pfizer, Inc. License No. 189	Schering-Plough	Dogs	1	3 mos	Annually	IM or SC
			Cats	1	3 mos	Annually	SC
RABVAC 1	Fort Dodge Animal Health License No. 112	Fort Dodge Animal Health	Dogs	1	3 mos	Annually	IM or SC
			Cats	1	3 mos	Annually	IM or SC
RABVAC 3	Fort Dodge Animal Health License No. 112	Fort Dodge Animal Health	Dogs	1	3 mos	1 yr later and triennially	IM or SC
			Cats	1	3 mos	1 yr later and triennially	IM or SC
			Horses	2	3 mos	Annually	IM
PRORAB-1	Intervet, Inc. License No. 286	Intervet, Inc.	Dogs	1	3 mos	Annually	IM or SC
			Cats	1	3 mos	Annually	IM or SC
			Sheep	2	3 mos	Annually	IM
PRORAB-3F	Intervet, Inc. License No. 286	Intervet, Inc.	Cats	1	3 mos	1 yr later and triennially	IM or SC
IMRAB 3	Merial, Inc. License No. 298	Merial, Inc.	Dogs	1	3 mos	1 yr later and triennially	IM or SC
			Cats	1	3 mos	1 yr later and triennially	IM or SC
			Sheep	2	3 mos	1 yr later and triennially	IM or SC
			Cattle	2	3 mos	Annually	IM or SC
			Horses	2	3 mos	Annually	IM or SC
			Ferrets	1	3 mos	Annually	SC
IMRAB	Merial, Inc.	Merial, Inc.	Cattle	2	3 mos	Annually	IM or SC
BOVINE PLUS	License No. 298		Horses	2	3 mos	Annually	IM or SC
			Sheep	2	3 mos	1 yr later and triennially	IM or SC
IMRAB 1	Merial, Inc. License No. 298	Merial, Inc.	Dogs	1	3 mos	Annually	IM or SC
			Cats	1	3 mos	Annually	IM or SC

\* National Association of State Public Health Veterinarians, Inc.

† Minimum age (or older) and revaccinated 1 year later.

§ Intramuscularly.

¶ Subcutaneously.

**Part II: (Continued) Rabies vaccines licensed and marketed in the United States and NASPHV\* recommendations, 2001**

Product name	Produced by	Marketed by	For use in	Dosage (mL)	Age at primary vaccination <sup>†</sup>	Booster recommended	Route of inoculation
<b>B) MONOVALENT (Rabies glycoprotein, live canary pox vector)</b>							
PUREVAX Feline Rabies	Merial, Inc. License No. 298	Merial, Inc.	Cats	1	8 wks	Annually	SC
<b>C) COMBINATION (Inactivated rabies)</b>							
ECLIPSE 3+ FeLV/R	Fort Dodge Animal Health License No. 112	Schering-Plough	Cats	1	3 mos	Annually	IM or SC
ECLIPSE 4+ FeLV/R	Fort Dodge Animal Health License No. 112	Schering-Plough	Cats	1	3 mos	Annually	IM or SC
Fel-O-Guard 3+ FeLV/R	Fort Dodge Animal Health License No. 112	Fort Dodge Animal Health	Cats	1	3 mos	Annually	IM or SC
Fel-O-Guard 4+ FeLV/R	Fort Dodge Animal Health License No. 112	Fort Dodge Animal Health	Cats	1	3 mos	Annually	IM or SC
Fel-O-Vax PCT-R	Fort Dodge Animal Health License No. 112	Fort Dodge Animal Health	Cats	1	3 mos	1 yr later and triennially	IM
Feline 3+ IMRAB	Merial, Inc. License No. 298	Merial, Inc.	Cats	1	3 mos	1 yr later and triennially	SC
Feline 4+ IMRAB	Merial, Inc. License No. 298	Merial, Inc.	Cats	1	3 mos	1 yr later and triennially	SC
PUREVAX Feline + LEUCAT	Merial, Inc. License No. 298	Merial, Inc.	Cats	1	8 wks	Annually	SC
MYSTIQUE II	Bayer Corp. License No. 52	Bayer Corp.	Horses	1	3 mos	Annually	IM
POTOMAVAC+ EQUINE	Merial, Inc. License No. 298	Merial, Inc.	Horses	1	3 mos	Annually	IM
POTOMAVAC+ IMRAB	Merial, Inc. License No. 298	Merial, Inc.	Horses	1	3 mos	Annually	IM
<b>D) COMBINATION (Rabies glycoprotein, live canary pox vector)</b>							
PUREVAX Feline 3/ Rabies	Merial, Inc. License No. 298	Merial, Inc.	Cats	1	8 wks	Annually	SC
PUREVAX Feline 3/ Rabies + LEUCAT	Merial, Inc. License No. 298	Merial, Inc.	Cats	1	8 wks	Annually	SC
PUREVAX Feline 4/ Rabies	Merial, Inc. License No. 298	Merial, Inc.	Cats	1	8 wks	Annually	SC
PUREVAX Feline 4/ Rabies + LEUCAT	Merial, Inc. License No. 298	Merial, Inc.	Cats	1	8 wks	Annually	SC
PUREVAX Feline 4/ Rabies + LEUCAT	Merial, Inc. License No. 298	Merial, Inc.	Cats	1	8 wks	Annually	SC
<b>E) ORAL (Rabies glycoprotein, live vaccinia vector) RESTRICTED TO USE IN STATE AND FEDERAL RABIES CONTROL PROGRAMS</b>							
RABORAL V-RG	Merial, Inc. License No. 298	Merial, Inc.	Raccoons	N/A	N/A	As determined by local authorities	Oral

\* National Association of State Public Health Veterinarians, Inc.

<sup>†</sup> Minimum age (or older) and revaccinated 1 year later.

<sup>§</sup> Intramuscularly.

<sup>¶</sup> Subcutaneously.



## Part III: Rabies Control

### A. Principles of Rabies Control

- 1. Rabies Exposure.** Rabies is transmitted only when the virus is introduced into bite wounds, open cuts in skin, or onto mucous membranes.
- 2. Human Rabies Prevention.** Rabies among humans can be prevented either by eliminating exposures to rabid animals or by providing exposed persons with prompt local treatment of wounds combined with human rabies immunoglobulin and vaccine. The rationale for recommending preexposure and postexposure rabies prophylaxis and details of their administration can be found in the current recommendations of the Advisory Committee on Immunization Practices (ACIP).<sup>\*</sup> These recommendations, along with information concerning the current local and regional status of animal rabies and the availability of human rabies biologics, are available from state health departments.
- 3. Domestic Animals.** Local governments should initiate and maintain effective programs to ensure vaccination of all dogs, cats, and ferrets and to remove strays and unwanted animals. Such procedures in the United States have reduced laboratory-confirmed cases of rabies among dogs from 6,949 in 1947 to 111 in 1999. Because more rabies cases are reported annually involving cats (278 in 1999) than dogs, vaccination of cats should be required. The recommended vaccination procedures and the licensed animal vaccines are specified in Parts I and II of this compendium.
- 4. Rabies Among Wildlife.** The control of rabies among wildlife reservoirs is difficult. Vaccination of free-ranging wildlife or selective population reduction might be useful in certain situations, but the success of such procedures depends on the circumstances surrounding each rabies outbreak (see Part IIIC, Control Methods among Wildlife). Because of the risk for rabies among wild animals (chiefly raccoons, skunks, coyotes, foxes, and bats), AVMA, NASPHV, and CSTE strongly recommend the enactment of state laws prohibiting their importation, distribution, and relocation.
- 5. Rabies Serology.** Evidence of circulating rabies virus neutralizing antibodies should not be used as a substitute for current vaccination in managing rabies exposures or determining the need for booster vaccinations.

### B. Control Methods Among Domestic and Confined Animals

- 1. Preexposure Vaccination and Management.** Parenteral animal rabies vaccines should be administered only by, or under the direct supervision of, a veterinarian. This ensures that a qualified and responsible person can be held accountable to assure the public that the animal has been properly vaccinated. Within 1 month after primary vaccination, a peak rabies antibody titer is reached, and the animal can be considered immunized. An animal is currently vaccinated and is considered immunized if the primary vaccination was administered at least 30 days previously and vaccinations have been administered in accordance

---

<sup>\*</sup>CDC. Human rabies prevention—United States, 1999: recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 1999;48(No. RR-1).

with this compendium. Regardless of the age of the animal at initial vaccination, a booster vaccination should be administered 1 year later (see Parts I and II for recommended vaccines and procedures). Because a rapid anamnestic response is expected, an animal is considered immunized immediately after a booster vaccination.

- a. **Dogs, cats, and ferrets.** All dogs, cats, and ferrets should be vaccinated against rabies and revaccinated in accordance with Part II of this compendium. If a previously vaccinated animal is overdue for a booster, it should be revaccinated with a single dose of vaccine. Immediately after the booster, the animal is considered immunized and should be placed on an annual or triennial schedule, depending on the type of vaccine used.
- b. **Livestock.** Vaccinating all livestock against rabies is neither economically feasible nor justified from a public health standpoint. However, consideration should be given to vaccinating livestock that are particularly valuable or that might have frequent contact with humans. Horses traveling interstate should be currently vaccinated against rabies.
- c. **Confined Animals.**
  - 1) **Wild.** No parenteral rabies vaccine is licensed for use among wild animals. Wild animals or hybrids should not be kept as pets.
  - 2) **Maintained in Exhibits and in Zoological Parks.** Captive animals that are not completely excluded from all contact with rabies vectors can become infected. Moreover, wild animals might be incubating rabies when initially captured; therefore, wild-caught animals susceptible to rabies should be quarantined for a minimum of 6 months before being exhibited. Employees who work with animals at such facilities should receive preexposure rabies vaccination. The use of pre- or postexposure rabies vaccinations for employees who work with animals at such facilities might reduce the need for euthanasia of captive animals. Carnivores and bats should be housed in a manner that precludes direct contact with the public.
2. **Stray Animals.** Stray dogs, cats, and ferrets should be removed from the community. Local health departments and animal-control officials can enforce the removal of strays more effectively if owned animals are confined or kept on a leash. Strays should be impounded for at least 3 days to determine if human exposure has occurred and to give owners sufficient time to reclaim animals.
3. **Importation and Interstate Movement of Animals.**
  - a. **International.** CDC regulates the importation of dogs and cats into the United States. Imported dogs must satisfy rabies vaccination requirements (42 CFR, Part 71.51[c], which is available at <[www.cdc.gov/ncidod/dq/lawsand.htm](http://www.cdc.gov/ncidod/dq/lawsand.htm)> [accessed April 18, 2001]). The appropriate health official of the state of destination should be notified within 72 hours of the arrival into his or her jurisdiction of any imported dog required to be placed in confinement under the CDC regulation. Failure to comply with these requirements should be promptly reported to the Division of Quarantine, CDC, (404) 639-8107.

CDC regulations alone are insufficient to prevent the introduction of rabid animals into the country. All imported dogs and cats are subject to state and



slaughter any animal known to have been exposed to rabies within 8 months.

- 2) Neither tissues nor milk from a rabid animal should be used for human or animal consumption. Pasteurization temperatures will inactivate rabies virus; therefore, drinking pasteurized milk or eating cooked meat does not constitute a rabies exposure.
  - 3) Having more than one rabid animal in a herd or having herbivore-to-herbivore transmission is rare; therefore, restricting the rest of the herd if a single animal has been exposed to or infected by rabies might not be necessary.
- c. **Other Animals.** Other mammals bitten by a rabid animal should be euthanized immediately. Animals maintained in USDA-licensed research facilities or accredited zoological parks should be evaluated on a case-by-case basis.

#### **6. Management of Animals That Bite Humans.**

- a. A healthy dog, cat, or ferret that bites a person should be confined and observed daily for 10 days; administration of rabies vaccine is not recommended during the observation period. Such animals should be evaluated by a veterinarian at the first sign of illness during confinement. Any illness in the animal should be reported immediately to the local health department. If signs suggestive of rabies develop, the animal should be euthanized, its head removed, and the head shipped under refrigeration (not frozen) for examination of the brain by a qualified laboratory designated by the local or state health department. Any stray or unwanted dog, cat, or ferret that bites a person may be euthanized immediately and the head submitted as described for rabies examination.
- b. Other biting animals that might have exposed a person to rabies should be reported immediately to the local health department. Prior vaccination of an animal might not preclude the necessity for euthanasia and testing if the period of virus shedding is unknown for that species. Management of animals other than dogs, cats, and ferrets depends on the species, the circumstances of the bite, the epidemiology of rabies in the area, and the biting animal's history, current health status, and potential for exposure to rabies.

### **C. Control Methods Among Wildlife**

The public should be warned not to handle wildlife. Wild mammals and hybrids that bite or otherwise expose persons, pets, or livestock should be considered for euthanasia and rabies examination. A person bitten by any wild mammal should immediately report the incident to a physician who can evaluate the need for antirabies treatment (see current rabies prophylaxis recommendations of the ACIP\*). State-regulated wildlife rehabilitators may play a role in a comprehensive rabies-control program. Minimum standards for persons who rehabilitate wild mammals should include receipt of rabies vaccination, appropriate training, and continuing education. Translocation of infected wildlife has contributed to the spread of rabies; therefore, the translocation of known terrestrial rabies reservoir species should be prohibited.

---

\*CDC. Human rabies prevention—United States, 1999: recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 1999;48(No. RR-1).

- 1. Terrestrial Mammals.** The use of licensed oral vaccines for the mass vaccination of free-ranging wildlife should be considered in selected situations, with the approval of the state agency responsible for animal rabies control. Continuous and persistent government-funded programs for trapping or poisoning wildlife are not cost-effective in reducing wildlife rabies reservoirs on a statewide basis. However, limited control in high-contact areas (e.g., picnic grounds, camps, or suburban areas) may be indicated for the removal of selected high-risk species of wildlife. State agriculture, public health, and wildlife agencies should be consulted for planning, coordination, and evaluation of vaccination or population-reduction programs.
- 2. Bats.** Indigenous rabid bats have been reported from every state except Hawaii and have caused rabies in at least 33 humans in the United States. Bats should be excluded from houses and adjacent structures to prevent direct association with humans. Such structures should then be made bat-proof by sealing entrances used by bats. Controlling rabies among bats by implementing programs designed to reduce bat populations is neither feasible nor desirable.



Use of trade names and commercial sources is for identification only and does not imply endorsement by the National Association of State Public Health Veterinarians, Council of State and Territorial Epidemiologists, Association of Avian Veterinarians, American Veterinary Medical Association, or the U.S. Department of Health and Human Services.

References to non-CDC sites on the Internet are provided as a service to *MMWR* readers and do not constitute or imply endorsement of these organizations or their programs by CDC or the U.S. Department of Health and Human Services. CDC is not responsible for the content of pages found at these sites.

## MMWR

The *Morbidity and Mortality Weekly Report (MMWR)* Series is prepared by the Centers for Disease Control and Prevention (CDC) and is available free of charge in electronic format and on a paid subscription basis for paper copy. To receive an electronic copy on Friday of each week, send an e-mail message to [listserv@listserv.cdc.gov](mailto:listserv@listserv.cdc.gov). The body content should read *SUBscribe mmwr-toc*. Electronic copy also is available from CDC's World-Wide Web server at <http://www.cdc.gov/mmwr/> or from CDC's file transfer protocol server at <ftp://ftp.cdc.gov/pub/Publications/mmwr/>. To subscribe for paper copy, contact Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402; telephone (202) 512-1800.

Data in the weekly *MMWR* are provisional, based on weekly reports to CDC by state health departments. The reporting week concludes at close of business on Friday; compiled data on a national basis are officially released to the public on the following Friday. Address inquiries about the *MMWR* Series, including material to be considered for publication, to: Editor, *MMWR* Series, Mailstop C-08, CDC, 1600 Clifton Rd., N.E., Atlanta, GA 30333; telephone (888) 232-3228.

All material in the *MMWR* Series is in the public domain and may be used and reprinted without permission; citation as to source, however, is appreciated.