CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION

March 17, 1995 / Vol. 44 / No. RR-2

MMWR

Recommendations and Reports

MORBIDITY AND MORTALITY WEEKLY REPORT

Compendium of Animal Rabies Control, 1995

National Association of State Public Health Veterinarians, Inc.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Centers for Disease Control
and Prevention (CDC)
Atlanta, Georgia 30333

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

SUGGESTED CITATION

Centers for Disease Control and Prevention. Compendium of Animal Rabies Control, 1995. MMWR 1995;44(No. RR-2):[inclusive page numbers].

Copies can be purchased from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402-9325. Telephone: (202) 783-3238.

Compendium of Animal Rabies Control, 1995 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 control. These recommendations serve as the basis for animal rabies-control programs throughout the United States and also facilitate standardization of procedures among jurisdictions, thereby contributing to an effective national rabies-control program. This document is reviewed annually and revised as necessary. Recommendations for immunization procedures are contained in Part I; all animal rabies vaccines licensed by the U.S. 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 Immunization 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

In comprehensive rabies-control programs, only vaccines with a 3-year duration of immunity should be used. This procedure constitutes the most effective method of increasing the proportion of immunized dogs and cats in any population. (See Part II.)

C. Route of Inoculation

All vaccines must be administered in accordance with either the specifications of the product label or the package insert. If administered intramuscularly, vaccine must be administered at one site in the thigh.

D. Wildlife Vaccination

Parenteral vaccination of captive wildlife is not recommended because the efficacy of rabies vaccines in such animals has not been established and no vaccine is licensed for wildlife. For this reason and because virus-shedding periods are unknown, bats

*THE NASPHV COMMITTEE: Suzanne R. Jenkins, VMD, MPH, Chair; Keith A. Clark, DVM, PhD; John G. Debbie, MS, DVM; Russell J. Martin, DVM, MPH; Grayson B. Miller, Jr., MD; F. T. Satalowich, DVM, MSPH; Faye E. Sorhage, VMD, MPH. CONSULTANTS TO THE COMMITTEE: James E. Childs, ScD, (Centers for Disease Control and Prevention [CDC]); Robert B. Miller, DVM, MPH (APHIS, USDA); Patrick Morgan, DVM, DrPH (AVMA Council on Public Health and Regulatory Veterinary Medicine); Charles E. Rupprecht, VMD, PhD (CDC); R. Keith Sikes, DVM, MPH; Richard A. Zehr (Veterinary Biologics Section, Animal Health Institute). ENDORSED BY: American Veterinary Medical Association (AVMA); Council of State and Territorial Epidemiologists (CSTE).

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

and wild or exotic carnivores should not be kept as pets. Zoos or research institutions may establish vaccination programs that attempt to protect valuable animals, but these programs should not be in lieu of appropriate public health activities that protect humans. The use of licensed oral vaccines for the mass immunization of wildlife should be considered in selected situations, with the approval of the state agency responsible for animal rabies control.

E. Accidental Human Exposure to Vaccine

Accidental inoculation may occur during administration of animal rabies vaccine. Such exposure to inactivated vaccines constitutes no risk for acquiring rabies.

F. Identification of Vaccinated Animals

All agencies and veterinarians should adopt the standard tag system. This practice will aid persons who administer local, state, national, and international rabies control procedures. Animal license tags should be distinguishable in shape and color from rabies tags. Anodized aluminum rabies tags should be no less than 0.064 inches in thickness.

1. **Rabies Tags**

Calendar year	Color	Shape
1995	Green	Bell
1996	Red	Heart
1997	Blue	Rosette
1998	Orange	Oval

2. **Rabies Certificate.** All agencies and veterinarians should use the NASPHV form #51, Rabies Vaccination Certificate, which can be obtained from vaccine manufacturers. Computer-generated forms containing the same information are acceptable.

Part II: Vaccines Marketed in the United States and NASPHV Recommendations

Product name	Produced by	Marketed by	For use in	Dosage (mL)	Age at primary vaccination*	Booster recommended	Route of inoculation
A) INACTIVATED							
TRIMUNE	Fort Dodge License No. 112	Fort Dodge	Dogs Cats	1 1	3 mos & 1 yr later	Triennially Triennially	IM† IM
ANNUMUNE	Fort Dodge License No. 112	Fort Dodge	Dogs Cats	1 1	3 mos 3 mos	Annually Annually	IM IM
DURA-RAB 1	ImmunoVet License No. 302-A	ImmunoVet, Vedco, Inc.	Dogs Cats	1 1	3 mos 3 mos	Annually Annually	IM IM
DURA-RAB 3	ImmunoVet License No. 302-A	ImmunoVet, Vedco, Inc.	Dogs Cats	1 1	3 mos & 1 yr later	Triennially Triennially	IM IM
RABCINE 3	ImmunoVet License No. 302-A	SmithKline Beecham Animal Health	Dogs Cats	1 1	3 mos & 1 yr later	Triennially Triennially	IM IM
ENDURALL-K	SmithKline Beecham License No. 189	SmithKline Beecham Animal Health	Dogs Cats	1 1	3 mos 3 mos	Annually Annually	IM IM
ENDURALL-P	SmithKline Beecham License No. 189	SmithKline Beecham Animal Health	Dogs Cats	1 1	3 mos 3 mos	Annually Annually	IM or SQ§ SQ
RABGUARD-TC	SmithKline Beecham License No. 189	SmithKline Beecham Animal Health	Dogs Cats Sheep Cattle Horses	1 1 1 1 1	3 mos & 1 yr later 3 mos 3 mos 3 mos	Triennially Triennially Annually Annually Annually	IM IM IM IM IM
DEFENSOR	SmithKline Beecham License No. 189	SmithKline Beecham Animal Health	Dogs Cats Sheep Cattle	1 1 2 2	3 mos & 1 yr later 3 mos 3 mos	Triennially Triennially Annually Annually	IM or SQ SQ IM IM
RABDOMUN	SmithKline Beecham License No. 189	Mallinckrodt Veterinary, Inc.	Dogs Cats Sheep Cattle	1 1 2 2	3 mos & 1 yr later 3 mos 3 mos	Triennially Triennially Annually Annually	IM or SQ SQ IM IM
RABDOMUN-1	SmithKline Beecham License No. 189	Mallinckrodt Veterinary, Inc.	Dogs Cats	1 1	3 mos 3 mos	Annually Annually	IM or SQ SQ

Part II: Vaccines Marketed in the United States and NASPHV Recommendations — Continued

Product name	Produced by	Marketed by	For use in	Dosage (mL)	Age at primary vaccination*	Booster recommended	Route of inoculation
SENTRYRAB 1	SmithKline Beecham License No. 225	Synbiotics Corp.	Dogs	1	3 mos	Annually	IM
			Cats	1	3 mos	Annually	IM
CYTORAB	Coopers Animal Health, Inc., License No. 107	Coopers Animal Health, Inc.	Dogs	1	3 mos	Annually	IM
			Cats	1	3 mos	Annually	IM
TRIRAB	Coopers Animal Health, Inc., License No. 107	Coopers Animal Health, Inc.	Dogs	1	3 mos & 1 yr later	Triennially	IM
			Cats	1	3 mos	Annually	IM
EPIRAB	Coopers Animal Health, Inc., License No. 107	Coopers Animal Health, Inc.	Dogs	1	3 mos & 1 yr later	Triennially	IM
			Cats	1		Triennially	IM
RABVAC 1	Solvay Animal Health, Inc., License No. 195-A	Solvay Animal Health, Inc.	Dogs	1	3 mos	Annually	IM or SQ
			Cats	1	3 mos	Annually	IM or SQ
RABVAC 3	Solvay Animal Health, Inc., License No. 195-A	Solvay Animal Health, Inc.	Dogs	1	3 mos & 1 yr later	Triennially	IM or SQ
			Cats	1		Triennially	IM or SQ
			Horses	2	3 mos	Annually	IM
PRORAB 1	Intervet, Inc. License No. 286	Intervet, Inc.	Dogs	1	3 mos	Annually	IM or SQ
			Cats	1	3 mos	Annually	IM or SQ
			Sheep	2	3 mos	Annually	IM
RM IMRAB 1	Rhone Mérieux, Inc. License No. 298	Rhone Mérieux, Inc.	Dogs	1	3 mos	Annually	IM or SQ
			Cats	1	3 mos	Annually	IM or SQ
RM IMRAB BOVINE PLUS	Rhone Mérieux, Inc. License No. 298	Rhone Mérieux, Inc.	Cattle	2	3 mos	Annually	IM or SQ
			Horses	2	3 mos	Annually	IM or SQ
			Sheep	2	3 mos	Triennially	IM or SQ
RM IMRAB 3	Rhone Mérieux, Inc. License No. 298	Rhone Mérieux, Inc.	Dogs	1	3 mos & 1 yr later	Triennially	IM or SQ
			Cats	1		Triennially	IM or SQ
			Sheep	2	3 mos & 1 yr later	Triennially	IM or SQ
			Cattle	2	3 mos	Annually	IM or SQ
			Horses	2	3 mos	Annually	IM or SQ
			Ferrets	1	3 mos	Annually	SQ

Part II: Vaccines Marketed in the United States and NASPHV Recommendations — Continued

Product name	Produced by	Marketed by	For use in	Dosage (mL)	Age at primary vaccination*	Booster recommended	Route of inoculation
B) COMBINATION (inactivated rabies)							
ECLIPSE 3 KP-R	Solvay Animal Health, Inc., License No. 195-A	Solvay Animal Health, Inc.	Cats	1	3 mos	Annually	IM
ECLIPSE 4 KP-R	Solvay Animal Health, Inc., License No. 195-A	Solvay Animal Health, Inc.	Cats	1	3 mos	Annually	IM
CYTORAB RCP	Coopers Animal Health, Inc., License No. 107	Coopers Animal Health, Inc.	Cats	1	3 mos	Annually	IM
FEL-O-VAX PCT-R	Fort Dodge License No. 112	Fort Dodge	Cats	1	3 mos & 1 yr later	Triennially	IM
RM FELINE 4 + IMRAB 3	Rhone Mérieux, Inc. License No. 298	Rhone Mérieux, Inc.	Cats	1	3 mos & 1 yr later	Triennially	SQ
RM FELINE 3 + IMRAB 3	Rhone Mérieux, Inc. License No. 298	Rhone Mérieux, Inc.	Cats	1	3 mos & 1 yr later	Triennially	SQ
RM EQUINE POTOMAVAC + IMRAB	Rhone Mérieux, Inc. License No. 298	Rhone Mérieux, Inc.	Horses	1	3 mos	Annually	IM

*≥3 months of age and revaccinated 1 year later.
†Intramuscularly.
§Subcutaneously.

Part III: Rabies Control

A. Principles of Rabies Control

1. **Human Rabies Prevention.** Rabies in humans can be prevented either by eliminating exposures to rabid animals or by providing exposed persons with prompt local treatment of wounds combined with appropriate passive and active immunization. Both 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) of the Public Health Service (PHS). These recommendations are available from state health departments, along with information concerning the current local and regional status of animal rabies and the availability of human rabies biologics.
2. **Rabies in Domestic Animals.** Local governments should initiate and maintain effective programs to ensure vaccination of all dogs and cats and to remove strays and unwanted animals. Such procedures in the United States have reduced laboratory-confirmed rabies cases in dogs from 6,949 in 1947 to 130 in 1993. Because more rabies cases are reported annually involving cats 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 the Compendium.
3. **Rabies in Wildlife.** The control of rabies among wildlife reservoirs is difficult. Selective population reduction may be useful in some situations, but the success of such procedures depends on the circumstances surrounding each rabies outbreak. (See C. Control Methods in Wildlife.)

B. Control Methods in Domestic and Confined Animals

1. **Preexposure Vaccination and Management.** Animal rabies vaccines should be administered only by, or under the direct supervision of, a veterinarian. This is the only way to ensure that a responsible person can be held accountable to assure the public that an 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 it was vaccinated at least 30 days previously and if all vaccinations have been administered in accordance with this Compendium. Regardless of the age at initial vaccination, a second vaccination should be given 1 year later. (See Parts I and II for recommended vaccines and procedures.)
   a. **Dogs and Cats.** All dogs and cats should be vaccinated against rabies at 3 months of age and revaccinated in accordance with Part II of this Compendium.
   b. **Ferrets.** Ferrets can be vaccinated against rabies at 3 months of age and revaccinated in accordance with Part II of this Compendium.
   c. **Livestock.** It is neither economically feasible nor justified from a public health standpoint to vaccinate all livestock against rabies. However, consideration should be given to the vaccination of livestock, especially animals that are

particularly valuable and/or might have frequent contact with humans, in areas where rabies is epizootic in terrestrial animals.

d. Other Animals

1) Wild. No rabies vaccine is licensed for use in wild animals. Because of the risk for rabies among wild animals (especially raccoons, skunks, coyotes, foxes, and bats), the American Veterinary Medical Association (AVMA), the National Association of State Public Health Veterinarians, Inc. (NASPHV), and the Council of State and Territorial Epidemiologists (CSTE) recommend the enactment of state laws prohibiting the importation, distribution, relocation, or keeping of wild animals and wild animals that are crossbred to domestic dogs and cats 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 can be incubating rabies when initially captured; therefore, wild-caught animals susceptible to rabies should be quarantined for a minimum of 180 days before exhibition. Persons (e.g., employees) who work with animals at such facilities should receive preexposure rabies immunization. The use of preexposure or postexposure rabies immunizations of persons who work with animals at such facilities might reduce the need for euthanasia of captive animals.

2. Stray Animals. Stray dogs and cats should be removed from the community, especially in areas where rabies is epizootic. Local health departments and animal control officials can enforce the removal of strays more effectively if owners either confine their animals or keep them on 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. Quarantine

a. International. CDC regulates the importation of dogs and cats into the United States, but current PHS regulations* governing the importation of such animals are insufficient to prevent the introduction of rabid animals into the country. All dogs and cats imported from countries with enzootic rabies should be currently vaccinated against rabies as recommended in this Compendium. Appropriate public health officials of the state of destination should be notified within 72 hours of any unvaccinated dog or cat imported into their jurisdiction. The conditional admission of such animals into the United States is subject to state and local laws governing rabies. Failure to comply with these requirements should be reported promptly to the Division of Quarantine, CDC (404) 639-8107.

b. Interstate. Before interstate movement, dogs and cats should be currently vaccinated against rabies in accordance with the Compendium's recommendations. (See B.1. Preexposure Vaccination and Management.) Animals in transit should be accompanied by a currently valid NASPHV Form #51, Rabies Vaccination Certificate.

*42 CFR No. 71.51.

4. **Adjunct Procedures.** Methods or procedures that enhance rabies control include the following:
   a. **Licensure.** Registration or licensure of all dogs and cats can be used to aid in rabies control. A fee is frequently charged for such licensure, and revenues collected are used to maintain rabies or animal control programs. Vaccination is an essential prerequisite to licensure.
   b. **Canvassing of Area.** House-to-house canvassing by animal control personnel facilitates enforcement of vaccination and licensure requirements.
   c. **Citations.** Citations are legal summonses issued to owners for violations, including the failure to vaccinate or license their animals. The authority for officers to issue citations should be an integral part of each animal control program.
   d. **Animal Control.** All communities should incorporate stray animal control, leash laws, and training of personnel in their programs.
5. **Postexposure Management.** *Any animal bitten or scratched by a wild, carnivorous mammal (or a bat) not available for testing should be regarded as having been exposed to rabies.*
   a. **Dogs and Cats.** Unvaccinated dogs and cats exposed to a rabid animal should be euthanized immediately. If the owner is unwilling to do this, the animal should be placed in strict isolation for 6 months and vaccinated 1 month before being released. Dogs and cats that are currently vaccinated should be revaccinated immediately, kept under the owner's control, and observed for 45 days.
   b. **Livestock.** All species of livestock are susceptible to rabies; cattle and horses are among the most frequently infected of all domestic animals. Livestock that is exposed to a rabid animal and is currently vaccinated with a vaccine approved by USDA for that species should be revaccinated immediately and observed for 45 days. Unvaccinated livestock should be slaughtered immediately. If the owner is unwilling to do this, the animal should be kept under close observation for 6 months.

      The following are recommendations for owners of unvaccinated livestock exposed to rabid animals:

      1) If the animal is slaughtered within 7 days of being bitten, its tissues may be eaten without risk of infection, provided liberal portions of the exposed area are discarded. Federal meat inspectors must reject for 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. However, because pasteurization temperatures will inactivate rabies virus, drinking pasteurized milk or eating cooked meat does not constitute a rabies exposure.

      3) It is rare to have more than one rabid animal in a herd or to have herbivore-to-herbivore transmission; therefore; it may not be necessary to restrict the rest of the herd if a single animal has been exposed to or infected by rabies.

c. **Other Animals.** Other animals bitten by a rabid animal should be euthanized immediately. Such animals currently vaccinated with a vaccine approved by USDA for that species can be revaccinated immediately and placed in strict isolation for at least 90 days.

6. **Management of Animals That Bite Humans.** A healthy dog or cat that bites a person should be confined and observed for 10 days; it is recommended that rabies vaccine not be administered 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 humanely killed, its head removed, and the head shipped under refrigeration for examination by a qualified laboratory designated by the local or state health department. Any stray or unwanted dog or cat that bites a person may be humanely killed immediately and the head submitted as described above for rabies examination. 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 may 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 and cats depends on the species, the circumstances of the bite, and the epidemiology of rabies in the area.

C. Control Methods in Wildlife

The public should be warned not to handle wildlife. Wild mammals (as well as the offspring of wild species cross-bred with domestic dogs and cats) that bite or otherwise expose humans, pets, or livestock to rabies 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.*

1. **Terrestrial Mammals.** 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) might be indicated for the removal of selected high-risk species of wildlife. The state wildlife agency and state health department should be consulted for coordination of any proposed population reduction programs.
2. **Bats.** Indigenous rabid bats have been reported from every state except Alaska and Hawaii and, since 1951, have been associated with at least 21 human deaths in the United States. However, it is neither feasible nor desirable to control rabies in bats through programs to reduce bat populations. Bats should be excluded from houses and surrounding structures to prevent direct association with humans. Such structures should then be made bat-proof by sealing entrances used by bats.

*Centers for Disease Control and Prevention. Rabies Prevention — United States, 1991. MMWR 1991;40(No. RR-3):1–19.

The *Morbidity and Mortality Weekly Report* (*MMWR*) Series is prepared by the Centers for Disease Control and Prevention (CDC). The 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 each Friday; compiled data on a national basis are officially released to the public the following Friday. Inquiries about the *MMWR* Series and material to be considered for publication should be addressed to Editor, *MMWR* Series, Mailstop C-08, CDC, 1600 Clifton Road, N.E., Atlanta, GA 30333; telephone (404) 332-4555.

The *MMWR* is available on a paid subscription basis for paper copy and free of charge in electronic format. For information about paid subscriptions, contact the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402; telephone (202) 783-3238. For electronic copy, send an e-mail message to *lists@list.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/* or CDC's file transfer protocol server at *ftp.cdc.gov*.

☆**U.S. Government Printing Office: 1994-633-175/05057 Region IV**