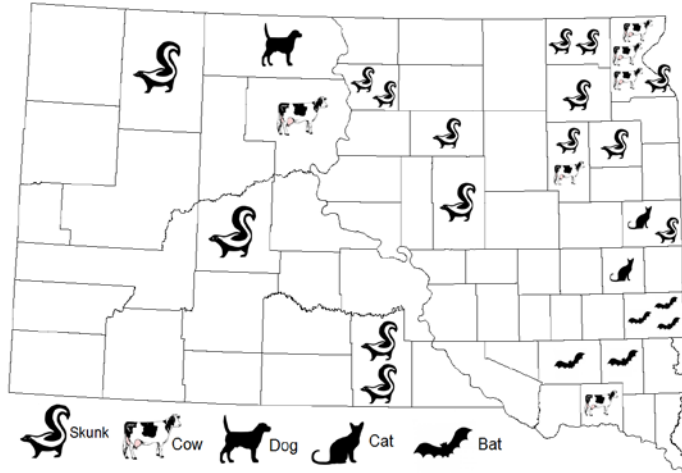


Rabies surveillance, South Dakota, 2015

Rabies is a serious public health concern in South Dakota. In 2015, 29 animals tested positive for rabies, a +38% increase from the previous year. The 29 rabid animals included 9 domestic animals (6 cattle, 2 cats, 1 dog) and 20 wild animals (14 striped skunks, 5 bats, 1 spotted skunk). No human rabies was reported. South Dakota's last human rabies case was in 1970.

During 2015, 625 animals tested negative for rabies, including 174 cats, 170 bats, 105 dogs, 77 cattle, 33 raccoons, 14 skunks, 12 deer, 6 goats, 5 sheep, 5 squirrels, 4 horses, 3 coyotes, 3 woodchucks, 2 each badger, fox, gopher, opossum, rat, and 1 each moose, otter, prairie dog and rabbit.

Animal rabies, South Dakota 2015

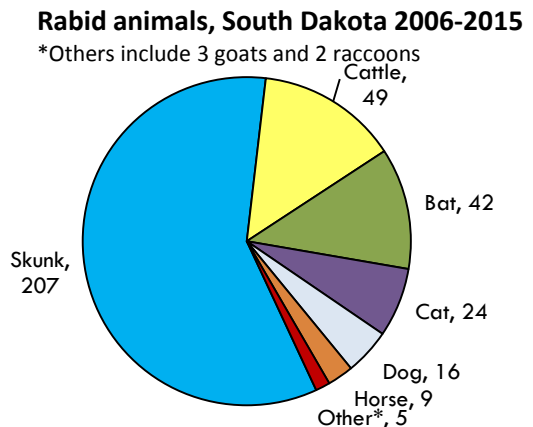


This year animals from 60 of South Dakota's 66 counties were submitted for testing, and 20 counties reported rabid animals. Over the past decade, 2006-2015, rabid animals were reported from 59 of the state's counties, with every county, except Ziebach, submitting animals for testing. Over the decade 6,740 animals were tested and 352 (5.2%) were rabid.

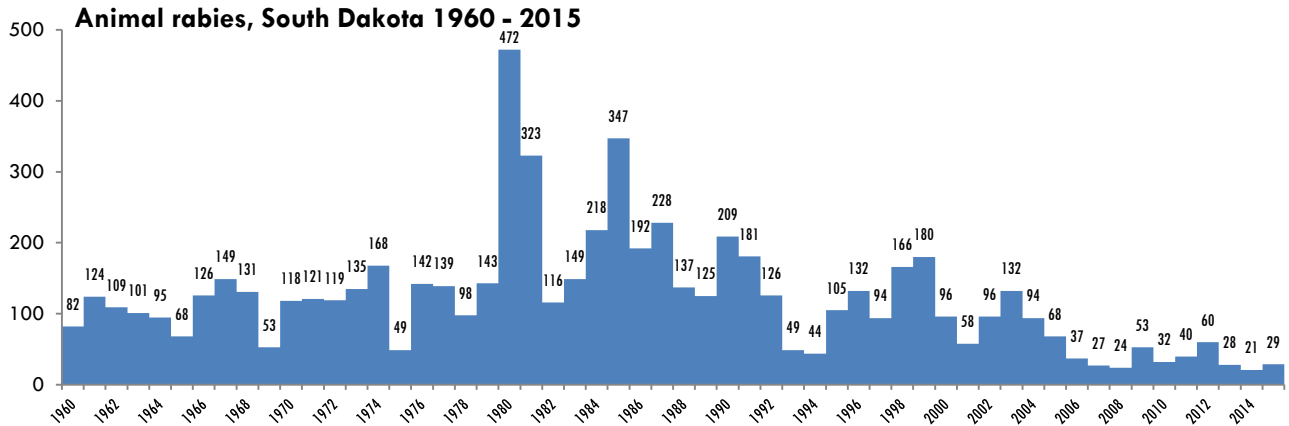
During the past decade 29% of our 352 South Dakota rabies cases were domestic animals, including 24 rabid cats and 16 rabid dogs, many of which were unvaccinated. Rabid livestock included 49 cattle, 9 horses and 3 goats.

Skunks (*Mephitis mephitis*) are the primary rabies reservoir in South Dakota. Over the past decade 49% of skunks tested have been rabid. Bat rabies is also enzootic in South Dakota with 3% bats tested being positive. Although rabies is not enzootic in other South Dakota animals, during the past decade 2 rabid raccoons were detected, likely spillover infections from skunk exposure. In 2015 a rabid spotted skunk (*Spilogale putorius*) was reported.

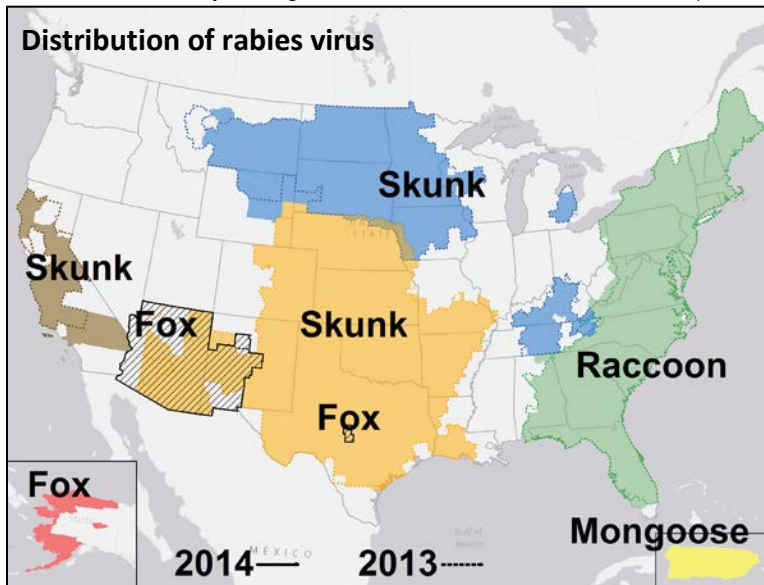
Two South Dakota laboratories offer rabies testing services: (1) Animal Disease Research Diagnostic Laboratory (ADRDL) in Brookings; (2) State Public Health Laboratory (SDPHL) in Pierre. During 2015, 61% of rabies tests were done at ADRDL and 39% at SDPHL. Both laboratories use the direct fluorescent antibody (DFA) technique. Human serum rabies antibody titers may be ordered through SDPHL.



The most recent national animal rabies surveillance data are reported for 2014 (Monroe, et al.). Nationally, there was a -2.8% decrease from the previous year with 6,033 rabid animals rabies reported (7% domestic and 93% wild animals). Nationally, rabid domestic animals included 272 cats, 78 cattle, 59 dogs, 25 horses/mules, 10 sheep/goats and 1 llama. Wild animals testing positive for rabies included 1,822 raccoons, 1,756 bats, 1,588 skunks, 311 foxes, 43 groundhogs, 32 mongooses, 18 bobcats, 9 coyotes, 4 deer, 2 beavers, 2 opossums and 1 otter.



Over the past decade (2006-2015) 25 human rabies cases were reported nationally, including 23 deaths and 2 survivals, which is a 92% case fatality rate. The 25 human rabies cases were from Texas (3), California (4), Massachusetts (3), Indiana (2), Missouri (2), and 1 each in Louisiana, Maryland, Michigan, Minnesota, New Jersey, New York, North Carolina, South Carolina, Virginia, Wisconsin and Wyoming. Fourteen of the human cases (56%) were associated with bat-rabies virus, 7 (28%) had dog rabies virus (all foreign exposures: Afghanistan, Brazil, Guatemala, Haiti, India, Philippines), 2 raccoon, 1 fox, 1 unknown exposure, and 1 human rabies cases was attributed to an infected kidney transplant.



The case definition of a confirmed animal rabies case is a positive DFA test, performed preferably on central nervous system tissue, or isolation of the rabies virus in cell culture or in a laboratory animal.

Rabies cases by county, South Dakota 2006-2015

COUNTY	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	TOTAL
Aurora	0	0	0	1	0	0	0	0	0	0	1
Beadle	0	1	0	0	0	1	0	1	0	0	3
Bennett	0	0	0	0	0	0	2	3	0	0	5
Bon Homme	2	1	0	0	0	0	0	0	1	0	4
Brookings	2	2	1	1	3	1	4	1	1	2	18
Brown	5	4	2	3	0	0	0	1	0	0	15
Brule	1	0	0	0	1	0	1	0	0	0	3
Buffalo	0	0	0	0	0	0	0	0	0	0	0
Butte	0	0	0	0	0	2	2	0	1	0	5
Campbell	0	0	0	0	0	0	0	0	0	0	0
Charles Mix	0	0	0	2	1	2	3	1	0	0	9
Clark	2	3	3	2	0	0	0	0	0	2	12
Clay	3	0	0	1	0	1	0	0	0	0	5
Codington	0	1	0	2	2	1	1	0	0	1	8
Corson	0	0	0	0	0	0	2	0	0	1	3
Custer	0	0	0	0	0	0	0	0	0	0	0
Davison	1	0	0	0	1	0	1	1	1	0	5
Day	1	0	2	2	2	0	2	2	1	1	13
Deuel	1	1	0	0	0	0	1	0	0	0	3
Dewey	0	0	0	0	0	0	1	2	0	1	4
Douglas	0	0	0	1	0	0	0	0	0	0	1
Edmunds	0	1	1	0	0	0	2	0	1	0	5
Fall River	0	0	0	0	0	0	1	0	0	0	1
Faulk	1	1	0	0	0	1	0	0	0	1	4
Grant	0	0	1	1	0	3	1	1	0	0	7
Gregory	0	0	2	1	0	1	2	0	0	0	6
Haakon	0	0	0	0	0	0	4	0	0	1	5
Hamlin	2	2	2	0	4	1	0	1	1	0	13
Hand	0	0	0	1	0	0	0	0	0	1	2
Hanson	1	0	0	1	0	0	0	0	0	0	2
Harding	0	0	0	2	0	2	1	0	0	0	5
Hughes	1	0	0	1	0	1	0	0	0	0	3
Hutchinson	0	0	1	3	2	0	3	0	0	1	10
Hyde	0	0	0	1	0	0	0	1	0	0	2
Jackson	0	1	0	0	0	0	0	0	0	0	1
Jerauld	1	0	0	0	0	0	0	1	0	0	2
Jones	0	0	0	0	0	0	0	0	0	0	0
Kingsbury	1	1	0	2	2	0	2	2	1	0	11
Lake	0	0	1	6	1	0	1	0	0	1	10
Lawrence	0	0	0	0	0	1	0	0	1	0	2
Lincoln	0	0	0	1	1	1	0	0	0	0	3
Lyman	0	1	0	0	0	2	0	0	0	0	3
Marshall	1	0	1	0	1	1	1	0	0	2	7
McCook	1	0	2	0	0	1	0	0	0	0	4
McPherson	0	1	0	3	1	0	0	1	0	0	6
Meade	1	3	2	2	0	0	2	1	1	0	12
Mellette	1	0	0	0	0	2	0	0	0	0	3
Miner	1	0	0	0	1	1	0	1	0	0	4
Minnehaha	3	0	3	4	3	5	2	2	3	3	28
Moody	1	0	0	0	0	0	0	0	0	0	1
Oglala Lakota	0	0	0	0	0	0	0	0	0	0	0
Pennington	0	0	0	2	0	1	0	0	1	0	4
Perkins	0	0	0	0	0	0	0	3	2	1	6
Potter	0	0	0	0	0	0	0	0	0	0	0
Roberts	0	0	0	1	0	0	2	0	2	4	9
Sanborn	0	0	0	0	0	1	0	0	0	0	1
Spink	0	0	0	3	0	0	1	0	0	0	4
Stanley	1	0	0	0	0	0	1	0	0	0	2
Sully	0	0	0	0	0	0	0	0	1	0	1

2015 Rabies Surveillance: South Dakota Department of Health

COUNTY	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	TOTAL
Todd	0	0	0	0	0	0	0	1	0	0	1
Tripp	0	1	0	0	1	6	10	0	1	2	21
Turner	0	0	0	3	4	1	0	0	0	1	9
Union	2	1	0	0	0	0	0	0	0	0	3
Walworth	1	1	0	0	0	0	3	0	1	2	8
Yankton	0	0	0	0	1	0	1	1	0	1	4
Ziebach	0	0	0	0	0	0	0	0	0	0	0
TOTAL	38	27	24	53	32	40	60	28	21	29	352

Pet rabies prevention:

- Vaccinate pet dogs, cats and ferrets.
- Keep pets away from wildlife so they won't be bitten by a rabid animal.
- Call local Animal Control to remove wild or stray animals, especially if acting strangely.
- If an animal bites your pet, take it to a veterinarian for a rabies booster vaccination.

Human rabies prevention:

- Never touch stray, unfamiliar or wild animals, especially skunks and bats.
- Don't adopt wild animals or bring them into your home.
- Keep your trash cans tightly closed and don't leave pet food out to attract skunks.
- If you are bitten by an animal, consult your physician.
- Post-exposure prophylaxis: rabies immune globulin and 4 doses of rabies vaccine over 14 days.

Rabies by animals tested (P, positive; N, negative), South Dakota 2006-2015

Animal	2006		2007		2008		2009		2010		2011		2012		2013		2014		2015		TOTAL	
	P	N	P	N	P	N	P	N	P	N	P	N	P	N	P	N	P	N	P	N	P	N
Striped skunk	25	22	16	19	16	18	31	26	20	31	20	21	36	39	16	12	12	13	14	14	206	215
Cattle	4	72	2	64	2	61	4	75	5	68	4	70	16	94	5	66	1	81	6	77	49	728
Bat	2	64	4	95	4	120	4	104	3	107	6	115	3	168	5	143	6	161	5	170	42	1247
Cat	5	203	2	224	0	241	4	227	3	199	4	191	2	212	1	206	1	154	2	174	24	2031
Dog	1	129	2	131	0	138	7	152	1	138	3	167	0	126	1	111	0	90	1	105	16	1287
Horse	1	10	0	11	2	6	2	12	0	15	1	14	3	14	0	11	0	10	0	4	9	107
Goat	0	0	1	2	0	2	1	3	0	5	0	2	0	2	0	2	1	3	0	6	3	27
Raccoon	0	52	0	29	0	24	0	27	0	28	2	41	0	45	0	28	0	24	0	33	2	331
Spotted skunk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
Cervid	0	10	0	5	0	4	0	13	0	12	0	12	0	12	0	7	0	10	0	13	0	98
Muskrat	0	4	0	0	0	7	0	4	0	5	0	13	0	8	0	1	0	2	0	0	0	44
Squirrel	0	6	0	1	0	11	0	5	0	8	0	1	0	1	0	0	0	2	0	5	0	40
Sheep	0	8	0	2	0	3	0	3	0	5	0	0	0	6	0	5	0	1	0	5	0	38
Opossum	0	10	0	2	0	1	0	2	0	0	0	3	0	1	0	2	0	3	0	2	0	26
Mouse	0	0	0	2	0	3	0	1	0	1	0	4	0	5	0	2	0	4	0	0	0	22
Coyote	0	3	0	1	0	5	0	0	0	1	0	3	0	1	0	1	0	3	0	3	0	21
Mustelidae	0	2	0	3	0	3	0	2	0	1	0	3	0	4	0	1	0	1	0	0	0	20
Fox	0	2	0	4	0	2	0	1	0	2	0	2	0	2	0	2	0	0	0	2	0	19
Rat	0	2	0	3	0	1	0	5	0	2	0	2	0	0	0	0	0	1	0	2	0	18
Woodchuck	0	2	0	1	0	1	0	2	0	1	0	1	0	2	0	2	0	2	0	3	0	17
Gopher	0	2	0	1	0	1	0	1	0	3	0	1	0	0	0	1	0	0	0	2	0	12
Rabbit, hare	0	1	0	1	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	1	0	7
Badger	0	0	0	1	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	2	0	6
Shrew	0	0	0	0	0	1	0	0	0	2	0	0	0	1	0	0	0	1	0	0	0	5
Beaver	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	3
Pig	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	3
Porcupine	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	0	0	0	0	3
Prairie dog	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	3
Kangaroo	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Otter	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
Mt lion	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2
Bison	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Gerbil	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Grnd Squirrel	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Guinea pig	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
TOTAL	38	607	27	606	24	655	53	665	32	639	40	671	60	745	28	607	21	568	29	625	352	6388

Rabies consultations by the South Dakota Department of Health are available seven days a week. Consultations are based on Centers for Disease Control and Prevention (CDC) recommendations*. We strive to recommend appropriate rabies prevention measures and to minimize unnecessary and inappropriate testing and post-exposure prophylactic treatment.

Addresses, telephone numbers and websites

Department of Health (rabies consultations)
 615 East Fourth Street
 Pierre, SD 57501-1700
 Phone: 800-592-1861 or 605-773-3737;
 after hours 800-592-1861 or 605-773-3737
<https://doh.sd.gov/diseases/infectious/diseases/facts/rabies.aspx>

Department of Health, Public Health Laboratory (rabies testing)
 615 East Fourth Street
 Pierre, SD 57501-1700
 Phone: 800-592-1861 or 605-773-3368
<http://doh.sd.gov/Lab/rabies.aspx>

Animal Disease Research and Diagnostic Laboratory (rabies testing)
 North Campus Drive
 South Dakota State University
 Brookings, SD 57007-1396
 Phone: 605-688-5171
www.sdstate.edu/vs/adrdl

SD Animal Industry Board (livestock and animal veterinary and regulatory issues)
 441 S. Fort Street, Pierre, SD 57501
 Phone: 605-773-3321
<http://aib.sd.gov>

South Dakota Bat Group <http://sdbwg.org>

CDC Rabies: www.cdc.gov/rabies

Post-exposure Prophylaxis for Non-immunized Individuals

www.cdc.gov/rabies/medical_care/index.html

Treatment	Regimen
Wound cleansing	All postexposure prophylaxis should begin with immediate thorough cleansing of all wounds with soap and water. If available, a virucidal agent such as povidine-iodine solution should be used to irrigate the wounds.
RIG	If possible, the full dose should be infiltrated around any wound(s) and any remaining volume should be administered IM at an anatomical site distant from vaccine administration. Also, RIG should not be administered in the same syringe as vaccine. Because RIG might partially suppress active production of antibody, no more than the recommended dose should be given.
Vaccine	HDCV or PCECV 1.0 mL, IM (deltoid area), one each on days 0, 3, 7, and 14.

Post-exposure Prophylaxis for Previously Immunized Individuals

Treatment	Regimen
Wound cleansing	All postexposure prophylaxis should begin with immediate thorough cleansing of all wounds with soap and water. If available, a virucidal agent such as povidine-iodine solution should be used to irrigate the wounds.
RIG	RIG should not be administered.
Vaccine	HDCV or PCECV 1.0 mL, IM (deltoid area), one each on days 0 and 3.

Human Rabies Vaccines and Immunoglobulin Available in the United States

Type	Name	Route	Indications
Human Diploid Cell Vaccine (HDCV)	Imovax® Rabies	Intramuscular	Pre-exposure or Post-exposure
Purified Chick Embryo Cell Vaccine (PCECV)	RabAvert®	Intramuscular	Pre-exposure or Post-exposure
Human Rabies Immune Globulin (RIG)	Imogam® Rabies-HT	Local infusion at wound site, with additional amount intramuscular at site distant from vaccine	Post-exposure
Human Rabies Immune Globulin (RIG)	HyperRab™ S/D	Local infusion at wound site, with additional amount intramuscular at site distant from vaccine	Post-exposure

References and resources

*CDC. Human rabies prevention – United States, 2008 (ACIP). MMWR 2008; 57 (RR-3).
www.cdc.gov/mmwr/preview/mmwrhtml/rr5703a1.htm

Compendium of animal rabies prevention and control, 2016. National Association of State Public Health Veterinarians.
<http://nasphv.org/Documents/NASPHVRabiesCompendium.pdf>

Compendium of measures to prevent disease associated with animals in public settings, 2013: National Assoc of State Public Health Veterinarians. Journal of the American Veterinary Medical Association 243: 1270-1288.
<http://avmajournals.avma.org/doi/pdf/10.2460/javma.243.9.1270>

Monroe, B., P. Yager, J. Blanton, M. Birhane, A. Wadhwa, L. Orciari, B. Peterson and R. Wallace. 2015. Rabies surveillance in the United States during 2014. Journal of the American Veterinary Medical Assoc 248: 777—788.
<http://avmajournals.avma.org/doi/pdf/10.2460/javma.245.10.1111>

South Dakota Rabies Control Laws

RABIES CONTROL STATUE: Chapter 40-12 (Section 12-1, 2, 3, 4, 5, 6)

40-12-1. Confinement of animals required in localities where rabies exists -- Neglect as misdemeanor. In localities where rabies exists, the animal industry board may require that any animal deemed likely to spread such disease shall be muzzled, caged, tied or confined in any manner that may be deemed necessary. It is a Class 1 misdemeanor for any owner or person in charge of any animal so ordered to be muzzled, caged, tied or confined, to refuse or neglect to carry out such order.

40-12-2. Destruction of rabid animal required. If the animal industry board determines that rabies exists in any animal, the board may kill such animal and any animal there is reason to believe has been bitten by any animal affected with rabies.

40-12-4. Definition of terms. Terms used in this chapter mean:

- (1) "Department," the department of health;
- (2) "Owner," any person who has a right of property in a pet, keeps or harbors a pet or who has it in his care or acts as its custodian, or permits a pet to remain on or about any premises occupied by him;
- (3) "Pet," any dog, cat or other species of carnivore kept for domestication or display.

40-12-5. Confinement of pet after attack upon person -- Violation as misdemeanor. The department may serve written notice upon the owner of any dog or cat which has attacked or bitten a person to confine the animal at the owner's expense upon his premises or at a city pound or other place designated in the notice for a period of at least ten days after the animal has attacked or bitten any person. The department may examine the animal at any time within the ten-day period of confinement to determine whether such animal shows symptoms of rabies. In the case of any pet other than a dog or cat, which has attacked or bitten a person, the department may serve written notice upon the owner of such animal that the owner shall have the animal euthanized immediately and submit the brain to an approved laboratory for rabies examination. Any owner who fails to comply with a written notice served pursuant to this section is guilty of a Class 1 misdemeanor.

40-12-6. Confinement of pet bitten by animal suspected of having rabies -- Violation as misdemeanor. The department may serve written notice upon the owner of a dog or cat known to have been bitten by an animal known or suspected of being affected by rabies, requiring the owner to confine such dog or cat for a period of not less than six months. However, if such dog or cat had been properly treated with an antirabic vaccine, confinement shall be for a period of not less than three months. In the case of any pet other than a dog or cat, the department may serve written notice upon the owner of such animal that the owner shall have the animal euthanized immediately. Any owner who fails to comply with a written notice served pursuant to this section is guilty of a Class 1 misdemeanor.

SHERIFF: Chapter 7-12 (Section 7-12-29) Taking and holding animal suspected of being dangerous -- Formal determination -- Disposal of dangerous animal. The sheriff may take possession of any animal suspected of being dangerous. The sheriff may hold such animal until a formal determination can be made of the extent of the danger such animal poses. If the animal has attacked or bitten a human or an animal pet, the formal determination shall include consultation with the Department of Health for the purposes of rabies control. The sheriff may dispose of any animal so determined to be dangerous.

REPORTABLE DISEASES: Administrative Rule 44:20:01:03 Category I reportable diseases have a potential for epidemic spread or require rapid application of public health measures to prevent a serious threat to public health or safety. Category I reportable diseases include: Rabies, human and animal.

CONTROL MEASURES: Administrative Rule 44:20:03:10 Application of public health measures to animals. The department may instruct a person who owns or is in possession of an animal known or suspected to be a carrier of an infectious agent in public health measures for preventing infection and spread of disease. If the department knows or has reason to believe, because of testing or epidemiological information, that an animal is infected with an infectious agent and is a threat to the public health, it may issue a public health notice directing the person who owns or is in possession of the animal to take one or more of the following actions:

- (1) To examine or test the animal to determine whether it is infected with an infectious agent capable of causing human disease
- (2) To report to an authorized department representative for counseling on methods for preventing transmission of the infectious agent;
- (3) To confine or quarantine the animal for the duration of the incubation period or contagious period;
- (4) To destroy the animal or provide treatment until it is cured or free from the infection and to follow measures for preventing reinfection;
- (5) To cease from specific activities involving the infected animal that endanger the health of others;
- (6) To cooperate with the department in implementation of reasonable public health measures.

Health requirements for dogs and cats on exhibit: Administrative Rule 12:02:10:03 All dogs for exhibition must be accompanied by a health certificate signed by a licensed accredited veterinarian within 30 days before entry to the South Dakota State Fair. The health certificate shall indicate the dates of vaccination for rabies, canine distemper, and canine parvovirus. All vaccines must be current. All cats for exhibition must be accompanied by a health certificate signed by a licensed accredited veterinarian within 30 days before entry to the South Dakota State Fair. The health certificate shall indicate the dates of vaccination for rabies and feline distemper. All vaccines must be current.

Importation of imported cats and dogs: Administrative Rule 12:68:06:09 No person may import any dog or cat over three months of age without certification of a current rabies vaccination. If a dog or cat is imported from an area that is quarantined for rabies, a certifying statement is required from an accredited veterinarian that the dog or cat has not been exposed to rabies. No person may import any dog or cat less than three months of age from an area under quarantine for rabies. A certificate of veterinary inspection is not required for dogs and cats entering the state unless: (a) The animal originates from an area quarantined for rabies; (b) The animal originates from a foreign county; (c) The animal is to remain in the state for 30 days or more; (d) A resident travels with an animal to another state or province and does not return within 30 days; or (e) The state veterinarian determines that it is necessary based on disease information for a time period not to exceed the term of the threat; (3) It is not a violation of this section to bring a dog or cat into the state from a bordering state for the purpose of obtaining any vaccination or other health care from a licensed veterinarian.