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RABIES

ALBERTA DEPARTMENT OF AGRICULTURE

HUMAN PRECAUTIONS

"Although rabies is exceedingly severe in man, it also is very rare. Even in those persons, actually bitten by a rabid animal, who are not protected by vaccination, only a small proportion contact the disease. Vaccination, if given soon after the bite, is almost a complete preventive.

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People should observe these five precautionary measures :

1. Avoid contact with wild animals.

2. Avoid contact with domestic animals with which you are not familiar.

3. A wild animal which bites a person should, if possible, be destroyed immediately.

4. If a domestic animal shows "suspicious signs", it should be tethered or placed in a pen, and the case should be reported to a veterinarian, doctor, nurse, forest ranger, the R.C.M.P., or the local health department.

5. If a person is bitten, the bite should be thoroughly washed with soap and water, and the victim should be taken immediately to a physician, municipal nurse or the health department for vaccination.

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The Pasteur treatment consists of an injection of vaccine into the abdominal muscles for fourteen consecutive days.

GOVERNMENT OF THE PROVINCE OF ALBERTA

DEPARTMENT OF AGRICULTURE

RABIES

Issued by

CENTRAL RABIES CONTROL COMMITTEE

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HONOURABLE D. A. URE,
Minister of Agriculture

RABIES

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PREVALENCE OF RABIES

Rabies, also called hydrophobia or mad dog disease, is world-wide in distribution in dogs, cats and carnivores in general such as wolves, foxes and coyotes. It is transmitted to domestic livestock and man by bites of these animals. The following countries are reported to be free from rabies: Great Britain, Ireland, Denmark, Norway, Sweden, Holland, Australia, Switzerland, and Hawaii. The disease has been present in the wild foxes and wolves in Northern Canada for several years.

Rabies in man is rare compared to its wide prevalence among dogs and other animals, both wild and domestic. Rabies is widespread in the United States. In 1948, there were 8,495 cases reported in animals and 28 in persons. Several thousand people had to take treatment through having been bitten or exposed to rabid or suspected rabid animals. Only 12 States were free from the disease.

HISTORY IN ALBERTA

In Alberta, the first case was reported at Ft. Fitzgerald on June 8, 1952, when a wild fox bit a trapper's dog which later developed the disease. On July 9, a case was reported in the Little Red River-Fifth Meridian area. On July 29 a wolf bit several hogs in the Ft. Vermilion district. Two pigs died from the disease in two weeks and three more in September, but they were not reported until September when foxes and wolves bit several dogs, cattle, horses and hogs in the district. In October the disease was present in the Keg River district. In November a coyote from Ft. McMurray was positive for the disease when examined at the laboratory. Early in December a fox from Margie on the N.A.R., 174 miles from Edmonton, in 74-9-W. 4, was also found positive. Since then, up to January 31, 1953, positive cases have occurred in the Lac La Biche, Boyle, Woking, Peace River, Chipewyan Lake, Peerless Lake, Whitecourt, Morinville and Grande Prairie districts. In Saskatchewan, it has occurred at Lac La Loche, about 70 miles East of Ft. McMurray, Alberta, where dogs were bitten by foxes. In Alberta several cattle, hogs and horses have died of the disease in the Ft. Vermilion-Keg River area. Some dogs have died in practically all of the affected areas in the North.

GENERAL

Rabies is a virus disease of all warm-blooded animals. If affects the central nervous system. It is essentially a disease of dogs, in which 80% - 90% of all cases in the world occur. Where wild animal populations are involved, foxes, wolves and coyotes are the chief host, although it may infect skunks, rats, and other animals to lesser degrees. Poultry may become infected, but it is extremely rare. To become infected they practically have to be injected with the virus.

The disease is transmitted by the bite of a rabid animal. The virus is present in the saliva and is introduced through the bite wound. It follows the nerve trunks to the spinal cord and brain. It is possible to have infection result from the virus gaining entrance through a cut or scratch, when people handle infected animals that are drooling, or when examining the mouth.

The incubation period is relatively short when the wound is located near the central nervous system, as on the face and head, when it is a deep puncture, when the tissues are rich in nerves and lymphatics such as the hands, when the virus is rich in virulence and quantity, and in young animals or children. Bites on the lips and nose are especially dangerous.

Only a limited number of those bitten by rabid dogs become affected by the disease; this is estimated in man at 15 per cent and in animals at from 20 to 30 per cent. Evidence from Northern Alberta would indicate a higher percentage of infection in domestic animals. For example, at Keg River, 11 out of 15 pigs bitten by a fox developed the disease.

The average period of incubation for man and different species of animals is: dog, 3 - 6 weeks; horse and cow, 2 - 10 weeks; sheep and goat, 3 - 4 weeks; swine, 2 - 3 weeks; man, 3 - 9 weeks; — in some cases, the period of incubation is longer or shorter. In Northern Alberta it is reported that dogs frequently develop the disease one week after being bitten by a fox or wolf. There are cases on record in some countries where dogs developed the disease six months or more after having been bitten.

The virus of rabies has been found in the milk of infected animals. Although transmission of the disease through infected milk would be extremely unusual, milk or even the meat from questionable animals

should not be used for human or animal consumption. Persons with fresh cuts on their hands should not milk animals suspected of having rabies.

Seasons and weather have no effect upon the spread of rabies. Nor does warm weather or food cause the disease as only the virus is responsible. The disease is not spread either from one animal to another such as a cow or horse drinking from a contaminated water trough. They have to be bitten.

SYMPTOMS

In studying the symptoms listed below, please consider that these are only a guide as all animals do not show all the symptoms listed. In Northern Alberta, there have been very few cases classified as the furious type of rabies. A few dogs have become furious, as well as an occasional cow, horse and pig.

1. WILD ANIMALS

The infected foxes in Alberta have shown the following symptoms : — very bold, without fear of man or beast, have attacked dogs tied up in yards or kennels; attacked domestic livestock in fields and even in pens; bitten bumpers of cars, tractor wheels, etc., may have porcupine quills in the lips, most of them stagger or are lame and don't move very fast; most of them bite at abnormal objects such as sticks and even bite at themselves; most of them champ at the jaws and some drool saliva at the mouth; the eyes are starey and appear cross-eyed; several have had broken teeth from biting at stones. Sticks, stones, grass and even part of a rubber boot have been found in the stomachs. Only a trained person should open up one of these animals.

2. DOGS

There are two distinct types of rabies in dogs : (A) Furious, and (B) Dumb.

A. FURIOUS

Three stages marks the typical course.

(1) **EARLY STAGE** — In this stage the dogs seem to change in their disposition. They are capricious, and at other times irritable or depressed. They show symptoms of anger, are easily excited, fretful, change from one place to another, are easily frightened on the slightest cause or may become very affectionate. They soon show a tendency to

gnaw or swallow indigestible substances. They refuse their usual food, or they may take such food as they have a special taste for, holding it in their mouth for a few moments and then letting it drop out of the mouth again. They will lick and gnaw, in a greedy manner, various objects such as wood, coal, furniture, and eat straw, earth, stones, wood, blankets and even their own faeces. There is commencing evidence of paralysis shown by difficulty in swallowing; cough, and labored breathing. The sexual desire is very much increased and in the first stage an uncertainty in the gait such as staggering or lameness and a weakness in the hind quarters is noticed. Constipation is practically always present. **After a short space of time, generally from one to three days, the second stage appears.**

(2) **STAGE OF EXCITEMENT** — This is characterized: (a) by a tendency to escape and run away; (b) by a great irritation and an inclination to bite animals, objects, or man; (c) by a strange alteration in the voice, or bark.

The inclination to run off is very marked. They will eat through wooden boxes or floors, tear chains apart, or dig great distances through earth. As soon as they get their liberty they will run about aimlessly, covering a great deal of ground in a short space of time, and return in one or two days, showing every indication of great excitement or of having travelled long distances. When they return they are covered with dirt and utterly exhausted, and may be very quiet and well behaved for a short time. While in this condition they bite any object that comes in their way. Soon the delirium increases and they run around in an insane way, attacking and biting anything that is within their reach, snarling or biting all the time. If they are confined they bite at the bars and frequently break their teeth. If a stick is held toward them they attack it furiously. As a rule these cases do not tear or mutilate their own bodies, and if they do, they generally bite the region of the wound where they were formerly bitten or the toes of the hind legs. In the first stage of the disease it has often been noticed that they will lick and bite places where they have had wounds before. The dog snaps frequently, as if it were catching flies, and as a rule, will bite any animal that comes within its reach.

The biting and delirium are not constant, but appear after alternate periods of rest, followed by uncontrollable delirious attacks, especially if another dog should come near. These attacks may occur at intervals varying from one to four hours. **The peculiar change in the voice** is due to a paralysis of the vocal cords, and the sound of the bark is prolonged into a higher vocal sound, so that it makes a combination between a howl and a bark, which has been described as a "howling" bark. This is harsh and shrill. Fear of water does not exist

in the dog as in man, but toward the end of the second stage, due to paralysis of the throat muscles, there is great difficulty in swallowing. Very often an animal will pick up some indigestible object, attempt to swallow it, and not succeeding, drop it from its mouth. Frequently the animal will lap out of its bowl, but it is seen if observed closely that he does not swallow. On the other hand animals may cower and draw away from water that has been spilled on the floor of the cage. Vomiting sometimes occurs. There is great difficulty in passing manure which seems to produce considerable pain. There is very little alteration in breathing, but it may be slightly increased. The pulse is increased; the temperature also rises, but falls toward the end of the course of the disease.

The duration of the second stage, or excitement stage, which does not always present all of the characteristic symptoms of this condition, **may last from three to four days.**

(3) **PARALYTIC STAGE**—After the delirious spells have increased in intensity and the intervals between them grow shorter, the paralytic, or last, stage begins. The animals rapidly become thin; the eyes are staring, dull, and the eyeball is sunken into the skull. The conjunctiva is generally blood shot, the cheeks are sunken; the hair is erect; and symptoms of paralysis begin to appear. As a rule, the first sign of this is a paralysis of the muscles that close or raise the lower jaw. This allows the saliva to run out of the corners of the mouth and form threads which hang down, and it is easily recognized that the tongue and lower jaw have lost their power. The tongue becomes lead-colored and hangs out of the mouth. Soon there is paralysis of the hind quarters. This begins with a staggering, unsteady gait, and finally total inability to use the back half of the body. Then the animals stretch themselves out and become completely paralyzed. In the last stage convulsions may be seen but this is very rare. **Death, as a rule, occurs in the fifth to the seventh day after the onset of the disease. In rare instances it may last ten days.** Variations may occasionally occur in the regular course of the disease; for instance, paralysis of the jaw has not been observed, and difficult breathing has been observed for hours before death.

This is distinguished from furious rabies by the fact that the nervous symptoms appear early in this type. First, there is paralysis of the muscles of the lower jaw. The mucous or saliva runs out of the opened mouth, and the desire to bite is entirely absent, although under certain conditions when the mouth is forcibly opened the animal will be able to bite. The voice

is also changed, but it is very rarely heard. There is a loss of appetite, the animal being unable to seize or swallow foreign bodies. In this quiet form the three stages follow very closely on each other, the course of the disease being very rapid, and **death, as a rule, appears in two or three days, never over five.** With dumb rabies, the owner often thinks that the dog has a bone in its throat.

3. CATS

Cats present symptoms much like those in the dog, except there is less tendency to wander. The cat will hide in a dark corner or under furniture from which it will jump and attack persons who come near. Its voice becomes hoarse. The appetite is lost. It gets thin and paralysis occurs. Death results in a few days. Up to January 31, 1953, two people of Ft. Vermilion have taken the Pasteur treatment due to bites from suspected rabid cats.

4. HORSES

In the horse, often the first symptom is an intense itching of the bitten place (lips, nose), which causes extreme rubbing. Fear and restlessness are obvious. The animals stare, paw, and grab at the manger with the teeth, and move the ears continually. With the development of mania, the horse may attack other animals and man, and may direct the attack against some particular individual. The periods between such attacks are variable. They may bite themselves, tearing out parts of the flesh, or bite viciously on parts of the stall, injuring the mouth and breaking the teeth. As in other species, diagnosis in the early stages may be difficult because of absence of excitation, especially at the onset, between spasms and even during the entire course (paralytic type). **Finally, paralysis is general, the end coming on the fifth to eighth day, as in the dog.** Again, as in dogs, the paralytic or dumb form is common without the animal being furious.

5. CATTLE

Cattle are restless, excitable, and aggressive, though at first these symptoms may be periodic and somewhat indefinite. They stand in one place, raise and lower the head, retract the upper lip, bore with the horns, and show spasms of the muscles of the limbs by sudden jerking movements of the legs. There may be periodic attacks of excitement when they exert every

effort to break loose from the stanchion. Between such spells they are apparently normal. In most cases there is a prolonged hoarse bellow. They rub and bite, salivate, and grate the teeth. The digestive symptoms are loss of appetite, suspended chewing of the cud, bloating, inability to swallow, and impaction of the rumen with extreme straining. The bloating and other symptoms of choke have led to suspicion of a foreign body in the throat. Other symptoms are spasms of the neck muscles, and switching the tail. The initial paralysis is in the throat or hind parts, leading to death in the usual time.

6. SHEEP

In sheep, the symptoms are similar to those in cattle, though excitement is often wanting. Excitement is manifested by restlessness, stamping the feet, and marked sexual desire shown by riding other animals. Gnawing and licking of the wound are common.

7. SWINE

Swine attack other animals, even their own young, when excited. They hide in the straw, gnaw at the wound, and soon become paralyzed. In most of the cases in Alberta, the hogs just refused to eat, dying in a few days from paralysis of the legs, throat, etc.

CONTRACTED THROUGH BITES

Rabies is chiefly contracted through bites, but may occasionally be contracted through fresh skin cuts or scratches or contamination of mucous membranes such as those of the eye, with saliva of the infected animals. This is an important fact for trappers to remember. They should not skin wolves, etc., that were definitely rabid unless gloves are worn to protect their hands from contacting saliva. Heavy rubber gloves are recommended so that they can be effectively disinfected after skinning the animal. The knife should also be disinfected or boiled. The eyes should not be rubbed with the gloves. The best advice is not to handle or skin these animals at all. Also an axe should not be used to remove the head of an animal as fluids may splash into a person's eye.

The virus has a special liking for the central nervous system, travelling from the point of bite by way of the nerve sheaths to the brain. **Not all rabid animals excrete the virus of rabies in the saliva**

all the time (some authorities state only 50%) which may explain why only about one person in eight will develop the disease even if no treatment is given. So uncertain is this situation, however, that all persons bitten should receive the treatment when the animal is infected.

While minor cuts and scratches of less than 24 hours duration will permit the entrance of the virus into the body, large, deep and ragged wounds are the most serious. The virus does not penetrate the unbroken skin. Bites about the head are always very serious, as the virus has a very short distance to travel to the brain. Hence no time should be lost in taking intensive treatment. If treatment is delayed a fatal condition may develop. Bites through clothing are less serious than those to the bare skin as the saliva may be absorbed by the cloth. Rabies virus may be present in the saliva a few days before the animal shows symptoms of the disease and also may survive in the brain tissues many days after the death of the animal.

The virus is readily destroyed by drying, boiling or exposure to sunlight. It is dead in a matter of a few hours in the saliva after the animal dies. This is of importance to trappers as no person yet has developed rabies from handling furs. The only danger is at the time of skinning around the head as explained above. Chemicals such as 3 per cent creosol will destroy the virus in 15 minutes. The care of bites is explained below.

WHAT TO DO WITH PERSONS EXPOSED

First, get a detailed and accurate history of the actions, symptoms and behaviour of the animal that did the biting. Without such a history it will be difficult at times to determine whether the animal is rabid and whether antirabic treatment is indicated.

In cases of bites or scratches from a suspected rabid animal the family physician should be called promptly. In districts where a doctor is not available, report bites to the local public health nurse, veterinarian, Forest Ranger, or R.C.M.P. so that arrangements can be made to get medical attention. The bite or scratch should receive prompt attention though. A shallow wound should be washed with soap and water (preferably 20% soft soap) for 15 - 20 minutes, changing the fluid frequently. Following this, Tincture of Iodine should be applied in liberal amounts. Deep and torn wounds should be treated similarly, except a syringe should be used to force fluid down into the depth of the wound repeatedly. Remove as much fluid as possible and force Tincture of Iodine into the depths of the wound.

When a doctor becomes available he will determine what other steps are necessary, such as the use of antirabies vaccine, called the Pasteur treatment. It must be remembered that antirabies treatment is not without danger, therefore the doctor or nurse will only administer it when there are definite indications for its use. There is at present no available vaccine which is suitable for a widespread program of immunizing the public at large. The present vaccine is only suitable for those who have been bitten.

WHAT TO DO WITH SUSPECTED ANIMALS

DO NOT KILL THE ANIMAL. If it is killed early in the disease, the Negri bodies in the brain (explained under diagnosis) may be so widely scattered or be so small as to be hard to find on microscopic examination. Thus it is always advisable to keep the suspected animal alive at least long enough to allow full development of symptoms. Put it in a secure pen or tie it up securely, preferably the former. Give it plenty of food and water. Call your veterinarian who is skilled in the diagnosis of rabies and other allied animal diseases. For example, the dog may have distemper, acute indigestion, etc., which would make it act queer. If the dog or other animal has rabies it will show progressive symptoms and die within a few days, usually in 5 to 8 days. If it is alive and well at the end of 14 days one can be certain that the animal did not have rabies. Thus a lot of needless antirabies treatment can be avoided by confining the animal and placing it under the observation of your veterinarian.

All cases must be reported to the Federal Health of Animals Division as rabies is a reportable disease under the Federal Animal Contagious Diseases Act. Contact the closest Veterinary Inspector of that Division or notify your closest veterinarian, Forest Ranger, R.C.M.P. or District Agriculturist and they will report for you.

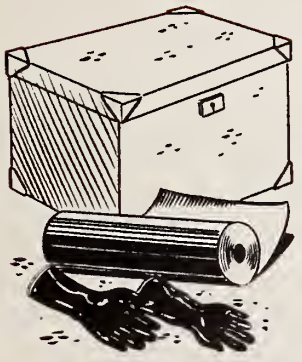
DIAGNOSIS

Study the symptoms. Confine the animal. Call your veterinarian. If it is living at the end of 14 days it didn't have rabies, or if it has been sick for over 14 days before the time of bite, rabies is very unlikely. If it died before that time it may have died from some other disease unless the symptoms were very diagnostic. The final diagnosis is made at a laboratory.

If it is necessary to kill the animal **do not shoot it through the head** as a whole undamaged brain is essential to a satisfactory laboratory examination.

The pathologist will take very thin sections of certain parts of the brain to look for Negri bodies. If found, the animal had rabies. If not found, a suspension of brain tissue is injected into young mice. If the original animal was infected the mice will usually show symptoms in 7 to 21 days. But in some cases a much longer period of observation is necessary, even up to several months, before it is safe to say that virus was not present in the specimen.

COLLECTION AND SHIPPING HEADS TO THE LABORATORY



Your closest practising veterinarian, Federal Health of Animals Division Inspector, Forest Ranger, R.C.M.P. or District Agriculturist will arrange for shipment of the head of the suspected animal to a laboratory. Special leak-proof containers and rubber gloves are stationed with the Forest Rangers, the above veterinarians or R.C.M.P. throughout the province at aanger centres for shipping the specimens. All specimens from northern Alberta go through the Veterinary Laboratory, Alberta Department of Agriculture for servicing and then on to the Federal Veterinary Research Laboratory, Lethbridge, for the official diagnosis.

The brain must arrive fresh and intact at the laboratory. First, do not shoot the animal through the head. The head is removed, wrapped in several layers of paper in order that the blood or saliva will not leak out, put in the special containers with ice and sawdust, shavings, peat moss or newspapers around it, and frozen or packed with ice. Unless the above special containers are used the head should be wrapped as described, frozen and placed in a tightly closed can. This first can to be placed in a larger leak-proof one, packed with sawdust and ice and sealed tight.

Care must be taken to prevent fluids escaping during transit. These fluids may be contaminated with virus and it is a criminal offence to expose persons and equipment to infection.

IMPORTANT — A full and detailed report should accompany each specimen submitted to the laboratory. This should include the symptoms of the animal, name, address and land location of the owner or where the animal was found. The report should be sealed in an envelope, attached securely to the container and postage added as required by law or mailed immediately to the laboratory. The report should not be placed inside the container as that would be dangerous to the office help at the laboratory, who keeps the records.

PREVENTION AND CONTROL

There are broad principles which, if followed, will control rabies in any area. Eradication should be the aim though, not just control. This is difficult or remote in areas where wild animals are infected.

1. All dogs should be confined or tied up. This is of utmost importance as most of the human cases originate from dog bites. The stray or ownerless dog that runs around the country, which, if it becomes infected, may bite people or animals, is the most dangerous dog. If all other dogs are confined these strays must be caught and destroyed. Full co-operation of all dog owners in observing the law concerning keeping their dogs confined is a necessity.

Another reason for confining dogs is that after a dog is bitten by a rabid animal the disease may not develop for several months. (See General — incubation period).

2. In the North country, however, where the reservoirs of infection such as foxes, wolves and coyotes are not under control the difficulty becomes very great. Therefore, the common sense of the people must be depended upon so that every means is taken to prevent dogs being exposed to wild animals that may be carriers.

3. **Vaccines** — No vaccine is 100% perfect; therefore, they should not be depended on as the only means of control. It takes a month after the time of vaccination for the immunity to become well developed. Vaccination of domestic dogs has an important place though, especially in the North, in that the number of dogs that could develop the disease is thus drastically reduced. This is important from the public health viewpoint.

In Canada the dog vaccination program is under the supervision of the Federal Department of Agriculture, Health of Animals Division.

4. Where rabies is present in the wild life the population of these should be drastically reduced, especially in years of peak density. The history in other parts of the world where foxes, etc., are infected is that there are very few cases in domestic livestock during the low wild life population years but that it is frequently serious in the peak years.

Poisoning, shooting, etc., should be carried out preferably on a systematic basis to reduce the number of foxes, coyotes and wolves. Everyone should lend a hand in this work.

5. Carcasses of rabid or sick animals should be buried deeply or burned.

WHAT TO DO WITH SUSPECTED ANIMALS

1. Do not kill the animal. Tie or confine it for 14 days. Call your veterinarian to keep it under observation.

2. If the dog has to be destroyed in the interests of public safety, don't shoot it through the head as the brain has to be used for the diagnosis.

3. As rabies is a reportable disease under the Animal Contagious Diseases Act of the Federal Department of Agriculture, Health of Animals Division, notify any of the following :

(a) Federal Health of Animals Division.

(b) Local Veterinarian.

(c) Forest Ranger.

(d) R.C.M.P.

(e) Medical Doctor or Public Health Nurse.

(f) Veterinary Services Branch, Alberta Department of Agriculture, Edmonton.

Full co-operation in observing the quarantine laws for dogs is essential in the interests of public safety.

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