

VETERINARY SCIENCE
FACT SHEET No. 25—1981
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Tularemia (Rabbit Fever) in Minnesota

INTRODUCTION

Tularemia is a disease of both animals and man caused by the bacteria *Francisella tularensis*. Synonyms for tularemia include: rabbit fever, deer-fly fever, and Francis' disease.

The disease was first identified in California ground squirrels in 1910, and the organism was named after Tulare County in California where the infected ground squirrels were found. However, it was not until four years later that the first human case was reported. In North America, human cases have been reported in the United States, Canada, and Mexico.

TULAREMIA IN THE UNITED STATES AND MINNESOTA

There were 1,614 human tularemia cases reported in the United States from 1970 through 1979—an annual average of 161 cases. During the same period in the West North Central Region (Minnesota, Iowa, Missouri, North Dakota, Nebraska, and Kansas), the number of human cases was 263 (annual average 26). Seventy-five percent of the human cases reported in the West North Central Region were from Missouri. In Minnesota, there were six human tularemia cases identified during that decade.

Two documented cases of human tularemia were reported to the Minnesota Department of Health in 1980. One case involved a male trapper who resided in St. Louis County. He routinely trapped animals and skinned them with his bare hands. The second case was a 39-year-old male in Yellow Medicine County who contracted tularemia after dressing a rabbit his son had shot.

HUMAN TULAREMIA

The common incubation period (the time from exposure to onset of clinical signs) is 3-5 days, through it may range from 1 to 10 days. Of the five clinical forms of the disease, only three are commonly reported in the United States. The clinical form in man is determined by the portal of entry of the organism.

1. Ulceroglandular Form

The most common clinical form is the ulceroglandular form, which accounts for 85 percent of the human cases reported in the United States.

A local lesion occurs at the portal of entry (insect bite, scratch by contaminated nails, or knife cut) and later develops into a necrotic ulcer accompanied by swelling of the regional lymph nodes. The lymph nodes frequently drain and ulcerate. In untreated cases, the course of the disease is 3-5 weeks, with convalescence lasting several weeks or even months accompanied by intermittent fever.

2. Oculoglandular Form

The oculoglandular form develops when contaminated material reaches the eye. The primary lesion is localized in the lower eyelid and consists of an ulcerated papula with simultaneous swelling of the regional lymph node.

3. Typhoid Form

The typhoid form is believed to be caused by consuming contaminated foods, usually the meat of infected wild rabbits, or contaminated water. Symptoms include gastro-enteritis, fever, and toxemia; and ulcerative lesions in the mucosa of the mouth, pharynx, and intestines, sometimes accompanied by swelling of the cervical, pharyngeal, and mesenteric lymph glands. If not treated promptly, the course of this clinical form may be short and fatal.

It is estimated that 30 percent of all tularemia patients, irrespective of the portal of entry of the infection, develop bronchopneumonia. The fatality rate in diagnosed human tularemia cases in the United States is less than 1 percent in treated cases and 5 percent in untreated human cases. Man to man transmission of tularemia is extremely rare.

TULAREMIA IN ANIMALS

The most susceptible animal species for tularemia are rodents and lagomorphs (rabbits and hares), which suffer a generally fatal septicemic disease. These animals are an important source of infection for man. *In Minnesota, we are most concerned about beavers, muskrats, and wild rabbits.*

The disease also has been reported in sheep, goats, swine, cattle, and horses. The infection is transmitted by arthropods (insects) as well as by water and contaminated feed. Dogs and cats are susceptible and have been known to contract the disease by eating raw meat of sick, wild rabbits.

DOMESTICATED RABBITS

Although the domestic rabbit is susceptible to experimental tularemia, rabbits raised in rabbitries and confinement in the United States have *very rarely* been found infected; therefore, they may be handled and eaten safely.

WHITE SPOTTY LIVERS — WILD RABBITS

People often are concerned about the relationship between "white spotty" livers in wild rabbits shot as game and tularemia. Although white spots in the liver may be indicative of tularemia, it is by no means the only cause of such lesions. The important point to remember is that once you have opened the carcass using bare hands and have observed the

liver, human exposure probably already has occurred.

Important: Use protective gloves anytime you are skinning and eviscerating wild game (rabbits, hares, beaver, and muskrats).

The most common cause of white spotty livers in rabbits, particularly domesticated rabbits, is a coccidia (*Eimeria stiedae*) that multiplies in the liver. Infections lasting more than 16 days can be recognized by the white circular nodules on the liver. In moderate infections, there is no mortality but disfigurement of the liver makes it unmarketable. In most cases, providing the carcass is sound, the liver should be discarded and the rabbit meat is safe to eat.

PREVENTION

Man is infected from handling, skinning, and cleaning infected wildlife; from eating incompletely cooked infected meat and drinking contaminated water; and through insect bites.

Critical at-risk groups in Minnesota include trappers (particularly those of muskrats, beaver, water rats, and lagomorphs); fur dealers and those working in fur processing plants; and hunters and their families. The seasonal occurrence of tularemia in Minnesota is directly related to the animal sources involved. Cottontail rabbits usually are hunted from November to January, and as a result, human tularemia from contact with that source is more common then. Muskrats and beaver usually are trapped in winter and early spring.

Education is both the best preventive and best control measure available to the Minnesota hunter and trapper. By following these simple precautions, you will greatly reduce the chance of becoming the one human tularemia case identified annually in Minnesota.

- Do *not* kill or handle a wild rabbit or hare that is too sick to run or that is caught by a dog.
- Wear rubber gloves, or at least thoroughly disinfect hands, during or after dressing or skinning rabbits or aquatic fur animals.
- Thoroughly cook wild game meat (rabbits, water rats, muskrats, beaver). The causative agent is destroyed within 10 minutes at 140°F.
- Avoid drinking untreated water.
- Avoid bites of flies, mosquitoes, and ticks through the use of insect repellents and protective clothing when working in endemic areas.

REFERENCES

The following readings are recommended for further information on the subject:

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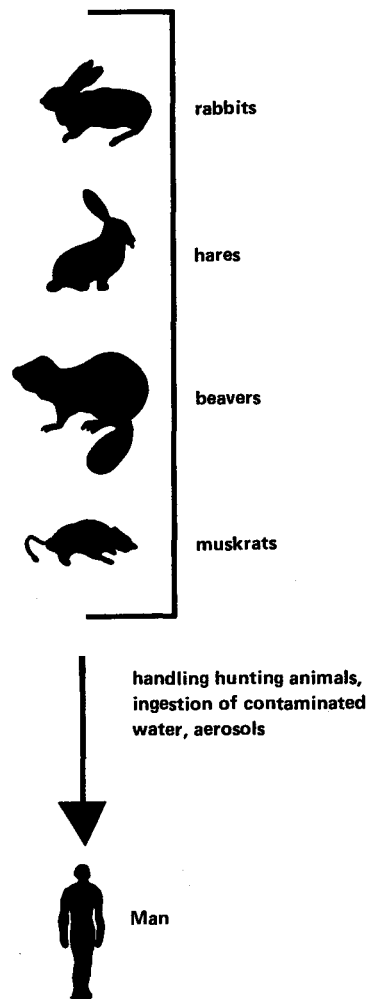
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Infected wild animals



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