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SWINE BRUCELLOSIS and human health

US Public Health Service

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U. S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE

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Swine brucellosis is caused by *Brucella suis*, a strain of bacteria which also causes human brucellosis, or undulant fever. This disease is an important public health problem which affects thousands of farmers, livestock handlers, meat processors, and butchers.

The U. S. Department of Agriculture estimates that 6.15 percent of the 1.8 million swine herds in the Nation are infected with brucellosis. This represents about 131,000 infected herds on farms, where some 579,000 farm people come into daily contact with these herds.

The infection rate among these rural persons varies considerably in different areas. The highest incidence of human brucellosis of swine origin is found in the major pork producing regions. In some

EPIDEMIOLOGY

Swine brucellosis is transmitted to man by various means including the handling of diseased animals and contact with their discharges, infected carcasses, and contaminated meat products. Sometimes water and greens may be a vehicle of the organism.

The disease is spread from animal to animal and to man by the natural body discharges such as milk, urine, feces, and semen. Infected sows which abort or farrow normally may also eliminate *Brucella suis* for variable intervals after parturition. *Br. suis* is prone to produce abscesses which may break open and spread *Brucella* about the premises.

The survival of *Br. suis* outside the animal must be considered in the epidemiology of the disease. Studies that have been made indicate that *Br. suis* may live for 3 or 4 months in tapwater and sterile soil and for shorter periods of a month or so in distilled water, urine, feces, and unsterile soil. Infected boar semen is often teeming with *Br. suis* and the organism may remain viable for long periods outside the animal's body.

Processors and others handling diseased carcasses and animal byproducts are exposed to viable *Brucella* in their daily activities. McCullough (3) in a study of swine carcasses reported that 0.7 percent of those that he examined yielded *Brucella*.

areas the infection rate among hog producers is estimated to be as high as 20 percent.

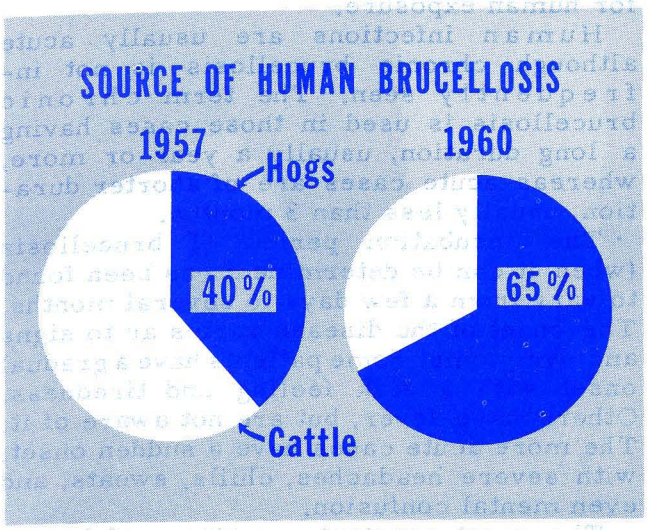
Brucellosis is also a health problem among livestock handlers who move swine and other animals from the farm to shipping points and to processors.

The disease problem among persons processing pork has been of serious concern to public health authorities in the Midwest and Southeastern United States. The highest incidence of human infection has been found in those plants handling only swine.

Veterinary and lay meat inspectors are other groups in which infection is frequently seen. The incidence of brucellosis among veterinarians has always been higher than in any other group. Attack rates in the past have exceeded 950 per 100,000 among rural practitioners (5).

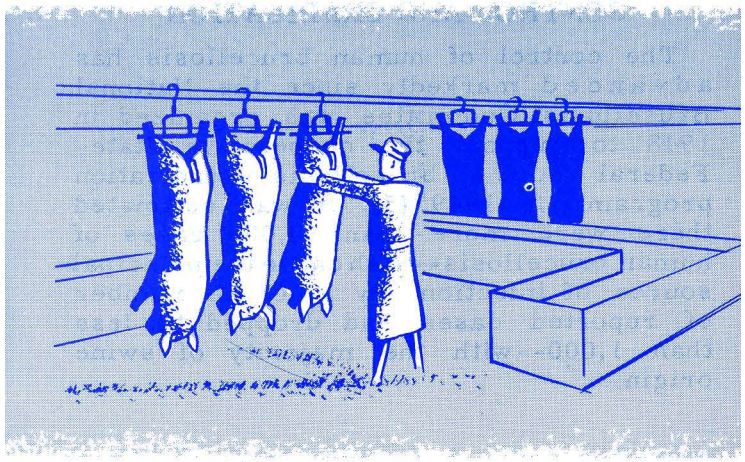
The following is an estimate of the number of persons who may come in contact with diseased swine in their daily activities:

Persons on farms with diseased swine	579,000
Livestock handlers	50,000
Processors and butchers	200,000
Veterinarians and others	20,000
	849,000



In 1960, 65 percent of the human brucellosis reported in the United States was thought to be of swine origin. This is a notable change since 1957, when 60 percent was of cattle origin and only 40 percent of swine origin. This reversal is explained by the intensive bovine brucellosis eradication program, which now covers 80 percent of the Nation's counties.

The success of this program in reducing the incidence of bovine brucellosis has resulted in a precipitous drop in the number of cases of human brucellosis. But it has also focused attention on the remaining reservoir of the disease in swine.



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He concluded that, if this was a true incidence of infected carcasses, workers in plants handling hundreds of carcasses daily would come in frequent contact with *Brucella* organisms. More recent studies by Hendricks (1) reveal that *Brucella* may be airborne in large plants where thousands of animals are processed daily.

Hutchings, et al. (2) studied the viability of *Br. suis* in carcasses subjected to the usual refrigeration. They were able to recover *Brucella* from many locations in the carcasses for as long as 3 weeks after slaughter. McCullough (3) confirmed this and found *Br. suis* in lymph nodes as late as 49 days after slaughter.

In another study McCullough demonstrated that *Brucella* could survive the usual commercial curing process as long as 3 weeks. During smoking the hams are subjected to relatively high temperatures and no bacteria were recovered after smoking. It would appear that the smoking process destroys the *Brucella*, but that pickling does not.

Since *Brucella* organisms are readily killed by normal cooking temperatures, humans cannot contract brucellosis by eating cooked meat products. However, it is quite obvious that human brucellosis of swine origin is a problem of concern to livestock handlers and processors of pork products, and that control is dependent on the eradication of brucellosis in swine.

DISEASE IN MAN

Physicians who have studied brucellosis in man are of the opinion that the swine form of the disease produces a more serious illness in man than that of cattle origin. Brucellosis in man varies as to its effects. It may be a mild infection with malaise and fever or a severe disease with many signs and symptoms. The underlying state of health of those exposed is an important factor in the severity and duration of the illness. Likewise, local customs and food habits will influence the opportunities

for human exposure.

Human infections are usually acute although chronic brucellosis is not infrequently seen. The term chronic brucellosis is used in those cases having a long duration, usually a year or more, whereas acute cases are of shorter duration, usually less than 3 months.

The incubation period of brucellosis (when it can be determined) has been found to vary from a few days to several months. The onset of the disease varies as to signs and symptoms. Some patients have a gradual onset with a sick feeling and tiredness. Others have fever, but are not aware of it. The more acute cases have a sudden onset, with severe headaches, chills, sweats, and even mental confusion.

The most constant symptoms of human brucellosis are weakness and fatigue. Headaches, chills, night sweats, generalized aches and pains, and nervousness are other common signs. Many patients have enlarged lymph nodes about the neck.

Enlargement of the spleen is seen in the more severe cases. In some severe cases abscesses occur and there may be involvement of the bony structure of the body. Occasionally there are reports of human abortion and sterility caused by *Brucella*. In fatal cases there is usually bacterial endocarditis. With the advances in antibiotic therapy, the severe cases seen years ago can be successfully treated, although there are some relapses.

CONTROL AND ERADICATION

The control of human brucellosis has advanced markedly since the National Brucellosis Committee was organized in 1948 to support the cooperative State-Federal bovine brucellosis eradication program. In 1949 (5), it was estimated there were more than 10,000 cases of human brucellosis--with cattle the principal source of infection. By 1960, the number of reported cases had dropped to less than 1,000--with the majority of swine origin.

Presently more than 80 percent of the Nation's counties are participating in the bovine brucellosis eradication program. But to eliminate this disease as a public health threat, brucellosis must be eradicated in all domestic animals. The United States is fortunate in that brucellosis is not a problem among sheep. Likewise, the incidence in goats is low and the disease is rare among wildlife.

Thus, infected swine herds are the last reservoir of brucellosis of concern to animal health and public health officials. The means to eradicate the disease are available. It behooves all farmers, livestock handlers, processors, and veterinarians to give their complete support to the eradication of swine brucellosis.

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