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Trichinosis Prevalence from Farm to Table

by Kelly Namminga, SDSU nutrition and food science graduate student,
with review by Dr. Bob Thaler, SDSU Extension swine specialist

Trichinosis is a foodborne disease caused by the parasite (worm) *Trichinella spiralis*. Many meat-eating animals, including humans, can be infected with trichinosis. In humans, the incidence of infection depends upon the number of *Trichinella* larvae ingested. The initial sign of trichinosis infection in humans is gastroenteritis. Symptoms may include vomiting, diarrhea and abdominal pain. Many cases are mild and generally go by unnoticed or are confused with other foodborne illnesses with similar symptoms.

Trichinosis is much less prevalent in humans than in the past. In 1943, the National Institute of Health reported 16.1% of the U.S. population infected with *Trichinella*. By 1970, the rate had dropped to 4.2%, and it has continued to decline since then. But even though the infection rate in humans has declined dramatically, the association of pork with trichinosis still adversely affects pork consumption.

Wild animals -- rodents, skunks, raccoons, foxes, wild boar and bears -- are reservoirs for *Trichinella*. Swine are the most commonly infected domestic animal. Swine come in contact with *Trichinella* by consuming uncooked garbage that contains infected meat scraps or from rodent contamination. Once ingested, the parasite sexually matures in the intestine and migrates to muscle tissue. In 17 to 21 days, the larvae become encysted and infective. Encysted larvae can remain viable for many years, and in most cases, for the life of the animal. An infected swine will generally not show any clinical signs of illness unless large numbers of the parasite are present.

Table 1. Cooking and Freezing Temperatures for Pork to kill *Trichinella*.*

	Internal Cooking Temps(°F)		Freezing Temps (°F) and Times
Ground pork	160 °F	Fresh pork	5 °F / 20 days
Fresh-Medium	160 °F	Less than 6" thick	-10 °F / 10 DAYS
Fresh-Well done	170 °F		-20 °F / 6 DAYS
Ham-not cooked	160 °F		
Ham-full cooked	140 °F		

*USDA / FSIS

In pork, it is estimated that about 25% of *Trichinella* larvae infecting an animal are present in the hams and 20% are present in the shoulders. Infective larvae can survive in the meat for long periods of time. Cooking and freezing will destroy *Trichinella* larvae in pork (Table 1).

The threat of trichinosis has led some people to completely avoid pork products. Of those who eat pork, many tend to overcook the meat. Using a meat thermometer to record that proper internal temperature has been reached can prevent overcooking and retain eating satisfaction.

The pork industry's response to consumer concerns has been the National Trichinae Research Project (NTRP), begun in 1994 as a collaborative effort of the National Pork Producer's Council (NPPC), USDA's Agricultural Research Service (ARS), Animal Plant Health Inspection Service (APHIS), Food Safety and Inspection Service (FSIS), and allied industries. This project was designed to determine the prevalence of *Trichinella* in swine herds and to determine the risk factors for *Trichinella* infection on the farm. An area of the country with a high incidence of *Trichinella* infection in swine 10 years ago was also studied to see if there had been a reduction in infection.

Results of the study showed that the risk of *Trichinella* infection is significantly lower than it has been in the past (see Table 2). A quick and reliable blood test can be used to detect infected animals prior to harvest.

Table 2. Prevalence of *Trichinella* in Swine over the Decades

YEAR	PREVALENCE
1900	>2.5%
1930	0.95%
1952	0.63%
1965	0.16%
1970	0.12%
1995*	0.013%

*National Animal Health Monitoring System

Many swine producers today follow production practices that virtually eliminate the risk of infection with *Trichinella*. These practices include changes in feeding practices and improvements in animal husbandry. Pork producers no longer feed uncooked garbage, and they exclude rodents from the pig's environment more effectively.

The model for a *Trichinae*-free certification program incorporates the principles of the Hazard Analysis Critical Control Point (HACCP) system. Each control point established in swine production has zero tolerance for exposure to the hazard *Trichinella*. Irradiation of pork products kills the *Trichinella* parasite and could be another method of control before products reach the consumer.

With the incidence of *Trichinella* infection declining and developing programs to eliminate *Trichinella* infection in swine, it is likely that trichinosis will no longer be a consumer food safety concern.

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