

FOOD SAFETY RESEARCH: A FOCUS ON

# Trichinella - A Nematode Parasite

Internationally, the United States is among the lowest-cost pork producers in the world.

A barrier to expanding the U.S. pork export market is international concern over the perceived risk of *Trichinella spiralis* in U.S. swine. The lack of a program to address the perception of *Trichinella* infection in swine creates a negative impact on consumer perception and the pork export market.

In the past, *Trichinella* prevention focused on post-harvest methods including processing techniques (heating, curing, freezing and irradiating), pathogen detection methods in pork at slaughter (compression and digestion) and consumer food safety education programs.

Currently, pork producers implementing good production practices to reduce trichinae risk factors are not recognized. This year, the USDA proposed to administer and implement a voluntary National Trichinae Certification Program to ensure the quality and safety of pork products from the farm through slaughter. Under the program, pork producers following certification criteria will be able to market their swine as "trichinae-safe", according to the USDA's Draft Environmental Assessment.

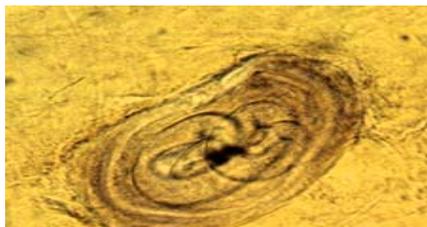


*Trichinella* - a nematode parasite

## FSRIO Web site: A Resource for Food Safety Research Projects

For detailed information and descriptions of trichinella-related research projects, search the Food Safety Research database at [www.nal.usda.gov/fsrio/fsresearch.htm](http://www.nal.usda.gov/fsrio/fsresearch.htm)

It is the mission of USDA/ARS National Food Safety Program 108 to decrease the risk of human transmission of parasites such as *Trichinella* and reduce the economic cost of parasitism.



*The nematode parasite, Trichinella, encysted in a muscle cell known as a nurse cell.*

## RESEARCH AREAS

Determine the role of cytokines in the development of neonatal immune systems to understand and stimulate appropriate protective mechanisms against *T. spiralis*.

Develop new methods to detect *Trichinella* pathogens in serum and meat juice samples. Provide educational materials to pork producers on risk reduction strategies.

Conduct quality control testing and training in *Trichinella* inspection methods approved by the EU and Russia.

## GENERAL FACTS

- There are five species and two types of the nematode parasite *Trichinella*. The species are: *T. spiralis*, *T. nativa*, *T. britovi*, *T. nelsoni* and *Trichinella pseudospiralis*. The types are: *Trichinella* T-5 and *Trichinella* T-6.
- Most human infections are caused by *T. spiralis*, followed by *T. nativa* and *T. britovi*.
- Trichinella* species can infect swine, horses, and wild animals (foxes, wolves, bears, skunk, raccoons, rats, and other small mammals).
- All species can cause the human foodborne illness, Trichinellosis or Trichinosis, when raw or improperly cooked meats containing the larvae of the parasite are consumed. Clinical manifestations of the infection can vary from asymptomatic to moderate gastrointestinal distress to severe cardiac and neurologic complications.
- All stages of *Trichinella*'s life-cycle are completed in one host. *Trichinella* is transferred from one host to another by the ingestion of muscle tissue infected with the encysted larvae. The complete development takes between 17 to 21 days. Adult worms will continue to produce larvae for several weeks until they are finally expelled.
- Enzyme-Linked Immunosorbent Assay (ELISA) is a detection method that has been used to test pigs in both pre- and post-slaughter.

## ONLINE RESOURCES

### Trichinellosis -- CDC Division of Parasitic Diseases

[http://www.cdc.gov/ncidod/dpd/parasites/trichinosis/factsheet\\_trichinosis.htm](http://www.cdc.gov/ncidod/dpd/parasites/trichinosis/factsheet_trichinosis.htm)

### Trichinellosis -- The OIE Manual of Standards Diagnostic Tests and Vaccines 2000

[http://www.oie.int/eng/normes/mmanual/A\\_00046.htm](http://www.oie.int/eng/normes/mmanual/A_00046.htm)

### The Trichinella Page -- Columbia University - Division of Environmental Health Sciences

<http://www.trichinella.org/index.htm>

### Getting Rid of the Trichinae Stigma -- National Hog Farmer

[http://nationalhogfarmer.com/ar/farming\\_getting\\_ride\\_richinae/](http://nationalhogfarmer.com/ar/farming_getting_ride_richinae/)

### Giving Pork a New Image -- Agricultural Research Magazine, August 2000

<http://www.ars.usda.gov/is/AR/archive/aug00/pork0800.pdf>

### Facts About Trichinosis -- USDA/APHIS Veterinary Services

<http://www.usaha.org/species/trichinosis.html>

### National Trichinae Certification Program Draft Environmental Assessment -- USDA/APHIS

<http://www.aphis.usda.gov/ppd/es/vs/trichfndr.PDF>

### Trichinae Herd Certification -- USDA

[http://www.aphis.usda.gov/vs/trichinae/docs/herd\\_certificate.htm](http://www.aphis.usda.gov/vs/trichinae/docs/herd_certificate.htm)

### Trichinosis Prevalence from Farm to Table -- South Dakota State University CES

<http://extfcs.sdstate.edu/foodsafety/new%20fs%20website/Producer%20Publications/Trich.htm>

### Trichinae -- National Pork Producers Council and AMS

<http://www.meatscience.org/Pubs/factsheets/facttrichinae.pdf>

### Trichinae Information - Fact Sheets, FAQ's, Forms, Logs -- USDA/APHIS

<http://www.aphis.usda.gov/vs/trichinae/>



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The Food Safety Research Information Office (FSRIO) publicly launched its web site, [www.nal.usda.gov/fsrio](http://www.nal.usda.gov/fsrio), on July 2, 2001, in support of the National Food Safety Initiative.

A key component of the web site is a database of food safety research projects. The database is a resource for researchers and administrators to assess food safety research needs and priorities, thereby minimizing duplication of effort. FSRIO was established in accordance with H.R. 2534 Agricultural Research, Extension and Education Reauthorization Act of 1997, SEC. 503.

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