



## 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.



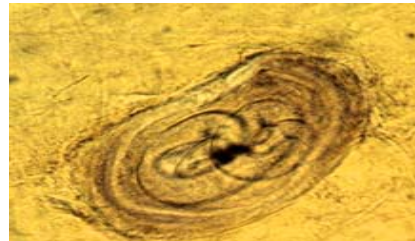
*Trichinella* - a nematode parasite

### 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 <http://fsrio.nal.usda.gov/quicksearch.php>

The ARS National Program 108 Food Safety Annual Report 2005:

[http://www.ars.usda.gov/research/projects/projects.htm?ACCN\\_NO=409642](http://www.ars.usda.gov/research/projects/projects.htm?ACCN_NO=409642)



*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.

## FSRIO DATABASE PROJECTS

Projects in the FSRIO database related to this topic are listed below. Visit FSRIO online to access the projects.

Analyst Training and Check Sample Program for Pork and Horsemeat Export Program

USDA. Agricultural Research Service.

Immunity to Parasitic Infection

NIH. National Institute of Allergy and Infectious Diseases.

Implementation of a Food Safety Improvement System for the Independent Pork Producer and Packer

USDA. Agricultural Research Service.

Parasitological Food Safety Analysis Assessment and Education

USDA. Cooperative State Research Education and Extension Service.

## RESOURCES

This factsheet was produced using the resources listed below. Visit FSRIO online to access these links.

**Trichinellosis**

CDC. Division of Parasitic Diseases.

**Trichinellosis**

The OIE Manual of Standards Diagnostic Tests and Vaccines 2000.

**The Trichinella Page**

Columbia University. Division of Environmental Health Science.

**Getting Rid of the Trichinae Stigma**

National Hog Farmer.

**Giving Pork a New Image**

Agricultural Research Magazine, August 2000.

**Trichinae Information - Fact Sheets, FAQ's, Forms, Logs**

USDA. Animal and Plant Health Inspection Services.

**National Trichinae Certification Program Draft Environmental Assessment**

USDA. Animal and Plant Health Inspection Services.

**Trichinae Herd Certification**

USDA. Animal and Plant Health Inspection Services.

**Trichinosis Prevalence from Farm to Table**

South Dakota State University Cooperative Extension Service.

**Trichinae**

National Pork Producers Council; American Meat Science Association.

This fact sheet is one of several information products developed by the Food Safety Research Information Office (FSRIO) at the USDA's National Agricultural Library (NAL). Fact sheets on specific food safety research topics are available on the FSRIO web site at:

<http://fsrio.nal.usda.gov/topics.php>

FSRIO is a unique resource for the food safety research community. The program features a web site that serves as a gateway to research information and includes a database of federally-funded research projects. The database is available for researchers, policymakers, consumers and others to learn about research initiatives, and assist the government in assessing food safety research needs and priorities, thereby minimizing duplication of effort. FSRIO also provides a reference service at no charge.

Created by: Dietetic Intern, Cynthia Lechman

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<http://www.nal.usda.gov>

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Food Safety Research Information Office  
10301 Baltimore Ave Room 304, Beltsville, MD 20705-2351  
Phone: 301-504-7374 Fax: 301-504-7680  
Email: [fsrio@nal.usda.gov](mailto:fsrio@nal.usda.gov)