

# VIRGINIA EPIDEMIOLOGY BULLETIN

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## *Trichinella spiralis* Infection—United States & Virginia, 1990\*

Since 1947, when the U.S. Public Health Service began to record statistics on trichinosis, the number of cases reported by state health departments each year has declined: in the late 1940s, health departments reported an average of 400 cases and 10-15 deaths each year; from 1982 through 1986, the number declined to an average of 57 per year (Figure 2) and a total of three deaths.<sup>1,2</sup> Although this trend reflects a decline in the number of cases related to commercially purchased pork, recent outbreaks of trichinosis emphasize the continuing need for education about the dangers of eating inadequately cooked pork.

In November and December 1990, 15 cases of trichinosis were reported in Virginia by eight local physicians in Augusta, Page, Rockingham, and Shenandoah counties to the Central Shenandoah Health District, Virginia Department of Health. Six cases were confirmed by muscle biopsy, five had positive serology by bentonite flocculation, and four were epidemiologically linked. Nine of these persons required hospitalization. All patients had fever, myalgia, and perior-

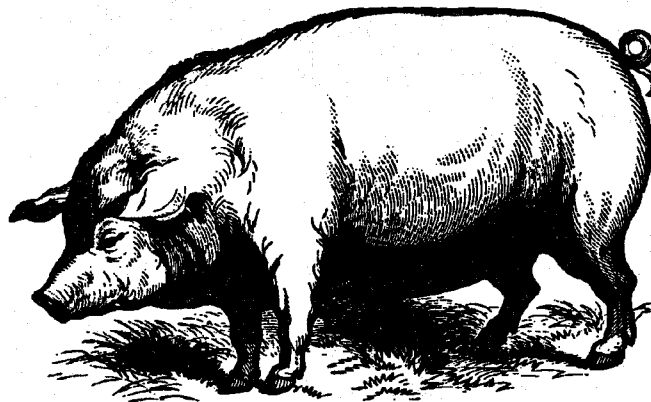
bital edema; all nine patients for whom eosinophil counts were available had elevated levels.

Detailed case histories were available for all ill persons. Fourteen (93%) persons reported eating pork sausage 4-21 days before onset of symptoms; 10 (67%) ate the sausage

the outbreak, the plant purchased hogs from two brokers who had obtained hogs from multiple producers in Virginia and surrounding states. The plant produces 1500 lbs of sausage per week, which is distributed throughout eight counties in the Shenandoah Valley.

The health department issued an areawide alert to physicians and hospitals and a news release to all area newspapers that included information on proper cooking and handling of raw pork.

During the preceding 17 years (1973-1989), 35 cases of trichinosis were reported in Virginia. Although these cases were distributed throughout the State, 59% were reported from the northwest region where the 1990 outbreak occurred. Pork was the implicated food item in 93% of cases; hamburger meat was suspected in the remainder (beef may be adul-



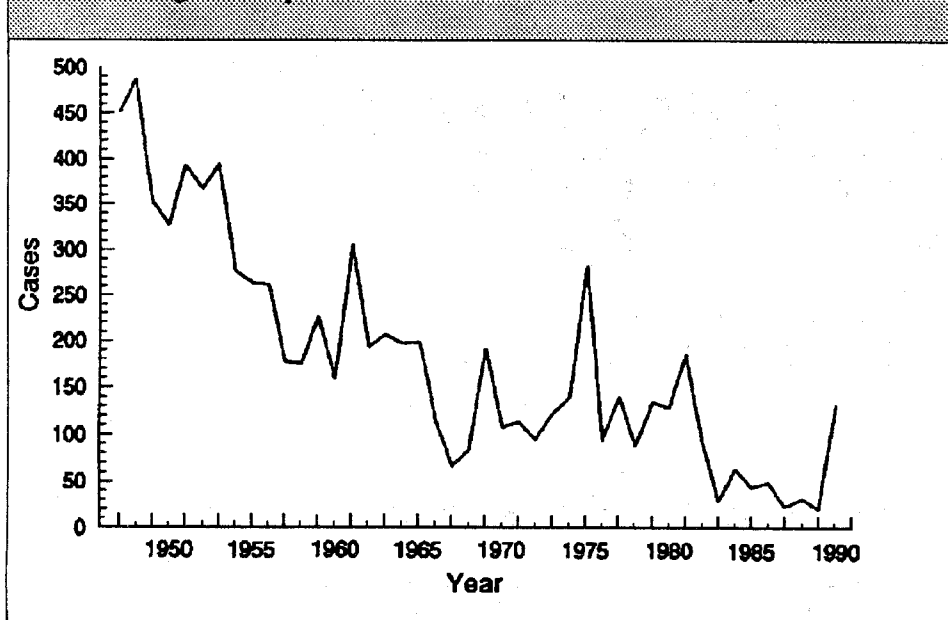
terated either intentionally or unintentionally by pork). In 19 cases (56%) the food item was consumed uncooked, in 8 (24%) it was fried, and in one (3%) it was cooked in a microwave. In the remaining cases the cooking method, if any, was not reported. In 20 (59%) cases the implicated meat was obtained from a commercial source. Three cases occurred in immigrants from Southeast Asia where it is customary to serve pork uncooked. Six cases in 1986 were traced to a Page County resident who bought a live pig, slaughtered it himself, and then distributed

uncooked. One person who denied eating undercooked sausage was employed as a meat handler in the plant that processed the implicated sausage. The investigation was limited to those who were ill; no controls were interviewed. The 14 persons who had consumed sausage had purchased bulk pork sausage from several local retail grocery stores; the stores had purchased this sausage from a local processing plant. No pork was available for analysis at the time of investigation. During the 6 weeks before

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Figure 2. Reported Trichinosis Cases—United States, 1990



must be made with trichina-free pork or pork adequately cooked or treated to kill trichina larvae. *Trichinella* larvae in pork are killed by freezing at 5°F (-15°C) for 21 days (or longer if meat is greater than 15 cm thick); however, *Trichinella* larvae present in wild game are often relatively resistant to freezing.<sup>6</sup> Cooking is one of the most common methods of assuring that *Trichinella* are destroyed; a temperature of 170°F (77°C) substantially exceeds the thermal death point and is usually achieved if the meat is cooked until it is no longer pink.<sup>7</sup>

Physicians need to be aware of the continued presence of *T. spiralis* in commercial pork in the United States and should consider the diagnosis in any patient with an illness compatible with trichinosis and whose dietary preferences put them at risk for infection.

the meat to his family and friends; all except one of these individuals ate the meat uncooked and became ill.

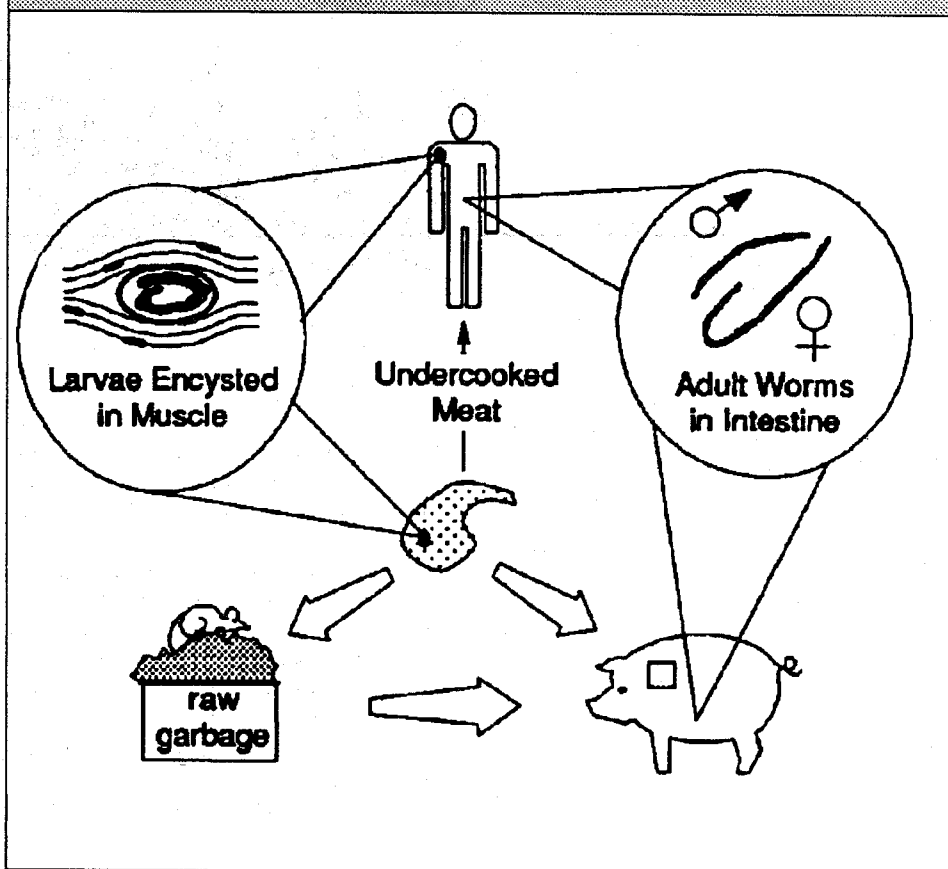
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**Editorial Note:** Since 1975, the proportion of trichinosis cases associated with consumption of contaminated commercial pork has declined in the United States. This decline probably reflects a combination of factors, including laws prohibiting the feeding of offal to hogs, the increased use of home freezers, and the practice of thoroughly cooking pork. In recent years the relative importance of consumption of wild game (including bear, wild boar, and walrus)<sup>2,3</sup> as a cause of trichinosis has increased. Consumption of meat from any carnivorous animal that has fed on trichina-infested flesh poses a risk (Figure 3).

Based on serologic examination of hogs at abattoirs, the prevalence of *Trichinella* infection in commercial pork ranges from 0 to 0.7%.<sup>4,5</sup> Approximately 80 million hogs are slaughtered commercially each year in the United States. About 40% of the pork produced is sold as "ready to eat" pork products; such products

Figure 3. Life Cycle of *Trichinella spiralis* in Humans.

Flesh with infective larvae is eaten by humans or other animals. The larvae become adult worms in the intestine of the host and in turn release new larvae, which penetrate the intestinal wall and encyst in striated muscle. Cannibalism, scavenging for meat scraps, and consumption of farm rats may be important sources of infected flesh. Feeding raw garbage to pigs is illegal in the United States. Wild game, especially bear and boar, are often sources of infection in humans.



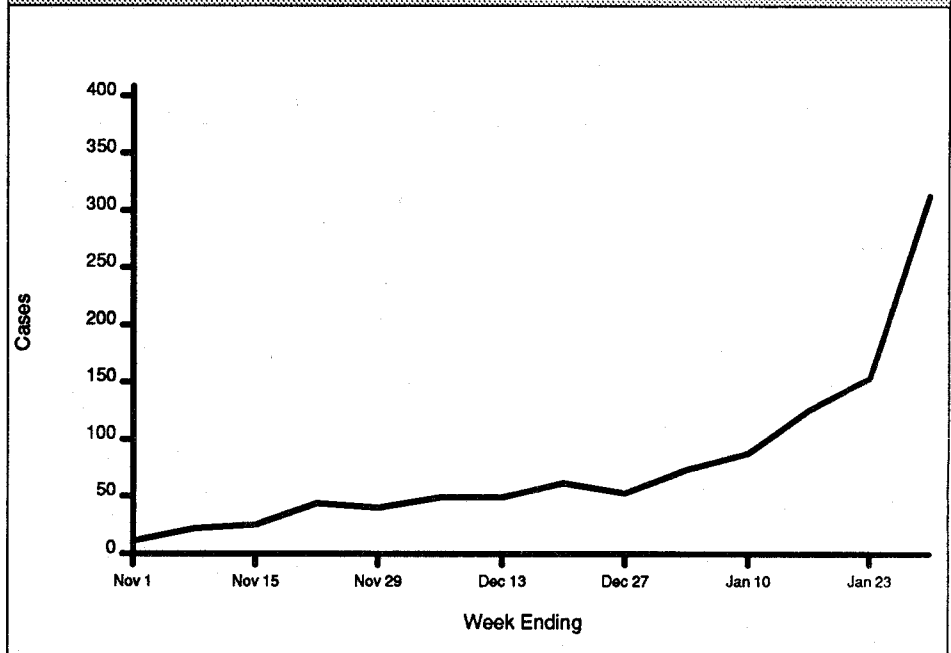
## References

1. Schantz PM. Trichinosis in the United States, 1947-1981. *Food Technol* 1983;37:83-6.
2. Bailey TM, Schantz PM. Trends in the incidence and transmission patterns of human trichinosis in the United States, 1982-1986. *Rev Infect Dis* 1990;12:5-11.
3. CDC. Trichinosis surveillance, United States, 1986. *MMWR* 1988;37(no. SS-5):1-8.
4. Duffy CH, Schad GA, Leiby DA, et al. Slaughterhouse survey for swine trichinosis in Northeast United States. In: Kim CW, ed. *Trichinellosis, proceedings of the Sixth International Conference on Trichinosis*. Albany, New York: State University of New York Press, 1985.
5. Hill RO, Spencer PL, Doby KD, et al. Illinois swine trichinosis epidemiology project. In: Kim CW, ed. *Trichinellosis, proceedings of the Sixth International Conference on Trichinosis*. Albany, New York: State University of New York Press, 1985.
6. Dick TA, Chadee K. Biological characterization of some North American isolates of *Trichinella spiralis*. In: Kim CW, Ruitenberg EJ, Teppema TS, eds. *Trichinellosis, proceedings of the Fifth International Conference on Trichinosis*. Surrey, England: Reedbooks, 1981.
7. Leighty JC. Control I public-health aspects (with special reference to the United States). In: Campbell WC, ed. *Trichinella and trichinosis*. New York: Plenum Press, 1983.

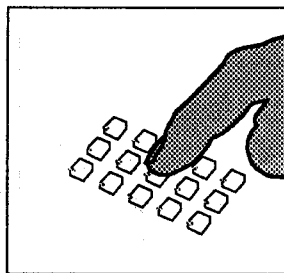
\* Adapted from *MMWR* 1991;40:57-60.

§ The CDC case definition for trichinosis is 1) a *Trichinella*-positive muscle biopsy or positive serologic test for trichinosis in a patient with eosinophilia, fever, myalgia, and/or periorbital edema; or 2) in an outbreak, at least one person must meet the first criterion; associated cases are defined by either a positive serologic test for trichinosis or eosinophilia, fever, myalgia, and/or periorbital edema in persons who have shared the epidemiologically implicated meal or consumed the implicated meat product.

Influenza-like Illness Reported by Sentinel Physicians (N=42) in Virginia Widespread Activity has Occurred Since Mid-January. Influenza B Virus Has Been Isolated from Patients Seen in the Eastern, Northern, Southwestern, and Central Regions of the State.



## CDC Voice Information System



The CDC Voice Information System is an automated telephone service that provides information

about the MMWR and public health topics, including acquired immunodeficiency syndrome, chronic fatigue syndrome,

Lyme disease, rabies, hepatitis, influenza, international travel, and malaria. Information includes an overview of each topic; symptoms; prevention methods; immunization requirements, if any; and an option for transfer to a public health professional during business hours. The CDC Voice Information System is available 24 hours a day, 365 days a year; the telephone number is (404) 332-4555.

## Regional AIDS Resource and Consultation Centers

The Virginia Department of Health has a statewide network of health care professionals who provide state of the art AIDS education and clinical training to health care providers and students. The centers not only coordinate professional educational activities in the area of HIV infection and AIDS, but also provide consultation and library services. Each center maintains a consultation staff including physicians, dentists, nurses, dieticians, psychologists, social workers, and



clergy to readily respond to questions. Each Resource Center may be accessed by a toll free number.

Locations and phone numbers of each center are:

- Northern Virginia HIV Resource and Consultation Center, 3299 Woodburn Road, Suite 220, Annandale, Virginia 22003, phone number 1-800-828-4927.
- Eastern Regional AIDS Resource and Consultation Center, P.O. Box 1980,

Norfolk, Virginia 23501, phone number 1-800-999-8385.

- Central Regional AIDS Resource and Consultation Center, P.O. Box 147, MCV Station, Richmond, Virginia 23298-0147, phone number 1-800-525-7605.
- Western Regional AIDS Resource and Consultation Center, P.O. Box 385, University of Virginia, Charlottesville, Virginia 22408, temporary phone number (804) 982-1699.
- Southwest location - 1009 1st Street, Roanoke, Virginia 24016, phone number 1-800-950-4056.

**Cases of Selected Notifiable Diseases, Virginia, January 1 through January 31, 1991.**

Disease	Total Cases Reported This Month						Total Cases Reported to Date in Virginia		
	State	Regions					This Yr	Last Yr	5 Yr Avg
		NW	N	SW	C	E			
AIDS	38	1	15	5	11	6	38	49	27
Campylobacter	23	4	7	5	5	2	23	39	35
Gonorrhea	1135	-	-	-	-	-	1135	1335	1378
Hepatitis A	4	0	2	0	1	1	4	3	10
Hepatitis B	13	0	4	2	3	4	13	21	24
Hepatitis NANB	2	0	0	2	0	0	2	2	2
Influenza	26	0	0	0	25	1	26	308	312
Kawasaki Syndrome	1	0	0	0	0	1	1	1	1
Legionellosis	1	0	1	0	0	0	1	1	1
Lyme Disease	0	0	0	0	0	0	0	2	1
Measles	0	0	0	0	0	0	0	4	1
Meningitis, Aseptic	8	0	4	1	2	1	8	15	13
Meningitis, Bacterial*	9	6	0	2	1	0	9	7	12
Meningococcal Infections	1	0	0	0	1	0	1	4	5
Mumps	5	0	2	1	0	2	5	5	6
Pertussis	1	0	1	0	0	0	1	1	4
Rabies in Animals	7	2	2	1	1	1	7	14	14
Reye Syndrome	0	0	0	0	0	0	0	0	0
Rocky Mountain Spotted Fever	0	0	0	0	0	0	0	0	0
Rubella	0	0	0	0	0	0	0	0	0
Salmonellosis	75	9	18	9	18	21	75	95	78
Shigellosis	8	3	1	2	1	1	8	10	22
Syphilis (Primary & Secondary)	67	2	16	6	15	28	67	56	41
Tuberculosis	7	2	0	0	0	5	7	13	19

*Localities Reporting Animal Rabies:* Botetourt 1 skunk; Gloucester 1 raccoon; Hopewell 1 raccoon; Loudoun 1 raccoon; Prince William 1 raccoon; Rockbridge 1 raccoon; Rockingham 1 horse.

*Occupational Illnesses:* Asbestosis 5; Carpal Tunnel Syndrome 35; Coal Workers' Pneumoconiosis 31; Loss of Hearing 8; Repetitive Motion Disorder 3; Silicosis 1.

\*other than meningococcal

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