

## TRICHINELLOSIS IN PIGS IN IBADAN, NIGERIA.

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### Abstract

The artificial digestion method, using pepsin: hydrochloric acid solution, and the double glass compression microscopy method were used to detect *Trichinella spiralis* in slaughtered pig muscles in Ibadan

Nineteen (19) or 9.5% of the 200 pigs screened by the artificial digestion method were positive. This compares with zero (0%) in the 200 samples screened using the compression microscopy method. The artificial digestion method is therefore more sensitive and recommended for use.

This work provides additional information on the occurrence of *Trichinella spiralis* in Nigerian domestic pigs.

### Introduction

Trichinosis is a parasitic zoonosis capable of affecting virtually all mammalian species caused by a filiform nematode *Trichinella spiralis* (Acha & Szyfres, 1981).

It is important to establish the cycles of transmission - domestic, synanthropic or sylvatic - in a given locality. This will be helpful in instituting adequate control measures to break up the cycle (Steele and Arambulo III, 1975).

The specific animal hosts differ from one geographical zone to the other. While WHO (1980) stated that over 120 mammals have been found to be naturally infected, but carnivores and omnivores are more naturally infected (Du-Sai *et al.*, 1989; Georgi and Georgi, 1990).

Although rats are said to be important in the synanthropic cycle, recent work by Du - Sai (1989) in Nigeria has confirmed that the rat may not be important in Nigeria as none of 500 rats (*Arvicanthus niloticus*) sampled using the digestion method was positive.

Conversely, of the 600 pigs examined by Akinboade *et al.* (1984), using the artificial digestion method, 42 (7%) were positive. Hence pigs could be a very important link in the epidemiology of trichinosis in Nigeria.

There are four main methods reported for the diagnosis of *Trichinella spiralis* in meat these are: the serological ELISA technique, immunofluorescence, the artificial digestion method and the direct microscopy (Trichinoscopy) method (van - Knapen, *et al.*, 1981).

In this work, the artificial digestion and the compression microscopy methods were used to detect *Trichinella spiralis* in the muscles of slaughtered pigs and their efficacy compared.

#### Materials and Methods

##### The Compression Microscopy Method:

From the Ibadan municipal abattoir, pieces of meat were cut from the masseter and diaphragm of slaughtered pigs. Samples were collected from 200 pigs consisting of 155 West African Dwarf breed and 45 large white. The sources of the pigs were private farms and households within Ibadan and its environs. They were raised by the semi-intensive or free range (scavenging) systems. The samples were placed in laboratory, each piece were placed in labelled universal bottles. In the laboratory, each piece was further chopped into tiny pieces and 1 gm was compressed between 2 thick glass plates which were screwed together firmly. The samples were then examined for the presence of encysted larvae of *Trichinella spiralis* under X50 magnification using a light microscope.

##### The Artificial Digestion Method:

The digester was made of 1g powdered pepsin dissolved in 10ml concentrated hydrochloric acid and made up to 100 ml with distilled water. Meat samples were taken from the pig masseter muscles, tongue or the diaphragm. In a beaker, 4 gm of meat was chopped into pieces and the 100 ml pepsin on HCl digester added. This was incubated at 37°C for 6 hours. The digested sample was centrifuged at 1500 rpm for 10 minutes. The supernatant was discarded while the sediment was transferred onto a glass slide, covered with a slip and examined under a light microscope at x50 magnification. Positive sample showed the larvae of *Trichinella spiralis*.

#### Results

**Compression Microscopy:** In all 200 Pigs examined, no single larvae was detected.

**Artificial digestion:** Of the 200 Pigs examined, 19 (9.5%) were positive for the larvae of *Trichinella spiralis*.

**Prevalence:** All positive cases were among the 155 West African Dwarf breeds sampled.

A summary of the result is shown in Table 1.

Table 1

##### *Trichinella spiralis* in Pigs in Nigeria.

	No Examined	No Positive	Percentage
Male Pigs	124	11	8.87
Female Pigs	76	8	10.53
Total	200	19	9.5

#### Discussion

Naked eye detection of the parasite in the carcass is not reliable even when the cysts are calcified; anyway, several other cysts are capable of having their walls calcified. Practical diagnosis of *Trichinella spiralis* in swine has been restricted to two main procedures: trichinoscopy and artificial digestion (Gracey, 1981).

Though trichinoscopy is cheap and fast, it has serious limitations because of its low sensitivity. It can detect the infection when there are 10 or more larvae per gm of meat. (Acha and Szyfres, 1981). The compression microscopy is a form of trichinoscopy. Therefore this work has confirmed its low sensitivity.

The infection rate of 9.5% in this work, though higher than the 5% found in pigs by Steele and Schultz (1978) in the USA; and the 7% found by Akinboade *et al.* (1984) in the same Nigerian environment, using the same artificial digestion method, it reconfirms the presence of *Trichinella spiralis* in Nigeria.

Though this work showed a higher infection rate in female pigs, there is no evidence of differential sex influence in trichinosis infection. However it is note-worthy that all the positive samples were from scavenger pigs which have access to infected carcasses, faeces and contact with possible wildlife

reservoirs in the bush around the houses and villages. Further work is required to determine the domestic cycle of the parasite in Nigeria since Du - Sai (1989) has ruled out the rat as a possible reservoir of the parasite in Nigeria.

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