

STUDY REPORTS

Title: The Prevalence of Toxoplasma gondii in Domestic Swine and Rodents in Thailand.

Principal Investigators: Chua Wongsongsarn, D.V.M.¹
Pibul Chaianan, D.V.M.²
Dilok Kasornsombat, D.V.M.²
Preecha Klainil, D.V.M.²

Assistant Investigators: Dennis O. Johnsen, Major, VC
Paul C. Smith, Major, VC

BACKGROUND

The importance of toxoplasmosis as a zoonotic disease has not been fully investigated. Recent studies in other Southeast Asian countries imply that Toxoplasma gondii may be the causative agent in certain CNS and ocular diseases in children. The organism has recently been incriminated as a complicating pathogenic infection in patients with debilitating malignancies. The identification of the organism from a wild rodent in the Kao Yai area raises the possibility that wild rodents may be a natural reservoir of infection.

OBJECTIVE

The objective of this study is to determine the prevalence of Toxoplasmosis in domestic animals and rodents by serological, skin test, and isolation techniques.

PROCEDURE

Blood samples from swine are collected by field teams of the Thai Department of Livestock Development, Ministry of Agriculture. The samples are collected by impregnation of standard blotter paper strips properly preserved and transported to the laboratory for testing. Hemagglutination tests are conducted on each serum sample by the technique described by Jacobs, L. and Lunde, M.H. in J. Parasitol., 43:308—314 with the modifications suggested by Nobuto, K.³

Skin tests are conducted on mature swine by injecting 0.2 ml. of commercially prepared toxoplasmin³ intradermally on the dorsal surface of the skin of the ear. The tests are read 24, 28 and 72 hours later and evaluated by measurement. A characteristic arthus-type hypersensitive reaction occurs at the site of injection in positive animals. Swelling, edema and necrosis of the skin are criteria for making a positive determination.

Skeletal muscle, especially the diaphragm is taken from swine at random as they are being slaughtered. These tissues are ground in mortar and pestle diluted with PBS and injected intraperitoneally into mice. Mice dying 2—8 days after injection are opened aseptically and examined for evidence of infection. Squash preparations of organ tissues and smears of the peritoneal exudate are stained with Giemsa and examined microscopically for organisms having the characteristic shape and morphology of Toxoplasma gondii.

1 Chief, Education and Research Division, Dept. of Livestock Development.

2 Department of Livestock Development.

3 National Veterinary Assay Laboratories, Kakobunja, Tokyo, Japan.

PROGRESS

Samples of pork muscle were taken at random from 251 hogs killed at the Bangkok Municipal slaughter house and specimens were collected from 49 live-trapped wild rodents. The samples were tested by mouse inoculation but all were negative. The tissues of two pigs that reacted positively to skin testing and the hemagglutination test were examined and cultured for Toxoplasma gondii. No evidence of infection was found.

Hemagglutination and skin tests were performed on swine herds at two different farms. The results are shown in Tables 1 and 2. A total of 80 swine were tested at both farms, 6 were positive to the skin test, 17 were "positive" to the hemagglutination test and 14 were designated "suspicious" because agglutination occurred at low dilutions.

SUMMARY

Antibodies to Toxoplasma gondii occur in swine in Thailand. The hemagglutination test appears to be more sensitive than the skin test. All but one animal with high titered HA antibody were also positive to the skin test. Generally strong positives to both tests occurred among older animals. No Toxoplasma gondii organisms were isolated from 251 swine and 49 wild rodent specimens examined.

Table 1. The Occurrence of Antibodies to Toxoplasma gondii in Swine at Kasetsart University Farms.

Number of Animals	Skin Test Reaction			Hemagglutination Test	
	Erythema	Swelling	Size*	Titer**	Diagnosis
19	None	None	None	None	Negative
1	None	+	8×12	None	Negative
1	None	+	9×12	None	Negative
1	None	None	None	1:64	Suspicious
1	+	++	17×17	1:256	positive
1	++	+++	30×32	1:1024	Positive

* Measured in millimeters

** Reciprocal of Serum Dilution

Table 2. The Occurrence of Antibodies to Toxoplasma gondii in swine at Tab Kwang Livestock Station.

Number of Animals Tested	Skin Test Reacton			Hemagglutination Test	
	Erythema	Swelling	Size*	Titer**	Diagnosis
27	None	None	None	None	Negative
14	None	None	None	1:64	Suspicious
10	None	None	None	1:256	Positive
1	++	++	18×19	1:256	Positive
1	+	+	15×38	1:1024	Positive
1	+	+++	23×24	1:1024	Positive
1	None	None	None	1:16384	Positive
1	++	+++	23×25	1:16384	Positive

* Measured in millimeters

** Reciprocal of Serum Dilution