

QUESTIONNAIRE RESULTS FROM A COMMUNITY-BASED PROJECT ON PORCINE CYSTICERCOSIS IN THE EASTERN CAPE PROVINCE OF SOUTH AFRICA

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Abstract. For many decades the pork tapeworm, *Taenia solium*, has been recognized as a problem in South Africa. Recent reviews of neurocysticercosis and the emergence of *T. solium* cysticercosis as a serious agricultural problem and public health risk in Eastern and Southern Africa, have brought the cysticercosis situation in South Africa into focus. An early report from slaughterhouses in South Africa indicated that 0.50-25.70% of pigs were infected. More recently hospital surveys utilizing serological and radiological diagnostic techniques have indicated that 28-50% of epileptics, predominantly African and many children, were positive for this parasite. This paper will focus on the preliminary results of a current questionnaire survey targeting emerging pig producers in the Eastern Cape Province who live in areas where neurocysticercosis is known to occur. The results are presented against the background of increasing reports of its occurrence throughout the subregion and current studies underway in the country. The human population considered to be at highest risk of being infected by this zoonotic helminth are people living in rural areas most of whom earn their livelihood wholly or partially through livestock enterprises. The questionnaire and interviews with these producers were designed to gain knowledge of community practices on pig husbandry, pork consumption, and sanitation as well as people's knowledge of *T. solium* infections in both pigs and humans. This is the first community-based study on porcine cysticercosis infections in South Africa. The results from this questionnaire will provide information for designing interventions acceptable to endemic communities while also contributing to sustainable and appropriate recommendations for cysticercosis prevention and control.

INTRODUCTION

Many countries in Africa have the highest prevalence of *Taenia solium* cysticercosis/taeniasis in the world or are countries with no information available at all (World Health Assembly, 2003). South Africa is one country with the highest prevalence and is the country with the largest number of pigs of the Eastern and Southern African countries in the subSaharan region (Phiri *et al.*, 2003). Total pig numbers in South Africa increased by 14% from 1,395,920 in 2000 to 1,590,837 in 2001 with similar trends reflected throughout the country's provinces (National Department of Agriculture Directorate, 2001). Approximately 25% of these pigs are free-ranging and are owned by emerging pig producers in resource-poor areas of South Africa.

Projections indicated that pork consumption over the next 16 years is expected to increase only slightly in the developed regions of the world (38 to 41 million tonnes) but will be more than double in the developing regions (39 to 81 million tonnes (Delgado, 1999). A recent review paper on the current status of neurocysticercosis (NCC) in Eastern and Southern Africa (Mafojane *et al.*, 2003) highlighted the need for community-based studies on both human and porcine cysticercosis to be undertaken on both health and agriculture aspects of this zoonotic disease. In response to this, a study funded by the United States Agency for International Development (USAID) in South Africa is addressing the epidemiology of *T. solium* in emerging farming areas of the Eastern Cape Province where the highest levels of NCC have been reported. There are two objectives of this community-based study. The first is to compare lingual examination in pigs with three biotechnological diagnostic tests to determine presence of *T. solium* cysticerci and therefore prevalence of the disease. The second is, with a questionnaire, to gain a better understanding of practices of pig husbandry, pork consumption,

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sanitation, and people's knowledge of this parasite in communities where NCC and cysticercosis occur. The results of this study provide essential information for appropriate interventions of prevention and management. The current paper includes some results from the above mentioned project.

MATERIALS AND METHODS

Epidemiological design

Provincial veterinary activities center around dip tanks in the Eastern Cape Province of South Africa (Fig 1). The communities around these dip tanks then are contacted through these structures. Using this system, owners with free-ranging pigs identified in the Alfred Nzo District, were invited to take part and visits were scheduled. All owners chose to take part in the study.

Pig samples

The free-ranging pigs are largely the indigenous or hut pig. The animals sampled were examined lingually for the presence of cysticerci in the tongue using an improved method developed in this study. The animal is restrained with cotton mutton cloth strips to

hold the mouth open, the tongue is grasped gently but firmly and extended from the mouth cavity with a Guy's 7 $\frac{1}{2}$ " (9.5 cm) tongue holding forceps. The tongue is illuminated for the examination of the cysts by visually seeing and palpating. A Search Guard rechargeable weather proof 1,000,000 candle power halogen lantern is used. The advantage of this lantern is its ability to illuminate the pig's mouth well even when the work is taking place in the bright sunlight of the day, and is easily recharged in the field as required. Blood samples were also drawn, and sex, age, and body condition scoring values recorded.

Questionnaires

From February 2003 to June of 2003, 12 villages in the Alfred Nzo District of the Eastern Cape Province of South Africa were visited (Fig 2), blood samples from 196 pigs were drawn and 122 questionnaires (modified from I Phiri, 2003, personal communication), and interviews with emerging pig producers completed. The questionnaire data was coded and transferred to spread sheets using Microsoft[®] Excel (2002) and then electronically analysed with a statistical program (Genstat for Windows, 2000). Questions were cross-tabulated by response categories

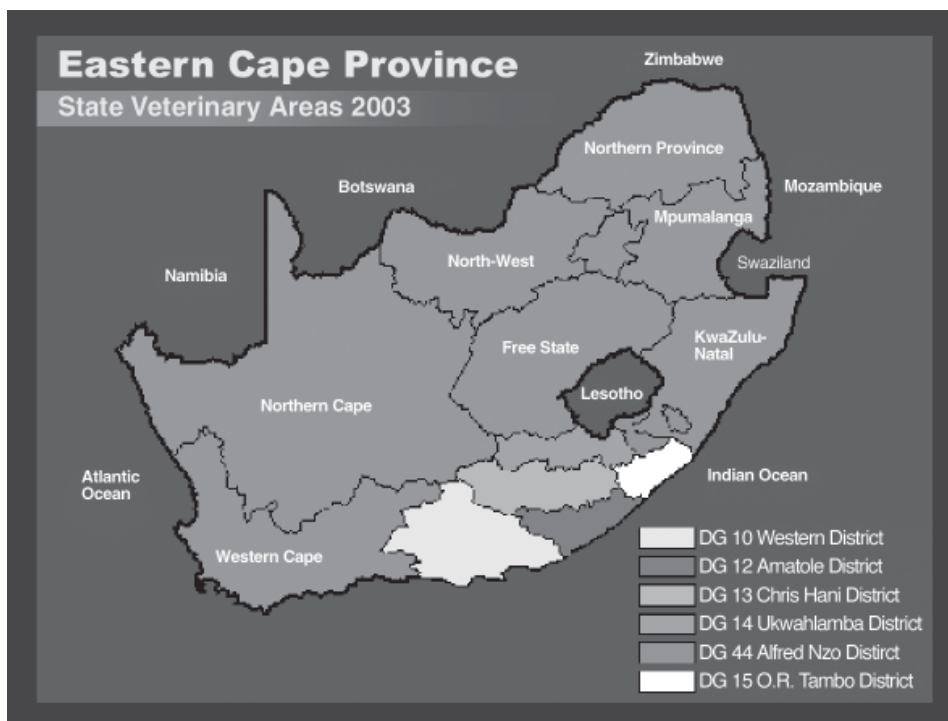


Fig 1- Six veterinary districts in the Eastern Cape Province, South Africa. The Alfred Nzo district is where the study took place.



Fig 2- Twelve villages (excluding Matatiele) in the Alfred Nzo District where the study took place.

Table 1

Lingual examination of pigs from 12 villages in the Eastern Cape Province, South Africa.

Lingual examination of pigs			
Dip tank /village	Number examined	% positive	
Mt Frere	(Mvuzi)	8	37.50
	(Tshungwana)	11	54.55
	(Mhlanganisweni)	22	27.27
	(Cabazi)	15	0
	(Mtshazi)	17	17.65
	(Colana)	15	26.67
Umzinkulu	(Ntshongo Krom 2)	20	0
	(Magwala)	13	15.38
	(Mvolozana)	19	0
Maluti	(Sidakeni)	12	0
	(Gwadana)	27	3.70
	(Afondering)	12	0

to summarize the frequencies per category and bar charts were produced.

RESULTS

The results of the lingual examinations of the pigs which include the dip tank locations and villages visited, the numbers of pigs examined and the percentage positive are in Table 1. The results of the questionnaire include a profile of the emerging pig producers, pig husbandry practices, and people's knowledge of the parasite.

The profile of the emerging pig producer respondent in the current study follows. Seventy-five percent were women, all were African and 66% of Bhaca ethnic background. The main source of income was pensions (50%), occupation was unemployment (38%), and farmers (25%), and the ages of 90% of these farmers were distributed evenly from 20 to 70 years.

The questionnaire also obtained information about pig husbandry. The majority of the pigs (55%) were maintained in free-ranging conditions, 46% have one pig per household and 76% of the pigs are the indigenous breeds compared with exotic breeds. Forty-four percent keep pigs for home consumption and an additional 40% keep them for both home consumption and sale. All of the respondents indicated that the meat is not inspected.

When the respondent was asked if they knew of anyone complaining of having a tapeworm infection in their village, 75% said yes. Eighty percent did not know how people acquire tapeworm infection, 62-84% had heard of persons in their village saying or complaining of epilepsy, chronic headaches, madness and skin nodules. Eighty-eight percent had observed measles in pig meat, though 73% did not know what measles are. Fifty-two percent did not know how to treat, prevent or manage the disease.

DISCUSSION

This is the first community-based project in an emerging pig producing area in South Africa to provide data on the prevalence of porcine cysticercosis. The results from the questionnaires are providing information about the practices of owners concerning their pigs and their knowledge of the parasite. The final goal in this work is to highlight promising interventions and appropriate recommendations for prevention and management of this parasite.

The Eastern Cape Province is challenged in terms

of infrastructure, unemployment, and the economy. When compared with national statistics, unemployment is higher (55% vs 42%), homes with piped water lower (62% vs 84%), and more homes with no toilets at all (14% vs 31%). Such statistics are required to consider the perspective in which the disease currently occurs and how this environment will impact on the success of recommendations and interventions (Statistics South Africa, 2001).

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