

Taeniid cysticercosis in pigs with special reference to prevalence, distribution and economic implications in the Gauteng Province

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INTRODUCTION

Transmission to pigs occur upon:

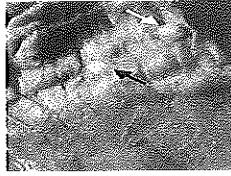
- Ingestion of food/water contaminated with *Taenia solium* infected human faeces.
- Contaminated material can either derive directly from human faeces or via sewage plants after flooding or;
- Sewage sediment distributed on pastures

Direct transmission of eggs from infected carriers have been reported, but appears to be a rare mode of transmission.



INTRODUCTION

- Cysticercosis in animals, more of economic importance.
- Economic loss due to condemnation and treatment of infected carcasses.
- Infected carcasses are treated by freezing meat at lower temperatures.
- Current standard diagnosis: meat inspection.

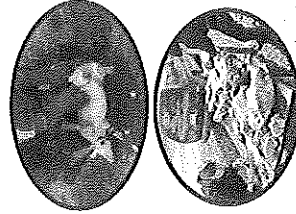


INTRODUCTION

- Useful in detecting cysticercosis in heavily infected carcasses, lightly infected ones may be easily missed. Misaken identifications due to:
 - Dead/degenerated cysts/Macroscopic similarities in lesions by taeniid larvae and other tissue larvae
 - Consequently, the use of meat inspection records
 - Underestimate/overestimate the disease prevalence.

INTRODUCTION

- Meat inspection does not avert financial loss.
- Condemnation and treatment of infected carcasses
- Not all pigs slaughtered for human consumption are taken to abattoirs and inspected.



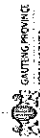
INTRODUCTION

- Improvement in public health, sanitation, animal management practices.
- Effective control programme requires the use of more sensitive and specific diagnostic tools.
- Developed serological tests:
 - Antibody detecting (Ferreira et al., 1997; Garcia and Sotelo, 1991; Ito et al., 1998; Miller et al., 1984; Rocha et al., 2002; Tsang et al., 1989; Gottstein et al., 1986; Farkhouse and Harrison et al., 1987)

INTRODUCTION

Antigen detecting methods

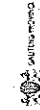
- (Geerts et al., 1981; Correa et al., 1989; Harrison et al., 1989; Brandt et al., 1992; Choromansky et al., 1990; Wang et al., 1992; Erhart et al., 2002; Dorny et al., 2000).
- Less sensitive in animals with fewer cysts, 3X more sensitive. Successfully used in epidemiological studies.
 - Low levels of cross reactions observed form a wide range of helminth and protozoan infections



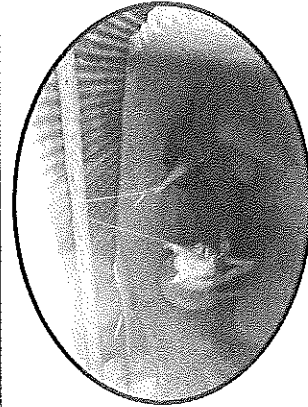
OBJECTIVES

To determine the epidemiology of *Taenia cysticercosis* in pigs in Gauteng Province through visual inspection, serological and molecular approaches.

- To determine prevalence and distribution of cysticercosis in live pigs belonging to emerging farmers in the Gauteng Province.
- To determine risk factors associated with *Taenia* infections in Gauteng Province.
- To determine prevalence of cysticercosis in pigs brought to Gauteng abattoirs
- To determine economic implications of *Taenia* cysticercosis in Gauteng Province.

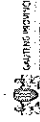


METHODOLOGY



METHODOLOGIES

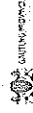
1. On-farm survey
 - Mab (HP10)AgELISA (Harrison et al., 1989)
 - Questionnaire survey
 2. Abattoir survey
 - Serological assay
 - Molecular methods
- Multiplex HDP2-PCR (Gonzalez et al., 2002)
- Meat inspection
 - Data sheet



METHODOLOGY

Questionnaire survey

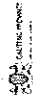
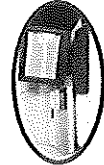
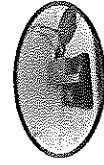
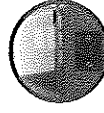
- Risk factors for cysticercosis
- Livestock management practices, Livestock access to human excreta & source of water for animals
- Risk factors for human cysticercosis
- Access to treated water, Soil eating habits, Handling of vegetables, Origin of manure used in farmers' gardens
- Risk factors for taeniosis
- Meat inspection, Meat preparation



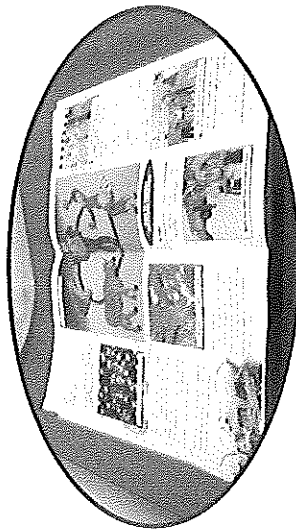
METHODOLOGY

Serological method

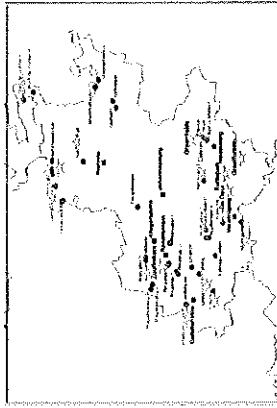
- Mab (HP10)AgELISA (Harrison et al., 1989)
- Detecting parasite products associated with current infection
- Serum from *T. igalagala* infected sheep was also used during validation process.
- Specific for *Taenia* *spargana* and *T. solium*



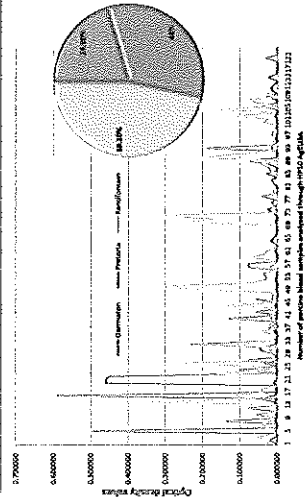
METHODOLOGY



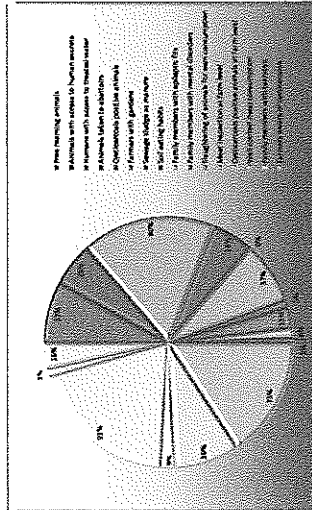
RESULTS



RESULTS



RESULTS



DISCUSSION

Presence and wide distribution of cysticercosis in the province:

- Animal management practices in the province, animals are not completely confined, but are let to roam freely.
- Less sensitive meat inspection used at abattoirs, which may allow for infected meat to be passed on for human consumption & parasite circulation in population.



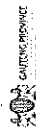
DISCUSSION

Comparison of Prevalence of porcine cysticercosis between the current study and other similar studies:

- The current study had lower prevalence (48.7%) than ECP by Krecek et al, (2008): 54.8%
- Higher prevalence than Zambia (23.3%), Tanzania (3-48%), North West Cameroon (7.6%), West Cameroon (11%)

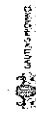
DISCUSSION

- 37% of the farmers let their animals roam freely during the day, which means that animals may have access to human excreta and get infected, should they be contaminated with *Tylenz* eggs.
- Already 26% of the interviewed farmers agreed that their animals might have access to human excreta.
- Although contaminated water, soil and vegetation are regarded as risk factors for human cysticercosis.
- They seem to be less of risk factors as it was found that 80% of farmers in the studied area have access to treated water.



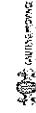
DISCUSSION

- Only 6% and 13% respectively uses sewage sludge as manure for their gardens and have soil eating habits.
- Only about 6 and 3% of family members of the farmers have epilepsy and mental disorder respectively.
- 73% do slaughter their animals for consumption, only 39% do meat inspection which is a huge tylenzosis risk should the animals be cysticercosis positive.
- 91% eat their meat well cooked which lessen the risk of infection.
- Only 5% have family members diagnosed with tylenzosis.
- 100% of the farmers had toilets in their homes.



RECOMMENDATIONS

- Major risk factors in the current study: consumption of uninspected meat, limited use of toilets and free roaming pigs.
- Development and use of more sensitive and specific diagnostic tools and amendment or improvement on the meat inspection procedure.
- Only 16% of the Gauteng farmers are aware of cysticercosis and this calls for more workshops as literature has shown that even though cysticercosis has been declared an eradicable disease, *Tylenz* infection and diseases remain uncontrollable because of lack of information and awareness about the extent of the problem.



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