

Taenia solium cysticercosis: Risk factors, perceptions and practices in smallholder pig production systems in Uganda

Joseph. M. Kungu , Michel M. Dione, Francis Ejobi, Michael Ocaido,
Delia Grace

AITVM/STVM Conference, Berlin, 4-8 September 2016



Background

- Pigs are “living banks”
- More than 1.1 million households
- Backyard production, mainly managed by women and children
- Tethering & scavenging are common
- Limited access to technical services and information
- Poor slaughtering and waste management practices



Objective of the study

Given the high potential for occurrence of *T. solium* cysticercosis in Ugandan pig production systems:

- ***Objective:*** to determine the risk factors for occurrence of *T. solium* cysticercosis as well as perceptions and practices of farmers regarding the disease

T. solium cysticercosis cycle

LET'S BREAK THE PORK TAPEWORM CYCLE

with these 6 easy steps

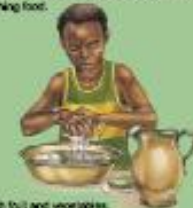
1. Always use a toilet.

Use a toilet to stop worm eggs infecting pigs and other people.



2. Wash your hands.

Tapeworm eggs are too small to see and spread easily. So wash your hands well with soap and clean water after using the toilet and before touching food.



Wash fruit and vegetables. Drink drinking water.

3. Go to the clinic.

If you think you have tapeworm, go to the clinic and get treatment as soon as possible.

Becoming the doctor will kill the tapeworm and stop you from infecting pigs and other people.



Swallowing tapeworm eggs is dangerous. Tapeworm eggs grow into cysts in the brain, eyes and muscles causing epilepsy (fits), blindness, paralysis, severe headaches, insanity and even death.

Pigs get infected. Free-range pigs get infected by eating human feces containing tapeworm eggs.



Pigs infected with cysts. The eggs grow into cysts and can be found in infested meat.



People get tapeworms when they eat the cysts in undercooked meat.



This child has a tapeworm growing inside him.



Thousands of tapeworm eggs come out with the faeces. Tapeworm segments can be seen in the faeces. They release thousands of eggs into the environment.

THE PORK TAPEWORM CYCLE



The tapeworm: The pork tapeworm (Taenia solium) lives inside the small intestine. It is one foot long and can grow up to 2 metres long.

Tapeworm cysts in the back, spine or muscles cause epilepsy (fits), blindness, paralysis, severe headaches, insanity and even death.

6. Cook meat well.

It is better to be safe than sorry. Pork must be cooked thoroughly so that there is no pink meat and no blood running out. This will kill any tapeworm cysts and prevent infection.



5. Check meat is safe.

Check meat carefully to make sure there are no cysts. Meat with cysts should not be eaten or sold.

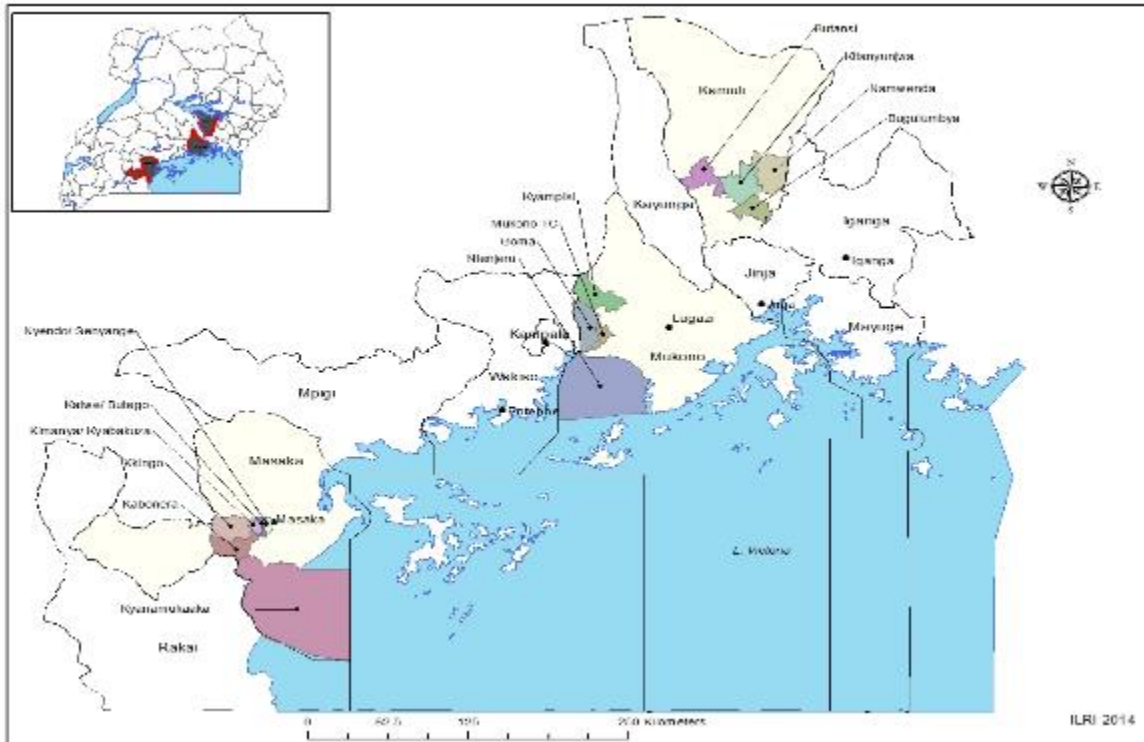


4. Stop pigs from roaming.

Keep your pigs in a fence or tied to a stake, so that they can't eat human faeces containing tapeworm eggs.



Study sites

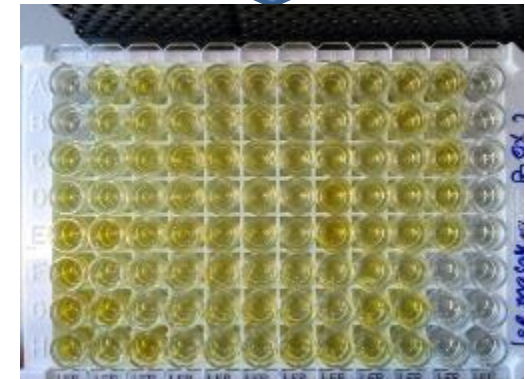


- Masaka, Mukono and Kamuli districts
- High pig density, high poverty levels
- Poor pig management systems



Methodology

- **Sample collection:** Blood and serum
- **Household survey:** semi-structured questionnaire
- **Laboratory analysis:** HP10 and B158C11A10/B60H8A4 antigen ELISA
- **Statistical analysis:** Logistic regression to measure associations of predisposing factors with the infection and *performance scores* to assess perceptions and practices of farmers regarding taeniosis, human cysticercosis and porcine cysticercosis.



Results: Serology

District	Production System (positive / total samples)		
	Rural	Urban	Overall
Kamuli	(55/408) 13.5%	---	(55/408) 13.5%
Masaka	(20/243) 8.2%	(24/132) 18.2%	(44/375) 11.7%
Mukono	(25/276) 9.1%	(20/126) 15.9%	(45/402) 11.2%
Overall	(100/927) 10.8%	(44/258) 17.1%	(144/1185) 12.2%

Antigen sero-prevalence results from parallel interpretation of the two ELISA tests (ApDia, HP10) (Kungu *et al.*, 2016)

Results: Risk factors

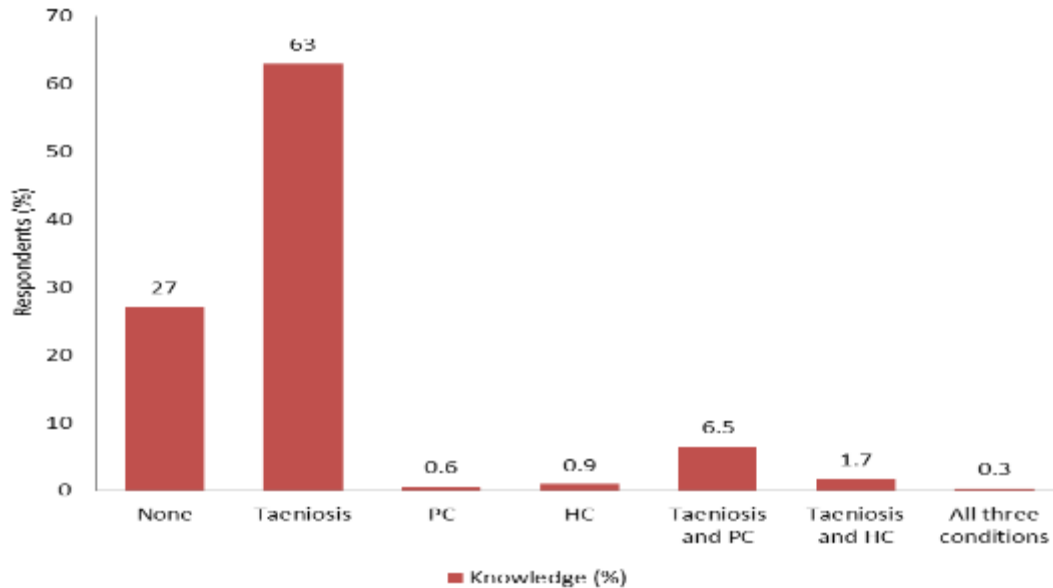
- **Improved breed**
- Poor farmer **knowledge** about *T. solium* cysticercosis transmission cycle
- Dirty sources of **water**
- Absence of **latrines**

Results: risk factors

- Up to 54.6% of the farmers interviewed had clean water near the latrines designated for washing hands
- Of these, 41.9% used water with soap to wash hands after latrine use



Results: knowledge about *T. solium*



- Farmers were mostly aware about taeniosis (63.0%; CI95:60.0-65.8);
- Only 3/1096 (0.3%; CI95=0.1-0.8) had knowledge on all three conditions (*taeniosis, human cysticercosis and porcine cysticercosis*).

Conclusions

- Predisposing factors to the maintenance of taeniosis- *T. solium* cysticercosis cycle exist
- Farmers lack knowledge and capacities to combat the disease in pigs and humans

Recommendations

- Improve pig management and husbandry practices
- Sensitize and educate farmers and other value chain actors on the control of *T. solium* cysticercosis
- “One health Approach” is needed to achieve efficient and sustainable control of *T. solium* cystricercosis

This work was financed by
*German Academic Exchange Services (DAAD) and International Fund for
Agricultural Development (IFAD)*

It was implemented in partnership with the *National Livestock Research
Resources Institute (NALIRI), Uganda; College of Veterinary Medicine Animal
Resources and Biosecurity (COVAB), Makerere University*

It contributed to the CGIAR Research Programs on
Livestock and Fish and Agriculture for Nutrition and Health

We thank all donors that globally support our work through their contributions
to the [CGIAR system](#)



better lives through livestock

ilri.org

Patron: Professor Peter C Doherty AC, FAA, FRS

Animal scientist, Nobel Prize Laureate for Physiology or Medicine—1996

Box 30709, Nairobi 00100 Kenya

Phone +254 20 422 3000

Fax +254 20 422 3001

Email ilri-kenya@cgiar.org

ilri.org

better lives through livestock

ILRI is a member of the CGIAR Consortium

Box 5689, Addis Ababa, Ethiopia

Phone +251 11 617 2000

Fax +251 11 667 6923

Email ilri-ethiopia@cgiar.org

ILRI has offices in East Africa • South Asia • Southeast and East Asia • Southern Africa • West Africa



This presentation is licensed for use under the Creative Commons Attribution 4.0 International Licence.