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PREVALENCE OF CYSTIRCERCUS CELLULOSE INFECTION AMONG PIGS SLAUGHTERED IN ARAPAI MARKET- SOROTI DISTRICT.

BY

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A DISSERTATION SUBMITED TO THE FACULTY OF AGRICULTURE AND ANIMAL SCIENCES IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF A BACHELORS DEGREE IN ANIMAL PRODUCTION AND MANAGEMENT OF BUSITEMA UNIVERSITY

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DECLARATION.

I AKELLO FRANCES solemnly declare that I personally carried out this research and wrote this report myself and it has never been submitted in any institution of higher learning for academic award.

Signature..... Date.....7th Aug. 2018.....

APPROVAL

This report has been submitted under the approval of my academic supervisor

Dr. Omadang Leonard

Busitema University.

Department of Animal Production and Management,

Faculty of Agriculture and Animal Sciences.

Signature:

date.....

DEDICATION

I greatly dedicate this report to my dear son Mugumya Brevic, Mr. Obed mugumya, dear Mum Janet Mary Otuco, Dad David Angobu, Brothers Sam Opolot, Amos Epulu, Tito Okello, Sisters Edith Immalingat, Ziporah Atukei, Nieces, Nephews relatives and friends

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I would like to express my heartfelt thanks to my parents for the great support they offered to me financially, morally, physically and spiritually and may the almighty God bless them so much and bless the works of their hands.

I also appreciate all my friends who helped me in any way during my stay at school may God bless unendingly.

I also extend my special thanks to Mr. Obed mugumya who worked tirelessly all through my time of studies and most especially in making this book a success may the almighty God reward you abundantly.

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LIST OF ABBREVIATIONS.

ESA	Eastern and Southern Africa
FAO:	Food and Agricultural Organization.
Fig	figure
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries
NAADS	national agricultural advisory services
NCC	Neurocysticercosis
NTD	Neglected Tropical Diseases
UBOS:	Uganda Bureau of Statistics
WHO	World Health Organization

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ABSTRACT.

This study was designed to establish the prevalence of *Cysticercus cellulosae* infection by postmortem examination of pigs slaughtered at Arapai market from May to June 2018. *Cysticercus cellulose* is a zoonotic infection maintained by a pig-human cycle. Examination involved visual, palpation and incision. Out of 111 pigs examined, 9 were positive for *Cysticercus cellulosae*, representing a prevalence of 8.1%. A 95% confidence level and P-value < 0.05 was considered significant in all analysis. Odds ratio was used to evaluate association between variables (sex, breed and affected organs). Less males (n=48) than females (n=63) were examined but more males (5) than females (4) were infected with a prevalence of 4.5 %(n=48) and3.6 %(n=63) respectively. According to breed, the local breeds had the highest prevalence of 6.3% (n=80) whereas the crosses had a prevalence of 1.8% (n=31). The tongue and thigh muscles both had a prevalence of 6% and 2.7% respectively. In conclusion the prevalence of 8.1% reveal that the human population in Arapai is at a risk of getting infected and proved an economic threat, therefore I recommend, proper human waste disposal by use of pit latrines, proper management systems, confinement of free-ranging pigs and massive treatment with albendazole and oxfendazole.

CHAPTER ONE.

1.0. Background.

Pig production is increasingly becoming an important economic activity in Uganda, with the pig population increasing in the last three decades from 0.19 million to 3.6 million (MAIF, 2009; UBOS, 2013).

In comparison to other animal rearing enterprises, pig production requires minimal inputs and relatively smaller space (eusebio 1980) which makes pig farming popular. It is thus not surprising that more than 1.1 million families (about 18% of the total households) in Uganda own pigs (UBOS, 2009). Rapid increase in pig production is as a result of increase in consumption of pork within the country, driven not only by population growth but also by a combination of rising income and changing preferences associated with urbanization. 44% of world meat protein consumption is derived from pork and pork products (faustin *et al.*, 2003).Uganda is having the highest per capita consumption of pork in sub-Saharan Africa, with an estimate of 3.4 kg/person/year (ballantyne 2012) yet programs promoting pig production are not emphasizing proper management and public health concerns (UBOS, 2009).

Cysticercus cellulosae infection caused by the metacestodes (cysticerci) of the cestode *Taenia solium* is endemic in Uganda (C. Waiswa *et al.* 2009). *Cysticercus cellulosae* is a zoonotic infection that is maintained by a pig-human cycle in the ecosystem. The infection is contracted by pigs when they either ingest human faeces containing infective eggs or when fed on feeds contaminated with *t. solium* eggs (carrique-mas *et al.* 2001). In areas where open defecation is done, the faeces containing the infective eggs are consumed directly by pigs and the lifecycle is perpetuated (ito *et al.* 2006). When people consume raw or inadequately cooked pork from infected animals, the larval cysts will develop into the adult stage tapeworm in their intestines where gravid proglottids containing infective eggs detach from the adult tapeworm and are excreted in the faeces (Garcia *et al.* 2003).

Humans can also act as an aberrant intermediate host for *t. solium* if there is fecal-oral contamination with the infective eggs, in such cases the larval stage can be found in human muscle, heart, eyes, skin or central nervous system causing human cysticercosis (flisser, Rodriguez- canul & Willingham 2006).

Adult *t. solium* infestation in humans is associated with subclinical conditions of malnutrition due to larval migration through the tissues (delgado-azanero *et al.* 2007). Human NCC may manifest with headaches, blindness, hydrocephalus, chronic meningitis and dementia (carabin *et al.* 2005).

NCC contributes to epilepsy in regions where pigs are free-ranging and hygiene is poor (blocher *et al.* 2011; rottbeck *et al.* 2013). *Cysticercus cellulosae* infection is an emerging and expanding zoonosis in Africa (zoli *et al.*, 2003). Some studies done reveal the following prevalence.

In Nigeria 8.7%, Ethiopia 1.4%, Zambia 6.3% (e. assana et al 2013). Kenya githigia *et al.*, (2006) reported 9%, 15% and 3% in three places, in Tanzania the prevalence was 17.4% (boa *et al.*, 1995) and in Uganda a

REFERENCES

Ballantyne, P., 2012, 'Smallholder pigs value chain project to increase rural incomes in Uganda'

Blocher, J., Schmurtzhard, E., Wilkins, P.P., Gupton, P.N., Schaffert, M., Aner, H. *et al.*, 2011, 'A cross-sectional study of people with epilepsy and neurocysticercosis in Tanzania:

Carabin, H., Budke, C.M., Cowan, L.D., Willingham III, A.L. & Torgerson, P.R., 2005, 'Methods for assessing the burden of parasitic zoonoses: Echinococcosis and cysticercosis'

Carrique-Mas, J., Iihoshi, N., Widdowson, M.A., Roca, Y., Morales, G., Quiroga, J. *et al.*, 2001, 'An epidemiological study of *Taenia solium* cysticercosis in a rural population in the Bolivian Chaco'

Chimonyo, M., Bhebhe, E., Dzama, K., Halimani, T.E. & Kanengoni, A., 2005, 'Improving smallholder pig production for food security and livelihood of the poor in Southern Africa'

Delgado-Azanero, W.A., Mosqueda-Taylor, A., Carlos-Bregni, R., Del Muro-Delgado, R., Diaz-Franco, M.A. & Contreras-Vidarre, E., 2007, 'Oral cysticercosis: A collaborative study of 16 cases'

Eshitera, E.E., Githigia, S.M., Kitala, P., Thomas, L.F., Fevre, E.M., Harrison, L.J. *et al.*, 2012, 'Prevalence of porcine cysticercosis and associated risk factors in Homa Bay District, Kenya'

Eusebio, J.A., 1980, *Pig Production in the Tropics*, Intermediate Tropical Agriculture Series, Longman Group, London.

Flisser, A., Rodríguez-Canul, R. & Willingham III, A.L., 2006, 'Control of the taeniosis/ cysticercosis complex: Future developments'

Garcia, H.H., Gonzalez, A.E., Evans, C.A.W. & Gilman, R.H., 2003, '*Taenia solium* cysticercosis'

Gonzalez, A.E., Cama, V., Gilman, R.H., Tsang, V.C, Pilcher, J.B., Chavera, A. *et al.*, 1990, 'Prevalence and comparison of serologic assays, necropsy and tongue examination for the diagnosis of porcine cysticercosis in Peru'

Ito, A., Takayanagui, O.M., Sako, Y., Sato, M.O., Odashima, N.S., Yamasaki, H. *et al.*, 2006, 'Neurocysticercosis: Clinical manifestation, neuroimaging, serology and molecular confirmation of histopathologic specimens'

Jayashi, C.M., Arroyo, G., Lightowlers, M.W., Garcia, H.H. & Rodriguez, S., 2012, 'Seroprevalence and risk factors for *Taenia solium* cysticercosis in rural pigs of Northern Peru'

Krecek, R.C., Michael, L.M., Schantz, P.M., Ntanjana, L., Smith, M.F., Dorny, P. *et al.*, 2008, 'Prevalence of *Taenia solium* cysticercosis in swine from a community based study in 21 villages of the Eastern Cape Province, South Africa'

Lescano, A.G., Garcia, H.H., Gilman, R.H., Guezala, M.C., Tsang, V.C.W., Gavidia, C.M. *et al.*, 2007, 'Swine cysticercosis hotspots surrounding *Taenia solium* tapeworm carriers'

Ministry of Agriculture, Animal Industry and Fisheries & Uganda Bureau of Statistics, 2009, *The National Livestock Census Report 2008.*

Moses Gweba(1), Olufemi O. Faleke(2), Abdulkadir U. Junaidu(2), Joseph P. Fabiyi(3) & Akinyemi O. Fajinmi.,2010, 'Some risk factors for *Taenia solium* cysticercosis in semi - intensively raised pigs in Zuru, Nigeria'

Mutua, F.K., Randolph, T.F., Arimi, S.M., Kitala, P.M., Githigia, S.M., Willingham, A.L. *et al.*, 2007, 'Palpable lingual cysts; a possible indicator of porcine cysticercosis in Teso District, Western Kenya'

Mwape, K.E., Phiri, I.K., Praet, N., Muma, J.B., Zulu, G., Van Den Bossche, P. *et al.*, 2012, '*Taenia solium* infections in a rural area of Eastern Zambia - A community based study'

Newell, E., Vyungimana, F., Geerts, S., Van Kerckhoven, I., Tsang, V.C. & Engels, D., 1997, 'Prevalence of cysticercosis in epileptics and members of their families in Burundi'

Nsadha, Z., Kawuma, P., Doble, L., Kivali, V., Eric, F., Ojok, L. *et al.*, 2014, 'Diagnostic efficiency of meat inspection service to detect *Taenia solium* cysticercostic pork at Wambizi pig abattoir, Kampala, Uganda: Implications for public health'

Phiri, I.K., Ngowi, H., Afonso, S., Matenga, E., Boa, M., Mukaratirwa, S. *et al.*, 2003, 'The emergence of *Taenia solium* cysticercosis in eastern and southern Africa as a serious agricultural problem and public health risk'

Pondja, A., Neves, L., Mlangwa, J., Afonso, S., Fatetine, J., Willingham III, A.L. *et al.*, 2010, 'Prevalence and risk factors of porcine cysticercosis in Angonia District, Mozambique'

Pouedet, M.S., Zoli, A.P., Nguekam, A., Vondou, L., Assana, E., Speybroeck, N. *et al.*, 2002, 'Epidemiological survey of swine cysticercosis in two rural communities of West Cameroon'