

# Survey of *Taenia saginata* in cattle slaughtered in Chokocho abattoir in Etche Local Government Area, Rivers State, Nigeria

BY

**ELELE KINGSLEY, ANWURI NDUBUISI, NWANKWO PRECIOUS CHINAZA**

**IGNATIUS AJURU UNIVERSITY OF EDUCATION, RUMUOLUMENI PORT  
HARCOURT, NIGERIA**

**CORRESPONDING AUTHORS E-MAIL: [KINGSLEY.ELELE@GMAIL.COM](mailto:KINGSLEY.ELELE@GMAIL.COM)**

**CORRESPONDING AUTHORS PHONE NUMBER: 08029359564**

## ABSTRACT

The parasitological investigation of *Taenia Saginata* in Cattle slaughtered in Chokocho abattoir in Etche Local Government Area, Rivers State Nigeria was carried out over a period of eight weeks from January to March 2020. A total of 150 Cattle comprising of 82 females and 68 males and comprising of three breeds; namely, White Fulani, Sokoto Gudali and Red Bororo were sampled, out of which 29 (19.33%) cattle were found infected with *Taenia saginata*. The infection rates in the various breeds encountered in this study were; White Fulani 24.21% (23/95), Sokoto Gudali 11.43% (4/35), and Red Bororo 10.00% (2/20). With p-value = 0.137 the difference was not statistically significant. The females had a prevalence of 25.60% (21/82) while the males had 11.76% (8/68) prevalence. Statistically, sex related prevalence were significant (p-value = 0.033). This study has provided an insight into the infection rate of *Taenia saginata* in cattle slaughtered in Chokocho abattoir, Etche Local Government Area, Rivers

State, Nigeria and further reveals that *Taenia saginata* exists in Cattle and still remains a public health concern in the study area. It is therefore recommended among other things; herders should always consult veterinary officers for treatment of infected livestock and parasite prevention programmes; also meat inspection should be done thoroughly before releasing them to the markets for sale in order to forestall the transmission of these parasites from the muscle fibers of the Cattle to humans.

Keywords: Cattle, Chokocho, *Taenia saginata*, infection.

## INTRODUCTION

The zoonotic and public health importance of *Taenia saginata* cannot be overemphasized especially in developing countries. Although humans harbouring the adult worms show no symptoms (Krauss *et al.*, 2003; Garcia *et al.*, 2007).

*Taenia saginata*, also called beef tapeworm is an obligate endoparasitic worm with a worldwide distribution (Dorny & Praet, 2007). It is however, prevalent in developing countries especially in the sub-Saharan Africa (Kebede, 2008) due to prevailing low sanitary standards and poor animal management practices (Ibrahim & Zerihun, 2012). Bovine cysticercosis is caused by the larval stage of the beef tapeworm *Taenia saginata*. Humans are the final hosts of the parasite (Nigatu, 2008).

Humans acquire the taeniasis infection after consuming undercooked beef containing viable cysticerci. *Taenia saginata* is considered to have a global distribution, with higher prevalence in low-income regions where sanitary situations are poor, and the meat inspectorate services are often poorly funded and understaffed or non-existence (Carlos *et al.*, 2013). The zoonotic and public health impact of *T. saginata* cannot be over emphasized especially in developing

countries. Although humans harbouring the adult worms may show no symptoms (Krauss *et al.*, 2003; Asaolu & Ofoezie, 2003). The larvae of *Cysticercus bovis* may invade the tissues of the brain and spinal cord causing neurocysticercosis and or the eye causing ocular lesion (Gonzalez *et al.*, 2000; Pawlowski & Murell, 2000).

It is reported that about 10,000 to 20,000 trucks of cattle are transported to various abattoirs in Nigeria on daily basis where they are slaughtered for human consumption (Gboeloh, 2015). Meat is one of the most important livestock products, although there could be losses due to various diseases including helminth infections (Bolajoko *et al.*, 2011).

Due to rearing habits in Nigeria, allowing the cattle to roam from place to place under herd to feed on natural pastures that are not guaranteed free from contamination from gastro-intestinal parasites, it becomes imperative to investigate to what extent the cattle slaughtered on daily basis are free from these worms and how possible to educate the general public on the health implications of meat borne parasitic diseases as posited by Ikpeze *et al.*, (2008).

The data generated from this study will provide enlightenment to the people of Etche Local Government Area and neighboring areas that depend on this abattoir for their beef supplies on daily basis with regards to the public health implication of *Taenia saginata* and will also contribute to the provision of information for subsequent researchers and improvements in this area of study.

## **MATERIALS AND METHODS**

### **Study Area:**

This study was conducted in Chokocho. Chokocho is the commercial nerve of Etche Local Government Area of Rivers State, Nigeria. It is situated near the Otamiri River. It lies in Latitude

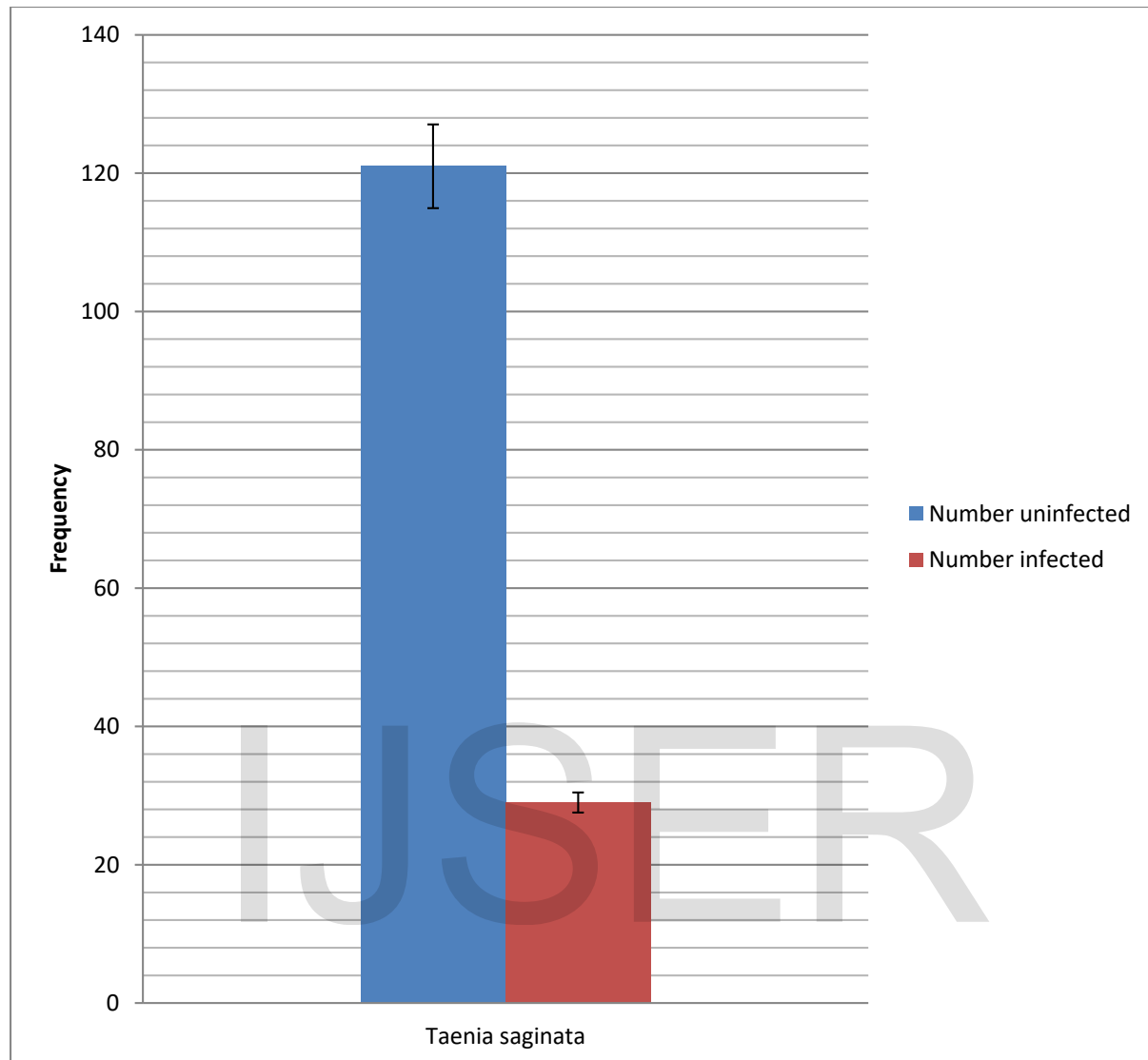
of 4° 59' 27.00" N and Longitude of 7° 03' 16.00" E. Major activities in this commercial center includes sand mining and distribution. This has attracted other small scale businesses over time.

### **Sample collection**

This study was conducted from January to March, 2020. Visitation to the abattoir was done in the early morning hours (05:30am – 07:00am) when the cattle were slaughtered. A total of 150 Cattle from the Chokocho abattoir were randomly sampled and examined for the presence of tapeworm (*Taenia saginata*) in their gastrointestinal tracts. With the assistance of the butchers, the gastrointestinal content was inspected by manual and visual examination. The adult worms encountered were collected and put in well labelled specimen bottles, preserved in 10% formalin and transported to the Biology laboratory, Ignatius Ajuru University of Education Rumuorlumeni Port Harcourt for further parasitological examination.

### **RESULT AND DISCUSSION**

The result gotten from this investigation reveals that out of the 150 cattle sampled from the Chokocho-Etche abattoir, a total of 29 (19.33%) cattle were positive for the cestode - *Taenia saginata* (Fig. 1).



**Fig.1: Overall Prevalence of Gastrointestinal Parasite in the study area**

The 150 cattle composed of 3 breeds which are: White Fulani, Sokoto Gudali and Red Bororo. 95 White Fulani were encountered in this study out of which 23 (24.21%) were positive for the helminth parasite. 35 Sokoto Gudali were sampled out of which 4 (11.43%) tested positive for the gastrointestinal helminth seen, while out of the 20 Red Bororo sampled, 2 (10.00%) tested positive for the cestode parasite seen. The prevalence of gastrointestinal helminth in relation to breed was however statistically non-significant ( $p=0.137$ ) (Table 1).

**Table 1. Prevalence of *Taenia saginata* in relation to cattle breed (n=150)**

Breed of Cattle	Total no. examined	Presence of Parasite	
		Positive (%)	Negative (%)
White Fulani	95	23 (24.21)	72 (75.79)
Sokoto Gudali	35	4 (11.43)	31 (88.57)
Red Bororo	20	2 (10.00)	18 (90.00)
<b>Total</b>	<b>150</b>	<b>29 (19.33)</b>	<b>121 (80.67)</b>

**Legend**

$\chi^2 = 3.97; p = 0.137$

The 150 Cattle sampled in this study is further composed of 68 males and 82 females. Out of the 68 males sampled, 8 (11.76%) tested positive for the gastrointestinal helminth seen, while out of the 82 females sampled, 21 (25.60%) tested positive for the gastrointestinal parasite seen. The difference in relation to sex was however statistically significant ( $p < 0.05$ ) (Table 2).

**Table 2: Prevalence of *Taenia saginata* in relation to sex of the cattle (n=150)**

Sex	Presence of Parasite		Total no. examined
	Positive (%)	Negative (%)	
	Male	8 (11.76)	60 (88.24)
Female	21(25.60)	61 (74.40)	82
<b>Total</b>	<b>29(19.33)</b>	<b>121 (80.67)</b>	<b>150</b>

**Legend**

Chi-Square ( $\chi^2$ ) = 4.57; Probability = 0.033

The parasitological survey of *Taenia saginata* in Chokocho abattoir Etche Local Government Area, Rivers State Nigeria, revealed that out of the 150 cattle sampled a total of 29 (19.33%) tested positive for the helminth – *Taenia saginata*. This result obtained from this investigation is lower than 74.3% recorded by Umar *et al.*, (2018) in their study carried out in Bauchi State Nigeria and the 26.25% reported by Abunna *et al.*, (2008) in Awassa municipal abattoir, Ethiopia. It is however higher than that of Ibrahim (2012) who reported a prevalence of 3.6% in Addis Ababa Municipal Abattoir Ethiopia and Gboeloh (2015) who recorded a prevalence of 6.8% in his study carried out in Port Harcourt metropolis Nigeria. Furthermore, this result is also higher than the 4.8% prevalence reported by Karshima *et al.*, (2013) in Ibi slaughter house, Ibi Local Government Area, Taraba State and the 2.09% recorded by Usip *et al.*, (2011) in Uyo, Nigeria.

The difference in prevalence rates could be due to the number of cattle sampled by the researchers, the level of sanitation observed by the populace, the different animal husbandry practices adopted in the various study areas and the exposure of cattle to eggs of *Taenia saginata*.

For the sex related prevalence the females were more parasitized than the males in this study. Out of the 68 males sampled, 8 (11.76%) tested positive while out of the 82 females sampled 21 (25.60%) tested positive for helminth parasites. This result agrees with Gboeloh (2015) who reported that the female Cattle were found to be more infected than the male cattle and asserted that it may be due to hormonal fluctuation in female especially during pregnancy which predisposes females to infection (Karshima *et al.*, 2013). Another reason again could be that female Cattle are left for a relatively long period to enhance production, and are presented for

slaughter at an older age than males (Gajadhar *et al.*, 2006) this practice increases their chances of contracting the infection (Basem *et al.*, 2009).

## **Conclusion**

This present study has shown the presence of *Taenia saginata* in slaughtered Cattle in Etche abattoir, Etche Local Government Area, Rivers State, Nigeria and also proves that Taeniasis remains a public health concern in Nigeria especially in the study area. Some adult worms were also recovered from the samples in the abattoir. Taeniasis is therefore of serious economic importance to livestock industries especially in Etche area where the awareness is not yet very high.

## **Recommendations**

It is therefore recommended that public enlightenment about the disease be carried out both to educate the market operators and the herders. Animals should be inspected thoroughly by appropriate authorities before release for public consumption. Efforts should be made by the government and other stakeholders to come up with programmes that will enhance the prevention and possible eradication of this parasite.

## **Acknowledgements**

We sincerely want to thank the entire abattoir association for granting us access to the slaughter house. The same goes to the entire laboratory staff of the Department of Biology, Ignatius Ajuru University of Education Port Harcourt for their various roles in course of this research work. We say, God bless you all.



## REFERENCES

- Abunna, F., Talahum, G., Megersa, B., Regassa, A & Kumsa, B (2008). Bovine cysticercosis of slaughtered cattle at Awassa municipal abattoir, Ethiopia. *Zoonosis and Public Health*, 41:291-4
- Asaolu, S. O., & Ofoezie, L. E. (2003). The role of health education and sanitation in the control of helminth infections. *Acta Tropica*, 86, 283-294.
- Basem, R. N. A., Amal, S. M. S., Asmaa, A. A. H. & Mahsen, L. A. (2009). Occurrence of cysticercosis in Cattle and Buffaloes and *Taenia saginata* in man in Assiut Governace in Egypt, *Vererinary World*, 2(5):173 – 176.
- Bolajoko, M. B., Moses, G. D., Gambari-Bolajoko, K. O., Ifende, V. I., Emenna, P. and Bala, A (2011). Participatory rural appraisal of livestock diseases among the Fulani community of the Barkin Ladi Local Government Area, Plateau State, Nigeria. *Journal of Veterinary Medicine and Animal Health*, 3(1), 11-13.
- Carlos, E., Armando, N. & Williams A. (2013). *Taenia solium* cysticercosis/taeniosis: potential link with FAO activities: *FAO support possibilities, animal production and health division, animal health service* FAO, Rome, Italy.
- Chen, Y., Xu, L., & Zhou, X. (2004): Distribution and burden of cysticercosis in China. *Southeast Asian. Trop. Med. Public Health*, 35 (Suppl.), 231-239.
- Dorny, P. & Praet, N. (2007). *Taenia saginata* in Europe. *Veterinary parasitology*. 149/1 2:22-24.
- Gajadhar, A. A., Scandrett, W. B & Forbes, L. B. (2006). Overview of food and water-borne zoonotic parasites at the farm level. *Revue Scientifique Et Technique (International Office of Epizootics)*. 25(2), 595-606
- Garcia, L. S., Jimenez, J. A., & Escalante, H. (2007). *Manual of Clinical microbiology* (9<sup>th</sup> ed., pp. 2166). Washington, D.C.: ASM Press.
- Gboeloh, L. B. (2015): Occurrence of adult *Taenia saginata* in cattle slaughtered in major abattoirs in Port Harcourt metropolis in Nigeria. *International Journal of Animal and Veterinary sciences*.Vo. 9, No. 12.
- Gonzalez, L. M., Montero E., Harrison L. J., Parkhouse R. M. & Garate T. (2000): Differential diagnosis of *Taenia saginata* and *Taenia solium* infection by PCR. *J Clin Microbiol*, 38(2):737–744.
- Hoberg, E. (2002). *Taenia* tapeworms; their biology, evolution and socioeconomic significance. *Microbes and infection*, 4;859-866.
- Ibrahim, N., & Zerihum, F. (2012). Prevalence of *Taenia saginata* cysticercosis in cattle slaughtered in Addis Ababa Municipal abattoir, Ethiopia. *Global veterinaria* 8(5): 467-471.

- Ikpeze, O. O., Eneanya, C. I., & Ekechukwu, W., (2008): Significance of meat inspection in the estimation of economic loss due to bovine cysticercosis. *Animal Research international*. 5(3); 896-899.
- Karshima, N. S., Pam, V. V., Bobbo, A. A. & Obalisa, A (2013). Occurrence of cysticercus bovis in cattle slaughtered at Ibi slaughter house, Ibi Local Government Area of Taraba State. Nigeria. *Journal of Veterinary Advances*. 3(3): 130-134
- Kebede, N. (2008). Cysticercosis in slaughtered cattle in northwestern Ethiopia. *Research in veterinary science*, 85(3) 522-526 doi;DOI: 10. 1016/j.rvsc 2008. 01. 009.
- Krauss, H., Weber, A., Appel, N., Enders, B., Isenberg, D., Schiefer, H., Slenczka, W., Von Graevenitz, A. & Zehner, H. (2003): Parasitic Zoonoses; Zoonoses: infectious disease transmissible from Animal to Human (3<sup>rd</sup> ed. Pp 261-403). Washington DC; ASM press.
- Nigatu, K. (2008). Cysticercosis of slaughtered cattle in North-western Ethiopia. *Research in Veterinary Science*. 85(3): 522-526
- Otte, M., Chilonda., P., (2002): Cattle and small ruminant production systems in sub-Saharan Africa - a systematic review. Rome: *Food and Agriculture Organization of the United Nations*.
- Pawlowski, Z., & Murell, K. D. (2000). Taeniasis and Cysticercosis. In Y. Hui, K. D. Murrell, W. K. Nip, P. Stanfield and S. A. Saller, eds. *Food-borne Diseases Handbook*. pp. 217-227 New York. Marcel Dekker Inc.
- Umar, Y. A., Babayo, S. A. & Mao, P. S. (2018) Gastrointestinal helminthes f cattle in Bauchi central abattoir, Bauchi state Nigeria. *GSC Biological and Pharmaceutical Sciences*. Pp 59-65.