DISTRIBUTION OF INTESTINAL PARASITES IN FECAL EFFLUENTS FROM CATTLE SLAUGHTERED AT THE ABAKALIKI ABATTOIR

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Abstract: A study to determine the distribution of intestinal parasites in fecal effluents from cattle was carried out at the Gariki abattoir in Abakaliki; Ebonyi State. Samples were collected from cow slurries. A total of 200 samples were examined for intestinal parasites. The conventional wet preparation procedure by the World health organization and the Formol ether concentration technique were used to analyse the slurry samples. Both helminth and protozoan parasites were discovered in this study. Parasites species recovered include *Ascaris lumbicoides, Giardia lamblia,* Hookworms *and Taenia spp.* Among all the organisms discovered, *Fasciola spp* had the highest prevalence (26.7%) and the lowest observed were *Entamoeba coli* and *Hymenolepis diminuta* with the prevalence of 0.9% each. Incidence of gastrointestinal parasites in cattle is an economic threat to the farmer as well as direct consumers who rely on beef as their source of protein. This study established an incidence of helminth and protozoan infections of both zoonotic and socioeconomic importance in some of the slurries examined. Considering the impact of the infections on animal production and public health, it is suggested that effective prophylactic measures be adopted as a first step to curtail helminth infections of cattle in Nigeria especially as regards maintaining abattoirs with high sanitary standards.

Keyword:

INTRODUCTION

In many parts of the world, cattle production is a profitable enterprise because of the high demand for dietary protein (Anaeto *et al.,* 2009). Cattle is widely distributed and reared in most part of the country. Cattle are virtually slaughtered at virtually all abattoirs in Nigeria where they are sold to the public as beef (Edosomwan and Shoyemi, 2012). Infection with parasites especially gastrointestinal parasites can in some circumstances cause substantial losses to cattle owners. Hence abattoirs are instruments for the insurance of wholesome meat and meat products as well as providing abattoir by products for livestock based industries. More importantly, abattoirs are used for the purpose of surveillance against animal and zoonotic diseases (Yahaya and Tyav, 2014).

A survey of abattoirs is an excellent means of knowing the prevalent ruminant diseases so as to control them (Hadiza and Halima, 2014). Intestinal parasites are common problem among human and animals; the infection rate are variable depending upon different intrinsic and extrinsic epidemiological and

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biological factors. The common problem may be in form of mortality, decreased productivity, reduced weight gain and other means resulting globally from parasitic diseases (Cheesbrough, 2004). Food-borne infections can be contaminated from poor hygiene in food handlers and washing of foods with contaminated water or by ingestion of undercooked food, fruits, meat etc (Wolfe, 1992). The cysts of parasites have a productive carbohydrate wall that makes them resistant to environmental destination and are only destroyed by desiccation, heat, UV (ultraviolent) radiation and high concentration of biocides (Wolfe, 1992 and Marshal *et al.*, 1997). Abattoir slurries run-off are incorporated into the soil when discarded. These wastes can enter water systems by direct contamination or through surface run-off. Abattoir slurries (Animal wastes) contaminate water sources through poorly processed sewage effluents, malfunctioning septic tanks and seepage from sanitary landfills. Failure to appropriately process abattoir effluents probably poses a threat to human health, although it is often difficult to identify sources of food and water contamination. The objectives of this study include assessing the presence and distribution of intestinal parasites in abattoir slurries from the slaughter house of cattle, establishing a general prevalence rate and distribution of various species of intestinal parasites.

MATERIALS AND METHODS

STUDY AREA: This study was carried out in Abakaliki, the capital of Ebonyi state, which is located in south eastern part of Nigeria with a population of 5.5 million and total land area of about 15,800 square miles (about 41,000 square kilometers). The inhabitants are mainly civil servants, traders and peasant farmers. Nigeria comprises various ethnic groups such as Yoruba, Igbo, Hausa, Ijaw, Tiv, Efiki and Fulani's. Analysis for this study was carried out in the microbiology laboratory of Ebonyi State university Abakaliki.

Sample Collection: A total number of 200 slurry samples were collected randomly from the Abakaliki cattle slaughter abattoir. Ten samples were collected daily from 10 different cows killed every morning. All samples were collected in a clean transparent wide mouth, screw-capped universal bottle for laboratory processing. All specimen collected were properly numbered and labeled appropriately to obtain qualitative estimation of parasitic contamination of these cows.

ANALYSIS OF FECAL EFFLUENTS

Standard techniques employed in analyzing the effluents include

1. WHO wet preparation procedure(1991).
2. The formol ether concentration technique (Cheesbrough 2009; Edosomwan and Shoyemi, 2012).

RESULTS

A total number of 200 abattoir effluent samples were collected and examined for intestinal parasites; out of which 132 of the samples were positive of intestinal parasites, giving a prevalence of 66.0%. *Fasciola* species had the highest prevalence (26.7%) and the lowest recorded were *Entamoeba coli* and *Haemonchus dimunuta*, having the prevalence of 0.9% each. The results of this research are presented in the following tables;

Table 1: SHOWING PERCENTAGE DISTRIBUTION OF POSITIVE AND NEGATIVE SAMPLES

No Tested	No positive	Percentage	No negative	Percentage
200	132	66	76	34

Table 2: SHOWING PREVALENCE RATE OF ALL RECOVERED PARASITES

Species	No observed	Prevalence rate(%)
Ascaris lumbricoides	10	9.5
Entamoeba coli	3	2.9
Entamoeba histolytica	1	0.9
Fasciola sp.	28	26.7
Giardia lamblia	8	7.6
Haemonchus diminuta	1	0.9
Diphyllobotrium latum	13	12.4
Paragonimus sp.	14	13.3
Opisthorchis sinensis	2	1.9
Schistosoma japonicum	3	2.9
Trichuris trichiura	10	9.5
O. ostertagi	3	2.9
Vampirolepis nana	3	2.9
Taenia sp.	6	5.7
	105	100

Table 3: SHOWING PREVALENCE RATE OF PROTOZOAN PARASITES

Species	No observed	Prevalence rate(%)
E. coli	3	25.0
E. histolytica	1	8.3
G. lamblia	8	66.7
	12	100

Table 4: SHOWING PREVALENCE RATE OF HELMINTH PARASITES

Helminths	No observed	Prevalence rate(%)
Ascaris lumbricoides	10	10.8
Fasciola spp	28	30.1
Haemonchus diminuta	1	1.1
D. latum`	13	14.0
Paragonimus Sp	14	15.1
O. sinensis	2	2.2
Schistosoma japonicum	3	3.2
T. trichiura	10	10.8
O. ostertagi	3	3.2
V. nana	3	3.2
Taenia spp	6	6.5
	93	100.2

DISCUSSION

In most cases, cattle management practices are inefficient with regards to general cattle products, disease prevention and control program with little or no access to technical support. This study shows that 132(66%) samples were positive for intestinal parasites out of the 200 effluent samples examined. Outdoor breeding of cattle is a significant factor that supports this prevalence. Cattle loosely graze on faecally-contaminated forage land and drinking sewage water. Hence, infection by active penetration of the organism rises. The high prevalence of parasites in cattle could be due to their free-range grazing management which increase their chances of picking up the cyst, ova, larvae or the intermediate host of these gastrointestinal helminth parasites that were attached to the pastures (Regassa *et al.*, 2006). Hence, infection by active penetration of the organism rises. Fasciola species had the highest prevalence from this study (26.7%). This agrees with the emphasis made by Pathak and Pal (2008). This agrees with the emphasis made by Pathak and Pal (2008). This is in contrast to a study by Raunelli and Gonzalez (2009) where sheep had a higher prevalence of 97% than cattle (78%) in Cajamarca, Peru. Though producers in that region recognized fasciolosis as the most common and serious disease affecting their cattle (84%) with a prevalence higher than 90% in previous studies. *Taenia spp.* recorded the prevalence of 5.7%. Olson and Guselle (2000) observed that *Taenia solium* is a common parasite of pigs and has been extensively reported in developing countries. From the study, improper defecation on loose forage lands in Abakaliki could be a contributing factor in the development of *Taeniasis*. Also, ingestion of improperly cooked or raw meat (Beef or Pork) eaten in form of the traditional barbecue (suya) could mostly be a contributing factor. *Giardia* species recorded 7.6%. This represents a fact that *Giardia* spp. is parasite of wild and domestic animals. The prevalence of parasites in this work is on the high side. The safety of foods obtained from animals for human consumption has become a public health concern. Intestinal parasites devitalize animals, robbing them of essential nutrients and injuring their vital organs. The resulting diseases are relative threat to the economy. Generally, poor disease control practices, lack of intensive farming, climate, and low level of enlightenment are all predominating factors. Improper treatment of effluents from the slaughter house could predispose the neighbouring environment and its inhabitants to the risk of infection by these parasites. Zoonotic transmission of these diseases poses serious threat to man. Abattoir effluents and runoff to a varying extent, are incorporated into the soil following indiscriminate slaughter of animal; intestinal parasites harboured by these animals are mixed up and carried in the effluents. Parasites cysts and larva in these effluents directly contaminate the vegetation, the stream and soil around the area. Ingestion of vegetables contaminated with parasite cysts, ova or larva could occur. Active penetration of the skin by some parasites' larva (hookworm) and the use of the stream for domestic purposes, all stand to pose a serious threat to the health of the people who work or reside around the abattoir. A study conducted in Morocco shows that close proximity to waste water constitutes an infection hazard *by Ascaris* (Moubarrad *et al.*, 2005). Animals that graze on vegetations around the abattoir still pose a serious threat to health as life cycle of some of the parasites *(Taenia spp)* are enhanced by the grazing action of these animals. Seepage from sanitary land fill should be well processed in functional septic tanks as this will help to check human contaminations around the abattoir. Provision of septic (holding) tanks will help

in treating effluents from the abattoir prior to disposal. Some parasite cysts have been shown to be degraded when effluents are held in septic tanks, hence reducing contamination. (Guselle and Olson, 1999). Animals should be well inspected; treated for parasitic diseases (deworm). It should be ensured that animals are in apparent health condition prior to slaughter. Sanitary measures should strictly be employed as this will help check environmental contamination. Abattoir staff including butchers should be well enlightened on safety measures to be taken so as to guarantee their state of health. The use of safety boots and other safety wears should be encouraged. The public should be enlightened in handling meat/meat products. For instance, meats should be properly washed and cooked. Well situated toilets should be provided for staff

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