GASTRO-INTESTINAL HELMINTHS OF PIGS SLAUGHTERED AT THE JOS ABATTOIR, NIGERIA

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Abstract

A careful case study was carried out on the gastro-intestinal helminths of pigs slaughtered in the Jos Abattoir. 250 pigs were examined and the following parasitic ova and oocysts were recovered from their faecal matter; *Ascaris suum* 73 (29. 2%), *Bonyclatio dubeta* 49(19.6%), *Trichuris trichura* 43(17.2%), *Hecator* sp. 39(15.6%), *Oesophagostomum dentatum* 38(15.2%), *Ascaraps Strongylina* 30(12.0%), *Eimeria* sp. 22(8.8%) respectively. The helminths and protozoan ova and oocysts were most abundant during the rainy season in contrast to the dry season period, this indicates the rainy season attribute to providing favourable conditions for the development of parasites. Female pigs were discovered to be most susceptible to helminthosis than to their male counterparts, with the increasing in prevalence of animal parasites and disease, there has been a corresponding interest of researchers in further finding of veterinary public health problems hence, the possible parasitological and economic implications of this distribution of helminthosis in pigs, a veritable source of protein for a significant segment of the population within the vicinity are discussed. However, there was a significant difference in the sex related and seasonal distribution of parasites ($P<0.05$) and no significant difference in the overall mixed infection ($p>0.05$)

Introduction

The piggery industry has progressed a great deal in the past years. It has changed from producing large-type pigs to a more meaty and heavier muscled animals. It has changed from an industry with little expertise to one in which some sophisticated housing with temperature control is being used, and in which breeding practices and management have undergone many changes. Profitable pig production, whether in tropical or temperate regions, and however efficient and technical sound, may not succeed unless the product is produced in the right place at the right time.

Henderson and Blood (1976) reported that helminthological disease very greatly between areas, depending on the relative importance of climatic factors , nutritional status of the animal, pasture management and immunity of worm infection. Gastrointestinal helminthes are generally recognised for their role in malnutrition since the host is robbed of available nutrients. Fabiyi, (1979) and Roberts Walker, (1980) reported that, helminthes and protozoan infections lead to a very high loss in the piggery industry.

With the increase in prevalence of animal parasites and disease, there has been a corresponding interest of researchers in all aspect of veterinary public health problems to serve the livestock and livestock meat industries which leads to an increase in the nutritional value of the livestock and a better grade of meat for man.

This practice is necessary to ensure that by the year 2015, disease and parasitic problems facing the piggery industry in Nigeria should have been brought under control.

The purpose of this introduction is to determine the effects of parasites in the piggery industry in Nigeria and also further draw attention to the forces that operate to determine what product is

required, where it is wanted, and how much it is worth. Understanding the context of pig production is therefore, necessary to give the producer an awareness of his situation, enabling him to anticipate the consequences of the changing circumstances and there, avoid financial failure and loss.

Materials and Method

This research work was carried out at the Jos – North L.G.A of Plateau State, Nigeria. Located in the northern guinea savannah vegetational belt (Keay, 1959), situated approximately on latitude 9.5 degree north and longitude 8.5 degree east with the annual rainfall, concentrated almost entirely to five months period lasting from May to September. Annual mean minimum temperature is 17.2°C while the annual mean maximum temperature is 27.2° C. The study site Abattoir is located at Dogonkarfe, well - equipped and well staffed.

Two hundred and fifty faecal matter were collected and examined for a period of six months (September-December, 1994; June and July, 1995). One hundred and nine (109) of faecal matter were collected in the dry season of 1994 while 141 were collected during the wet season of 1995 respectively.

Faecal material were collected into the specimen bottles containing normal saline solution and were examined immediately or kept in a refrigerator to be examined within the next 48 hours. The faecal samples; were pre- labeled on the specimen bottles differentiating the male pigs and female pigs.

The method involved the examination of gastrointestinal parts from guts to anus of slaughtered pigs, with a background knowledge of the parasites location. The faecal matters were also examined for adult parasites and samples were taken directly from the rectum of the animals into the specimen bottles containing normal saline solution (0.85% Nacl). The mixture of each sample solution was washed and filtered three times through fine grades of sieve of mesh sizes, of 90, 60 and 30 into sieve tubes which were pre-labelled differentiating the male from the female pigs. This arrangement prevents unnecessary loss of adult parasites and ova. Part of the sieve liquid was added an equal volume of sugar solution (1 Kg granulated sugar into 1.5 litres of well boiled water) which was carefully and thoroughly mixed and allowed to settle for about 24 hours to enable eggs float at the surface area.

A portion of the filter solution was poured into centrifuge tubes and was centrifuged for 5 minutes at 1,500rpm using an electric centrifuge machine. The supernatant was then poured off leaving behind the sediments. After which 1 or 2 drops of the deposits was placed on a glass slide and viewed under a light microscope for identification of ova of the helminthes, protozoan oocysts and adult parasites respectively otherwise, the sample solutions are kept in a refrigerator to be examined within 48 hours.

The adult worms were preserved in 10% formalin to await identification and counting. Though, worms for identification were mounted in lactophenol for microscopic examination. Lactophenol is used to clear the worms while the hot mixture helped in extending them for easy identification.

Identification of adult parasites and ova/oocyst was done using the method of Faust (1964) and Muller (1975). In cases where eggs were not seen from the float, sediments at the bottom were examined.

Also the method of Margaret and Kemp (1964) were used for identification. The number of the helminths and other protozoan were also estimated in the following manner. All faecal matter and samples were thoroughly subjected to critical laboratory analysis.

Results

The overall incidence of parasites in the animals under study shows in Table I. Among the parasites encountered in pigs were *Ascaris suum* 73 (29.2%) the most prevalent. This was followed by *Bougelatia diducta* 49 (19.6%) while others include *Trichuris trichura* 43 (17.2%), *Neccator* sp. 39 (25.6%); *Oesophagostomum dentatum* 38 (15.6%); *Ascarops strongylina* 30 (12.0%) *Phacesophalus sexalatus* 24 {9.6%}, *Strongyloides* sp. 23 (9.2%) and *Eimeria* sp. 22 (8.8%), the least.

Table 2 shows the overall monthly rates of infection which include September, October and November, 1994 with 37.2% while others include December, 1994; June and July, 1995 with 62.8%.

Table 1: Showing Overall Prevalence of Parasitic Ova/Oocysts in Faeces of Pigs Examine.

Names Of Parasites	Ascaris Suum.	Bougelatia diducta.	Necator sp	Phasocephalus Sexalctus	Trichuris trichra	Strongyloides sp	Ascarops strongy line	Oesophago stomum dentatum	Eimeria sp
Total No Examined	250	250	250	250	250	250	250	250	250
No Infected	73	49	39	24	43	23	30	38	22
%	29.2%	19.6%	15.6%	19.6%	17.2%	9.2	12.0%	15.2%	8.8%

Table 2: Showing The Overall Monthly Rate of Infection in Pigs.

Months of the year	September 1994	October 1994	November 1994	December 1994	June 1995	July 1995
Season	Wet Season	Dry Seasqu	Dry Season	Dry Season	Wet Season	Wet Season
Total No. Infected.	42	22	39	77	58	12
%	16.8%	4.8%	15.6%	23.2%	30.8%	8.8%

One hundred and eighteen (118) males were examined and parasitic ova and oocysts were recovered with 110.9%. *Ascaris suum* and *B.diducta* were recorded the highest prevalence of all the parasitic ova discovered, on the other hand 132 (163.7%) females were examined with the total number of female infection rates which varies greatly in contrast to their male counterparts. *Ascaris suum* was reported highest in the infection rate of female faecal matter examined and this is indicated in Table 3.

The helminthes and protozoan ova and oocysts were most abundant during the raing season in contrast to the dry season period (Table 4). This indicate that, this period of rainy season attribute to providing favourable conditions for the development of parasites. Such favourable conditions include temperature, moisture, habitat for some oocysts and ova.

The overall monthly rates of infection includes September, 1994 to July, 1995. The seasonal distribution showed a higher peak of prevalence during the wet season (82%) in contrast during the dry season with (58.8%) respectively. Mixed infection in relation to sex is indicated in Table 5.

Most of the pigs brought to Abattoir were from the large white local breed under traditional husbandry. Though, high incidence of parasitism was due to the fact that most of the animals are allowed to forage extensively for themselves eating all that comes their way.

It could also be seen that nematodes were the most prevalent. Female pigs were most susceptible to helminthosis, because of them being exposed to environment foraging on things that come their way, as many female pigs are kept reserved unslaughtered for the purpose of breeding than their male counterparts, this indicates that, female pigs harbour more of these parasites and disease.

Table 3: Sex Related Prevalence Infection of Pigs (Large White Local Breed).

Names Of Parasites	Ascaris Suum.		Bougelatia diducta.		Necator sp		Phasocephalus Sexalctus		Trichuris trichra		Strongyloides sp		Ascarops strongy line		Oesophago stomum dentatum		Eimeria sp	
Sex.	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
No. Infected.	20	41	25	25	13	22	16	18	15	32	5	22	10	23	14	23	12	20
%Infected	8.0	16.4	10.0	10.0	5.2	8.8	6.4	7.2	6.0	12.8	2.0	8.8	4.0	9.2	5.6	9.2	4.8	8.0

Table 4: Showing Seasonal Distribution of Parasitic Ova/Oocysts of Pigs Examined.

Names Of Parasites	Ascaris Suum.		Bougelatia diducta.		Necator sp		Phasocephalus Sexalctus		Trichuris trichra		Strongyloides sp		Ascarops strongy line		Oesophago stomum dentatum		Eimeria sp	
Season	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry
No. Infected	35	31	23	25	32	4	13	11	15	18	13	18	24	18	26	11	24	11
%	4.0	12.4	9.2	10.0	12.8	1.6	5.2	4.4	6.0	7.2	5.2	7.2	9.6	7.2	10.4	4.4	9.6	4.4
Total Infected	66		48		37		24		33		31		42		37		35	
%	26.4		19.2		14.8		9.6		13.2		12.4		16.8		14.8		14.0	

Table 5: Showing The Overall Mixed Infection In Pigs Faeces Examined

Total No Examined.	51	12	39	55	71	22
Sex.	M F	M F	M F	M F	M F	M F
No. Mixed Infection.	15 20	4 4	14 17	16 31	24 35	8 6
%Infected	6.0 8.0	1.6 1.6	5.6 6.8	6.4 12.4	8.4 14.0	3.2 2.4
Total No. Of Mixed Infection.	35	8	31	47	56	14
%.	14.0	3.2	12.4	12.4	22.4	5.6

Discussion

This research was extensively carried out at the Jos Abattoir, Plateau State, Nigeria *Ascaris suum* was discovered to predominates with the highest infection rate of 29.2%. This is because round worms reproduce by laying eggs which may be found on improperly cleaned vegetables or unsanitary places. The eggs are hatched inside the human lumen of the host's intestine. Roundworms migrate to the other parts of the body such as the liver and appendix. *Ascaris suum* of swine may inhabit the lumen of the small intestine in the young and cause colicky pains and diarrhoea. It was also discovered that, *B. diducta* followed with 19.6% and others followed simultaneously with the least among them *Eimeria* sp. 8.8%.

Ajayi, (1986) noted that the prevalence of coccidian infection has spread wide particularly in the Jos Plateau, where it was reported of *Eimeria sp.* In about 780 observed and examined pigs. From many parts of the world, reports have shown that the prevalence of intestinal parasitic infections in pigs range between 5%-78%(Janeczek, 1960).

Sex was also considered a determining factor in the prevalence of parasites in pigs. Both sexes were exposed to the infection risk since feeding and breeding pattern was not a confirmed one, thereby stand the danger of infection. From all indications, females were comparatively the most infected as a result of their exposure to environment foraging on things that come their way indiscriminately. This attributed to females being susceptible to infection than their male counterparts, possibly because of physiological differences (Vitterling, 1966).

There was seasonal variation with the wet season higher than the dry season, which means that there was greater risk in the parasitic infection during wet season.

Mixed infection indicates that nearly, if not all the animals faecal matter examined were seen and found with two or more parasitic ova and oocysts, this may be because of free range system of rearing pigs. Piglets however, harboured the least number of parasites.

Levine, (1960) noted that, some nematodes require specific amount of rainfall for the full development of parasitic stages, that it was found to require about 150mm of minimum monthly rainfall in the nor-thern Nigeria. But between October, November and December, 1994 marked the

period of dry season while September, 1994; June and July, 1995 marked the period of sampling and thus, could account for the low rate of infection found in the result during the dry season period.

Present study has been confirmed that some reports by the previous researchers on pigs examined were foragers and they were normally exposed to more infection than those which are kept under control. The foraging pigs could have eaten anything they come in contact with including human faeces.

Finally, characteristic lesions of this species were found in pigs carrying single and mixed infection of parasites which include the complete blockage of the intestinal tract by adult *Ascaris* sp. and enlargement of duodenum. Its occurrence would not have been surprising because indigenous farmers in and around Jos use human manure which contain ova of the adult parasites to fertilize the field on which pigs feed.

There was however, significant difference in sex related and seasonal distribution ($P<0.05$) and no significant difference in the overall mixed infection ($R>0.05$).

Conclusion

The prevalence of gastro-intestinal parasites has indicated heavy infection leading to emaciation, pale looking (anaemia), anorexia and malnutrition.

To highlight the great need to the pig husbanders towards adjusting to the management principles in order to achieve the principal goal of husbandry. Henderson and Blood (1976), noted that helminths and protozoan parasites can be controlled even without anti-helminthic and protozoanic drug (but if infected more should be treated with the prescribed drug) by taking some considerable preventive measure.

1. Pigs running outdoors should regularly be removed to a clean field to avoid the build-up of worm egg population. Fathering and rearing pens should be washed with a mild disinfectant, particularly around the udder before farrowing.
2. Control of tape worms is largely a matter of public health. The incidence in man is kept extremely low by meat inspection and the practice of thorough cooking therefore, the opportunity for cattle and pigs to become infected is small. Water logged and wet land should be fenced often to keep stock completely away. Deworming of breeding, up to 2 weeks before farrowing and weaners at about 8 weeks old, with a powder containing piperazine as a routine task.
3. "Dose and move" should be the practice of the day as to reduce the rate of spread of worms in a given localized area of herds or livestock.

However, the economic importance of pigs, their association with man and their possible role as carriers of zoonotic parasites necessitates further study of their parasitic fauna.

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