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Full length Research Paper

Prevalence of gastrointestinal nematode parasites in intensively managed pigs of different ages and sexes in Umuahia city of Abia State.

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Gastrointestinal parasites of pigs is a big constraint in the management of pigs, however paucity of information on their existence and prevalence have necessitated the research on the prevalence of gastro- intestinal parasites in intensively managed pigs in Umuahia city of Abia state. The survey lasted for 4 months from September 2010 to December 2010. Faecal samples from 15 intensive pig farms were randomly collected from a total of 300 pigs, both sex of different age brackets (Piglets 80, Winners 50, Dam 50, Sow 70 and Boar 50) and examined for the presence of helminths eggs and protozoan oocysts using saturated salt floatation technique. 300 samples examined were all positive, 290 were from apparently healthy pigs while 10 were from sick pigs. 50 out of 300 examined from one farm were recently dewormed while 250 from other farms had no recent history of deworming. The 300 positive samples were of mixed infections comprised of *Globocephalus spp* 205 *(68%)*; *Fasciolopsis spp150 (50%); Ascarops spp 200(67%); Shephamurus spp 150 (50%) Oesophagostomum spp 300 (100%)*; *Trichuris trichuria 50 (17%) and Necator spp 100(33%).* These infected pigs were mainly from farms without a strategic anti-parasite treatment regime. Piglets and Dams have high prevalence of *Globocephalus spp* (100, 100) %; *Oesophagostomum* (100, 100) %; *Necator spp* (46, 60) % and *Shephamurus spp* (50, 80) % respectively when compared to other age brackets. Winners have high prevalence of *Trichuris trichuria* (60%); Sows have high prevalence of *Shephamurus* (57%), O*esophagostomum spp* (50%), *Ascarops* (86%), *Fasciolopsis spp* (71%). Boar maintained a low prevalence of all the gastrointestinal parasites. The prevalence of infection in undewormed pigs (92%) was high compared to recently dewormed pigs (2%). The prevalence of infection in unhealthy (70%) was relatively higher compared to healthy ones (15%). The result of this study provides a 'base-line' data for assessing the effectiveness of control strategies against gastro-intestinal parasitism in intensively raised pigs in Umuahia, Abia state and the presence of different types of gastrointestinal parasite in different sex and age bracket.

Keywords: *Globocephalus sppi*; *Fasciolopsis spp; Ascarops spp; Shephamurus spp Oesophagostomum spp.*; Pig; *Trichuris trichuria; Necator spp*; Umuahia

INTRODUCTION

Gastrointestinal parasites are one of the major constraints to efficient swine production of all ages (Intervet, 2011). Swines raised in intensive operations are less prone to gastrointestinal infection however; the large round worm (*Ascaris spps*), whipworm (*Trichuris spps*) and the nodular worms (*Oesophagostomum spp*) are often found in such operation (Sangeeta, *et al.*, 2002; Weng, *et al.,* 2004; Eijck and Borgsteede, 2005). The large round worms' remains the most prevalent while parasite such as kidney worms, lungworms, red worms and thread worms are only found in pigs raised on free range (Slifu, *et al.,* 1990; Tamboura, *et al.*, 2006 and Intervet, 2011). Gastrointestinal parasitism in swine affects swines performance in terms of efficient feed conversion, growth rate and general health status (Hale and Stewart, 1987). They've also been associated with depressed immunity in infected animals leading to decreased ability to fight off infection thereby predisposing them to concurrent infections with disease pathogens (Intervet, 2011). The disease is also

Map of umuahia North LGA of Abia state.

associated with a lot of economic losses compounded by the fact that once roundworm infection establishes in a conventional farm, it's always very difficult to eliminate it (Intervet, 2011). Therefore, the importance of this work to determine the prevalence of gastrointestinal parasites in pigs of different age bracket raise in confinement which will determine the adoption of improved manage mental strategies in the farm in-order to reduce losses.

MATERIAL AND METHODS

Study area

Umuahia is the city of Abia state. The town is made up of two L.G.A, Umuahia north and Umuahia south. Umuahia north is comprised of about 35 communities bordered at the northwest by a river. It is located at longt 5^{o} 35′N and Lat 7^{o} 25′E. The main city of umuahia is located within umuahia north L.G.A which is where this work took place. The standard of living is not particularly low however there are few veterinary clinic establishments in the city and a substantial proportion of inhabitants managing pig farms have no access to veterinary services. Therefore, most intensive pig farms have never had any form of antihelminthic treatment prior to the work.

Faecal sample collection

Three hundred faecal samples of pigs of different age bracket (Piglets, Dams, Winners, Sows and Boars) were randomly collected from both the healthy and unhealthy fifteen intensively managed pig farms located within Umuahia city of Abia state. The work lasted for about four months from September to December 2010.

Sampling procedure and data collection

Which data was collected at a single point and time was used (Thrusfeild, 2005). Data was collected from pig farmers or the farm attendants as the case may be on the pig demographic characteristics (Age, gender, unhealthy, healthy, history of deworming). The Pigs are characterised into piglets (those still suckling their mother); Dam (Those still nursing their litters); Winners (those between 3-4 months of age that have stopped nursing and are feeding on their own); Sows (matured female pigs) and Boars (matured male pigs). The study was conducted during the months of September to December, 2010.

Sampling and parasitological technique

Three grams of fecal samples were collected from 300 pigs per rectum into a labelled container of merthiolate iodine formalin (MIF) solution as fixative (Pessôa and Martins, 1982) and kept cool before transportation to the department of veterinary medicine labouratory for immediate analysis or stored in the refrigerator at 4^{oc} for a day before analysis. The faecal samples where analyzed using the simple saturated salt floatation technique (Urquhart, *et al.,* 1987). Using the method gastrointestinal parasites of pigs of different age bracket were detected and recorded.

Statistical analysis

Collected data were analysed using descriptive statistics (Swai, *et al*., 2010) and presented as tables. The prevalence (P) of various types of gastrointestinal parasites in different sex ,health status and age of pigs were calculated using the formula P=d/n. where d is the number of positive samples analyzed at that point in time and n= total number of pigs sample analysed at that material point in time (Thrusfeild, 2005). The prevalence

Table 1: Prevalence of different gastrointestinal parasite eggs in intensively managed pigs in Umuahia city of Abia state (%).

PARASITE SPP	NUMBER EXAMINED	NUMBER POSITIVE	PREVALENCE (%)
Globocephalus spp	300	205	68
Necator sp	300	100	33
Trichuris trichuria	300	50	17
Fasciolopsis buski	300	150	50
Ascarops strongylina	300	200	67
Oesophagostomum dentalium	300	300	100
Stephamurus dentatus	300	150	50

Table 2: Proportion of each category investigated and the associated prevalence of parasite in intensive managed pigs in Umuahia city of Abia state.

Variable	*Globocephalus spp*	No examined	Positive cases	Prevalence%
Age category				
Piglets		80	80	100
Winners		50	25	50
Dam		50	50	100
Sow		70	30	43
Boar		50	20	40
Health status				
Health		290	198	68
Unhealthy		10	7	70
History of deworming				
Yes		50	10	20
No		250	195	78

was calculated in percentage.

RESULT

The 300 faecal samples analysed were all positive for gastrointestinal parasites which were of mixed infection with all the parasites itemised in Table 1. *Oesophagostomum spp* (70%) and *Globocephalus spp* (68%) were of highest prevalence, followed by Ascarops (67%); *Fasciolopsis buski (*50%), and *Stephamurus spp* (50%) have same prevalence. *Necator spp* (33%) was of low prevalence while *Trichuris spp* (17%) had the least prevalence.

From Table 2. The prevalence of *Globocephalus spp* (100,100) % respectively was highest in piglets and their dams. The prevalence in Winners (50%) was comparatively high to that in Sow (43%) and Boar (40%). seems to have the least prevalence with the parasite. The prevalence of *globocephalus spp* in the unhealthy animals was slightly higher (70%) than the healthy (68%). The prevalence in the dewormed pigs was low (20%) to the undewormed pigs (78%).

From Table 3. The prevalence of *Necator spp* (60%) was highest in the Dam and Piglets (46%) followed by Sow (34%). Winners and Boar have the least prevalence of (6, 16) % respectively. The prevalence in the healthy (32%) was low compared to the unhealthy (80%). The prevalence in the dewormed was very low (4%) to undewormed (39%).

From Table 4. The prevalence of *Trichuris trichuria* was relatively high in Winners (60%). The prevalence in the rest of the age groups Sow (7%); Dam (8%) and piglets (10%) were low and least in the Boar (6%). There was zero prevalence in the dewormed and 20% in the undewormed. The prevalence in the unhealthy was higher (70%) to the healthy (15%).

From Table 5. The prevalence of *Fasciolopsis spp* was highest in Sow (71%) and Winners (70%). The prevalence was relatively high in Dam (6.0%) compared

Table 3: Proportion of each category investigated and the associated prevalence of parasite in intensive managed pigs in Umuahia city of Abia state.

Variable	*Necator spp*	No examined	Positive Cases	Prevalence%
Age category				
Piglets		80	37	46
Winners		50	3	6
Dam		50	30	60
Sow		70	24	34
Boar		50	8	16
Healthy status				
Healthy		290	92	32
Unhealthy		10	8	80
Dewormed				
Yes		50	2	4
No		250	98	39

Table 4: Proportion of each category investigated and the associated prevalence of parasite in intensive managed pigs in Umuahia city of Abia state.

Variable	*Trichuris trichuria*	No examined	Positive cases	Prevalence %
Age category				
Piglets		80	8	10
Winners		50	30	60
Dam		50	4	8
Sow		70	5	7
Boar		50	3	6
Healthy status				
Healthy		290	43	15
Unhealthy		10	7	70
Dewormed				
Yes		50	0	0
No		250	50	20

Table 5: Proportion of each category investigated and the associated prevalence of parasite in intensive managed pigs in Umuahia city of Abia state.

Variable	*Fasciolopsis spp*	No examined	Positive cases	Prevalence%
Age category				
Piglets		80	30	38
Winners		50	35	70
Dam		50	30	60
Sow		70	50	71
Boar		50	5	10
Healthy status				
Healthy		290	143	49
Unhealthy		10	7	70
Dewormed				
Yes		50	10	20
No		250	140	56

Table 6: Proportion of each category investigated and the associated prevalence of parasite in intensive managed pigs in Umuahia city of Abia state.

Variable	*Ascarops spp*	No examined	Positive cases	Prevalence%
Age category				
Piglets		80	50	63
Winners		50	40	80
Dam		50	30	60
Sow		70	60	86
Boar		50	20	40
Healthy status				
Healthy		290	192	66
Unhealthy		10	8	80
Dewormed				
Yes		50	3	6
No		250	197	79

Table 7: Proportion of each category investigated and the associated prevalence of parasite in intensive managed pigs in Umuahia city of Abia state.

Variable	*Oesophagostomum dentalium*	No examined	Positive Cases	Prevalence %
Age category				
Piglets		80	80	100
Winners		50	25	50
Dam		50	50	100
Sow		70	35	50
Boar		50	20	40
Healthy status				
Healthy		290	200	69
Unhealthy		10	10	100
Dewormed				
Yes		50	20	40
No		250	190	76

to Piglets (38%). The prevalence in Boars (10%) was very low. Prevalence in the unhealthy (70%) was higher to the healthy (49%). The prevalence in the dewormed (20%) was low to the un-dewormed (56%).

From Table 6. The prevalence of *Ascarops* spp was highest in the Sow (8.6%). High in Winners (80%); Piglets (63%) and Dam (60%) and least in Boar (40%). The prevalence in the healthy (66%) was lower to the unhealthy (80%). The prevalence in the dewormed (6%) was very low to the undewormed (79%).

From Table 7. The prevalence of *Oesophagostomum spp* was highest in the Dam (100%) and Piglets (100%). Winners and Sow have same prevalence (50, 50) % respectively and Boar with the least (40%). The prevalence in the unhealthy was 100% and unhealthy (69%). The prevalence in the dewormed was (100%) and un-dewormed (76%).

From Table 8. The prevalence of *Shephamurus spp* was highest in the Dam (80%). The prevalence in piglets, Sow and Boars were high (50, 57 and 50) % resp. However, Winners had the least prevalence (10%). There was no significant difference ($P \geq 0.05$) between the healthy (5.0%) and unhealthy (5.0%). The prevalence was high in the un-dewormed (56%) compared to the dewormed

Table 8: Proportion of each category investigated and the associated prevalence of parasite in intensive managed pigs in Umuahia city of Abia state.

Variable	*Shephamurus dentatus*	No examined	Positive cases	Prevalence%
Age category				
Piglets		80	40	50
Winners		50	5	10
Dam		50	40	80
Sow		70	40	57
Boar		50	25	50
Healthy status				
Healthy		290	145	50
Unhealthy		10	5	50
Dewormed				
Yes		50	10	20
No		250	140	56

(20%).

DISCUSSION AND CONCLUSION

From the result of this work it was obvious there was existence of gastrointestinal parasites in the intensively managed pig farms in Umuahia city of Abia state. From Table 1. *Oesophagostomum spp* (100%) had the highest prevalence followed by *Globocephalus spp* (68%), *Ascarops spp* (67%), *Fasciolopsis* (50%), *Stephanurus* (50%), *Necator spp* (33%) and *Trichuris spp* (16%). These findings were in line with other workers in gastrointestinal parasites of pigs that the large round worms, whipworms and nodular worms are often isolated in conventional pig farms (Weng, *et al*., 2004; Eijck and Borgsteede, 2005, Eichhorn, *et al*., 2008 and Intervet, 2011). All the 300 samples examined were positive for one parasite or the other such that is seen in mixed infections. From the result tables, the prevalence of gastrointestinal parasites in the unhealthy pigs (10) were constantly higher for the whole parasites found compared to the apparently healthy pigs (290). The reason probably is because a sick animal's immune system already has an existing task to eliminate the offending pathogen and further assault to the system by the presence of the gastrointestinal parasites may over burden the immune system which will cause a reduction in the innate ability of the animal to respond fully in checkmating the gastrointestinal parasite as in the healthy. Also from the result tables the prevalence of gastrointestinal parasites was constantly higher in the undewormed (79%) compared to those that had recent deworming (6%) examplified in Ascarops spp. This concurred with Martin*, et al.,* (1974) that the control and elimination of gastrointestinal parasite is through application of empirical system of treatment regime. From the results of table 7 to table 2, the infection rate with *Oesophagostomum spp* and *Globocephalus spp* were highest in the Dam (100%) and Piglets (100%), high with *Stephanurus*- Dam (80%), Piglets (50%); *Ascarops*-Dam (60%), Piglets (63%); *Fasciolopsis spp*- Dam (60%), Piglets (38%); *Necator spp*- Dam (60%), Piglets (46%) and relatively low with *Trichuris spp*- Dam (8%) , Piglets (10%). This close relationship in the prevalence of gastrointestinal parasites in Dams and Piglets is dependent on the manage mental practises in the farms where by there is absence of worming programmes and piglets being in close confinement with their dams quickly pick up infections from their dams (Martin, *et al*., 1974). *Oesophagostomum spp* are one of the most common roundworm infections in confined pigs responsible for nodular inflammations on the caecum and colon of infected pigs (Urquhart, *et al*., 1998). Nursing Piglets may have also acquired the infection via in- utero from their dams or via their colostrums (Urquhart, *et al*., 1998) often seen in pigs reared outdoor (Intervet, 2011). In this case, the high prevalence of *Oesophagostomum spp* in the conventional farms was because most of these farms had concrete floors with beddings where infective larvae can remain protected and continuously contaminating the pen and enabling cycling of infection for years in an infected farm (Meissonnier, *et al*., 2008). Such infected piglets often develop uneven growth rate with gray sticky diarrhoea at two or three weeks of age.

In most case when a particular age group become positive for a parasite, it remains so for the rest of the parasites (Eijck and Borgsteede, 2005). *Ascarops spps* are the commonest spiruroids besides *Gnathostoma* and *Gongylonema* often seen in out door pig however, in this

study the prevalence was high in the confined pigs.

The prevalence of *Trichuris spp* was very low in the Dam (8%) and Piglets (10%) in this study. This is in line with Urquhart, *et al*., (1987) and Intervet, (2011) that infection with *Trichuris spp* is often light and asymptomatic and Sangeeta, *et al*., (2002) stating that young animals has low prevalence with *Trichuris spp.* However, it disagrees with Ejick and Borgsteede, (2005) who recorded high infection rate with *Oesophagostomum spp* and *Trichuris spp* in Sow.

Winners generally have high prevalence with the gastrointestinal parasites except with *Necator spp* (6%). This was contrary to the findings of Sangeeta, *et al.,* 2002 that young animals have low prevalence with most of gastrointestinal parasite.

The prevalence of the gastrointestinal parasites in Sow is relatively high compared to Boars that maintained steady low prevalence with almost all the parasites. This agrees with Sangeeta, *et al.,* 2002 that female animal's harbour more parasites than males and also Eijck and Borgsteede, 2005 in their record of high prevalence of *Oesophagostomum spp* and *Trichuria spp* in Sow.

Parasites of importance isolated in this study includes: *Necator spps, Fasciolpsis buski* and Trichuriasis because of their public health importance. *Necator americanus* is a hookworm of man (Soulsby, 1982) and its presence in the pigs poses health risk for man especially farm workers.

Fasciopsis buski is a fluke parasite of man that infects pig, therefore infected farm workers can easily transmitte the infection to pigs as man can also pick it up from infected pigs and the cycle continues.

Trichuriasis is another important parasite of man especially in children whereby untreated infections may lead to clubbing of the fingers, through an unknown mechanism with complications such as rectal prolapse, appendicitis, colitis and proctitis and in very rare cases could cause visceral larva migrans (OIE, 2005).

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