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The Occurrence of Gastrointestinal and Haemoparasites of cattle in Jos of Plateau State, Nigeria

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Abstract

Prevalence of haemoparasites and gastrointestinal parasites of cattle in Bassa local government area of Plateau State was carried out. The study showed that haemoparasites was less prevalence (21.70%) compared to gastrointestinal parasites (53.77%). Nine parasites were encountered among which Eimeria species has the highest prevalence of 26.42% followed by Oesophagostuma radiatum with 18.87%, while Strongyloides, Syngamus laryngeus and babesia bigemina has the least prevalence with 0.94%. The mean PCV of 35.13±5.2 (ranges from 24% to 54%) and 35.02±4.9 (ranges from 23% to 50%) for animals with one or more parasites or non-parasites respectively showed no significant difference (P<0.5). There was a high prevalence observed in females (44.34%) than males (40.57%) and high in adults compared to young animals. There was a high prevalence in white Fulani than other breeds which is due to the fact that white Fulani is the most common breed of cattle in the study area. White Fulani recorded the highest prevalence of 24.53% followed by Red Fulani with 21.70% and Sokoto Gudali with 19.81%, while N’dama and Muturu had least the prevalence of 9.43% each which shows a significant difference (P<0.05) between the breed of animals.

Keyword: Parasitism, haemoparasites, gastrointestinal parasite, cattle, infection, bassa.
THE OCCURRENCE OF GASTROINTESTINAL AND HAEMO PARASITES OF...

Introduction

Animal agriculture is an indispensable prerequisite towards the sustainability of human development because of food provision, employment generation, etc. Apart from serving as source of food for humans, animal agriculture is also important in providing non-food materials such as hides, skin, wool and feathers which are in turn used as raw materials for manufacturing other valuable products. Ajayi, *et al.* (1998) Livestock production is faced with a number of constraints, which on the long run results in low productivity and reduce profitability. Anon, (2006)

According to*3*, among these constrains are diseases; Animal diseases constitute a major obstacle to economic development as well as poising health, risk to livestock productivity and profitability, inadequate consumption of protein of animal origin, poverty, unemployment, low contribution to the nation’s gross domestic product among others. Parasitism is a primary cause of production losses which results in mortality, reduction in weight gain, low fertility, losses in most cattle producing countries of the world. Fabiyi, (1987)

Gastrointestinal parasites have been noted as major constraint to ruminants’ productivity in terms of pathology and economic importance. Gates *et al.*, and Wescott *et al.*, (2003). These parasites are found within the gastrointestinal tract (GIT) of the animal. Several wormssuch as cestodes, nematodes and trematodes at different location within the gastrointestinal tract are responsible for the disease. Coccidiosis is usually an acute invasion and destruction of intestinal mucosa caused by protozoa of the genera *Eimeria* or *Isospora* species. Bovine coccidiosis is caused by *Eimeria* *iso* *s* *pora* species, *E. bovis*, *E. auburnensis* and *E. ellipsoidalis*. Hensen and Perry (1994) Coccidiosis occurs in all species of animals when the environmental and managemental condition result in oral exposure of large numbers of sporulated oocyst to non-immune animals. Love and Hutchinson (2003)

Haemoparasites on the other hand are found in the blood stream and tissues of vertebrates throughout the world. Haemoproteoan diseases especially Babesiosis, Anaplasmosis, Trypanosomiasis and Theileriosis are considered some of the major impediments to the health and productive performance of cattle. Ochai, and Kolhatkar (2007)

The general clinical signs of haemoparasa*"t*es and gastrointestinal parasites shown on cattle as noted by Love and Hutchinson, (2003), Otto, (2005), and Otto *et al.* (2000) includes; weakness of the body, abdominal pains, anorexia, emaciation, potbelly, diarrhea, enteritis, anaemia, constipation, loss of weight, jaundice, rough hair coat, alopecia, coughing, labour breathing, fever, haemoglobinuria, infertility, abortion and sudden death. and noted that decreased growth, weight loss in young growing calves and late maturity of slaughter stocks are the major clinical signs in calves.

The direct losses caused by these parasites are attributed to acute illness and death, premature slaughter and rejection of some parts during meat inspection. Indirect losses includes the diminution of potential such as decreased growth rate, anaemias, weight loss in young growing calves and late maturity of slaughter stock, Oluwafemi, and Anosa, (2000)

This study was motivated by the need to isolate and identify the gastrointestinal and Haemoparasites of cattle in Bassa Local Government area of Plateau State with the objective of determining the prevalence of parasitic infection and its associating factors.

Materials and Methods

The Study Area

Bassa local government area was created in the year 1976 out of the Jos Native Authority. It has an area of 1870 kilometer square (km$^2$) with the population of 376,344 at the 2006 census. Bassa local government area shares common boundaries with Kano and Kaduna State to the north and west, Bauchi State to the north-east, Jos North and Jos South to the south and south-west respectively. It comprises of nine districts. Namely; Amo, Binchi, Bujii, Buhit, Jere, Kakek, Kwall, Miango and Zagun with the following tribes; Irigwe, Amo, Rukuba, Bujii, Cemoro, Jere, Chokobo, Kurama, Gusu, Banga, Tarya, Janji and Rabina as indigenous tribe (Land and Survey).
Sample size and type, Collection and Processing of Samples

One hundred and six fecal and Blood samples each were collected from the cattle recruited for this study. The samples cut across the different breeds of animals that include White fulani, Sokoto Gudali, Red Fulani, Muturu, N’Dama both Males and Female, kept under different system of management kept for different purposes and various sources. All animals were identified using their physical traits or features, the ages of animals were determined using their dentition and or the corneal ring method along with history records from owners where possible.

Five grams (5g) of the fecal samples was obtained directly from the rectum and the of each animals with the use of a hand glove on and transferred into a clean disposable polythene bags, similar to the technique described by WHO (1991), 10mil of Blood was equally collected from the animals by venipuncture using sterile needles and syringes from the jugular vein of the animals and were poured into a clean sterile EDTA bottles and were properly labeled. Prior to sample collection, the animals were restrained, identified and the perineum thoroughly prepared by cleaning with cotton wool soaked in distilled water to prevent contamination. Fecal samples were processed based on the formol ether concentration technique and the saturated sodium chloride flotation (WHO, 1991), the blood samples were processed using using Giemsa stained blood smear method adopted from Omoha, M. (2007)

Results and Discussion

*Eimeria species* has the highest prevalence of 26.42% followed by *Oesophagostomnia radium* with 18.87%, while *Strongyloides, Syngamus laryngeus* and *Babesia bigemina* has the least prevalence with 0.94% each the animals with *Strongeloides* had the highest PCV followed by *O. radiatum, S. laryngeus* had the least PCV; this is due to the fact that *S. laryngeus* is a blood sucking worm which results to anaemia.

The prevalence of haemoparasitism and gastrointestinal parasites was generally higher in females (44.34%) than males (40.57%) and Adults than young which shows a significant different (P<0.05).

![Fig. 1: Histogram showing the prevalence of haemoparasites and gastrointestinal parasites based on the species of parasites and mean PCV.](image-url)
Fig. 2: Histogram showing total percentage of infested animals based on sex and age.

### Table 1: Prevalence of haemoparasites and gastrointestinal parasites of cattle based on breed distribution

<table>
<thead>
<tr>
<th>Parasites</th>
<th>No. Positive (%)</th>
<th>White Fulani (%)</th>
<th>Red Fulani (%)</th>
<th>SokotoGudali (%)</th>
<th>N’dama (%)</th>
<th>Muturu (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gastrointestinal parasites</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>O. radiatum</em></td>
<td>20 (18.87)</td>
<td>5 (4.72)</td>
<td>5 (4.72)</td>
<td>3 (2.83)</td>
<td>5 (4.72)</td>
<td>2 (1.89)</td>
</tr>
<tr>
<td><em>B. phlebotomum</em></td>
<td>10 (9.43)</td>
<td>2 (1.89)</td>
<td>2 (1.89)</td>
<td>4 (3.77)</td>
<td>1 (0.94)</td>
<td>1 (0.94)</td>
</tr>
<tr>
<td><em>C. pectinata</em></td>
<td>7 (6.60)</td>
<td>2 (1.89)</td>
<td>1 (0.94)</td>
<td>2 (1.89)</td>
<td>-</td>
<td>2 (1.89)</td>
</tr>
<tr>
<td><em>S. laryngeus</em></td>
<td>1 (0.94)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1 (0.94)</td>
<td>-</td>
</tr>
<tr>
<td><em>Strongyloides</em></td>
<td>1 (0.94)</td>
<td>-</td>
<td>-</td>
<td>1 (0.94)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><em>Eimeri species</em></td>
<td>28 (26.42)</td>
<td>8 (7.55)</td>
<td>7 (6.60)</td>
<td>5 (4.72)</td>
<td>3 (2.83)</td>
<td>5 (4.72)</td>
</tr>
<tr>
<td><strong>Haemoparasites</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>B. bovis</em></td>
<td>16 (15.09)</td>
<td>7 (6.60)</td>
<td>6 (5.66)</td>
<td>3 (2.83)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><em>B. bigemina</em></td>
<td>3 (2.83)</td>
<td>-</td>
<td>2 (1.89)</td>
<td>1 (0.94)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><em>A. marginale</em></td>
<td>4 (3.77)</td>
<td>2 (1.89)</td>
<td>-</td>
<td>2 (1.89)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Mean pcv</td>
<td>34.71±5.62</td>
<td>36.82±18</td>
<td>33.06±7.25</td>
<td>35.12±7.05</td>
<td>35.75±10.43</td>
<td>37.63±42</td>
</tr>
<tr>
<td>Total</td>
<td>90 (84.91)</td>
<td>26 (24.53)</td>
<td>23 (21.70)</td>
<td>21 (19.81)</td>
<td>10 (9.43)</td>
<td>10 (9.43)</td>
</tr>
</tbody>
</table>

White Fulani recorded the highest prevalence of 24.53% followed by Red Fulani with 21.70% and Sokoto Gudali with 19.81%, while N’dama and Muturu had least the prevalence of 9.43% each which shows a significant difference (P<0.05) between the breed of animals. On the other hand, there is no significant difference in the mean PCV among the affected breeds of cattle.

Out of the 106 samples examined an infection rate of 84.91% for haemoparasites and gastrointestinal parasites was reported in this study which shows a continuous challenge by parasites and the existence of carrier animals in the study area. 57(53.77%) prevalence was reported for the gastrointestinal parasites while prevalence of 23(21.70%) for the haemoparasite. The parasites encountered are *O. radiatum* 20 (18.87), *B. phlebotomum* 10 (9.43), *C. pectinata* 7 (6.60), *S. Laryngeus* 1 (0.94), *Strongyloides* 1 (0.94), *Eimeri species* 28 (26.42), *B. bovis* 3 (2.83), *B. bigemina* 4 (3.77), *A. marginale* 4 (3.77). *Eimeria species* has the highest prevalence of 26.42% followed by *Oesophagostuma radiatum* with 18.87%, the least was observed with *S. Laryngeus* 1 (0.94), *Strongyloides* 1 (0.94). Considering the prevalence with the occurrence with the...
haemoparasites reveals B. bovis 16(15.09%) had the highest occurrence followed by B. begemina the least was recorded with A. marginale 3(3.775%). Reasons may be due to the present of high moisture content and temperature which favours the growth and development of the young stage of these parasites on pasture resulting to increased contact between the host and parasites. These agrees with the report of Packer, R.J. and Jones, G.W. (1990), and Anon, E. (2006) who also observed high prevalence of these parasites in their various research.

We also noted variation in the prevalence of these parasites in relation to sex in this study; this study confirms the reports of previous researchers on the range of haemoparasites and gastrointestinal parasites in cattle in Nigeria (packer, R.J. and Jones, G.W. (1990), Rajput, et al, (2005) and Springer – Verlag (2006)). The prevalence of haemoparasites and gastrointestinal parasites was generally higher in female than male animals (P>0.05) possible due to the fact that females are kept much longer for breeding and milk purposes. This is in contrast to the work of who observed a reverse trend in a survey conducted in Ngorongoro district of Manasai, Tanzania. The lower prevalence in calves compare to adults (P>0.05) can be attributed to restrict grazing of young animals which tend to reduce their chance of contact with the disease agents. The low prevalence of infection observed could agree with who reported that under natural conditions, younger animals appear to acquire infections shortly after birth, and also for the fact that in younger animals the immunity is still at its developing stage and does not provide the younger animals room to withstand invading parasites knowing that parasitic infection can be transmitted through fecal-oral means and that the parasites, could easily reach the young sucking animals through the infected teats of lactating dams in parasitic contaminated diarrheic feces, this findings also agrees with the result of most published research. The rates reported in the Calves can be characterized by profuse watery diarrhea with acute onset. Infection can also be accompanied by depression, In regards to the breed of animals samples, white Fulani recorded the highest prevalence of 24.53% followed by Red Fulani 21.70%, 19.81% prevalence was observed for Sokoto Gudali, the least prevalence was 9.43% these was observed for Muturu and N’Dama. The percentages observed for the different breed may be attributed to the contamination and recontamination of the feed and water these animals consume by their faecal matter and by the wide practice, even in advance countries of disposal of both animals and human excreta to farm land, and on pasture, which may lead to direct infection. Poor management practice by the local farmers such as poor deworming program, control of ecto-parasites, routine screening of animals and awareness programs can also be contributing factors. The low prevalence noted can be attributed to the fact that the animals are indigenous who are known to be resistance to infection than the exotic breed.

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