Helminth parasites of indigenous chickens in Oodi, Kgatleng District, Botswana

E Z Mushi[a], M G Binta[b], R G Chabo[a], R Ndebele[a] and T Thibanyane[a]

ABSTRACT

Thirteen adult indigenous chickens from Oodi, Kgatleng district, Botswana, were examined for helminth parasites. Two species of nematodes, *Ascaridia galli* and *Heterakis gallinarum,* and species of the cestode genus *Raillietina,* were recovered. *A. galli* and *H. gallinarum* were the most commonly seen parasites. The nematode *A. galli* occurred concurrently with *Raillietina* spp.

Key words: Botswana, helminths, indigenous chickens.

Mushi E Z, Binta M G, Chabo R G, Ndebele R, Thibanyane T **Helminth parasites of indigenous chickens in Oodi, Kgatleng District, Botswana**. *Journal of the South African Veterinary Association* (2000) 71(4): 247–248 (En.). Botswana College of Agriculture, Private Bag 0027, Gaborone, Botswana.

Indigenous chickens of local breed are kept by most homesteads in Africa and Asia[5], in a free-range system. They scavenge for food. Supplementary feeding, consisting mainly of food scraps left over from homesteads, is inadequate[1]. Helminthosis is important in the tropics, where the standard of husbandry is often poor, and climatic conditions are favourable for the development of these parasites[6]. Since almost no information was available on the occurrence of helminth infections of indigenous chickens in Botswana, a small number of these chickens were examined and the helminth species obtained recorded.

Thirteen adult indigenous chickens were examined. They were purchased from 5 different households in Oodi, Kgatleng district during the warm and dry months of October and November, 1999. The chickens were kept in a free-range system and were allowed to roam freely in search of food. The birds were starved for 1 day before a *post mortem* examination was performed. The respiratory and digestive tracts were examined systematically after being separated into trachea, oesophagus, crop, proventriculus, gizzard, small intestine, caecum and large intestine. The contents of each organ or section were emptied separately into Petri dishes and the mucosa washed thoroughly with tap water and later scraped off with the blunt edge of a scalpel blade.

The serosal and muscular layers of the proventriculus were also scraped and examined for parasites. The gut and tracheal washings were examined under a microscope for small nematodes. The visible parasites were collected and preserved in 5 % formalin and subsequently counted and identified as described by Soulsby[6].

Two nematode parasites, *Ascaridia galli* and *Heterakis gallinarum,* and species of the cestode genus *Raillietina,* were found (Table 1). *A. galli* and *H.gallinarum* were found in 85 % of these chickens (Table 2). *A. galli* occurred mainly in the small intestines in large numbers, and in one case, 98 adults were found in the small intestine, almost completely occluding the intestinal lumen, and thus preventing the free passage of intestinal contents. Adult *A. galli* worms were present in smaller numbers in the large intestine and, occasionally, in the gizzard and proventriculus (Table 1).

Small numbers of *H. gallinarum* were found, mainly in the caecum. The cestode *Raillietina* sp. was found not only in the small intestine, together with *A. galli,* but sometimes also in the large intestine and caecum (Table 1).

No worms were recovered from the trachea, oesophagus or crop.

Three helminth species were collected from apparently healthy indigenous chickens maintained under free-range conditions. This is the first published record of their occurrence in Botswana. *A. galli,* a nematode parasite, known to cause heavy infestation in wet and warm environments[6], was one of the most commonly found parasites, although Botswana is a relatively dry country. Heavy infection with *A. galli* resulting in partial occlusion of the intestinal lumen was reported by Ssenyonga[7] in local chickens in Uganda. In contrast to these 2 reports, low infection rates were reported for indigenous chickens in Zimbabwe[3]. Since the chickens in the present study were heavily parasitised, anthelmintics active against ascarid worms as described by Ssenyonga[8] should be administered to reduce worm burdens. This should improve productivity, since these worms compete with the chickens for available nutrients, resulting in low weight gains and poor carcass quality. Furthermore, deworming is necessary on aesthetic grounds.

Table 1: **Helminths found in indigenous chickens in Botswana.**

Location	Species	Number of chickens infested (*n* = 13)
Trachea	–	0
Oesophagus	–	0
Crop	–	0
Proventriculus	*Ascaridia galli*	1/13
Gizzard	*A. galli*	2/13
Small intestine	*A. galli*	11/13
	Raillietina species	8/13
Caecum	*Heterakis gallinarum*	11/13
	Raillietina spp.	4/13
Large intestine	*A. galli*	6/13
	Raillietina spp.	6/13

[a]Botswana College of Agriculture, Private Bag 0027, Gaborone, Botswana.

[b]National Veterinary Laboratory, Private Bag 0035, Gaborone, Botswana.

Received: May 2000. Accepted: August 2000.

Table 2: **Prevalence of helminths in indigenous chickens in Botswana.**

Helminth	Prevalence (%)
Ascaridia galli	84.6
Heterakis gallinarum	84.6
Raillietina sp.	66.6

Free-ranging fowls are likely to become infected with cestodes through ingestion of their arthropod intermediate hosts. In the present study, *Raillietina* sp. was recovered in relatively small numbers compared to Nigerian indigenous chickens that were reported to harbour more tapeworms than ascarids[4]. Similarly, indigenous chickens from southern Ethiopia were reportedly infected with various types of tapeworms[9]. The presence of cestodes in the chickens in this study suggests the presence of the intermediate host, and warrants treatment with an anticestodal anthelmintic.

It was noteworthy that no *Capillaria* spp., *Syngamus trachea* or *Tetrameres* spp. were recovered. This may have been partly because the chickens were sampled during a dry period when the eggs and their infective larvae are destroyed by the extremely high ground temperatures. Furthermore, the former 2 species are more prevalent in warm, humid environments. This emphasises the need to sample the chickens during the wet season in order to understand the population dynamics of the parasite.

The results of this study contrast markedly with a report from Zimbabwe[2] in which numerous tetrameres were found in the proventriculus. These authors also failed to demonstrate the presence of *Capillaria* spp.

Since backyard chickens are a source of meat in rural populations in Botswana, it is imperative to boost the productivity of indigenous chickens through government-financed projects in the rural areas. It is anticipated that deworming the indigenous chicken population would improve weight gain and carcass quality. A government subsidy for anhelmintics included in the FAP (financial assistance package) loan scheme may render this exercise affordable.

ACKNOWLEDGEMENT

This study was financially supported by the Research and Publications Committee of the Botswana College of Agriculture.

REFERENCES

1. Gueye F 1998 Village egg and meat production in Africa. *World's Poultry Science Journal* 54: 73–86
2. Jansen J, Pandey V S 1989 Observations on helminth parasites of domestic fowls in Zimbabwe. *Zimbabwe Veterinary Journal* 20: 15–17
3. Kelly P, Chitauro D, Rohde P, Rukwava J, Majok A, Davelaar F, Mason P R 1994 Diseases and management of backyard chicken flocks in Chitungwiza, Zimbabwe. *Avian Diseases* 38: 626–629
4. Sa'Idu L, Abdu P A, Umoh J U, Abdullah M 1994 Diseases of Nigerian indigenous chickens. *Bulletin of Animal Health and Production in Africa* 42: 19–23
5. Say R R 1986 *Manual of poultry production in the tropics.* CAB International, Wallingford, UK: 1–4
6. Soulsby E J L 1986 *Helminths, arthropods and protozoa of domestic animals.* Ballière Tindall, London
7. Ssenyonga G S Z 1982 Prevalence of helminth parasites of domestic fowl (*Gallus domesticus*) in Uganda. *Tropical Animal Health and Production* 14: 201–204
8. Ssenyonga G S Z 1982 Efficacy of fenbendazole against helminth parasites of poultry in Uganda. *Tropical Animal Health and Production* 14: 163–166
9. Tegene N 1993 Prevalence of diseases, parasites and predators of local chickens in Leku, southern Ethiopia. *Bulletin of Animal Health and Production in Africa* 41: 317–321

Book review — Boek resensie

Meat science: an introductory text

P D Warriss

2000. CABI Publishing, Wallingford & New York, 312 pp., soft cover, £25 (US$45). ISBN 0 85199 424 5.

In the preface, the author emphasises that the book is not intended to be a standard reference work, since various books of this nature are available. It is directed at many readers who require a simple overview of the subject. Such potential readers include undergraduate and postgraduate students in food science and technology and animal and veterinary science, as well as technical staff in the meat industry. It may also be of interest to veterinarians and meat inspectors.

With this declaration as background, the contents of the book have been found to comply with the expressed intentions of the author. It admirably outlines the general principles of meat science and provides sufficient references to allow readers to access further detailed information if required.

The 12 chapters of the book can be divided broadly into 3 categories. The first category deals with the concept of animal welfare and the effect of live animal handling on the carcass and meat quality, and adequately describes the slaughter of animals. The chapter on slaughter includes *antemortem* inspection, stunning, slaughter, *post mortem* inspection, carcass dressing and butchery. The second category of subjects includes the concepts of meat consumption and quality. The author states that 'the reason most people eat meat is that they enjoy eating it, but perhaps like most things we enjoy eating, the ideal is to consume it in moderation and as part of a well-balanced diet'. Eating quality is one of the aspects of general meat quality that can be measured, and taste panelling and sensory evaluation are more objective techniques included in the text. Other aspects of quality that are discussed include processing and packaging and topics such as antioxidants, tenderising, pressure treatment and mechanically-recovered meat. Microbial contamination of meat, meat preservation and ensuring safety are also dealt with.

The third and final category of subjects involve chemical and physical aspects of meat science. These include growth and body composition, post-mortem changes from muscle to meat, chemical composition and structure of the meat and the measurement of composition and physical characteristics of the meat. In conclusion, the book can be recommended because it provides enjoyable and informative reading for those wish to gain a broad overview in the field of meat science.

P J Jooste
ARC – Animal Nutrition and Production Institute
Pretoria