Regional Reports

Diseases and management of indigenous chickens in Oodi, Kgatleng, Botswana

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A total of 215 indigenous chickens were found in 10 homesteads visited in Oodi, Kgatleng, Botswana from June to July 1999. The mean (SD) flock size was 21.5 (11.6) with a range of 7–47. The chickens were not housed but instead spent the night on top of trees to escape predation. Vaccinations against poultry diseases such as Newcastle disease were not carried out. Instead, traditional herbal remedies were used to treat sick chickens. Only a few adult birds were infested with scaly leg mites and fleas. Worm eggs were not detected in faecal samples examined but some coccidial oocysts were seen. Antibodies to avian infectious bronchitis, infectious bursal disease, *Mycoplasma gallisepticum* and egg drop syndrome were demonstrated in some of these chickens, suggesting previous infections or exposure.

Keywords: Botswana; disease; indigenous chickens; management

Introduction

Indigenous or local breeds of chickens *(Gallus domesticus)* are kept in most tropical countries. These chickens serve as an important source of animal protein to the rural poor in most parts of the world (Say, 1987). Infectious diseases such as Newcastle disease and parasitism are the main constraints on the productivity of these chickens (Verger, 1986). There is a paucity of information on the management and the extent of disease in the local Tswana chicken population in Botswana.

In this study the disease and management of chickens at Oodi, Kgatleng district, Botswana were investigated using a questionnaire interview.

Materials and methods

Owners of indigenous chickens in Oodi village in the Kgatleng district of Botswana were selected at random and interviewed between June and July 1999.

The unbiased selection process depended on the availability of a member of the household at the time the interview was conducted. These homesteads were spread out over a wide area of about 4 km^2. A survey questionnaire on the management of the chickens was given. The chickens found were counted and physically inspected for the presence of ectoparasites. Any external parasites seen were preserved in 70% ethyl alcohol and sent to the laboratory for identification using the keys described by Soulsby (1986). Faecal samples were collected from the rectum, put into capped bottles and transported to the laboratory in a cool box containing ice blocks at 4°C to prevent the eggs from hatching. The flotation technique with saturated sodium chloride solution was used for the recovery of helminth and coccidial oocysts (Soulsby, 1986). Blood was collected by brachial venepuncture into sterile vacutainer tubes without anticoagulant and the serum thus separated was stored at –20°C in 1 ml aliquots until ready for analysis.

The serum samples were tested for antibodies to avian infectious bronchitis by the haemagglutination inhibition test as described by Alexander *et al.* (1983). Antibodies to egg drop syndrome (EDS) 76 agent were determined by the haemagglutination inhibition test described by McFerran *et al.* (1977) and antibodies to infectious bursal disease were identified by the agar gel precipitation test (AGPT) described by Cullen and Wyeth (1975). For the AGPT 0.9% (w/v) agarose (Sigma) was prepared in 0.15 M sodium chloride. A seven-hole punch was used to cut out wells in the agar. The six outer wells were 5 mm in diameter and were spaced 5 mm from the larger centre well which was 8 mm in diameter. The infectious bursal disease antigen and the control hyperimmune serum were obtained from the Central Veterinary Laboratory (Weybridge, UK). The precipitation lines were read after 48 hours of incubation in a humid box at room temperature. Antibodies against *Mycoplasma gallisepticum were* detected by the rapid slide agglutination test using commercial antigens (Intervet Laboratories, Boxmeer, The Netherlands).

Results

The 10 owners of the indigenous chickens had a total of 215 birds consisting of 141 adult hens, 21 adult cocks and 53 chicks (*Table 1*). Each had a mean (SD) of 21.5

Table 1 Details of chickens per household

Household	Hens	Cocks	Chicks	Total
1	15	1	0	16
2	16	1	4	21
3	18	3	8	29
4	16	2	5	23
5	22	3	5	30
6	12	2	2	16
7	20	4	23	47
8	11	1	4	16
9	3	2	0	7
10	6	2	2	10
Total	141	21	53	216
Average	14.1		5.3	21.5 (11.6)

Table 2 Seroprevalence of antibodies to some poultry diseases

Disease	No. tested	No. positive	% positive
Infectious bursal disease	100	13	13
Egg drop syndrome	87	27	31
Mycoplasma gallisepticum	50	30	60
Infectious bronchitis	42	21	50

(11.6) birds (range 7–47). None of the households kept any records and information was therefore provided from memory. It was learnt that some households purchased their laying birds from neighbours because there was no specific market place for chickens. The chicks, whose age ranged from one day to about six weeks, were relatively fewer than the hens and there were reports of predation by wild cats. The chickens were not housed but spent the night on treetops. They were left to roam freely in search of food and water and in the evening to make their way back home to roost. Commercial poultry feed was not provided. Supplementary feed consisting of sorghum grain was sometimes given. The slaughter age of the adult chickens for meat for home consumption varied. The productivity of the layers was not investigated particularly. Apart from chickens only one household kept a few ducks.

The majority of the owners (80%) reported using traditional herbal remedies to treat sick chickens instead of western medicines. Furthermore, the chickens were not vaccinated against any poultry disease, including Newcastle disease which was cited by most owners as the most common cause of mortality. Recognition of the disease as such was based on some suggestive clinical respiratory and nervous symptoms.

When the chickens were examined for external parasites, scaly legs caused by the burrowing mite *Knemidocoptes gallinae* were seen in a few adult birds. Fleas were also found around the eyes in a few cases.

None of the 50 faecal samples examined yielded any helminths or strongyle worm eggs. Furthermore, a low coccidia oocyst count/g faecal material was obtained from only 25% of the samples examined.

The seroprevalence of avian infectious bronchitis, infectious bursal disease, *Mycoplasma gallisepticum* and egg drop syndrome is shown in *Table 2*.

Discussion

The mean flock size of indigenous chickens in this study was higher than that reported for rural South Africa by Dreyer *et al.* (1994) but about 50% lower than that recorded for Chitungwiza, Harare, Zimbabwe by Kelly *et al.* (1994). Unlike the South African and Zimbabwean locations, Botswana, being a pastoral country, places more emphasis on the keeping of cattle than of poultry. In this survey it was found that chickens were kept mostly by women and children for domestic meat consumption rather than for sale. Markets for chickens are virtually unknown throughout Botswana. Likewise, eggs from these chickens tend to be consumed in the homes and mostly by children.

This study revealed that the birds were rarely vaccinated against the common poultry diseases such as Newcastle disease, fowl pox and infectious bursal

disease. Most households cited Newcastle disease as the major cause of mortality. This deduction was based on the observation of clinical signs of a severe respiratory disease resulting in a high mortality. This finding corroborates those from Zimbabwe (Kelly *et al.*, 1994).

Unlike the Zimbabwean experience, however, where western medicine was given to the chickens, the survey indicated that most households relied on traditional Setswana decoctions to treat sick birds. The continued survival of these chickens must be considered uncertain in view of the high mortality (Verger, 1986). High mortality among unvaccinated chickens could partly explain why there were so few chickens per household. Unfortunately, antibodies to Newcastle disease virus were not determined in the serum of these chickens because the antigen was not available at the time of testing.

Failure to recover worm eggs and coccidial oocysts in high numbers has been reported by other authors (Kelly *et al.*, 1994), in contrast to the findings in local Nigerian chickens (Oyeka, 1989). One plausible explanation for the difference could be that the chickens sampled were of different ages.

Antibodies to some important chicken pathogens (infectious bronchitis, *Mycoplasma gallisepticum* and infectious bursal disease) were demonstrated in the serum samples of some of the indigenous Tswana chickens. Antibodies to infectious bursal disease have recently been found in serum from unvaccinated indigenous chickens on farms around Gaborone (Mushi *et al.*, 1999). Workers in other countries in Africa have also found antibodies to infectious bursal disease (Salman *et al.*, 1983; Abd El Rahim *et al.*, 1996; Okoye *et al.*, 1999). The study by Okoye *et al.* (1999) also provided evidence for the susceptibility of indigenous chickens to the virus. A seroprevalence rate of 50% was obtained for antibodies to infectious bursal disease in this study. Although this was much lower than the 98% reported by Kelly *et al.* (1994), it was higher than those reported for the other pathogens in this survey.

In this study a seropositivity of 60% for *Mycoplasma gallisepticum* was obtained. This rate was higher than that reported by Kelly *et al.* (1994) in Zimbabwe but comparable to that reported for village chickens from Benin (Chrysostome *et al.*, 1995). Antibodies to an avian adenovirus (EDS) have not previously been reported from Botswana. The 31% seroprevalence obtained in this study may be responsible for some of the egg laying problems in these chickens. Significant antibody titres have been found in the serum of free range chickens elsewhere (Christensen and Stanislawek, 1994).

These backyard chickens may therefore be an important reservoir of disease for commercial poultry enterprises in the vicinity and this underlines the need to vaccinate these flocks against the common chicken diseases.

Acknowledgement

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

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