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Chick Mortality in Indigenous Chickens (*Gallus domesticus*) under Free-range Management in Sebele, Gaborone, Botswana

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Abstract: A total of 125 out of 307 (41%) chicks belonging to the indigenous breed of chickens under free-range management died in the first three months of life with most chicks being lost in the first month. The main cause of chick mortality was predation mostly by dogs but also as a result of inclement weather especially during the cold weather season. It is imperative that brooding should be provided to curb these chick losses and adequate housing should be provided for the hens so as to protect the young chicks from predation.

Key words: Botswana, indigenous chickens, chick mortalities, lack of housing, predation

INTRODUCTION

Indigenous chickens *Gallus domesticus* belong to a group of local unimproved breeds commonly found in developing countries and may include mixed (unspecified) breeds resulting from uncontrolled breeding[1]. These indigenous chickens also known as village, traditional chickens and backyard chickens are reared for meat and eggs for domestic consumption[2]. These birds are very hardy and can survive on scavenging without any supplementary feeding.

The flock size of indigenous chickens ranges from 3 to 97[3] while typical flocks in Southern African Development Countries (SADC) countries comprise 5 to 30 birds[4]. The small flock sizes could be attributed to high chick mortalities caused by predation and poultry disease such as Newcastle disease, infectious bursal disease, fowl pox and endoparasites[2,5]. Indigenous chickens are extensively kept and as such are not confined to one place but scavenge for all or most of the feed[2]. Housing is generally not provided. However crude shelter may be provided in case of bad weather otherwise they rest in trees near the homestead[6,7].

Although in Botswana, 80% of village people keep indigenous chickens[8] the cause of chick mortality in this country has not been established. In order to increase production and preserve indigenous genetic material, the causes of chick mortality among indigenous chickens under free range system of management was investigated during the first 3 months of life.

MATERIALS AND METHODS

The study covered some randomly selected homesteads rearing indigenous chickens in Sebele located 12 km north of Gaborone in Botswana. The survey was conducted through a structured interview-questionnaire covering 20 homesteads. During the months of April to May 2003, the chickens found in each homestead were counted and physically inspected for the presence of ectoparasites such as lice and mites. Once each month visits were made to the selected farms and the chicks counted. Any dead chicks were taken to the laboratory for post-mortem and further examination. In the questionnaire the poultry farmers were asked about their management practices and probable causes of chick mortality on the farm.

RESULTS

From the randomly selected homesteads, a total of 617 chickens were counted with a mean flock size of 30.85±3.47 and a range of 12 to 64 (Table 1). Chicks accounted for 49.43% of the total number of chickens, the chickens were 38.74% and cocks only 11.83% (Table 1) depicting a hens:cocks ratio of 3.27:1. Neither lice nor mites were seen on any of the birds examined.

The salient features of the questionnaire on the management were as follows: The majority of the chicken keepers were female (92%) and the men only 8% (Table 2). The only form of housing provided was the night shelter. The chickens were left to roam freely scavenging for food. Supplementary feeding in the form of commercial poultry feed was provided in only one out of 20 households (5%).

Table 1: No. of indigenous chickens in 20 households

Type	No.	Mean±S.E	(%)
Hens	239	11.95±2.07	38.74
Cocks	73	03.65±0.69	11.80
Chicks	307	15.25±1.90	49.40
Total	619		100.00

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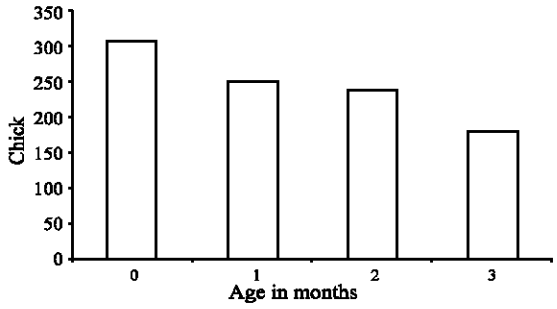

Fig. 1: Chicks surviving for first 3 months

None of the farmers vaccinated against any poultry diseases and even when sick, 100% of the chicken keepers used herbal concoctions instead of seeking veterinary assistance.

During the first visit a total of 307 chicks were found giving a mean of 15.3±1.93 chicks per household (Fig 1). On subsequent monthly visits the total chick numbers declined and after 3 months a many as 41.5% had been lost. Analysis of the causes of chick mortality among the 125 chicks implicated predators as the major cause accounting for 65.35% of mortalities. The cause of mortality in 15.75% of the cases could not be established. Dogs, cats, squirrels and mongoose were responsible for 62.7, 21.7, 9.6 and 6.0%, respectively.

DISCUSSION

Out of a total of 617 chickens counted from 20 homesteads in Sebele location, a mean flock size of 30.9±3.5 was obtained. These values were higher than the flock size of 21.5±11.6 in the neighbouring village of Oodi[9] but these values are comparable to those reported for Africa by Gueye[2]. The latter author found the flock size in Africa to vary with the season and intercurrent disease outbreaks. Chicks accounted for a sizeable proportion of the population at the beginning of the study probably due to the fact that the farmers practised natural incubation of the eggs.

The majority of the poultry keepers were women who kept these chickens for domestic consumption. This is mainly because the men in Botswana tend to look after large livestock such as cattle, sheep and goats and leave the keeping of chickens to the women and children. The chickens were raised on a free-range system with minimal supplementary feeding.

The high chick mortality reported in this study was comparable to that reported from Cote D'Voire for the same age group by Diampra[10]. The fact that the highest number of chick losses was experienced in the first month particularly in the first two weeks may partly have been attributed to inclement weather conditions especially in winter since no housing was provided. Most likely the chicks succumbed to the cold winter temperatures prevalent at the time of study for a heated brooder was not provided. Inanition with subsequent starvation could also have contributed to chick weakness. Nutritionally marginalized chicks could succumb to lack of food and therefore become weak and eventually die.

It was suspected that there might have been other poultry diseases but the farmers did not report them since chicks were not considered important and therefore not worth reporting. Most farmers reportedly threw away dead chicks or burnt them. During the period of this study Newcastle disease was not reported in the area. Some chicks dies by unknown causes. Gueye[2] reported, that low protein and energy of chicken feed, low hatching weight of chicks, high ambient temperatures and other associated factors were major causes of chick losses. In one instance in this study, cold exposure was implicated to have caused some chick mortality for after a chilly night chicks were found dead in the morning and on post-mortem examination, no specific lesions were seen.

Table 2: Chicken keeper's response on management of chickens

Items	Possible response	Percentage Respondents
Gender of indigenous chicken keeper	Male	8
	Female	92
Was housing provided	Yes	0
	No	100
Was night shelter provided	Yes	85
	No	15
Feeding of the chickens	Scavenging	100
	Food scraps	100
	Commercial poultry feed	5
Was water provided	Yes	100
	No	0
Action taken when chickens were sick	Use traditional medicines	100
	Buy drugs	0
	Visit veterinary office	0
Were chickens ever vaccinated against any disease	Yes	0
	No	100

Predation by dogs was responsible for most of the chick deaths. Similar studies conducted in Ethiopia implicated cats as causing the highest mortality[11]. In the present study cats were the main predators during the first weeks of the chick, probably due to the fact that cats are usually predators for small animal such as rats and small birds which are less than their size. On the other hand, dogs were the main predators during the third month of chick hood. Dogs are predators to bigger animals such as sheep and goats, since they are obligate carnivores not easily satisfied with a small chick. Other predators including hawks, eagles and snakes, which would normally cause heavy mortality were not seen, probably because this study was carried out during winter.

Since the main cause of chick losses in the first three months of life was found to be predation and heat intolerance it is recommended that housing with a source of heat be provided during brooding in free-range indigenous chickens.

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