

Full Length Research Paper

An insight into guinea fowl rearing practices and productivity by guinea fowl keepers in Zimbabwe

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The production practices used to rear seventy-three guinea fowl flocks in a semi-arid zone in north-eastern Zimbabwe were investigated during the period of June to July 2002. Data were generated using participatory research appraisal techniques. Extensive (scavenging) and semi-intensive rearing systems were the two types of rearing systems practiced, with the former accounting for 81% participants. Both practices farmed an indigenous helmeted guinea fowl (*Numidia meleagris*). Men managed approximately 69% of flocks while the fowl was reared for cash generation. Average productivity indices were: flock size 8 ± 6 birds (range: 2 to 30/keeper); egg production 89 ± 50 eggs (range: 0 to 200 eggs/hen); hatchability 64% (range: 0 to 100%) and keet survival rate 60% (range: 0 to 100%). Provision of supplementary feed was given to birds under the semi-intensive feeding regime. Feed was offered in a haphazard manner and feed offered comprised mainly of crushed maize, millet or sorghum grains. Ethno veterinary services were used as substitute for conventional veterinary support. Housing provided was substandard. From the results, it was inferred that scavenging was the popular rearing system, however, overall flock productivity compromised of immense eggs losses, poor hatchability and high keet mortality; but there is merit to pursue research for better management styles as strategy to enhance productivity.

Key words: Guinea fowl, rearing, practice, productivity, rural, Zimbabwe.

INTRODUCTION

In Africa, guinea fowl is truly the invisible animal, as it is hardly counted in wealth ranking as in the case of cattle, sheep and goats; yet, guinea fowl flocks make the best use of locally available resources in the quest to produce eggs and meat. Guinea fowl represents a reliable and active contributor to the survival of the rural folk since it has economic, cultural, livelihood and social values in their lives (Sonaiya et al., 1999a; Tye and Gyawu, 2001). In Zimbabwe today, guinea fowl is now being viewed as a potential vehicle in the reduction of rural poverty, a strategy already operational in Ghana (Zakari, 2007; Ghanadot, 2009). A unique observation from this at the study site was that, guinea fowl was being used as a tool

in the promotion of ecotourism (Saina et al., 2005). It contributes to family nutrition and income; however, the contribution is yet to be investigated. Cash income from guinea fowl has been used for food, school fees and unexpected expenses like medicines (Sonaiya, 1990b). Guinea fowl provides the opportunity for better utilization of water and pasture resources in Africa that can generate additional food and income for rural communities. They are more heat tolerant and less susceptible to disease than chickens. They use alternative natural feed resources, such as grass and water plants; however, there is paucity of documented information about production practices and characteristics of local guinea fowl managed under the smallholder farming systems and insufficient knowledge of the most suitable production strategies. The task is to identify all such production practices to determine and if possible, alleviate factors which contribute to variability

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Table 1. Partition (%) of guinea fowl ownership within the household (n = 73).

Class	Proportion (%)
Male	69
Cooperative	12
Women	10
Youth (children)	9
Total	100

Table 2. Summary of classification of helmeted guinea fowls according to type (class), number of birds in the total flock population and the proportion contribution to overall flock population.

Type	¹ Number	² Percent
Growers	438	72
Breeding hens	95	16
Breeding cocks	69	12
Total	602	100

¹Number total number of guinea fowl recorded, ²percent – proportion of class of fowl.

among productivity parameters performance responses.

MATERIALS AND METHODS

Site description

A brief description of the study site was published through our research laboratory (Saina et al., 2005). Briefly, the study is cited in a semi-arid area that lies 400 m above sea level within 30°18' E and 30°45' E, and 16°00' S, 16°22' S. Annual rainfall received in the area varies from 500 to 600 mm and mean maximum and minimum temperatures were 40 and 25°C, respectively. The vegetation is savannah woodland dominated by *Colophospermum mopane* and acacia species. It has been recently opened up mainly for cotton production and also, the site is endowed with conservancies with a diversity of wildlife and tropical plants. The agricultural production system in the area is primarily crop-livestock based following the effective control of tsetse in the 1980s (Kusina et al., 2000).

Participants' selection

A total of seventy-three guinea fowl keepers constituting 46% of fowl keepers were selected at random to participate in the study spanning a duration of 2002 to 2003. Selected participants were trained in data collation and recording prior to commencement of fieldwork.

Data collection

Qualitative data were obtained through use of participatory rural appraisal techniques (PRA) as outlined by Chambers (1993). Quantitative data were obtained through the use of data sheets

supplied to each participating fowl keeper. Data recorded included: flock size and class, number of laying hens and non-layers, number of eggs produced/hen, number of eggs that successfully hatched, keets that survived to sale weight and general management.

Data analysis

Data were processed using SPSS software (1998) to depict descriptive statistics. In this study, fertility was defined as the proportion of the total viable eggs from all eggs laid over the breeding period whereas hatchability was defined as the proportion of total incubated eggs that successfully produced keets following incubation. The proportion of hatched keets that survived to attainment sale weight constituted survivability.

RESULTS

Production practices

Extensive (scavenging) and semi-intensive management systems were the two types of rearing systems practiced. Scavenging was the most popular, accounting for eighty one percent of farmers adopting the style of guinea fowl rearing. A local guinea fowl breed, the helmeted guinea fowl (*Numidia meleagris*) was the single breed reared among all flocks. The breed was a mixture of varieties that included white, lavender, pied, splashed, white breasted and pearl.

Ownership

The ownership demographics are presented in Table 1, revealing that men managed 69% of the guinea fowl flocks.

Flock productivity

Overall flock classification comprised 12% cockerels, 16% breeding hens and 72% young keets (Table 2). Overall flock productivity results are presented in Table 3. Average productivity indices were: flock size 8±6 birds (range: 2 to 30/keeper); egg production: 89±50 eggs/hen (range: 0 to 200 eggs/hen); egg hatchability: 64% (range: 0 to 100%) and keet survival rate: 60% (range: 0 to 100%). Provision of supplementary feed was restricted to birds under semi-intensive feeding regime and when offered, it was provided in a haphazard manner. Feed offered mainly comprised of crushed maize, millet or sorghum grains. Housing was sub-standard with provision assigned mainly to the young keets while the rest of the fowl were allowed to roost in tree branches in the vicinity of the homesteads. Ethnoveterinary services were used as substitute for conventional veterinary services. Borehole water was always available to all flocks.

Table 3. Survey summary results of overall fowl productivity compiled from data obtained for the 2001/2002 breeding season.

Parameter	Mean	Standard deviation	Range
¹ Flock size (n)	8	6	2-30
² Number of breeding hens	3	2	1-9
³ Breeding period (months)	4	3	3-7
⁴ Fertility	89	50	10-200
⁵ Hatchability (%)	64	31	0-100
⁶ Survivability rate (%)	60	30	0-100
⁷ Brooding period (days)	12	3	1-120
⁸ Point of lay (months)	9	2	7-14
⁹ Age at sale (months)	6	1	3-10
¹⁰ Productive life span (yrs)	1	1	1-3

¹Flock size – number of guinea fowl within flock; ²breeding hens – guinea fowls that reached the reproductive stage; ³breeding period - the time from the start to end of laying during one breeding season; ⁴fertility - egg production per hen: - number of eggs produced by one guinea fowls during one breeding season; ⁵hatchability (%) - the proportion of incubated eggs that successfully produce a keet at the end of the incubation period; ⁶survivability – number of keets that survived up to attainment of sale weight; ⁷brooding period (days) - number of days the keets are provided with warmth and feed under an enclosure; ⁸point of lay - the age at which a guinea fowl hen start laying eggs; ⁹age at sale –duration to attainment of sale weight; ¹⁰productive life span (yr) - number of years a guinea fowl is allowed to breed before culling.

DISCUSSION

The results obtained in this study clearly showed that scavenging or extensive fowl rearing practice marked by the rearing of the indigenous helmeted guinea fowl (*N. meleagris*) was predominant. This finding concurs with several reports cited in literature (Bourzat and Saunders, 1990; Ouandaogo, 1990; Sonaiya et al., 1999a; Kitali, 2004). In all cases, scavenging was common and popular among smallholder fowl keepers due to the minimal investments requirements while achieving comparable benefit (Tye and Gyawu, 2001). According to extensive literature, free-range systems or scavenging practices have made exclusive use of local breeds, as was the case in this study. The use of exotic birds was avoided due to their liability under scavenging management system (Sonaiya, 1990b). Furthermore, the purchase of exotic stock proved prohibitive and unattainable by the poor resource fowl keepers. Basically, the local guinea fowl breed is renowned for being hardy; it exhibits remarkable resistance to many common diseases of chicken and such adaptability qualities results in it being suitable to any agro-climatic condition. Additionally, local breeds do not require elaborate and expensive housing, are capable of excellent foraging capabilities and consume all non-conventional feed not used in feeding chicken, making it an ideal poultry species for the poor to rear, compared to chicken. Raising guinea fowl in an integrated crop-livestock farming situation, as was this study, was ideal, in that, it permitted flexibility in resource allocation among the numerous chores associated with

integrated crop-livestock farming. It was therefore no surprise that all participating fowl keepers in the study preferred the use of a local breed, the helmeted guinea fowl (*N. meleagris*). An interesting revelation was that the fowl was represented in a mixture of varieties that included white, lavender, pied, splashed, white breasted and pearl, a latter finding similar to a report from Sonaiya et al. (1999a).

An interesting though controversial finding was that guinea fowl management was dominated by the male gender, managing approximately 69% of all flocks (Table 2). This finding concurs with an earlier publication by Ayorinde (1990) from Nigeria who stipulated that men were the owners of guinea fowl among Nigerian households. In support of this theory, Oke et al. (2004) suggested that women were not capable of managing guinea fowl, particularly in situations when the fowl did not respond to calls from feral fowl within the vicinity (Oke et al., 2004). Although an amazing suggestion, it is contrary to earlier reports by Gueye (1998) who reported that approximately 70% of guinea fowl were under the control of women in rural Sub-Saharan Africa. Furthermore, in a comprehensive report by Sonaiya (1990b), it was revealed that women were the primary management players in guinea fowl rearing. Their duties entailed ensuring the wellbeing of fowl with children helping in nest search and egg collection. A similar result was reported from work conducted by Kusina and Kusina (1999) in Zimbabwe who indicated the fundamental role of women in management of small stock including guinea fowl. Notwithstanding the previous suggestions, it is

highly plausible that cultural differences among research groups might play a major role in decision-making with regards to livestock management styles. In spite of the differences in monument impinge on management decision regarding management of livestock, it is recommended that promotion of women into managing guinea fowl flocks under the auspices of co-ops might be a prudent strategy to confronting the recurrent rural poverty amongst sub-Saharan African communities.

Faced with the economic meltdown prevailing in Zimbabwe today, logic dictates that farmers adopt agricultural enterprises and production practices that ensure low input demands that are profitable as well as sustainable. Guinea fowl production provides one of the best alternatives for the rural populace to access meat and eggs as well as potential for revenue generation through sales of live fowl and/or eggs. Taking into consideration our results summarized in Table 3, achieving success with such performance levels is remote. According to our study results, mortality ranged from 0 to 100%, a finding that is similar to a work from Ghana. In an earlier report by Tye and Gyawu (1991), mortality losses ranged from 80 to 100%. According to these authors, the major causes of mortality could have been exposure to bad weather, poor feeding and worm infestation. Several other research reports made similar remarks to the effect that exposure of eggs to bad weather was detrimental and negatively impacted on the fertility of the eggs (Nwagu and Alawa, 1995; Tye and Gyawu, 2001; Mahamadou, 2007). A remedy to curtail losses was through the provision of proper brooding facilities for keets, thereby enhancing survival of keets (Embury, 2001). It is highly possible the flocks in our study suffered the same predicament of exposure to adverse ambient conditions due to lack of adequate housing. Fertility might also have been compromised through substantial losses of both eggs as reflected by the immense variability in response to these parameters (Table 3). There is a great probability that substantial numbers of eggs and/or keet losses might have been exacerbated by predation from predatory birds due to lack of shelter. The most common predatory birds found in the study site included hawks and eagles. The citing within a mountainous range provides goof habitat for these birds. Additionally, occasional theft of eggs and mature birds were reported.

As previously reported, guinea fowl productivity compromised not only of high keet mortality, but also through low hatchability. In principle, hatchability is under direct control of the egg pool for brooding. In our study, results in Table 3 clearly revealed hatchability exhibited immense variation ranging from 0 to 100%. Other researchers reported different hatchability responses. For example, in Mali, hatchability was reported to be uniformly high in guinea fowl, ranging from 80 to 84%, while in Nigeria, Nwagu and Alawa (1995) reported mean hatchability of 71%. These compare considerably well

with our mean hatchability of 64%. The differences among these research groups might be ascribed to egg losses as a result of predation by predatory birds or wild animals as well as eggs that remain unaccounted for. In our case, it is highly plausible that much of the cost to hatchability could be ascribed to the abundant wild animals that roam the area. Notwithstanding predation, it is important to highlight that the lack of veterinary support might have exacerbated keet losses as reported in several other researches (Nwagu and Alawa, 1995; Tye and Gyawu, 2001; Mahamadou, 2007).

Although a few stocks were offered for sale, the finding that attainment of sale weight was achieved within 12 to 70 weeks implies a reasonable response that lies in statistics; Embury (2001) flock attained slaughter/sale weight within 24 weeks. It was majorly the level of reluctance exhibited as regards selling stock. The result contradict the common belief that fowl keepers produce for sale; nonetheless, the economic viability and contribution of guinea fowl through family consumption of excess eggs and meat, coupled with occasional sale of both eggs and live birds is unequi- vocal. It is therefore recommended that a nationwide promotion of traditional guinea fowl rearing be adopted in areas where the indigenous bird is in abundance as the benefits significantly accrue to the family budget as well welfare which is expected to be positively impacted through the use of the readily available guinea fowl products, as it relates to eggs and meat, a scenario of national benefit reducing dependence on external subsidies including government and/or non-profit organization. The latter will empower the involved communities culminating in reduced rural poverty.

Conclusion

From the results, it is concluded that scavenging was the popular guinea fowl rearing system. Poor hatchability of eggs and excessive mortality of keets and general mismanagement of both eggs and keets compromised guinea fowl production. Increasing the number of hatching eggs and reducing keet mortality might improve productivity substantially. These findings have tremendous relevance and importance in the future development and expansion of indigenous guinea fowl rearing in Zimbabwe.

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