

Constraints and Opportunities to Guinea Fowl Production in Zimbabwe: A Case Study of the Midlands Province, Zimbabwe

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Abstract: A study was conducted to determine the productivity and constraints of smallholder guinea fowl production in the Mberengwa and Gokwe districts of the Midlands Province in Zimbabwe. 250 households were randomly selected to respond to a standard questionnaire. The average flock size per household was 1.52 cocks, 5.6 hens and 1.89 keets. Egg hatchability varied between farmers with an overall mean of 64 %. Guinea fowls were acquired through purchase (88%), gifts (7%), or in exchange for labour. Scavenging was the major feeding system, seasonally supplemented with grains. 63% of the farmers provided birds with drinking water. Death of keets was prevalent (89%) and was mainly attributed to possibly Newcastle disease and adverse weather conditions, with most of the deaths occurring in the cold dry season. Survival of the guinea fowls was significantly affected ($P < 0.001$) and strongly correlated ($r = 0.$) with housing system. Guinea fowls and eggs are mainly used to generate household income and for home consumption.

Keywords: Keet. Productivity, Smallholder

1. Introduction

Poultry serves as a rich source of meat protein which is crucial in human nutrition. The per capita consumption of meat protein in Zimbabwe of 13kg [17] and indeed that of the African continent of 16kg falls below the recommended minimum of 16.5kg [6]. Animal protein intake is on the decline and more so in the rural areas which make up 85% of the extreme poor in African countries [7]. This deficit has led to increased imports of poultry meat [12], from developed countries.

Domestic guinea fowl (*Numidia meleagris*) is a common farm bird reared under the extensive system by almost all rural farmers in Zimbabwe [16]. For third world countries, guinea fowl production could become more valuable than it is currently [9]. The bird thrives under all conditions, forages well, and requires little attention [13]. It retains many of its wild ancestor's survival characteristics and it grows, reproduces and yields in both cool and hot conditions. There are hardly any cultural barriers against consumption of guinea fowl products [16]. It is also relatively disease free and requires little water or attention and is almost as easily raised as chickens [12]. Despite its abundance, potential and popularity, the guinea fowl has largely remained unimproved either as a meat or egg laying bird in Africa [14].

Compared to village chickens, the guinea fowl's advantages are low production costs, premium quality meat, greater capacity to scavenge for insects and grains, better ability to protect itself against predators and better resistance to

common poultry parasites and diseases that affect chickens; for example, Newcastle Disease and Fowl Pox [11]. Scant information is available on traditional guinea fowl production practices in Sub-Saharan African countries, including Zimbabwe. There is also limited information on the performance of guinea fowl under semi-extensive and intensive systems of production [9].

The guinea fowl's potential to increase meat production among hungry countries should be given greater recognition [11]. While production of alternate poultry may never raise enough to compete with the commercial chicken, these birds could become a significant source of food for the masses, a source for substantial supplement income and employment creation [12]; [19]. Guinea fowl production represents therefore a commercial opportunity for rural and peri-urban farmers; their promotion is important in Zimbabwe.

This study aims to evaluate the Guinea fowl population and their productivity under traditional management in Mberengwa and Gokwe areas of Zimbabwe as well as to identify the main constraints to their production.

2. Materials and methods

2.1 Study area

The study was carried out in the two Districts of Midlands Province of Zimbabwe, Mberengwa and Gokwe. The climate varies from dry to semi arid, with two main seasons; the summer season extending from November to April which is wet and warm, and winter, which extends from May to

September, which is generally cool and dry. The temperatures range between 18 and 40oC. Rainfall ranges between 300 to 800 mm per annum. The vegetation is Savannah. An extensive mixed crop-livestock system is adopted by nearly 60% of the population, with cotton as a cash crop, and maize and millet are grown for home consumption. The economy is essentially based on the agricultural sector. Rural families preserve a type of traditional exploitation characterized by a low output. The keeping of domestic animals, which plays an important role in families, represents only 5.1% of the Gross Domestic Product (GDP).

2.2 Data collection

Since the whole region could not be covered due to logistic problems, the districts Mberengwa and Gokwe were selected for the survey. Households selected were based on ownership of guinea fowls. Information was solicited from respondents by administering a well-structured questionnaire, and Participatory Rural Appraisal methods (PRA) relevant to rural poultry production. Information generated from PRA was used to design structured questionnaires to justify the claims. 250 households (25 per ward) with some experience in rearing guinea fowl were randomly chosen and interviewed. The illiterate farmers were assisted in filling the questionnaires after explaining the rationale of the survey. The questionnaire was structured in a way to establish the background of sampled farmers and guinea fowl production practices and constraints. Information collected included the historical information about the farmer, flock sizes and utilisation, housing, farmers’ selection criteria, disease challenges etc.

2.3 Analysis of Data

The procedure described by [20] was used for entry and analysis of quantitative data to generate descriptive statistics (means, standard deviations and range) on flock size, number of breeding hens, breeding period, egg production per hen, hatchability, keet survival rate, brooding period, age at slaughter and productive life span.

3. Results

3.1 Household characteristics

Households were largely male headed (90%), and almost all household head (87%) attained some form of formal education. The average age of the respondents was 41 years, with almost all of them having attained some formal education. The majority of the respondents had less than 10 years experience of rearing guinea fowls.

3.2 Adoption and flock ownership

The study revealed that women owned more guinea fowl flocks than men (71% vs. 20%). 33% of the respondents acquired foundation stock from neighbours with 29% used their own cocks, 6% exchanged cocks and 2% captured the birds from the wild.

3.3 Housing

About 95% of farmers had fowl runs where the birds were kept overnight. Keets with surrogate hens and chicks were housed. 5% of the farmers in the area had their adult guinea fowls roosting on trees during the night. In this context, they are difficult to capture and when there is need for meat, catapults are used to kill the birds and sometimes the birds can escape and vanish in the bush.

3.4 Flock structure and estimates of production parameters

Table 1: Flock structure

<i>Flock composition</i>	<i>Total number of guinea fowl recorded (n)</i>	<i>Percentage in flock – proportion of class of guinea fowl (%)</i>
Breeding cocks	91	14
Keets	435	67
Breeding hens	124	19

Two methods were used to incubate the guinea fowl eggs. These included natural incubation and the use of surrogate hens. There was no artificial incubation for the eggs in the study area.

Production estimates of the guinea fowls under the current management systems practiced by the farmers are shown below in Table 2. According to the farmers, guinea fowls breed from October to April.

Table 2: Production estimates of guinea fowls/ household flock (n= 650)

<i>Parameter</i>	<i>Mean</i>	<i>± SD</i>	<i>Range</i>
Flock size (n)	11	5	2-20
Breeding hens (n)	3	2	1-9
Breeding period	4	3	3-7
Egg production/hen/year	78	45	10-180
Hatchability (%)	64	31	0-100

4. Discussion

Predators quoted by the farmers included birds of prey, wild cats and domestic dogs, snakes and rats.

The ownership of guinea fowls was dominated by females who accounted for 71% versus 20% of males. As expected, [13] observed a similar pattern in Botswana and reported that out of the 258 guinea projects financed through the LIMID programme, 61.24% were owned by females and 38.76% by males. However in the contrary, [16] found different results in Gurube as men in that part of Zimbabwe owned about 67% of the flocks. This was attributed this to the perception that guinea fowls are very strong fliers, which creates difficulties in catching and holding them making it difficult for women to rear them. However in the Midlands most men

spent most of their time panning for gold in the rivers and most of the household jobs are done by the women.

Scavenging is the main feeding system under free-range system where birds search for feed and this system was practised by all the farmers in this study was similar to the system adopted on village poultry by smallholder farmers in Guruve and Binga and at large in most sub-Saharan African countries [9] and [16]. Guinea fowl feed on a wide range of flora and fauna and they are good scavengers and often cover a great distance from home in search of feed [15]). In Botswana, the common system of rearing guinea fowl is semi-intensive and this system, birds are provided with complete feeds, grains (mainly sorghum and maize), kitchen wastes and water within sheds. However, there is need to determine the suitability of this system for guinea fowl rearing in Zimbabwe.

No rational feeding system was practised by the farmers. They allowed the birds to scavenge for most of their feed around the village. 70% of the respondents provided small amounts of supplementary feed in the form of sorghum and millet for keets and whole grains for growers and breeders. [16] also showed that only 42% of the guinea fowl owners provided small amounts of supplementary feed as crushed maize, millet or sorghum grains to keets and the rest of the birds were left to scavenge. This shows that special attention is normally given to the young growing keets so as to increase their survival chances. 87% of the farmers provided drinking water but only in the dry season. This is in line with observations of [4] of Nigeria, who reported that guinea fowls drank water in ponds during the rainy season. Poor water availability and quality may also contribute to reduced guinea fowls' productivity.

The mean flock size of eleven guinea fowls was similar to results found in Nigeria [2]. On the other hand, the average guinea fowl egg production per breeding season of 78 eggs per breeding season was lower than the 89 that found by [16] in Guruve and differences might be attributed to factors that include geographical area, climatic conditions and differences in management practices.

4.1 Constraints faced by Guinea fowl farmers

The constraints identified by the farmers in order of importance were predation and mortalities, lack of funds to build shelters and poor marketing, lack of technical support, lack of shelter. Gardens were frequently destroyed by the guinea fowls, which often resulted in quarrels with neighbors. Other constraints mentioned were inadequate supply of veterinary requisites, inadequate feed supplies, parasites and poor growth rates. Cases of theft were also reported. Poor hatching of eggs was frequently reported as guinea fowl are generally careless mothers. Most farmers use surrogate mothers, especially chickens to hatch eggs. Mortality cases were reported especially when the keets are hatched during the rainy season and cold weather conditions as they are susceptible to chilling.

There were a high proportion of guinea fowls laying eggs in the bush predisposing the eggs to theft and predation. This could have resulted in under-estimation of the productivity of

guinea fowl breeders and the fact that in nature most guinea fowls refuse to lay their eggs in fowl runs. Elsewhere, a similar survey conducted in the Damongo area of Ghana [21] reported egg losses when laid in the bush. 80% of the respondents said there was high keet mortality, either by predators such as rates or birds of prey and by an unknown disease which caused sudden death. 74% of the interviewees in Benin reported that high keet mortality losses are found in the first month [5]. Most of them might have been due to exposure to bad weather such as rain, cold or heavy dew, and parasites like mites and lice.

External parasites, mites, bugs and lice were found in guinea fowl night enclosures. They were reported to affect guinea fowl production through increased mortality in keets and low egg production of breeding hens. [2] and [13] also found health constraints of mites and lice mainly contributed by the free ranging and foraging behavior of the guinea fowls. The uses of traditional herds like aloe have recently been acknowledged in the study area, although veterinary support is needed.

There is no organized marketing for guinea fowl meats and products in the province, as it is done on small scale in some African countries such as Nigeria [15] and Botswana [13]. There is however an opportunity to improve the marketing of the birds, meat and other products.

4.2 Opportunities

An opportunity of increasing the flock sizes that was proposed was to collect eggs in the wild and hatch them either under natural methods such as using surrogate chickens or the artificial incubation methods used in Nigeria called Kerosene incubators [15].

5. Conclusions and Recommendations

The major finding of this study is that guinea fowl flock sizes were small and the production of guinea fowls needs to be improved to increase productivity. This study revealed that many factors limit guinea fowl production under smallholder conditions, and these included predators, high keet mortality, inconsistent feed supply, limited extension services, egg losses when laid in bush and health management. To increase Guinea fowl production in rural areas, it is essential to provide suitable shelter. This constitutes the first protection against predators and the elements weather. The farmers should aim to better manage keets by limiting the scavenging area which is a source of many losses. Regular feed supply has to be provided, particularly to keets that require a high-protein diet in the starting period (during the first 4 weeks). Finally, prophylactic and sanitary programs must be considered, focusing on guinea fowl flocks to prevent mites and lice.

References

- [1] Ajala, M.K., Nwagu, B.I. and Otchele, E.O. (1997). Socio-economics of free range poultry production among agroparastoral Fulani women in Kaduna State,

- Nigeria. International Network for Family poultry Development Newsletter 8 (2): 3-6.
- [2] Ayorinde, K.L., Ayeni, J.S.O. and Oluyemi, J.A. (1990). Laying characteristics and Reproductive performance of four indigenous helmeted guinea fowl varieties (*Numidia meleagris galeata pallas*) in Nigeria. *Tropical Agriculture (Trinidad)* 66 (3): 277-280.
- [3] Ayorinde, K.L.A. (1991). Guinea fowl as protein supplement in Nigeria. *World Poultry Science Journal* 47 (2): 21-26.
- [4] Bessin, R., Belem, A.M.G., Boussini, H (1998). The raising of Guinea fowl. AERLS Extension Guide 83, Poultry series 10, AERLS, ABU, Nigeria.
- [5] Dahouda, M. (2007) Guinea fowl rearing constraints and flock composition under traditional management in Borgou Department, Benin
- [6] FAO (2004). Food and Agriculture Organization, Banques de donnees FAOSTAT: Agriculture [http://faostat.fao.org/site/. htm](http://faostat.fao.org/site/.htm), pp 3. Date accessed: 24 November 2001.
- [7] Kusina J.F., Kusina, N.T., Makuza, S.M., Maphosa T and Sibanda S. (2004). A monitoring study comparing production of village chickens between communal (Nharira) and small-scale commercial (Lancashire) farming areas of Zimbabwe. *Livestock Research for Rural Development* 16 (7): 13
- [8] Kusina, J.F. and Kusina, N.T. (1999). Feasibility study of agricultural and household activities as they relate to livestock production in Guruve District of Mashonaland Province with emphasis on poultry. University of Zimbabwe, Zimbabwe, pp 93.
- [9] Kusina, J.F., Kusina, N.T. and Mhlanga, J. (2000). Poultry production in Mashonaland Central Province: The role and opportunities for women. Integrated livestock-crop production systems in smallholder farming systems in Zimbabwe. *Proceedings of a Review Workshop, Harare, Zimbabwe 10-13 January 2000*: pp 247-264.
- [10] Mareko M.H.D., Nsoso S.J. and Lebetwa N. (2008). Nutritive Value of Meat of Guinea Fowl Raised in Concrete and Bare Soil Floors from 16 – 26 weeks of Age. *Research of Animal Sciences*, 2(1): 5 – 11.
- [11] Microlivestock, (1991). Little known small animals with promising economic future. Board on Science and Technology for International Development. Washington, DC: National Academy Press, Washington, pp 115-125.
- [12] Moreki J.C. (2009). Guinea Fowl Production. Reach Publishers, Wandsbeck, South Africa, 3631. pp. 7-31.
- [13] Moreki J.C., Thutwa M., Ntesang K., Koloka O. and Ipatleng T. (2010). Utilization of the guinea fowl and Tswana chicken packages of the Livestock Management and Infrastructure Development Support Scheme, Botswana. *Livestock Research for Rural Development*, 22(11)
- [14] Nsoso, S.J., Mareko, M.H.D., Molelekwa, C (2006). Comparison of growth and morphological parameters of guinea fowl (*Numida meleagris*) raised on concrete and earth floor finishes in Botswana. *Livestock Research for Rural Development* 18 (12) 2006
- [15] Nwagu, B.I. and Alawa, C.B.I. (1995). Guinea fowl production in Nigeria. *World Poultry Science Journal* 51: 260-270.
- [16] Saina H. (2005). Guinea fowl (*Numida meleagris*) Production under smallholder farmer management in Guruve District, Zimbabwe, Department of Animal Science, University of Zimbabwe. .
- [17] Simons, P. (2009). Global Production and consumption and International Market for Poultry Meat and Eggs. Poultry Seminar, Lonolava, India.
- [18] Simons, P. (2009). Global Production and consumption and International Market for Poultry Meat and Eggs. Poultry Seminar, Lonolava, India.
- [19] Smith, J. (2000). Guinea fowl. Diversification Data Base. Scottish Agricultural College. Available:<http://www.sac.ac.uk/management/external/diversification/tableofcontents>.
- [20] Statistical Package for Social Sciences (SPSS), version 14. User's Guide. SPSS Inc. Chicago, Illinois, USA.
- [21] Teye, G.A. and Adam, M. (2000) Constraints to Guinea fowl production in Northern Ghana: A case study of the Damongo area. *Ghana Jnl agric. Sci.* 33: 153-157

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