JWPR
Journal of World's Poultry Research

J. World's Poult. Res. 2(1): 01-04, 2012

Original Article

Guinea Fowl Production in Botswana

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ABSTRACT

Guinea fowl farming is still in its infancy in Botswana; hence the population of farmed guinea fowl is unknown, as well as, their contribution to human nutrition. Presently, production occurs mainly at subsistence level and females (women) appear to dominate the industry. In Botswana, guinea fowl are raised mainly under the semi-intensive system. Guinea fowl meat is of high quality, being high in protein and low in fat content, thus it is highly prized compared to chicken meat. It appears that guinea fowl farming could be more suitable to the rural areas where commercial chicken production has failed because guinea fowl are tolerant to diseases than chickens. Some challenges to guinea fowl production include farmers' inadequate management skills necessary to raise guinea fowl successfully, inadequate technical support and lack of financial support from government extension services. It appears that guinea fowl production could be an important supplier of high quality animal protein (meat and eggs), as well as, a job creator in the rural areas.

Keywords: Botswana, disease tolerance, guinea fowl, human nutrition, keets

INTRODUCTION

Guinea fowl are indigenous to Africa. Therefore, guinea fowl have ubiquitous distribution in Africa and have distinct popularity with smallholder farmers (Nwagu and Alawa, 1995). Obike *et al.* (2011) stated that this indigenous specie makes significant contributions to animal protein availability in Nigeria through cheap meat and eggs which serve as buffer to shortages of poultry products. The bird also occurs in Asia and Latin America as a semi-domesticated species while in Europe, North America and Australia, large-scale production of guinea fowl dominates (Bonds, 1997), indicating that it is adaptable to various climatic conditions. The three principal varieties of guinea fowl recognised across the world are the Pearl, Lavender and White with the Pearl being the most common. Nwagu and Alawa (1995) reported that guinea fowl have long contributed substantially to the supply of animal protein in the form of meat and eggs. Guinea fowl meat has a higher protein content of approximately 28% compared to 20% for domestic fowl (Ayeni, 1980).

As in most African countries, commercial guinea fowl production in Botswana is still in its infancy with production occurring mainly at subsistence level. However, there is evidence of their acceptance in the country as shown by numerous visits that farmers pay to the Ministry of Agriculture offices across the country seeking technical information on guinea fowl production (Poultry Annual Report, 2006). In Botswana, a permit is required to rear guinea fowl and it is obtained from the Department of Wildlife and National Parks (Ministry of Environment, Wildlife and Tourism). However, technical support is rendered to the farming communities by Ministry of Agriculture.

The introduction of the Livestock Management and Infrastructure Development (LIMID) support scheme in 2007 by Botswana government contributed to the number of farmers that rear guinea fowl in the country increasing significantly. However, the number of farmed guinea fowl in the country is unknown probably due to poor monitoring of projects by government extension services. According to Ministry of Agriculture (2006), LIMID programme provided resource-poor farmers with a P17 000 (equivalent to USD2313) grant that was used to construct guinea fowl shelters, purchase 25 guinea fowl (20 females and 5 males) and 6 chickens, veterinary requisites and feeds. The six indigenous *Tswana* chickens (2 cocks and 4 hens) supplied to farmers were used to incubate guinea fowl eggs as guinea fowl are poor sitters (not efficient in incubating eggs). The number of guinea fowl supplied per farmer depended on the price per bird and was hence variable among LIMID beneficiaries. According to Moreki *et al.* (2010), each beneficiary received on average 18.2

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guinea fowl. However, LIMID support was stopped in 2010, thus negatively affecting the growth of the infant guinea fowl industry.

There is little information on guinea fowl farming in Botswana as the industry is in its infancy. Therefore, the objective of this review is to describe guinea fowl production in Botswana.

Advantages of guinea fowl over chickens

Guinea fowl are free from the poultry diseases that are worrisome to most farmers and scientists (Dafwang, 2004). Also, Moreki (2009) and Sayila (2009) reported that guinea fowl are tolerant (resistant) to common poultry diseases (*e.g*., Newcastle disease, Gumboro and salmonellosis) and require less labour and management (Sayila, 2009). On the other hand, Tye and Gyawu (2001) in Ghana argued that although the bird is reported to be less susceptible to most poultry diseases, colossal losses are depriving the farmers of the full benefit of the bird. The workers cited the main causes of losses to be high keet mortalities, loss of eggs and theft of adult birds. Sayila (2009) reported that the off-take rate and mortality for guinea fowl in Botswana is only 3.4% and 2.2%, respectively, whereas chickens have scores of 10.6% and 6.8%. This gives guinea fowl, considering the local conditions, a better chance of becoming a favourite in future.

In Nigeria, Ikani and Dafwang (2004) reported that guinea fowl eggs command premium prices because of their gamey flavour and have better storage ability than chicken eggs, as their eggshell do not crack easily due to their thickness. Guinea fowl eggs are thicker than chicken eggs. In Botswana, guinea fowl eggs are not sold as table eggs but as hatching eggs and are only sold to permit holders. Guinea fowl eggs are believed to enhance virility and sexual potency. Moreki (2009) reported that guinea fowl meat also commands a premium price.

Other advantages of rearing guinea fowl include low production costs, greater capacity to utilize green feeds, control of ticks and other pests and better ability to protect itself against predators (Moreki, 2009). Furthermore, guinea fowl and their eggs are used for scientific research, notably in physiology (Ikani and Dafwang (2004). These advantages make guinea fowl suitable to the rural areas where commercial chicken production has failed due mainly to high input costs and inadequacies in health management.

Rearing systems

In most developing countries, guinea fowl farming is based mainly on the free range-system (scavenging system), which is characterized by low productivity (Mallia, 1999). In this system, birds are not confined and thus are free to fend for themselves. As they scavenge, guinea fowl control insect pests and weed seeds in the fields. As birds find their own feed and shelter, the management is almost at no cost to the farmer (Ikani and Dafwang, 2004). Scavenging is the main feeding system under free-range system where birds search for feed. Saina (2005) in Zimbabwe pointed out that under this system, no standard poultry management practices are followed. In the opinion of Boko *et al*. (2011), the scavenging farming system is the basis of guinea-fowl breeding with overnight housing in overcrowded coops and "natural" feeding/watering conditions. The workers observed that the scavenging system is predisposed to the onset and spread of microbial and parasitic diseases.

In Botswana, the common system of rearing guinea fowl is semi-intensive. Under this system, birds are provided with complete feeds, grains (mainly sorghum and maize), kitchen/garden wastes and water within sheds. Open-sided houses in which ventilation is naturally aided are the most common type of housing used. The roof may be made of thatch grass or iron sheets. Usually, the houses are equipped with some laying nests, perches and runs. Floors can be of concrete or earth type, with earth floor type being common. Where concrete floors are used wood shavings and sand are the common bedding materials with sand being the most common. Nsoso *et al.* (2006) reported no significant difference in growth and morphological parameters of guinea fowl raised on concrete and earth floors in Botswana.

Ownership by gender

As is the case with indigenous chickens, guinea fowl production appears to be dominated by females. Moreki *et al.* (2010) reported that out of the 258 guinea projects financed through the LIMID programme, 157 (61.24%) were owned by females and 76 (38.76%) by males. This suggests that guinea fowl like other poultry, especially chickens play important roles in poverty alleviation and economic empowerment of women, the majority of whom are unemployed.

Feeds and feeding

Guinea fowl have a unique ability to utilize a wide range of flora and fauna as feed resources (Saina, 2005). In the wild, they eat a wide variety of feedstuffs but most important are weeds, grasses, insects and waste grains (Adeyemo and Oyejola, 2004). Insects form a component feature in guinea fowl diets suggesting that protein and energy rich components predominate in the diets for maintenance of the bird's daily activities (Tewe, 1983).

Presently, there are no formulated rations for farmed guinea fowl in Botswana as the industry is evolving. As a result, guinea fowl are fed commercial broiler and layer diets with cereal grains mainly maize and sorghum and green vegetables such as spinach and cabbage leafs used as supplementary feeds. A broiler starter diet is fed to keets for the first 3 to 4 weeks of age followed by a grower diet which is fed up to slaughter age (about 4 to 5 months of age) or up to onset of egg production, i.e., about 7 months of age. Layer diets are usually fed when guinea fowl hens start to lay eggs. To minimize feeding costs, grains, bran and kitchen/garden wastes are fed alongside complete diets. However, it is common for smallholder poultry farmers to mix complete diets with bran as a way of reducing feeding costs though this is likely to result in poor bird performance.

Breeding, egg handling and incubation

Guinea fowl are seasonal breeders and lay eggs during the warm season (Moreki, 2009). In Botswana, the hens start to lay eggs in spring and

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continues to lay for about eight months i.e., usually from September to April. Bell and Smith (2010) in Australia also reported that guinea fowl hens start laying in spring (with increasing daylight) and continue laying for about nine months. The egg-laying period can be extended and early fertility improved by using artificial lighting. In Ghana, Konlan *et al.* (2011) argued that guinea fowl hens (pearl) are capable of laying fertile eggs throughout the year when given adequate supplementary feeds with the provision of water *ad libitum*. The workers reported that in a nine months laying period a guinea fowl lays about 100 eggs. This implies that in eight months laying period as is the case in Botswana a guinea fowl hen can lay about 90 eggs.

Guinea fowl lay eggs anywhere in the house or run. The number of eggs laid depends on the age of breeding stock, health status of the flock and nutrition provided during the breeding season. Usually, farmers collect eggs no less than twice a day to minimise the exposure of eggs to extreme temperatures, to reduce soiling and incidences of broodiness. Eggs are hatched naturally using hens (guinea fowl and/or chickens) or artificially with incubators. Incubators may be automated or manual. In automated incubators egg turning is automated while in manual incubators eggs are turned by hand. For this reason, hatchability of manual incubators is usually low (Moreki, 2009).

Breeding is indiscriminate; hence inbreeding is common. The mating ratio is one male with 5 to 10 females compared to one male with 4 to 8 females reported by Bell and Smith (2010). However, the ratio of one male to five females appears to give optimal fertility. Usually, the cock and hens run together all the time.

Health management

The study of Bonkoungou (2005) in Burkina Faso reported that guinea fowl are more tolerant to common viral and bacterial diseases that occur in poultry but are intolerant to internal and external parasites because of their scavenging behaviour under semi-intensive production systems. Tye and Gyawu (2001) in Ghana observed that although the birds generally exhibited considerable tolerance to common avian diseases, leg paralysis and yolk sack infection commonly occurred. According to Moreki *et al.* (2011), the common diseases of guinea fowl in Botswana in order of prevalence are coccidiosis, helminthiasis, colisepticaemia, salmonellosis, trauma, pediculosis and hardware disease.

Because flock sizes are small only few parasites of guinea fowl have been recorded in Botswana with the three common parasites being mites, helminths and mites.

As guinea fowl is mainly in the hands of smallholder farmers, disease and parasite control involves both the use of modern medicines and ethnoveterinary medicine with the latter predominating. As a result, keet mortalities are high, indicating that technical support is critical.

Marketing of guinea fowl

The market for guinea fowl in Botswana is undeveloped due to the fact guinea fowl farming is still evolving and is mainly at subsistence level. Guinea fowl are sold live to individuals possessing a permit allowing them to raise guinea fowl or they may be dressed for the restaurants, butcheries and hotels. The majority of live guinea fowl sold go to farmers that are starting new enterprises or expanding existing flocks.

The demand for one day old keets, growing and adult fowl is steadily growing due to growing interest in the bird (Moreki, 2009). Presently, a one-day-old keet and a three month old grower sells for P20 (USD2.70) and P35 (USD4.80), respectively, whereas an adult guinea fowl fetches P80 to P150 (USD10.90. to 20.41) depending on the size of the bird and market demand. Live birds and hatching eggs are only sold to permit holders.

According to Sayila (2009), it is difficult to market guinea fowl meat in Botswana as buyers tend to be cautious to buy it for fear of contravening wildlife laws that can land a buyer a jail sentence. As a result, before buying the meat, buyers demand to see a permit that allows the farmer to rear guinea fowl. Therefore, permit system is likely to affect the consumption of guinea fowl meat, as well as, guinea fowl rearing, thus stifling the growth of the industry.

CONCLUSIONS

- Guinea fowl farming has potential to contribute to economic empowerment by creating employment (especially to women) and alleviating poverty in the rural areas where the majority of people reside and poverty levels are high.
- The egg production of guinea fowl during the breeding season needs further investigation.
- For guinea fowl farming to grow, government support (technical and financial) is required.
- It is apparent that the involvement of two government ministries in promoting guinea fowl is deterring potential farmers from embarking on this promising industry due to bureaucratic requirements.

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