

Market potential for guinea fowl (*Numidia meleagris*) products

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Abstract The survey evaluated the market potential for guinea fowl (GF; *Numidia meleagris*) products in the city of Harare, Zimbabwe. Questionnaires were administered to traders/producers ($n=17$), retailers ($n=12$), cafeteria industry ($n=33$) and consumers ($n=1,680$) to establish their perceptions on guinea fowl products. The average household size was 6 ± 2 . Each trader sold 10 ± 6.30 keets (mean \pm standard error), 33 ± 15.05 growers, 20 ± 12.69 breeders and 20 ± 10.1 crates of 30 eggs per month. Each household consumed 2.5 ± 1.39 kg of GF meat and 3 ± 0.65 dozens of GF eggs per month. Retailers purchased 52 ± 44.42 crates of GF eggs and 41 ± 30.50 /kg of GF meat whilst cafeteria purchased 33.6 ± 14 crates of GF eggs and 65.5 ± 33.52 kg of GF meat per month. Growers for breeding were the major product for sale by traders (94.1%) at a price of US\$7.50 \pm 1.74/bird. Different industries were offering different prices for guinea fowl products because of their scarcity on the market. The mean purchase price per crate of 30 guinea fowl eggs sold to the retail and cafeteria were US\$3.00 \pm 0.58 and US\$4.50 \pm 0.50, respectively. The mean purchase prices for GF meat was lower ($P<0.05$) for retailers (US\$2.5 \pm 0.81/kg) than cafeteria (US\$3.67 \pm 0.83/kg). The challenges faced by producers in

the marketing of guinea fowl products included poor supply due to the absence of good road networks to connect source areas and the market, perishability of dressed chickens due to power cuts and poor publicity. Overall, the study showed that there is greater market potential for guinea fowl products and farmers can channel their products through traders, cafeteria and retail industries.

Keywords Demand · Eggs · Growers · Keets · Meat · Supply

Introduction

Poultry production is widespread in Africa and is regarded as a cheap way of alleviating poverty amongst resource poor rural communities (Saina 2005). In most developing countries' communal areas, poultry species include chickens, guinea fowls, turkeys, ducks and pigeons in their order of importance (Kusina and Kusina 1999). The production of guinea fowls has been on the increase in smallholder farming areas (Microlivestock 1991) especially in tropical environments. Guinea fowls are members of the family *Numidia*, with *Numidia meleagris* and *Numidia ptilorhycha* being the common species in Zimbabwe (Binali and Kanengoni 1998). Important attributes of guinea fowls include resistance to many poultry diseases and cheap production costs since they can scavenge for food (Saina 2005). Guinea fowl meat was reported to have high protein and low fat as compared to broilers; hence, it has less health risks (CAB 1987). The meat is a good source of vitamins, niacin and iron, and it is comparable to game meat; hence, it has been argued that it deserves a better price than chicken (Mareko et al. 2006; Ajala et al. 2007). There is general acceptability of guinea fowl products due their quality, value as a table bird with game flavour, high meat

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to bone ratio and limited cultural barriers on consumption (Embury 2001; Saina et al. 2005; Adeyinka et al. 2007). In other developed countries, guinea fowl eggs are highly priced and served in hotels and restaurants (Smith 2000).

In many developing countries, guinea fowl production is concentrated on smallholder farmers. In Zimbabwe, for instance, guinea fowl production is concentrated along the Zambezi Valley (Kusina and Kusina 1999; Saina 2001). Other areas reported to be very promising in terms of guinea fowl production include Binga, Gokwe, Guruve, Rushinga and Matibi Districts (Chivandi et al. 2002). Saina (2005) reported that the increase in guinea fowl production in most southern African countries has led to the development of informal traders who buy and sell the mature birds for breeding and consumption, especially during the festive season. Other guinea fowl products that can find their way to the market are the breeders, growers, keets and eggs (Saina 2005).

Despite the high level of production of guinea fowls in many developing countries, there is no formal market for guinea fowl products when compared with chickens (Kusina and Kusina 1999). The informal sector dominates and is comprised of non-agricultural households such as teachers and other civil servants (Kusina and Kusina 1999). Absence of a formal marketing system means that there are very high chances of farmers selling their products at very low and unprofitable prices due to powerful negotiating skills by middlemen in the informal sector. Sub-optimal pricing usually happens when farmers are taken advantage of due to desperation for school fees or food in drought-prone areas (Sonaiya 1992). Therefore, there is need to assess the marketing potential of guinea fowl products in areas with higher demand for guinea fowl products as a step towards identifying and developing a potential large formal marketing system. Saina et al. (2005) reported that most guinea fowls in Zimbabwe are sold in large cities such as Harare which have large population sizes and many business outlets.

This research will help establish a viable market for guinea fowl products so that producers who are mainly smallholder farmers can benefit through income generation hence poverty alleviation (Saina 2005). The information can also provide insight to many developing countries on market channels they can focus on in order to promote the market of guinea fowl products. The objective of the study is to assess the market potential for guinea fowl products in a typical developing country, Zimbabwe.

Materials and methods

The study area

The study was conducted in Harare, the capital city of Zimbabwe. Greater Harare has an area of 836 km² and has a

total population of 1,632,000 with a dependency ratio of 51% (Anonymous 2004). The city comprises of high (Mbare, Kuwadzana, Glenview), medium (Acardia, Sunningdale, Waterfalls) and low-density (Borrowdale, Mt Pleasant, Newlands) suburbs that were used for the consumer and retail surveys.

Sampling procedures

Formal survey questionnaires were administered between January and February 2009 to establish the perceptions of Mbare Market guinea fowl traders ($n=17$), retailers ($n=12$), cafeteria industry ($n=33$) and consumers ($n=1,680$) regarding marketing of guinea fowl products. A total of four research assistants were used to collect data from retail, consumer, cafeteria and traders' surveys as detailed below.

A trader's survey was conducted in Mbare farmer's market where guinea fowl products are sold. There were 20 tables of farmers selling different birds including guinea fowl products. All the farmers, except three who refused, were interviewed. For the consumer survey, stratified random sampling was done to divide suburbs into low-, medium- and high-density suburbs in Harare. Three suburbs were chosen from each of the low-, medium- and high-density suburbs. Ten percent of the customers shopping per day at shopping centres close to the picked suburb were selected by interviewing every tenth person coming to shop.

Regarding the retailer survey, stratified random sampling was done to divide supermarkets into four groups, Bon Marche group of supermarkets, OK group of supermarkets, TM group of supermarkets and other supermarkets located in different areas. From each group of supermarkets, three supermarkets were picked randomly. The cafeteria industry included all hotels, restaurants and supermarkets that were serving dishes based on guinea fowl products in and around the city of Harare.

Data collection

Pertaining to guinea fowl products, the consumer survey questionnaire focused on preference, purchase frequency, willingness to buy, source of these products, frequency of consumption, availability and promotion. The retailer and cafeteria questionnaires were used to collect data on frequency of selling, willingness to sell guinea fowl products, quantities sold, price of animal products and how often they would like to purchase guinea fowl products. The traders' questionnaire focused on frequency of selling guinea fowl products, transport cost, feed cost and price of different guinea fowl products.

Data analysis

The Statistical Analysis System (SAS 2003) was used for data analysis. PROC FREQ of SAS was used to generate

descriptive statistics such as frequency of buying or selling guinea fowl products, constraints faced, time of selling products, age and race of consumers and frequency of selling by different outlets. ANOVA was used to analyse data for average transport costs, guarding costs, feeding costs, level of supply and demand, producer and retail prices of guinea fowl products. The Kruskal–Wallis test (NPAR1WAY procedure) was used to rank different animal products according to level of consumption and sells. Chi-square test for association between guinea fowl products demand with suburbs, race, age and gender was also done.

Results and discussion

About 51% of the respondents were women. Ethnic groups were distributed as 92.6% blacks, 9.5% whites, 13.1% coloured and 3.6% Chinese. About 39% of consumers consumed GF meat (Table 1). Seventy-eight percent of the respondents confirmed they were willing to purchase the meat if available on the market. The results of the consumer survey showed that there is a demand for guinea fowl products. There was an association between suburb and consumption of guinea fowl meat. There were no taboos associated with guinea fowl products. The findings agree with those of Kusina and Muchenje (1999) who reported that there is potential market for guinea fowl products since there are no taboos associated with their consumption. About 15.5% of the consumers were unhappy about the irregular supply, and 9.5% said that the price was high.

Sixty-six percent of respondents liked guinea fowl meat because of good taste while 8% said they were not used to these products and were not very interested in them. Lean and moderately juicy guinea fowl meat was reported to be

better appealing to the health conscious population (Gracey et al. 1999; Mareko et al. 2006).

Fifty-six percent of the respondents said that they had purchased guinea fowl meat before. Most people would prefer to purchase guinea fowl meat as either cuts (41.1%) or dressed (20.6%) when compared to those who want to purchase it as live (31.5%) and as a prepared meal in hotels or restaurants (6.9%). Respondents preferred purchasing guinea fowl meat from the following sources, supermarkets (42.5%), local farmer (17.8%), farmers' market (16.4%), butchery (11%), hotel (8.2%) and restaurant (4.1%), respectively. Many consumers said that they eat guinea fowl meat irregularly and at an average of 2.5 ± 1.39 kg/household/month. Guinea fowl business is fast during the festive season as 77.8% of consumers buy guinea fowl meat during that period and 51% of respondents said that most table egg purchases are in the first quarter of the year. This implies that farmers would need to establish links with supermarkets where most people prefer to buy meat from. However, farmers need to first improve on the marketing standards of their guinea fowl products (Sonaiya 1992) by focusing on improving on the marketing mix such as grading and packaging the eggs (Anonymous 2009). These principles represent elements of marketing strategy that can be controlled by a farmer in developing countries.

Table 2 shows that the demand and consumption of chicken eggs were far above that for guinea fowls (Table 2). The findings disagree with Ajala et al. (2007) who reported a relatively more active market in guinea fowl eggs than chicken eggs in Nigeria. This observation might be attributed to poor supply of guinea fowl eggs at the market; hence, many people might not be very familiar with them. An interesting finding was that many consumers (51.2%) had bought guinea fowl eggs before and 90.4% expressed

Table 1 Consumer preference, retailers and cafeteria outlets selling (percentage) different animal products in Harare

Animal product	Consumer survey ($n=1,680$)	Retailer survey ($n=12$)	Cafeteria survey ($n=33$)
Beef	89.3	100	100
Chicken	95.2	83.3	100
Pork	76.2	83.3	71.4
Fish	82.1	66.7	78.6
Mutton	44.1	41.7	53.6
G/fowl meat	39.3	50.0	53.6
Goat	42.9	58.3	60.7
Turkey	25.0	16.7	25.0
Game	32.1	33.3	17.7
Duck	15.5	8.3	14.3
Chicken eggs	100	100	100
G/fowl eggs	17.0	16.8	7.1
Turkey eggs	8.5	16.7	7.1
Duck eggs	8.5	8.3	7.1

Table 2 Consumer preference, retailer and cafeteria sells mean rank for different animal meat and poultry eggs in Harare

Animal product	Consumer survey (n=1,680) Preference rank	Retail survey (n=12) Sells rank	Cafeteria survey (n=33) Sells rank
Beef	(2.15) ²	(1.17) ¹	(1.43) ¹
Chicken	(1.86) ¹	(1.83) ²	(4.13) ²
Pork	(4.39) ³	(3.75) ³	(4.11) ³
Fish	(4.84) ⁵	(3.92) ⁴	(4.13) ⁴
Mutton	(5.96) ⁶	(5.42) ⁵	(5.63) ⁶
G/fowl meat	(4.64) ⁴	(5.50) ⁶	(4.71) ⁵
Chevon	(6.42) ⁷	(6.88) ⁷	(6.89) ⁷
Turkey meat	(9.08) ⁹	(7.92) ⁸	(7.88) ⁸
Game meat	(7.75) ⁸	(9.04) ⁹	(9.55) ¹⁰
Duck meat	(9.08) ¹⁰	(9.58) ¹⁰	(9.00) ⁹
Chicken eggs	(1.10) ¹	(1.00) ¹	(1.07) ¹
G/fowl eggs	(1.51) ²	(1.46) ²	(1.96) ²
Turkey eggs	(1.99) ³	(1.92) ³	(2.93) ³
Duck eggs	(2.95) ⁴	(2.63) ⁴	(3.96) ⁴

Superscript represent ranking on a scale 1–10 for meat and scale 1–4 for eggs whilst the figure in brackets represents the Kruskal–Wallis mean rank. The lower the rank the higher the preference or sales for the product

willingness to purchase them. Saina et al. (2005) found that minimal egg sales for consumption were at variance with the hypothesis that improvement in production would translate into high household protein intake. This might indicate farmer intelligence and priority in keeping eggs for hatching with emphasis to ensure sufficient breeding stock in view of the excessive keet mortality (Saina et al. 2005). Consumers suggested the need to commercialise guinea fowl production in order to limit death of keets and adequately supply the market with products as was previously reported by Chivandi et al. (2002). The observation that the demand for growers for each trader exceeds supply by an average of 10 ± 2 shows great opportunities that exist within the guinea fowl value chain. This trend was also reported in Ghana (Zakaria 2007). Farmers have the potential of exploiting the insatiated guinea fowl market in the cafeteria and retailer industries. Farmers increase their income and hence improved livelihood by expanding their GF business. The shortage of chicken products on the market might have contributed to the observed high demand of guinea fowl products as they are a close substitute.

There were no differences in the price for chicken and guinea fowl meat despite high production costs for the latter; otherwise, people would prefer to go for chicken (Table 3). The market system in Harare is distorted for the period because of a number of economic challenges. It is not clear whether this marketing environment would prevail when there is economic stability, and there are many alternative products on the market. Hotels preferred purchasing guinea fowl meat at around 12 to 14 weeks when the meat is still tender, but in supermarkets, the bird should have a minimum dressed weight of 1 ± 0.15 kg, which implies a slaughter age of around 16 weeks for the

semi-intensive production system. Although pork is counter-indicated in many religions and cultures (Sonaiya 1992), its demand was higher in Harare than for guinea fowl meat (Table 1). This observation might be due to the large Christian population in Harare, most of which allow consumption of pork. There was no association between age, gender and attributes such as demand or product preference.

The traders' survey ranked the guinea fowl products that were being sold on the market from the highest to the lowest and the corresponding percentage of farmers selling them as growers (94.1%), table eggs (58.8%), breeders (58.8%), keets (29.4%) and hatching eggs (23.5%; Table 4). Amongst traders, 64.7% were men whilst 35.3% were women. Low supply of keets at the Harare Mbare market might simply be a demand–supply interface. Eggs under extensive production systems are difficult to locate in the grasses; hence, few are supplied to the market. Many traders (70.6%) indicated that guinea fowl table eggs were mainly sold in the first quarter of the year. This coincides with the rainy season when guinea fowls will be at their peak laying (Saina et al. 2005).

Breeders and growers were indicated to have high sales during the last quarter of the year. Traders purchased them at $US\$4.00 \pm 0.71$ /bird and the selling price was $US\$7.50 \pm 1.93$ /bird. Guinea fowl eggs were purchased at an average price of $US\$3.80 \pm 0.55$ /crate and sold at about $US\$5.70 \pm 0.60$ /crate. Sixty-five percent of the traders obtained guinea fowl products from middlemen while 35% sourced directly from farmers. The general observation was that the prices of guinea fowl products for those obtaining them from middlemen were slightly higher than those who purchased directly farmers. Eggs purchased from middlemen cost $US\$4.00 \pm 0.50$ whilst birds were $US\$5.5 \pm 0.80$. Eighty percent

Table 3 Retail and cafeteria mean prices (\pm standard error) per kilogramme of meat and per crate of 30 eggs in Harare

Animal product	Retailer survey ($n=12$) Mean price (\pm SE) (US\$)	Cafeteria survey ($n=33$) Mean price (\pm SE) (US\$)
Beef	2.25 \pm 1.54	5.93 \pm 1.27
Chicken	4.00 \pm 0.47	7.00 \pm 1.27
Pork	4.00 \pm 0.60	6.46 \pm 1.45
Fish	3.90 \pm 0.51	6.35 \pm 1.25
Mutton	3.50 \pm 0.80	6.04 \pm 1.26
Guinea fowl meat	4.00 \pm 0.79	7.00 \pm 1.47
Goat	2.90 \pm 1.00	5.71 \pm 1.44
Turkey	4.20 \pm 1.22	6.79 \pm 0.70
Game	3.00 \pm 0.66	6.04 \pm 1.04
Duck	3.8 \pm 0.75	6.14 \pm 1.20
Chicken eggs	6.90 \pm 1.83	7.60 \pm 0.82
Guinea fowl eggs	6.50 \pm 0.65	7.51 \pm 0.88
Turkey eggs	6.20 \pm 1.22	6.50 \pm 0.70
Duck eggs	5.91 \pm 0.79	6.50 \pm 0.76

SD standard error, US\$ United States Dollars

of traders reported that demand and supply for breeders and hatching eggs were low, maybe because there are few people in Harare who buy guinea fowls to rear unless they are taking them to rural areas. People are likely to purchase hatching eggs, especially in April so that hatching of keets coincides with feed availability when people harvest; hence, the demand was low during the study period (January and February).

The majority of traders (88%) preferred delivery of guinea fowl products to the market rather than collecting them directly from farmers. Many traders (82.4%) had problems of getting transport to source areas. The widely used mode of transport by traders to ferry guinea fowl products from source areas to the market was by bus (76.5%) followed by own car (17.7%) and hired transport (5.9%). Many people preferred to transport by bus since it was cheaper although some said it inconvenienced them since they walked long distances from bus stops to farmers' residences and the eggs might not be very secure during transit. There is need to improve transport to ensure efficient distribution of GF products. This is consistent with Kusina et al. (2002) who revealed that one of the factors which limits the range of market outlets and confines poultry sales to nearby consumers (within the village) is the absence of road networks and reliable transport to distribute products from rural to urban areas.

Table 4 Number of traders selling guinea fowl products at Mbare market in Harare and mean purchase and selling price in US\$ (\pm standard error)

Product	Traders selling ($n=17$)	Mean purchase price (\pm SE)	Mean selling price (\pm SE)
Keets	5	2.47 \pm 0.51	4.18 \pm 0.81
Growers	16	3.76 \pm 0.66	7.17 \pm 1.74
Breeders	10	4.00 \pm 0.71	7.64 \pm 1.93
Hatching eggs	4	3.88 \pm 0.49	5.64 \pm 0.61
Table eggs	10	3.88 \pm 0.70	5.29 \pm 0.59

SE standard error, US\$ United States Dollars

Sixty-five percent of the traders were sourcing guinea fowl products from Mashonaland Central Province, especially Guruve area, while the rest collected them from areas such as Buhera, Beatrice and Rusape. Many traders (82.4%) would only visit the source area or place new orders when there were very few products in stock while 17.6% would go once a month. It is costly to keep a large batch of live guinea fowls at the market since the feed cost is about US\$1.00 \pm 0.25/bird/month and security costs about US\$8.41 \pm 2.12/month/batch. However, 50% of farmers said that they never calculate these expenses. Generally, traders stated that the demand for guinea fowl products is higher than the supply; hence, farmers might need to take advantage of the lucrative market. Average sales per month (\pm standard deviation) for each trader were 10 \pm 6.30 keets, 33 \pm 15.05 growers, 20 \pm 12.69 breeders and 20 \pm 10.10 crates of eggs. Eighty-eight percent of traders thought guinea fowl products have a future while 12% thought that they will be pushed out of the market when eventually production of chicken products flood the market. All farmers stated that chicken had the highest turnover whilst ducks had the least turnover just like in the consumer and retail survey.

The retailer and cafeteria surveys reviewed that all outlets want to buy guinea fowls as dressed. However, smallholder farmers are limited in terms of temperature

control, preservation practices and handling of meat. Perishability of dressed poultry birds was reported as a big problem by 50% of farmers; hence, 88.2% of the traders/producers preferred selling live birds. The findings concur with Born (2004) who reported this problem especially in rural areas. Farmers can form a cooperative and get training in guinea fowl processing to increase shelf life, organize efficient transport and merchandising in order to improve marketing. Retailers said that they normally want to deal with somebody who can consistently supply good-quality products. The emphasis of retailers was to avoid bacteria growth and food-borne outbreaks in the meats in order to safeguard consumers. The concerns of retailers are in line with studies carried out in Moscow where food safety was the top-ranked consumer attribute with an average of 9.5 on a 10-point scale (Wulfhorst et al. 2002). This makes it difficult for smallholder farmers to be regular suppliers because their production level is low and product quality is not guaranteed (Kusina and Muchenje 1999; Saina 2005). Many retailers and cafeteria managers indicated that they prefer standard eggs (75%) and large eggs (25%).

Farmers in developing countries need to improve on marketing standards for guinea fowl meat and eggs covering grading, quality, weight and labelling in order to penetrate many retail outlets. Farmers can supply products to retail outlets, and these outlets package using their trade marks to create good customer perception. The packaging should also have more information about the recipes and advantages of guinea fowl products as an organic product. Guinea fowl products can be advertised as suitable for the health conscious population since the meat is lean and there are no additives during production which might interfere with a healthy active lifestyle. This is very important because price points are a function of the degree of innovation found in the product. The more innovation and thus value added, the more latitude retail outlets will have in setting a price, for example, selling guinea fowl cuts. There is need to set a price that serves the customer well and maximizes profits to the organization. If farmers are offered higher prices than for chicken, they will cover their higher production costs and remain in business. Promotions are also required so that they illicit buying response once customers get the message. Tactics that can be used by all stakeholders in promoting guinea fowl products include personal selling and advertising using posters to indicate their selling points (Kotler 1994).

All hotels indicated that they were very willing to purchase guinea fowl meat and eggs and serve it as a traditional menu. The survey showed that guinea fowl meat is considered a delicacy and is served occasionally in large prominent five star hotels such as Crown Plaza-Monomotapa. Guinea fowl eggs are used to make egg

salad or egg and potato salad. However, 81.5% of hotels, restaurants and supermarkets in the cafeteria industry highlighted that there was irregular supply of products mainly from traders, and they were not aware of reliable sources whilst 18.5% thought there was need to create awareness of the product to clients. Just like the retailers, people in the cafeteria industry mentioned that they would like a consistent supply of guinea fowl meat so that they offer the traditional menus to their wide clientele base regularly. An average of 52 ± 44.42 crates of guinea fowl eggs and 41 ± 30.50 kg of meat are required by each retail outlet per month, and they are prepared to pay $US\$2.5 \pm 0.81/\text{kg}$. However, the cafeteria industry requires an average of 33.6 ± 13.95 crates of eggs and 65.5 ± 33.52 kg meat per month, and they offer higher prices of $US\$3.67 \pm 0.83/\text{kg}$ of meat (Table 3). Fifty-eight percent of cafeteria outlets thought guinea fowl products had a future whilst 25% thought there was no future and 17% were not sure. From both the retail and cafeteria surveys, about 89% of respondents indicated that they neither give their clients information about the source of guinea fowl products nor recipes. This is a serious blow in the marketing of guinea fowl products since they will not get much publicity.

The better capacitated cafeteria industry can assist farmers in developing countries by promoting guinea fowl products. Hotels need to dedicate time and money to advertising guinea fowl products via the electronic media and pamphlets as niche area in the industry. These organizations are big enough and can use the web-marketing model to create customer satisfaction by building value-based relationships. Hotels and restaurant inns can create mailing lists and newsletters to effectively establish themselves whilst building rapport with customers. This will enable the cafeteria industry to understand customer needs and find solutions of superior value, quality and service. In addition, online web has the advantage of being always available when customers need information, and it ensures faster response time compared to offline methods (Constantinides 2002). The cafeteria industry has failed to realise that the easier their customers get information on guinea fowl products and their recipes, the more likely they are to respond favourably. Promotional activities can include discounts for guinea fowl products so as to build a large clientele base and command customer loyalty (Kotler 1994).

Conclusions

Problems faced in the marketing of guinea fowl products include poor supply due to the absence of road networks and reliable transport to distribute products from rural to urban areas, poor publicity of guinea fowl products and

rotting of dressed guinea fowls due to recurrent power cuts. It was concluded that there is greater market potential for guinea fowl products in developing countries like Zimbabwe, and farmers can channel their products through traders, cafeteria and retail industries. Farmers in other developing countries can use this information to identify potential retail and cafeteria outlets for marketing guinea fowl products. This will go a long way improving food security and ensuring poverty alleviation.

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