

A survey of indigenous tswana chicken farmers in Kgatleng agricultural district in Botswana

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ABSTRACT

The objectives of this study were to determine the production and marketing parameters of indigenous Tswana chickens in Kgatleng Agricultural District in Botswana. Data was collected through a structured questionnaire from five of the sixteen extension areas of this district. A total of 100 farmers i.e. 20 from each extension area, chosen at random were interviewed. Most farmers were predominantly women (84%), older than 35 years (78%) and with primary (58%) education. The majority of farmers (99%) interviewed practiced traditional farming system, characterised by chickens scavenging with occasional supplementation (97%), free access to clean water (100%) and no housing in most cases (87%). Most farmers (76%) kept 1-20 chickens per household and used a mating ratio of 1 cock:10 hens. Most hens (94%) laid 11-15 eggs per clutch per hen and most (75%) hatched all eggs from which 6-10 chicks per clutch per hen reached sexual maturity. The common disease that farmers could identify was Newcastle (79%), while mites (100%) was the common external parasite identified as negatively affecting production of chickens in the area. None of the farmers (0%) kept any records and they exhibited limited knowledge of modern chicken farming and improved management. There were no organized markets of indigenous chickens. Most farmers (85%) sold chickens whenever there was financial need and also when chickens had multiplied to reduce the costs of inputs. Research on indigenous Tswana chickens should be carried out to increase their productivity and explore marketing strategies in order to benefit the people of Botswana.

Keywords: Indigenous chickens, demographic, production and marketing parameters, Botswana

INTRODUCTION

Botswana is 98% self-sufficient in poultry meat and eggs and imports only special cuts of meat (Poultry Annual Report, 2001). In 2002 the per capita consumption of poultry meat was 20kg and 78 eggs (Poultry Annual Report, 2002). The poultry industry also creates employment to about 2000 people and is a source of income for rural and urban dwellers (Moreki, 2000). The population of chickens in Botswana is estimated to be approximately 15 million. Eighty percent of these are exotic breeds reared under commercial farming, while 20 percent are indigenous chickens kept

under traditional farming system (Moreki, 2000). The traditional farming system is characterized by low inputs, poor medical care, poor housing, poor feeding regimes and mediocre management (Aganga et al., 2000). The advantages of rearing indigenous chickens over the raising of industrial chickens, according to Moreki (2000) in Botswana, Mlozi et al. (2003) in Tanzania, Msoffe et al. (2002) in Tanzania and Tadelle et al. (2003a) in Ethiopia are; they are relatively easier to raise, they can often be combined more conveniently with other kinds of farming

practices, they require lower inputs, they do not need permanent housing i.e. they scavenge, they have a more stable price of finished products, their market price is higher than that of broilers, they give more free choice to farmers in time of selling chickens and they have a higher reproduction rate per unit time. The constraints that reduce the production of indigenous chickens according to Gueye (1998) in Senegal, Farooq et al. (2000) in Pakistan and Moreki (2000) in Botswana are; poor housing systems, poor feeding, lack of disease and parasite control, high predation and poor management. The objectives of this study were to investigate the production and marketing parameters of indigenous Tswana chickens in Kgatleng Agricultural District in Botswana.

MATERIALS AND METHODS

A survey was conducted in five out of the sixteen extension areas of Kgatleng Agricultural District in Botswana, namely; Bokaa, Malotwane, Mochudi, Morwa and Rasesa. A formal questionnaire was used to collect information on demographic characteristics of farmers keeping indigenous chickens, production and marketing parameters of the chickens. In each extension area 20 farmers were chosen randomly and interviewed.

Procedure Frequency in Statistical Analysis System (SAS) (SAS,1999-2000) was used to analyse the data.

RESULTS AND DISCUSSION

Out of the 100 farmers interviewed 16 and 84% were male and female, respectively. This contrasts with the surveys of Nsoso et al. (2003) for pigs and Nsoso and Rabasima (2004) for beef cattle where the majority of the farmers were males (76-87%). However, this is supported by the finding of Tlhwaafalo

(2004), which has shown that the frequency of women (48%) and men (52%) participating in small stock production were nearly equal. Moreki (2000), also reported that the majority of people employed in the poultry industry were women. Tadelles et al. (2000) reported in Ethiopia that rearing of poultry is one of the most appropriate activities for rural women. These findings could be attributed to the fact that chickens are smaller in size hence easier to raise in terms of day to day management compared to larger animals such as pigs and cattle, therefore, more women are keeping them.

Table 1 Demographic characteristics of farmers keeping indigenous Tswana chickens in Kgatleng Agricultural District in Botswana

Parameters	Frequency (%)
Gender	
Female	84
Male	16
Age	
Less than 20	7
21-35	15
36-55	31
More than 55	47
Marital status	
Single	41
Married	39
Widow	18
Divorced	2
Educational level	
None	15
Primary education	58
Secondary	22
Tertiary	5

Most farmers (78%) were older than 35 years, with 58 and 22 % having primary and secondary education, respectively (Table 1). These findings are consistent

with those of Nsoso et al. (2003) and Nsoso and Rabasima (2004), where similar phenomena are reported for farmers who keep beef or pigs in Botswana. In agreement with these studies, young people i.e. those less than 35 years of age and secondary school leavers should be attracted into farming because the former are future farmers and the latter have education and skills, both attributes, which are required to increase productivity.

All indigenous chickens (100%) were raised under traditional management system characterized by low inputs, poor housing and poor management. The majority of the farmers (76%) owned 1-20 indigenous chickens per household. A similar trend is reported at national level, where approximately 91% of farmers own 1-20 indigenous chickens per household (Botswana Agricultural Census Report, 2003). Farooq et al. (2000) also reported a similar phenomenon in Pakistan, where a flock size of 1-12 birds per household was the most common. According to Table 2 all farmers (100%) kept more hens birds than cocks for breeding purposes, resulting in 1cock:10hens.

All chicken farmers (100%) mentioned that the best breeding season for indigenous chicken was winter (Table 2). Nevertheless, respondents acknowledged that breeding is possible all year round, depending on the amount and frequency of feeding, for instance every morning and evening and type of feeds provided such as millet which increased chicken production. Breeding in indigenous chickens is not controlled because the cocks and hens run together all the time. As a result hens produce chicks all year round as reported by Moreki (2000). The majority of the farmers (94%) indicated that 11-15 eggs were laid per clutch per hen (Table 2).

Parameters	Frequency (%)
Production system	
Extensive	99
Semi-intensive	1
Intensive	0
Number of hens per flock	
1-10	46
11-20	38
21-30	11
31-40	3
More than 40	2
Number of cocks per flock	
1-5	89
6-10	9
11-15	2
Mating ratio in each flock	
1cock:10 hens	100
Eggs laid per clutch per hen	
1-5	0
6-10	6
11-15	94
More than 15	0
Eggs hatched per clutch per hen	
1-5	0
6-10	25
11-15	75
More than 15	0
Chicks that reach sexual maturity per hen	
1-5	0
6-10	67
11-15	33
More than 15	0
Production expansion	
Yes	80
No	20

Table 2 Production parameters of indigenous Tswana chickens in Kgatleng Agricultural District in Botswana

This confirms the findings of Moreki (2000) that indigenous chickens laid 0-15 eggs per clutch per hen. The highest number of eggs laid per clutch per hen was realized in the winter period. The majority of the farmers (75%) reported

that 11-15 chicks per clutch per hen were hatched in winter. In summer

Table 3 Management practices of indigenous Tswana chickens in Kgatleng Agricultural District in Botswana

Parameters	Frequency (%)
Feeding system	
Scavenge and occasional supplementation	97
Scavenge only	3
Mineral supplements	
Yes	0
None	100
Water source	
Tap water	100
Watering frequency	
Ad libitum	100
Housing type	
None	87
Free range and dirt runs	12
Dirt runs	1
Methods of controlling diseases	
Traditional	82
Traditional and modern	10
Modern	8
Season of diseases	
Summer	100

temperatures are high which result in most eggs deteriorating in quality (Moreki 2000) hence lower hatchability, whereas the reverse is true in winter. The majority of the chicken farmers (67%) reported that on average 6-10 chicks per clutch per hen reached sexual maturity (Table 2). These results agree with that of Moreki (2000) who stated that on average 7 ± 1.25 chicks per clutch per hen managed to reach sexual maturity,

signifying a mortality rate of approximately 50%

All farmers (100%) used their own savings to establish or purchase chickens for rearing. It is worth noting that farming with pure indigenous chickens should be seen as value adding because very little medicines are used hence residue-free meat is produced and as such farmers can capitalize on the niche markets for healthy meats (Jaume and Alfonso, 2000; Ramsay et al., 2000) and organic niche markets. This could enhance sales of indigenous chickens. Most respondents (80%) expressed the view that they would like to expand their production (Table 2). Generally, farmers were very positive with the rearing of these chickens and felt it is time that they were given financial and technical support in order to improve their production system. They were very much concerned about the high costs of feeds, lack of fencing to protect their chickens and high rate of diseases and parasites that reduced their production. Farmers suggested that the government and other stakeholders should specifically develop schemes and financial assistance to enable them to improve the production by means of employing better management practices.

Most of the farmers (97%) occasionally supplementary fed their chickens (Table 3), although chickens were allowed to scavenge during the day. The main supplementary feeds were cereals i.e. millet and mixed fowl feed (mixture of sorghum, maize and sunflower), which were purchased from local stores. Bran obtained from primary schools and milling plants around the villages was also widely used. All members of the household were responsible for feeding and watering chickens. No farmers gave mineral supplements such as calcium,

phosphorus and sodium. Ninety-six percent of the farmers used tap water as their source of supply that was provided ad libitum (Table 3). This is in contrast with Gueye (1998), who reported that generally indigenous chickens are not given any supplementary feeds even during periods of food scarcity and water provided in the extensive system is often not clean. The majority of the farmers (87%) did not house chickens at night, which meant that chickens roosted on tree branches, bush fence, piles of bricks/blocks and walls (Table 3). These chickens were prone to predation and theft at night compared to those that were provided with shelter. Moreki (2000) also found that risks of predation and theft were more common with birds that were not confined at night than with those that were sheltered at night.

Seventy-nine percent of the farmers mentioned that Newcastle disease frequently occurred and caused major losses (Table 3). This is supported by Gueye (1998), Moreki (2000) and Mushi et al. (2000) who reported that Newcastle disease is the most serious endemic disease of poultry throughout the African continent. The majority of the farmers were able to describe the symptoms of Fowl pox such as scab around the eyelids and wattles, whereas, they failed to describe symptoms of Newcastle except that they identified it with local names. Common parasites of indigenous chicken reported by farmers were mites. All the farmers (100%) indicated that parasites reduced the productivity of their chickens, especially in summer, which could be attributed to a combination of high temperatures and high humidity. Such conditions are conducive to the multiplication of parasites. All farmers (100%) also

Table 4 Use, record keeping and marketing parameters of indigenous chickens in Kgatleng District, Botswana.

Parameters	Frequency %
Use of chickens	
Income generation	1
Home consumption	45
Income generation and home consumption	54
Chickens consumption in last 6 months	
0	31
1-10	63
11-20	4
21-30	2
Chickens given away in last 6 months	
0	78
1-10	22
More than 10	0
Records kept	
None	98
Yes	2
How often do you sell	
Never	15
Occasionally	85
Use of money from chicken sales	
Food	52
School levies	18
Burial society	12
None	18
Chickens sold in last 6 months	
0	65
1-10	32
11-20	1
More than 20	2
Selling price for cocks (Pula)	
0	20
1-10	0
11-20	17
21-30	61
31-40	2
Selling price for hens (Pula)	
0	15
1-10	0
11-20	60
21-30	24
31-40	1

indicated that Newcastle disease predominantly occurred in summer.

Eighty percent and 95% of the farmers controlled diseases and parasites with traditional medicines, respectively. Common traditional medicines used were *Aloe spp.*, potassium permanganate, tobacco and other local herbs.

Fifty-four percent of the farmers kept chickens mainly for home consumption and to generate income, while 45% kept them for home consumption only and 1% kept them for generating income only (Table 4). Most farmers (94%) had killed between 0-10 chickens over a six months period for home consumption and most (78%) did not give chickens as gifts to visitors. Therefore, indigenous chickens were mainly kept for consumption. These results confirm those reported by Mopate and Lony (1999) in Chad, that the two main reasons for keeping indigenous chickens are to provide meat for special banquets for family guests and for home consumption.

Most farmers (98%) did not keep any records (Table 4). Ninety-eight percent mentioned that due to failure to keep records they were unable to determine whether they made profit or not. The majority of the respondents (85%) sold their chickens to local consumers. Selling was carried out to reduce cost of production and enhance better management. The majority of indigenous chickens (85%) were sold to meet financial needs and the majority of farmers (97%) had sold very few chickens (0-10) in the last six months. There were no indigenous chickens sold in the market centres as it is the case in some African countries. This is a clear indication that there are no organized markets for indigenous chickens. Eighty-five percent of the farmers sold chickens for meat, while eggs were mainly used

for hatching and few were given to the children to eat. This is in line with Yami (1995) in Ethiopia who found out that in the traditional system some eggs are retained for setting under broody hens and a small proportion is utilized for human consumption.

After selling chickens, 52% of the farmers indicated that they used the money to buy food for their families (Table 4). This is consistent with the findings of Mushi et al. (2000) in Botswana, Tadelle et al. (2000) in Ethiopia and Missohou et al. (2002) in Senegal, which indicated that indigenous chickens play a major role in the nutrition of the rural poor in many parts of Africa. The money from chicken sales was also used to pay school levies and pay contributions at burial societies. The results support the findings of Gueye (2003), who concluded that indigenous chicken production was an important component of the agriculture and contributed to household income. The farmers sold young cocks first and kept most of the young hens for breeding. The cocks were more expensive than hens because they were sold as breeding stock. The average prices for an adult cock and hen ranged between P21-30 and P11-20, respectively. Prices were uniform across the extension areas, which is not surprising since there are adjacent to each other and mobility between the areas is high.

All chicken owners (100%) did not seek any information from extension agents on production and marketing, rather preferring to rely on information from other farmers. Nsoso et al. (2003) also reported a similar phenomenon in traditional pig farming where most farmers (90%) did not seek any information even from extension officers provided for free by the government.

Ninety-nine percent of the respondents mentioned that there were no problems in marketing indigenous chickens. They indicated that demand for chickens was high regardless of how much each desire and nutritional requirements. These results agree with those of Gueye (1998) and Tadelles *et al* (2003b) who stated that poultry meat contributed to a well balanced diet to satisfy human needs.

CONCLUSIONS

Indigenous chicken farmers were mainly female, older than 35 years with predominantly primary education. Most farmers produced at subsistence level and practiced traditional management system. The indigenous Tswana hens laid 11-15 eggs per clutch per hen, hatching 11-15 chicks per clutch per hen and rearing 6-10 chicks per clutch per hen to sexual maturity. Most farmers identified Newcastle disease and mites external parasites as reducing the productivity of their chickens. Farmers predominantly used traditional remedies to control diseases and parasites. Most farmers did not keep any records and

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chicken was sold for. The farmers indicated that indigenous chicken meat is tasty as compared to that of exotic chickens. Therefore, many people would like to buy the chickens to satisfy their also they did not seek information from extension agents. There were no organized markets but still farmers managed to sell their chickens without any problems. Premium prices did not deter most buyers of indigenous Tswana chickens. Farmers should be trained in management, record keeping and marketing strategies in order to increase production. For indigenous Tswana chickens to benefit the country more than at present, research should be conducted to increase their productivity and to explore marketing strategies both locally and externally.

ACKNOWLEDGEMENTS

The authors express sincere gratitude to all traditional chicken farmers who were interviewed. The authors thank Botswana College of Agriculture for providing funds for this study

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