African Journal of Agricultural Research Vol. 7(17), pp. 2647-2652, 5 May, 2012
Available online at http://www.academicjournals.org/AJAR
DOI: 10.5897/AJAR11.1689
ISSN 1991-637X ©2012 Academic Journals

*Full Length Research Paper*

# Village chicken production practices in the Amatola Basin of the Eastern Cape Province, South Africa

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Accepted 16 February, 2012

**A majority of rural households in South Africa-own village chickens which contribute significantly to their livelihoods, yet, there is dearth of information on production practices of this enterprise. Thus, this study was conducted to determine the village chicken production practices in the Amatola Basin of the Eastern Cape Province. Data were gathered using a questionnaire survey of 81 households. They were identified from seven villages using snowball's sampling technique. Village chickens were mostly (60.5%; n = 49) owned by women and mainly raised to meet household food requirements. Some farmers (28.4%; n = 23) also occasionally sold their chickens to neighbours at an average of R50 (USD7.55) per bird. Most chicken flocks (96.3%; n = 78) were provided with supplementary feeds and drinking water. Majority (93.8%; n = 76) of their households also provided some form of shelter for their chickens. Although, most respondents (93.8%; n = 76) confirmed the use of alternative remedies to control parasites and treat diseases; most chicken keepers (81.5%; n = 66) experienced chicken losses due to predation and health related problems. Since this study was limited to the documentation of village chicken production, there is the need for a further research to ascertain the extent to which chicken management practices and environmental variables affect village chicken production in this area.**

**Key words:** Ethno-veterinary medicines, free-range, resource-limited farmers, rural, scavenging chickens.

## INTRODUCTION

Poultry production is an important agricultural activity for most rural communities in Africa. It provides rural households with scarce animal protein in the form of meat and eggs as well as being a reliable source of petty cash (Kalita et al., 2004; McAinsh et al., 2004; Njenga, 2005). Rural poultry have also been reported to be used for traditional ceremonies and festivals in some cultures (Alders et al., 2007), hence, they contribute significantly to the livelihoods of the most vulnerable rural households in developing countries (Mack et al., 2005).

It is estimated that up to 70% of poultry products in the developing world are produced by resource-limited farmers and in family-managed poultry systems (Sonaiya, 2000), of which 80% are found in rural areas under the free range system (Alders and Spradbrow, 2001). However, rural poultry production is not rated high in the mainstream of national economies because of the lack of measurable indicators of output (Alders and Spradbrow, 2001). Productivity levels of rural poultry in many African countries fall far below desirable levels. Output in terms of number of eggs per hen per year and flock sizes are low with relatively high mortality rates when compared to commercial poultry production (Gondwe and Wolly, 2007; Mapiye et al., 2008). Due to the low value resource-limited farmers attached to poultry in relation to other livestock, farmers often are ignorant of small changes that could enhance the quality, health and productivity of

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**Table 1.** Other livestock owned by Amatola basin village chicken farmers in the Eastern Cape Province of South Africa.

| Livestock | Ownership % (n) |
|---|---|
| Cattle and goats | 27.2 (22) |
| Cattle, goats and pigs | 16.1 (13) |
| Cattle, goats, pigs and sheep | 7.4 (6) |
| Pigs | 4.9 (4) |
| Cattle | 4.9 (4) |
| Goats | 3.7 (3) |
| Other poultry (geese and ducks) | 4.9 (4) |

their flocks (Acavomic et al., 2005). An extra effort in the management of poultry housing, feeding, and animal health care will increase village chicken productivity significantly (Sonaiya, 2007). Furthermore, strategic increases in the production of rural poultry flocks will greatly assist in addressing the challenge of fighting poverty and malnutrition (Sonaiya, 2007; Gillespie and Flanders, 2009).

Although, other poultry species which include ducks, turkeys, guinea fowl, quail, and pigeons are important in village systems; village chickens are the most important and major poultry species (Acamovic et al., 2005). Research on indigenous knowledge and associated traditional production practices of village chicken is limited in South Africa and yet in principle, this system contributes to the lives of many rural people (Swatson et al., 2002). Although, some studies have been conducted in the Limpopo and Kwa-Zulu Natal Provinces, the fact that village chicken production varies from area to area depending on the socio-economic, cultural and biological factors (Muchadeyi et al., 2007), makes an investigation imperative in the Eastern Cape Province. This will broaden the understanding of the significance of village chickens in the study area and also outline the challenges that farmers face. The main objective of this study, therefore, was to determine the village chicken production practices.

## MATERIALS AND METHODS

### Study area

The study was conducted in the Amatola basin of the Amathole district situated in the Eastern Cape Province of South Africa. Out of 13 villages, 7 were randomly selected to participate in the study. Consequently, about 30% of the households were sampled per village. The area has an altitude of 1 807 m above sea level, and lies within latitude 32°31.00 -32° 45.00 S and longi tude of 26°57.00-27°02.00 E on the Eastern slopes of the Amatola mountain range. The winter season temperatures range from 7 to 20°C, while summer temperatures range from 16 to 31°C. The Amatola basin receives an average annual rainfall of about 580 to 800 mm (ISCW, 2008).

### Sampling procedure and data collection

A total of 81 structured questionnaires were administered by personal interviews with households which owned chickens. These households were identified using the snowball sampling technique, where respondents were asked to give referrals to other persons believed to fit the study requirements. Only those households who owned chickens and were willing to participate in the research were considered. Information on village chicken production was gathered under the following categories: household demography, livestock inventory, roles of village chickens, chicken nutrition, housing and health management, and agricultural extension services. Interviews were conducted with the farmers and key individuals, namely chairpersons of villages, herbalists and agriculture extension officers. Farmers' perceptions of village chicken production constraints were also gathered.

### Statistical analysis

The collected data were analyzed using the Statistical Package for the Social Sciences (SPSS, 2009). Descriptive statistics and cross tabulations were computed. Chi-square ($\chi^2$) for association values were computed to determine the relationships between the ownership of village chickens and farmer's age, and chicken flock sizes and ownership of larger livestock (cattle).

## RESULTS

### Household demography

Many household heads (49.4%; n = 40) were over 60 years of age. Most households were female headed (53.1%; n = 43). Although, the majority of household heads (85.2%; n = 69) were not employed, they had attained some form of education-at least up to primary level (58.0%; n = 47). Household sizes ranged from as low as 1 to 13, with an average of 7. A majority of the families (61.7%; n = 50) received some monthly financial income in the form of old age pension and government grants. A great portion of village chicken flocks (60.5%; n = 49) were owned by women, 35.8% (n = 29) were owned by men, and a few (3.7%; n = 3) were owned by children. Most village chicken flocks were owned by persons above 60 years of age ($P < 0.05$; $\chi^2 = 6.7$). Although, ownership translated to chicken management in terms of decision making, other household members such as children played a role in looking after the chickens. Respondents that owned the most cattle also had large chicken flocks ($P < 0.05$; $\chi^2 = 13.2$).

### Livestock inventory

Households owned on average of 17 (±2 S.E.M.) chickens, with a range of 3 to 45. Most farmers (67.9%; n = 55) also owned cattle, goats, pigs, sheep, and other poultry, such as geese and ducks, as shown in Table 1. However, village chickens were ranked as most important livestock species by most farmers (60.5%; n = 49). On average each hen laid 11.3 eggs per clutch, with a hatchability of close to 68.0%. Hatchability levels were reported to be influenced by the effect of external

parasites (1.2%; n = 1), predation (8.6%; n = 7), management (32.1%; n = 26) and effects of weather (27.2%; n = 22). Most farmers actually preferred buying commercially produced eggs instead of eating those laid by their own chickens. Dogs were reported to eat some of the eggs, especially from chickens that incubated eggs outside in bushes or in the cattle kraals. On the average, 5.2 chicks reached maturity. Most chicks were lost due to predation and ill-health (24.7%; n = 20 and 33.3%; n = 27, respectively). Chicken production was not considered an economic venture by most respondents (60.5%; n = 49). Instead they saw it as a means to cater for household food requirements. Most farmers (91.4%; n = 74) did not introduce new chickens to old flocks, but the few who did neither inspected, vaccinated nor treated new chickens for diseases or parasites before introducing them to the flocks.

Farmers used different criteria when selecting chickens to be retained for production. The majority considered size (63.0%; n = 51), others the breed (40.7%; n = 33), color (16.1%; n = 13) and yet some considered cost (13.6%; n = 11). Old birds and those with poor productive performance were consumed as a way of culling the flocks.

## Roles of village chickens

Village chickens were mainly raised for consumption. Respondents considered village chicken meat a delicacy. However, there were a few (28.4%; n = 23) farmers who occasionally sold some of their chickens to neighbours to get some income. The price for a matured chicken was R50 (USD7.55) on the average. Most farmers (74.1%; n = 60) acknowledged that the market for village chickens was available throughout the year. However, none of the farmers reported selling chicken eggs but many (43.2%; n = 35) acknowledged consuming a few and reserving the rest for incubation. In most cases (64.2%; n = 52) village chicken eggs were regarded as only important for incubation purposes as a strategy to increase production. A few chickens (13.6%; n = 11) were used for gifts and donations to relatives and friends. Chicken manure was mostly (62.9%; n = 51) used by respondents to fertilize their home gardens, where they grew a range of vegetables. Village chickens were, however, not used in any rituals or traditional ceremonies.

## Nutrition

All chicken flocks scavenged for feed; however, the majority of households (96.3%; n = 78) provided feed supplements. In some instances (21.0%; n = 17), specific feed were prepared for chicks. Supplementary feeds given to chicks were ground into smaller particles for easy consumption. Almost all (96.3%; n = 78) respondents threw the supplements to the ground for chickens to peck, while the rest used improvised feeding troughs. Village chickens were usually given supplementary feed (74.1%; n = 60) twice a day in the morning and evening, but in some cases (21.0%; n = 17) were fed just once a day, in the morning. There was, however, one respondent who gave supplementary feed three times a day (morning, noon and evening). The supplementary feeds were comprised of yellow maize, kitchen wastes, sunflower cake, grower's mash for chicks, and/or wheat. Most farmers (87.7%; n = 71) bought yellow maize to supplement their chickens. The quantities given as supplementary feed, however, were based on the individual farmers' judgment and varied from household to household. It ranged from as little as one handful (approximately, 100 g) of yellow maize grain to about five handfuls (approximately, 500 g) per day. Furthermore, most chicken flocks (96.3%; n = 78) were provided with water. This came from different sources, including wells (2.5%; n = 2), boreholes (7.4%; n = 6), streams (9.9%; n = 8), ponds (11.1%; n = 9), and taps (65.4%; n = 53).

## Housing

Different forms of housing structures were provided for the chickens. However, in a few cases chickens roosted on trees overnight (3.7%; n = 3) and/or in open spaces (3.7%; n = 3), especially, in the kraals. Chicken houses were constructed using a wide range of materials. All structures were roofed with iron sheets. A few structures (8.6%; n = 7) had solid walls; some had wire mesh (14.8%; n = 12), whilst most (76.5%; n = 62) had a combination of iron sheets and wire mesh. Most of the floors were simply compacted soil (82.7%; n = 67), while some were either unaltered (11.1%; n = 9) or cemented (6.2%; n = 5). A few of the farmers provided bedding in the form of dry grass and/or crop residues (4.9%; n = 4). Most chicken houses (96.3%; n = 78) were cleaned approximately once a month on average.

The type of chicken shelters provided by the farmers depended on availability of resources (75.3%; n = 61) and were designed is such a way that farmers could enter without complications (6.2%; n = 5). In some instances (18.5%; n = 15), however, the shelter provided was influenced by both availability of resources and security from theft. A majority of farmers (59.3%; n = 48) were of the opinion that the chicken house structures adversely affected the growth and development of their chicken flocks. However, many did not have the financial means to make the necessary improvements.

## Health management

Most farmers (81.5%; n = 66) acknowledged that health related problems were a challenge. These ranged from

diseases (21.0%; n = 17), parasites (27.2%; n = 22), a combination of parasites and diseases (49.4%; n = 40), to wounds (2.5%; n = 2). In this context, disease refers specifically to a clinically evident condition resulting from the presence of pathogenic microbial agents, excluding helminths and ectoparasites. Most of the respondents (93.8%; n = 76) used alternative remedies, also referred to as ethno-veterinary medicines (EVM), to control and/or treat diseases and parasitic infections. The rest either did not know about the remedies (2.5%; n = 2) or were not interested in using them (3.7%; n = 3).

### Extension services

Government agricultural extension workers have the task of bringing scientific knowledge to rural farmers. The object of their task is to improve the efficiency of agriculture, for instance, in chicken production. Only 6.2% (n = 5) of the village chicken farmers in the current study acknowledged having had a chance to access some advice or information on chicken husbandry from extension officers. However, the current study revealed no association between advice or information received by respondents and village chicken flock sizes ($P>0.05$; $\chi^2 = 5.4$). Villagers shared some relevant information with neighbors, usually when there was a disease outbreak or when marketing the chickens.

## DISCUSSION

The average number of village chickens owned per household was consistent with previous studies (Aning, 2006; Muhiye, 2007; Mwale and Masika, 2009). The small flock sizes may be mainly ascribed to the slow growth rate and poor egg production of village chickens, as reported by Phiri et al. (2007). In addition, predation and ill-health may also be preventing increases in flock sizes (Mapiye and Sibanda, 2005). Although, some farmers also owned cattle, goats and sheep, these livestock were generally relatively low in numbers as compared to chickens; hence, the latter were regarded as very important by most farmers.

Ownership of chickens were predominantly by women, a finding consistent with Halima (2007) and Mwale and Masika (2009), which could be ascribed to the high number of female-headed households. However, in the male-headed households, men were the principal owners of village chickens, which disagrees with Mwale and Masika (2009) and Moreki et al. (2010). This deviation from the previous findings may be due to the fact that most men in the current study area were not employed and they did not have other larger livestock to concentrate on. Thus, to try and fulfil their responsibilities as principal household providers, men would retain the ownership of chickens. However, those men who also had other livestock in relatively large numbers also co-owned village chickens with other household members.

Selection of chickens was based on phenotypic characteristics similar to findings in earlier studies (Njenga, 2005; Mogesse, 2007). Farmers valued the size of the chicken because it was translated to the quantity of meat per bird, thus, reflecting the main role of these chickens - consumption. Although, village chickens were mainly kept for food security, they could be sold in cases of cash emergencies, a finding also affirmed in previous studies (Njenga, 2005; Mapiye et al., 2008; Mwale and Masika, 2009). This could be attributed to the fact that it is much easier to slaughter a chicken for consumption than other livestock such as cattle (Mwale and Masika, 2009). In addition, other livestock in the study area were few in number, hence, the villagers found it imprudent to slaughter some for consumption. However, a study to quantify the chicken that farmers consume per annum will be worth undertaking.

Village chickens were not used in rituals or traditional ceremonies, in contrast to earlier reports (Mafu and Masika, 2003; Mack et al., 2005). Respondents, however, indicated that cattle and goats were the livestock normally used during cultural ceremonies, a finding consistent with the reports from the coastal region (Centane district) of the Eastern Cape (Mwale and Masika, 2009). However, village chickens were used for gifts, a finding similar to that of Mwale and Masika (2009) in Centane. Farmers acknowledged that meat from village chickens was a delicacy compared to that from broiler (commercial) chickens. This could explain why they are used as gifts.

As also reported by Mapiye et al. (2008), productivity in terms of number of eggs laid per clutch, chicks hatched per clutch and chick survival to maturity were very low. The reported low hatchability could have resulted from the effect of external parasites which tended to bite and irritate chickens during incubation. When chickens are affected by external parasites they tend to leave their eggs often, and may abandon them completely in some cases (Banjo et al., 2009). Low hatchability may have also resulted from production of infertile eggs, poor egg handling and both incorrect storage and improper incubation environment, as supported by Cooper (2001). Furthermore, microbial infection of chicken eggs caused by contaminated nests and poor sanitation, results in low hatchability (Cooper, 2001). Chicken eggs in the current study were regarded as important only for incubation purposes and not for consumption, which may have been a strategy to counter the low hatchability so as to grow their flocks.

Although, supplementary feed was provided, village chickens depended mainly on scavenging for their nutritional needs, a finding consistent with Njenga (2005), Muchadeyi et al. (2007) and Mwale and Masika (2009). Feed supplementation was mainly maize grain, as observed in similar studies in Zimbabwe (Muchadeyi

et al., 2004), Ethiopia (Halima, 2007) and South Africa (Mwale and Masika, 2009). Not only did scavenging affect nutrition, it also exposed the chickens to predation, diseases and parasites, as also found by Acamovic et al. (2005). In addition, chickens at different stages of growth were left to compete for the same feed, a finding consistent with Muchadeyi et al. (2004) who reported that the provision of supplementary feed was indiscriminate and all age groups typically competed for the supplement. This non-preferential feeding might result in weaker groups, such as chicks, getting sub-optimal nutrition (Tadelle and Ogle, 2001). Moreover, since the supplements were thrown to the ground, feed losses (especially, of small grains) were inevitable and the chances of chicken exposure to internal parasites were increased.

The finding in the current study that the quantities given as supplementary feeds were based on the individual farmers' judgment and varied from household to household as was also observed by Mapiye et al. (2008). Chickens are known to require different amount of nutrients depending on the production stage (Tadelle and Ogle, 2001; Ogle et al., 2004). It is not clear, however, whether the chickens got enough nutrients through scavenging and supplementary feeding. Adequate hen nutrition is vital for ensuring fertility, increasing the number of eggs laid, and ensuring good survival rates of hatched chicks (Cooper, 2001). The fluctuations in the supply of feed resources require appropriate strategic supplementation programmes (Muchadeyi et al., 2005). Frequency of feeding in terms of when, what, and how to feed and the quantity to feed are important aspects to consider in developing strategies to improve the nutrition of village chickens (Mapiye and Sibanda, 2005; Mapiye et al., 2008). Most farmers in the current study provided clean water for their chickens, a finding in agreement with Mwale and Masika (2009). This could be due to the proximity and availability of clean water in the area of study.

Village chickens are vulnerable to theft and easily predated upon when not sheltered. The finding of this study that most chicken flocks were provided with housing is consistent with some recent studies (Muchadeyi et al., 2007; Mwale and Masika, 2009). Provision of shelter for chickens mainly during the night was in agreement with previous reports (Muchadeyi et al., 2004; Mwale and Masika, 2009). Most chicken keepers resorted to cheap and locally available materials such as mud, wooden poles, and corrugated sheets, as also reported by Mapiye et al. (2008).

Although, these village chickens contributed significantly towards the livelihoods of rural people in the study area in terms of food security, they were highly susceptible not only to parasite infestation, as Mwale and Masika (2009) reported, but also diseases. The disease challenge has previously been attributed to different ages in a flock, possible transfer from wild birds, and constant use of the land by poultry thereby, facilitating the numbers of parasites build up (Acamovic et al., 2005).

Various conventional drugs for controlling parasites and treating diseases of chickens have been effectively developed globally (Maphosa et al., 2004), however, most respondents were resource-limited and could not afford to purchase these drugs, a finding which is also supported by Mwale et al. (2005). Thus, most of them resorted to the use of alternative remedies when a disease or parasitic infection presented itself as a measure of control or treatment, respectively (Mathius-Mundy and McCorkle 1989; Mwale et al., 2005). However, information in the Eastern Cape Province of South Africa on the use of Ethno-Veterinary Medicine (EVM) in village chickens are very limited (Mwale and Masika, 2009). EVM can play a significant role in grassroots development, which seeks to empower people by enhancing the use of their own knowledge and resources (Mwale and Masika, 2009). It will be therefore, imperative for researchers to validate these EVM to ascertain their efficacy and document the findings for current and future use.

Village chicken production was carried out with no extension support, a finding consistent with a study conducted in Limpopo Province (Swatson et al., 2002). Farmers in the current study made use of their indigenous poultry rearing knowledge acquired over a long period of time, which is consistent with the findings of Swatson et al. (2002). Although, farmers shared some information on chicken production, there were no farmer organizations from which households could obtain chicken village chicken husbandry information or education. Village chicken production has not been accorded the recognition it requires in terms of development and policy support by governmental institutions and non-governmental organizations, yet, it contributes significantly to the livelihoods of rural people.

## Conclusion

The current study revealed that village chickens play a very important role in the livelihoods of rural farmers by meeting their family food needs.

Chicken flocks were provided with supplementary feeds, clean water and some form of shelter. Predation and health related problems were the main causes for chicken losses.

Farmers used alternative remedies to control parasitic infestations and treat diseases but they did not have any chicken husbandry education which may have led to mismanagement of flocks. Since this study is limited to the documentation of village chicken production in Amatola basin, there is the need for a further research to ascertain the extent to which chicken management practices and environmental variables affect village chicken productivity in the area of study.

## ACKNOWLEDGEMENTS

The financial assistance from the National Research Foundation of South Africa (Project number UID 62298) is acknowledged with gratitude. Authors, also thankfully acknowledged the support from the Agricultural and Rural Development Research Institute (ARDRI), the Department of Livestock and Pasture Science and the farmers in the Amatola Basin, Eastern Cape Province.

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