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Characteristics of rural chicken production in Apac and Kumi districts of Uganda

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Abstract

A cross - sectional survey was conducted to establish the characteristics of rural chicken production in Apac and Kumi districts. This was necessary to establish a baseline benchmark against which the impact of the NARO/DFID chicken project could be gauged. Systematic sampling techniques were applied to 120 households to capture the necessary baseline data. The study revealed that farmers keep indigenous chickens mainly for food, cash and gifts and use eggs mainly for hatching chicks. Most people keep 2-10 hens and 1 breeding cock, and in a family, the majority of chickens are owned by the husband and wife. The production indices obtained were typical of African rural chicken production systems and most chickens depended mainly on vending for themselves. Lack of proper housing and diseases were cited as major constraints and few farmers ever vaccinated their chickens. Traditional medicine is greatly used in disease control. Selection for genetic improvement is not commonly done although occasionally farmers buy new cocks. While women care for chickens, the decisions on sales and cash are jointly taken by the husband and wife. The results indicated that rural chicken production is still at subsistence level and the production indices still low, implying that the system is amenable to improvement in order to raise household incomes.

Key words: Rural chicken, production, characteristics, baseline information

Introduction

In Uganda the majority of people live in rural areas. These people practise subsistence farming which hardly meets food requirements for the households. The rural areas offer little opportunities for employment; this is compounded by the fact that the rural populace is mostly illiterate and unskilled and hence cannot be employed in formal sectors found mainly in urban centres.

Despite the economic shortfalls of rural areas, there exists potential for harvesting and utilizing the existing resources for improved productivity for better living standards. Among the resources available to the rural farming community are the indigenous chickens. It is estimated that over 90% of rural households in Uganda keep indigenous chickens (MAAIF, 2000). The importance of these birds is exemplified by the fact that they comprise 80% of the total poultry population of 23 million birds in Uganda (MAAIF, 2000). They are easy to acquire, manage and their reproduction and production are high enough to realise faster income generation, and this often makes them the first and easiest entry point of many poverty alleviation projects and programmes.

Indigenous chickens have, however, low productivity of meat and eggs. Previous research work has shown that improved chicken performance could be realised under good management practices (Ndegwa and Kimani, 1997; Kitalyi, 1998; Ndegwa *et al.*, 1999). More concerted research and development efforts should be made to sustain indigenous chicken production for poverty reduction and better standards of living. Research should study the rural chicken production system, identifying priority constraints and

opportunities; this should arguably lead to initiation of appropriate intervention measures.

This study was conducted to characterise rural chicken production in Apac and Kumi districts. The aim was to establish a baseline benchmark against which the impact of the NARO/DFID chicken improvement project could be gauged in future.

Materials and methods

A baseline survey was carried out by a multi-disciplinary team comprising researchers in animal breeding, nutrition, management, health and socio-economics, and extensionists in livestock production. A representative transect across a cluster area was selected in which farmers were randomly sampled. The sampling frame was 4 parishes per district, 3 villages per parish and 10 households per village, making a total of 120 farmers sampled in a district.

Questionnaires were administered to the 120 farmers keeping indigenous chickens in each district. Questionnaires were designed to elicit information pertaining to all areas of management and production of indigenous chickens. These included flock structure, purpose and utilisation of indigenous chickens, ownership, production indices, feeding, housing, disease control, traditional medicine, breeding strategies and gender roles. Farmers were interviewed individually, questions asked in the local dialect and observations were recorded.

All data obtained were collated and analysed as absolute figures or as percentages of totals.

Results and discussion

Purposes of rural chicken production

The main purposes of keeping indigenous chickens were the production of birds for home consumption, cash and gifts. The production of eggs was mainly for hatching to produce replacement stock and cash (Table 1). Whereas the farmers in Apac district tend to eat more chicken meat than those in Kumi, the Kumi farmers balance their chickens between food and cash and give away more chickens as gifts (almost 3 times more than the Apac farmers (Table 1). This is a true reflection of what is usually seen in buses or taxis in Tesoland. Most Itesot, going or coming from visits, are often seen carrying chickens as gifts.

In both districts, farmers used the eggs mainly for getting chicks, ate some and sold few eggs. This means that the farmers do realise that the sale of live birds fetches more income for them than the sale of eggs in the long run. None of the farmers gives away eggs as gifts.

Table 1. Farmers response (%) to main uses of chickens and eggs in Apac and Kumi districts

Product	District	Food	Cash	Chicks	Gifts
Chicken	Apac	71.9	21.9	-	6.2
	Kumi	40.1	42.1	-	17.8
Eggs	Apac	20.3	12.0	67.7	-
	Kumi	26.5	17.3	56.2	-

Flock structure

The total number of chickens and flock structure by age in Apac and Kumi districts are shown in Table 2. The two districts had a similar range for the number of chickens and a similar flock structure. Cock to hen ratio was about 1 : 10; the chicks formed 75-80% and the hens were 38-42% of the total flock. The flock structure may vary from season to season and from year to year depending on disease outbreaks and feed availability. Most homes in the two districts had 2-10 hens and 1 breeding cock. In Nigeria, Dipeolu *et al.* (1996) and Sonaiya (2001) also showed that most respondents in their studies had 0-10 chickens, a similar situation to that seen in Apac and Kumi districts. This observation seems to be typical to African rural chicken production systems. The big range (2-82) of total number of chickens gives an indication that any intervention to improve the indigenous chickens in the two districts will have a big variation and impact in terms of the individual households

Ownership

The ownership of chickens by family members in Apac and Kumi districts is presented in Table 3. While in Apac all the chickens are almost equally owned by the father, mother and children, in Kumi the children own fewer chickens than their fathers and mothers. It was interesting to note that in the two districts, men and women have an equal ownership of the chickens. This is a good observation because it indicates that the two parties would have the same enthusiasm in a chicken improvement project by virtue of their interest in owning the new improved stock.

Table 2. Chicken numbers and flock structure by age in Apac and Kumi districts

District	Total No. of chickens	No.of adult cocks	No. of adult hens	No.of chicks
Apac	2-80	1-3	1-30	1-60
Kumi	2-82	1-3	2-35	2-66

Table 3. Ownership (%) of chickens By Family members In Apac and Kumi districts

District	No. owned by men	No. owned by women	No. owned by children
Apac	31.8	33.3	34.9
Kumi	39.7	39.6	20.7

Production indices

Table 4 presents a whole range of production indices recorded in Apac and Kumi districts. The adult cocks weighed between 1.7Kg and 2.1Kg while the adult hens weighed between 1.1Kg and 1.7Kg, indicating that the lowest average weight of cocks was the highest average weight of hens across the two districts. Regarding the number of eggs laid per hen per clutch, the two districts had the same figures indicating that we could be dealing with the same chicken population or breed. However, in spite of that observation, hatchability and number of chicks weaned in about 3 months were better in Apac than in Kumi district. This difference means that the farmers in Apac manage brooding hens better than those in Kumi, or that the chickens in Apac have better mothering ability than those in Kumi district. Some birds generally have the ability to rear more chicks to weaning age than others.

Table 4. Average chicken production indices In Apac and Kumi disricts

Parameter	District	
	Apac	Kumi
Weight of adult cocks (kg)	2.1	1.7
Weight of adult hens (kg)	1.7	1.1
No. of eggs laid per hen per clutch	12.0	12.0
No. of eggs incubated	12.0	12.0
No. of chicks hatched	9.3	8.0
Hatchability (%)	77.5	66.7
No. of eggs wasted	2.7	4.0
No. of chicks weaned	6.3	6.0
Mortality from hatching to weaning (%)	32.3	25.0
Age of chicks at weaning (months)	3.5	3.0

The average mortality rate from hatching to weaning was reported as 32.3% in Apac and 25.0% in Kumi, respectively. This mortality was, however, usually higher during disease outbreaks. Farmers attributed those losses to various factors, including diseases particularly New Castle Disease (NCD) and predators. The death toll by NCD would sometimes reach 100% in some individual households.

Feeds and feeding

Most farmers left their birds to scavenge around the home but some supplemented them with a handful of grains and kitchen leftovers. Table 5 shows the feedstuffs accessed by the chickens on-farm and Table 6 shows the feeds used for supplementation.

While all the other feedstuffs grown on-farm had a seasonal abundance and scarcity during the year, cassava in Apac was available to the chickens throughout the year. Farmers supplemented commercial feeds mostly to young chicks. Some farmers housed chicks separately during the first few weeks and fed them commercial feeds. Supplements are usually offered in the morning when the birds are released to scavenge. The type and amount of supplement vary with seasons. During the harvesting season, there is a lot of grain offered and abundance of feed material to scavenge on. Additionally,

Table 5. Feeds accessed on-farm by chickens and their seasonal availability in Apac and Kumi districts

District	Feeds	Period abundant	Period scarce
APAC	Cassava	Throughout the year	-
	Maize	June - August	January-March
	Simsim	September - November	May-June
	Sorghum	July - September	January-February
	Millet	July - August	January-February
	Termites	June - August	March-November
KUMI	Cassava	August - November	January-March
	Maize	July-September	February-March
	Simsim	July-August	January-March
	Sorghum	July-September	February-April
	Millet	June-August	December-February
	Potatoes	September – October	December-February
	Insects/Ants	June-November	December-February

Table 6. Supplementary feeds given to chickens in Apac and Kumi districts

District	Supplementary feeds
APAC	Maize bran Rice bran Chick mash Growers mash Layers mash
KUMI	Brewers mash Fish meal Maize bran Layers mash

during the wet season, there are a lot of worms and insects which the chickens can pick on the ground. The low productivity of indigenous chickens in terms of egg production, the mortality and flock size observed in this study could be attributed to, *inter alia*, lack of enough feeds and energy to meet requirements for maintenance, growth and production (Ndegwa *et al.*,1999).

Housing and use of chicken droppings

In both districts, most farmers provided some sort housing for the chickens (Table 7) although what the farmers termed as "houses" left a lot to be desired. Lack of proper housing was an indication of the poor management accorded to the indigenous chickens and a lack of knowledge as to the importance of housing. In fact, some farmers did not know what a good chicken house should look like. Housing could possibly increase productivity as it prevents losses due to predation and unfavourable environmental factors. If not properly housed, birds would lay eggs and incubate them in places unknown to the farmer, and they may end up being eaten by wild animals or get stolen. Hens could also end up laying on wet ground, leading to egg rot and low hatchabilities.

All farmers in Apac district cleaned the chicken "houses" on a daily basis but a few in Kumi district did not clean the "houses" on a daily basis. This observation colloborates the earlier statement under the production indices that the farmers in Apac seemed to have better

Table 7 Farmers response (%) to housing, cleaning of chicken house, use of droppings as manure, vaccination and use of traditional medicine for disease control

District	Housing (any type)		Cleaning chicken house		Use of droppings as manure		Vaccination		Use of traditional medicine for disease control	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Apac	97.5	2.5	100	0	31.1	68.9	0.8	99.2	66.0	4.0
Kumi	84.1	15.9	96.5	3.5	76.1	23.9	28.7	71.3	70.0	30.0

management of the birds, leading to higher hatchability and more chicks weaned.

Disease control measures

None of the farmers in both districts ever dewormed the chickens. Vaccination was only reported by a small number of farmers in Kumi district (Table 7). Lack of proper disease control measures was one of the major constraints to indigenous chicken production. Infectious diseases, particularly NCD, have both a direct effect on survivability and an indirect one of decreasing production (Ndegwa *et al.*, 1999).

Over 65% of the farmers in both districts reported the use of traditional medicine in the control of chicken diseases. A variety of plants, ash, oil and paraffin were among the items used. Although most of them are used for treatment in general, a few are for specific ailments. There is need to investigate this area of indigenous technical knowledge (ITK) for curative and preventive purposes.

On the other hand, Kumi farmers seemed to appreciate the use of chicken droppings as manure more than those in Apac district.

Breeding

Table 8 shows some breeding aspects in rural chicken production. In the villages there is generally lack of a proper breeding programme. None of the farmers interviewed practised selection for improvement *per se*. Farmers could choose cocks based on colour and live weight but never select hens. Inbreeding was high in both districts because farmers kept cocks for more than 2 years, allowing them to mate with their daughters and grand daughters. None of the farmers in both districts had ever done crossbreeding. Control of inbreeding is essential for effective avoidance of birds with poor

Table 8. Breeding aspects in rural chicken production in Apac and Kumi districts

			Apac	Kumi
Selection	Cock	Yes	84.2	69.1
		No	15.8	30.9
	Hen	Yes	0	0
		No	100	100
Control of inbreeding		Yes	26.5	36.3
		No	73.5	63.7
Crossbreeding		Yes	0	0
		No	100	100

characteristics. Inbreeding reduces hybrid vigour (inbreeding depression) and causes appearance of lethal genes in chickens. This leads, in general, to a decrease in size and genetic potential of indigenous chickens. Crossbreeding, on the other hand, is important to exploit heterosis and combine breed effects. But farmers do not keep separate lines and breeding is haphazard. Rotational use of different cocks is therefore mandatory in a crossbreeding programme aimed at improving indigenous chickens.

Care and control

Care and control of rural chickens are shown in Table 9. In both districts, women care for the chickens more than any other member of the family. With respect to control (decision to sell, decision on use of cash from chicken sales), both men and women share the responsibility. It was interesting to note that, in Apac, while children own a substantial number of chickens (Table 3), they have absolutely no control in the decisions taken on their chickens (Table 9).

The observation that in both districts women care for the chickens more than any other member of the family means that project activities on rural chicken improvement should target women mainly. In many cases, this is the only source of income they have access to. Moreover, rural chicken production integrates well with other farm activities which are mostly a woman's domain.

Table 9. Care and control of chickens in Apac and Kumi district

	Whom	Apac	Kumi
Care	Wife	56.9	89.2
	Husband	31.9	3.6
	Wife/Husband	5.6	2.7
	Children	5.6	4.5
Control	Wife	31.3	28.4
	Husband	33.2	25.2
	Wife/Husband	35.5	45.1
	Children	0.0	1.3

Expected Scope of Improvement

As already indicated in Table 4, the production indices of indigenous chickens in Apac and Kumi districts are generally low and need to be improved, particularly in terms of growth, number of eggs laid per hen per clutch, number of chicks weaned and chick mortality. If an intervention were made, what would be the farmers' expectations with respect to the above production parameters?

Preliminary results from an on-farm study of improving indigenous chickens in Kidetok parish of Soroti district have shown that tremendous improvement in growth and average household income can be achieved through crossbreeding indigenous hens with Bovans Brown cocks. In just 5 months, crossbred cocks attained almost 2kg with supplementary feeding, underscoring the importance of good feeding. But even without supplementary feeding, F_1 Bovans Brown crossbreds had 341gm more than the contemporary local cocks (Ssewannyana *et al., 2003).*

The average household income from the sale of cocks alone at 5 months increased by 460%. This was tremendous contribution towards poverty reduction in the individual households. The study on-farm introduced a regular cycle of selling cocks every 5-6 months. So, the farmers had the benefit of selling many cocks at once instead of selling one cock at unspecified intervals.

Monthly vaccinations against NCD reduced chick mortality (hatching to weaning) due to that disease from almost 25% to negligible levels (0.8%).

Conclusions

Indigenous chickens are an integral component of rural households. Despite low productivity, they contribute towards the nutritional status of the household and are a source of income. They, therefore, play an important role in poverty alleviation in individual households.

The baseline information obtained in this study has indicated that rural chicken production is still at a subsistence level and the production indices still low, implying that the system is amenable to improvement in order to raise household incomes. The data will also help in assessing the impact of the NARO/DFID chicken improvement project in Apac and Kumi districts and

can also be a reference for any other intervention in rural chicken improvement in Uganda.

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