

Characterization and quantification of different indigenous chicken production, feeding and management systems in Babati district, Tanzania

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Summary

Qualitative and quantitative study methods were employed in characterizing the existing production systems, feeding, locally available feed resources, market and marketing in Babati district. Four villages namely Halu, Matufa, Sabilo and Seloto were involved in the study. A total of 72 people were involved in the PRA study of which 40 were males and 32 were females while the quantitative survey involved 141 farmers. The free-range feeding practices dominated in all villages of the study. The key issue was low productivity potential of the indigenous chickens mainly caused by death of chicks indicating lack of general poultry husbandry knowledge particularly feeding, disease control and housing. The results of this study draw an attention and a potential entry point for interventions in each village to enhance indigenous chicken productivity improvement.

Key words: feeding practices, houses, Indigenous chicken, performance, feed resources.

1. Background and objectives

1.1 Background

Poultry sector in Tanzania is mainly of traditional and commercial. However, the traditional small-scale chicken production is by far the largest one being raised under extensive management conditions (free range system) in rural areas and is dominated by indigenous chickens. In the free range system, the birds are not confined but they scavenge for their food over a wide area with rudimentary shelters provision. The amounts and availability of scavenged feed resources are not constant throughout the year. They vary with seasons, farming activities, climate and age of birds and their nutrient concentrations are below the nutritional requirement of the chickens. (Mwalusanya et al., 2001, 2002, and Goromela et al 2008). The poor nutritional profile of the scavenged feed resources contributes to the low productivity of the scavenging indigenous chickens. However, Tanzania is well endowed with non-conventional feed resources like soybean, pigeon pea, millet, sorghum etc. that could be used in developing specific feed formulations for indigenous chickens (Mwalusanya et al (2001).

1.2 Main objective

The main object of the current study was to explore the existing production, feeding and management systems of indigenous chickens, their limitations and possible strategies in improving the current status.

1.3 Specific objectives

- i. To characterize the existing indigenous chicken production feeding and management systems in the study area.
- ii. To characterize and quantify different potential locally available feed resources and their limitations to the existing production systems of the study area.

2. Methodology

2.1 Study site

The study was carried out in the selected villages of Babati district in Manyara region. The district is located below the equator between latitude 3° and 4° south and longitude 35° and 36°E with a total area of 6,069 km². Over 80% of the population in the region depends on agriculture as their main source of income and livelihoods. The district grows a variety of crops such as maize, sorghum, paddy, lablab, soybean, pigeon pea and sunflower. The study involved the Babati district council and the four villages of the study within the district. The villages involved for this study were Seloto, Matufa, Sabilo and Hallu which are among the Babati Africa RISING project villages. All the villages of study are characterized with two major seasons, the dry season (June- October) and the wet season (November – May).

2.2 Research team

The research team consisted of 1 researcher, 3 extension officers from the district (2 male and 1 female) and 4 village extension officers from the villages of study.

2.3 Gathering of secondary information

A visit to the study area was done so as to meet the key informants within the district council authority. The discussion was done with the knowledgeable individuals capable of providing information, ideas, and insights on aspects related to the study and it was essentially comprised of livestock officers at the district livestock department, village leaders and extension officers working in responsible villages. The discussion focused on getting a general understanding of the indigenous chicken production within the study area prior the qualitative and the quantitative survey. The discussion was guided by the structured guideline.

2.4 Qualitative and quantitative survey

Qualitative study through the participatory rural appraisal (PRA) was done prior the quantitative study. The PRA and a cross-sectional study were done involving different gender and age groups in four villages among the Africa RISING program villages. A total of 72 farmers were involved in the PRA study of which 40 were males and 32 were females while the quantitative study interviewed a total of 141 farmers. The PRA per group was accomplished for an average of 2 hours while the quantitative interview per person took 45 minutes. The study targeted in collecting exploratory and explanatory information through diagnosing and characterizing the indigenous chicken production systems, locally available feed resources and quantifying their availability.

Tools and techniques such as semi-structured questionnaire, pair-wise matrix ranking, and direct observations were applied during the PRA to enhance active participation of the farmers in gathering different information. The typed and printed questions were used to guide both qualitative and quantitative study. The questionnaire covered important aspects related to rural poultry sector such as seasonal variation of locally available feed resources, harvesting times,

poultry marketing opportunities and poultry disease incidences. The tools enhanced in identifying the proper time for indigenous chickens improvement interventions. Pair-wise ranking was employed during the rank the most available and cheap feeds in the study villages. This enhanced proper selection of the locally available feed resources, viable in formulating feed ration at cheap cost affordable to farmers. The study also determined the constraints with regard to the utilization of these feed resources for rural poultry in the existing management system. Other parameters for study included breed and breeding, poultry diseases, poultry shelters, market and marketing.



Figure 1: *Some farmers responding to PRA at Hallu village*



Figure 2: *A farmers responding quantitative survey at Sabilo village*



Figure 3: *Some farmers responding quantitative survey at Matufa village*



Figure 4: *Some farmers responding Quantitative survey at Seloto village*

2.5 Sampling of locally available feed resources

After identification of the locally available feed resources through PRA, selection was done for the cheap and abundantly available feed ingredients from four villages of the study. The selected ingredients were sampled for their chemical composition analysis. The ingredients were grouped as cereals and cereal by-products, legume, leaf meals, oil seeds and oil seed by-product meal. An average of 100 gm per sample was taken in each of the four villages of the study. The leaf meals were harvested and dried under shade for five days. The samples were then packed, labeled and transported to ILRI-Addis Ababa for laboratory analysis.



Figure 5: A discussion with some farmers at Seloto village prior feed sampling



Figure 6: Feed sampling at Seloto village-Babati

3. Data analysis

Data were analyzed as descriptive statistics using the Statistical Package for Social Science (SPSS)

4. Findings

The key findings show that indigenous chickens are kept by most interviewed households (96.5%) in Babati district as their primary source of protein and income. Only 3.5% of the interviewed households were found to keep different types of crossbreed chickens. The crossbreed chickens were found mainly in Matufa village and they were claimed to be introduced by non-governmental organizations. The mean chickens' population per household were 5 chickens being dominated with hens. Most of the village households (53.2%) were keeping their chickens under extensive system, left to scavenge as their main source of feeds.

Feed supplementations were rarely done during the late dry season and early wet season. However the supplementations were found to be unbalanced handful of grains particularly maize, maize bran and sorghum depending on their availability. Kitchen left over were found to be the dominant supplements throughout the year. The system is dominated with high mortality rate particularly for chicks as 40% of the hatched died prior maturity. The mortality for chicks was mainly due to malnutrition and diseases as 82.3% of the correspondents were not administering any vaccination. Moreover, chicks were ranked higher in mortality caused by predators and rough environmental conditions such as rainfall and this was influenced by the absence of chicken shelters.

Only 49.6% of the interviewed farmers were having chicken shelters though the chickens particularly chicks were roaming with their mothers scavenging for feeds at the day and the shelters were basically used for sleeping at night. Some farmers (0.7%) allowed their chickens to sleep at the kitchen while others (45.4%) share their houses with chickens at night. Consequently, the chickens particularly chicks were prone to predators, harsh environmental conditions such as rains, winds and cold resulting to high mortality (60%) prior maturity.



Figure 7: *Unroofed poultry shelter, prone to rainfall at Seloto village*



Figure 8: *Traditionally roofed poultry shelter, but prone to wind and cold*

However, the study revealed a plenty of cereals, legumes, vegetables and their by-products that are not efficiently used to feed indigenous chickens. The energy feed ingredients identified in the study sites were maize grain, maize bran, sorghum grain, rice and rice polish while the commonly found protein source ingredients were sunflower seed cake, blood and fish meals. Other locally potential chicken feed ingredients found in Babati but not used by farmers were pigeon pea, *Leucaena* leaf meal, *Moringa* leaf meal, *Lablab purpureus* and soya bean.

The main obstructs to utilization was pointed out as the absence of technical knowhow. Most of the available local feeds subjected to livestock especially cereals were spoilt and of poor quality and required post-harvest handling strategies before being in cooperated into the livestock feed chain.



Figure 9: Farmers harvest a lot but invest less to livestock feeding



Figure 10: The bad portion maize, the common feed channelled to livestock supplementation

Table 1: Locally poultry feeds availability, their order of availability to poultry feeding and months of their harvest-Matufa village

Name of crop	Order	Jan	Feb	Mar	April	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
1.Maize	1						√	√					
2. Sorghum	2							√	√				
2.Sunflower	3				√	√							
3. Rice	4			√	√	√	√	√					
4.Pigeon pea	6								√	√			
5. Lablab	7								√	√	√		
6.Vegetables	5	√	√	√	√	√	√	√	√	√	√	√	√

Table 2: Locally poultry feeds availability, their order of availability to poultry feeding and months of their harvest-Hallu village

Name of crop	Order	Jan	Feb	Mar	April	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
1.Maize	1						√	√	√				
2. Sorghum	3						√	√					
2.Sunflower	2					√	√	√					
3. Rice													
4.Pigeon pea	4								√	√			
5. Lablab	5								√	√			
6.Vegetables		—	—	—	—	—	—	—	—	—	—	—	—

Table 3: Locally poultry feeds availability, their order of availability to poultry feeding and months of their harvest-Seloto village

Name of crop	Order	Jan	Feb	Mar	April	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
1.Maize	1							√	√				
2. Sorghum	3							√	√				
2.Sunflower	2			√			√						
3. Rice		—	—	—	—	—	—	—	—	—	—	—	—
4.Pigeon pea	5									√	√		
5. Lablab	6								√	√			
6.Vegetables	4								√	√	√	√	√

Table 4: Locally poultry feeds availability, their order of availability to poultry feeding and months of their harvest-Sabilo village

Name of crop	Order	Jan	Feb	Mar	April	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
1.Maize	1							√	√	√			
2. Sorghum	3							√	√				
2.Sunflower	2			√		√	√						
3. Rice		—	—	—	—	—	—	—	—	—	—	—	—
4.Pigeon pea	5								√	√	√		
5. Lablab	6								√	√			
6.Vegetables	4									√	√	√	√

Poultry disease was revealed to be among the threats to poultry production in rural villages and the new castle disease ranked the first in killing indigenous chickens followed by fowl infectious coryza, fowl pox, external parasites and Coccidiosis. Their severity fluctuates over the year as indicated in table 5.

Table 5: Poultry disease incidences and their month of occurrences over the year

Poultry disease	month of occurrences			
	Sabilo	Seloto	Matufa	Hallu
New castle	March-June	March-June	June-Aug	Jan, March, Sept
Fowl pox	Sept-Oct	Sept-Oct	June-Aug	July
Infectious coryza	Oct-Dec	Oct-Dec	Aug-Sept	November
External parasites	Oct-Dec	Oct-Dec	Nov-Dec	Aug-Oct
Coccidiosis	-	-	Aug-Sept	-

Marketing of chickens revealed that most of indigenous chickens and their eggs were sold to village customers. However, the marketing fluctuates over the year as indicated in the graph (fig 11). Among the factors influencing price fluctuation of chickens over the year were mentioned to be the disease incidence. At the months with high disease incidences particularly new castle, the price were very low. Another factor was the feed availability whereby, after harvest, the feeds were plenty thus the scavenging chickens' body condition improved influencing high market price. On the other hand, the price were low during the critical dry period, where by both human and chickens suffer the scarcity of food which have the impact on the economy as well.

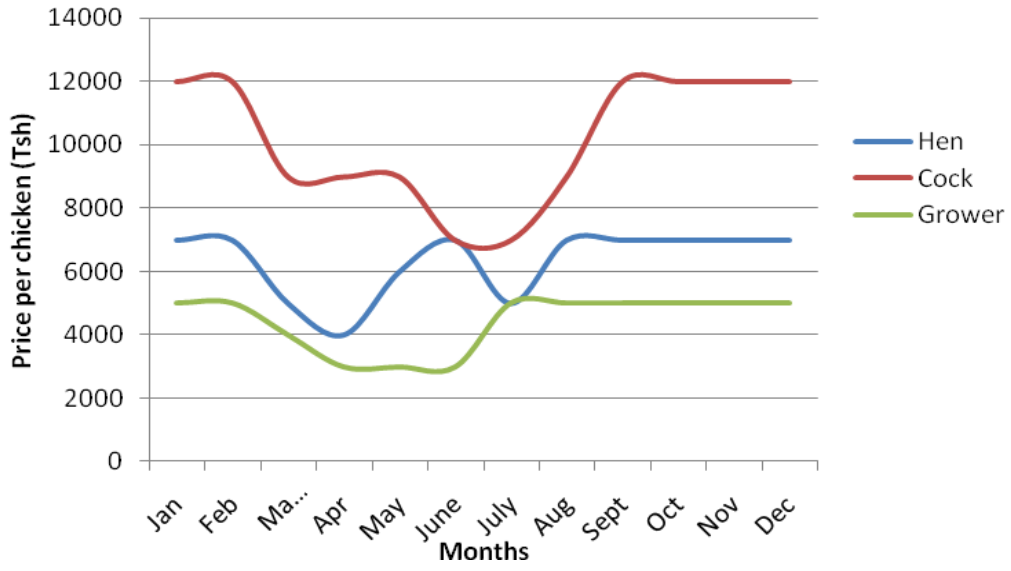


Figure 11: Poultry disease incidences and their month of occurrences over the year

5. Conclusions

These findings suggest the available opportunity for improving productivity of indigenous chicken in Babati district through improved feeding and housing using the locally available resources. Moreover mortality control particularly for chicks if taken into consideration, more number of chicks will attain the maturity age as the study revealed a mass death of chicks prior maturity mainly due to malnutrition, predators and diseases particularly the new castle disease. Vaccination for severe diseases specifically the new castle and fowl pox diseases should be taken into consideration for the future intervention package. Intervening the market fluctuation within the year should be one of the approach, focusing at the chickens to attain market age within months experiencing high market price for higher earning to farmers. The findings of this study therefore call for further research effort focusing on formulating indigenous chicken rations based on locally available feed resources, developing strategies to process and handle these feed resources, post-harvest handling of spoilt cereals, assessing different housing systems and testing these technologies with farmers while maintaining disease control aspect as well as assessing the cost effectiveness of the intervention.

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