

## **Common Diseases Affecting Poultry Production in Arusha Peri-urban, Northern Tanzania**

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### **Authors' contributions**

*This work was carried out in collaboration between both authors. Author ES designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author JM managed the analyses of the study and literature searches. Both authors read and approved the final manuscript.*

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**Short Research Article**

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### **ABSTRACT**

**Aims:** Poultry production has been the most significant source of income among farmers in Arusha peri-urban, Northern Tanzania. But in Recent days, the production of poultry farmers are getting reduced which is affecting their income. The study, therefore, was conducted to minimise the common affecting diseases that influence poultry production in Arusha.

**Study Design:** Study was a cross-sectional survey.

**Place and Duration of Study:** This study was conducted in selected 20 wards in Arusha Northern Tanzania from January to April 2015.

**Methodology:** Purposive sampling was used to select wards while simple random sampling was used to select farmers within selected wards. Key Informant (KI) and telephone interviews were conducted with the heads of poultry keepers' households while Focus Group Discussion (FGD) and semi-structured questionnaires employed to 100 households involved in poultry production. Data

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were analyzed by SPSS software to establish calculated descriptive statistics. A p value of less than 0.05 was considered significant.

**Results:** The results showed that almost half of the farmers (45%) had basic primary education and 15% with informal education. The rest of farmers had secondary and post-secondary education by 25 and 15% respectively. Livestock production was the main farmers' livelihood activity by 60% while mixed farming of livestock and horticulture was another farmers' activity by 27%. Those who were engaged in horticulture only were 10% while 3% involved in non-agricultural activities. Among the farmer' group involved in livestock production, the majority of them (68%) were keeping indigenous poultry mainly chicken and about 26% keeping both dairy cows and goats. Few farmers (6%) were keeping rabbits. Further assessment of common diseases affecting poultry production showed that Newcastle, and both coccidiosis and respiratory infections were causing high mortality in poultry by 44, and 28% respectively. From pair wise ranking lack of management skills, poor nutrition in poultry and inaccessibility of poultry drugs and vaccines were the factors behind the disease occurrence by 41, 35 and 24% respectively.

**Conclusion:** Fear of disease increasing and spreading to neighboring farmers is becoming a major concern. It is therefore concluded that local bylaws and quarantines are kept in a place to avoid this increase and their spreading.

*Keywords: Infections; influence; management; poultry diseases.*

## 1. INTRODUCTION

Both population and urbanization has a great influence on livestock production. One of the consequences of this influence is a shift of farmers from ruminant to poultry production due to lack of grazing land [1]. In recent years, poultry production has gained popularity among many communities due to its significant source of income and quality protein worthy of the current increase in population and urbanization [2]. In poultry industry, chicken especially the indigenous are becoming the most widely kept livestock species in both rural and peri-urban areas [3] due to the fact that it is easily adapted to many micro-habitats [4,5].

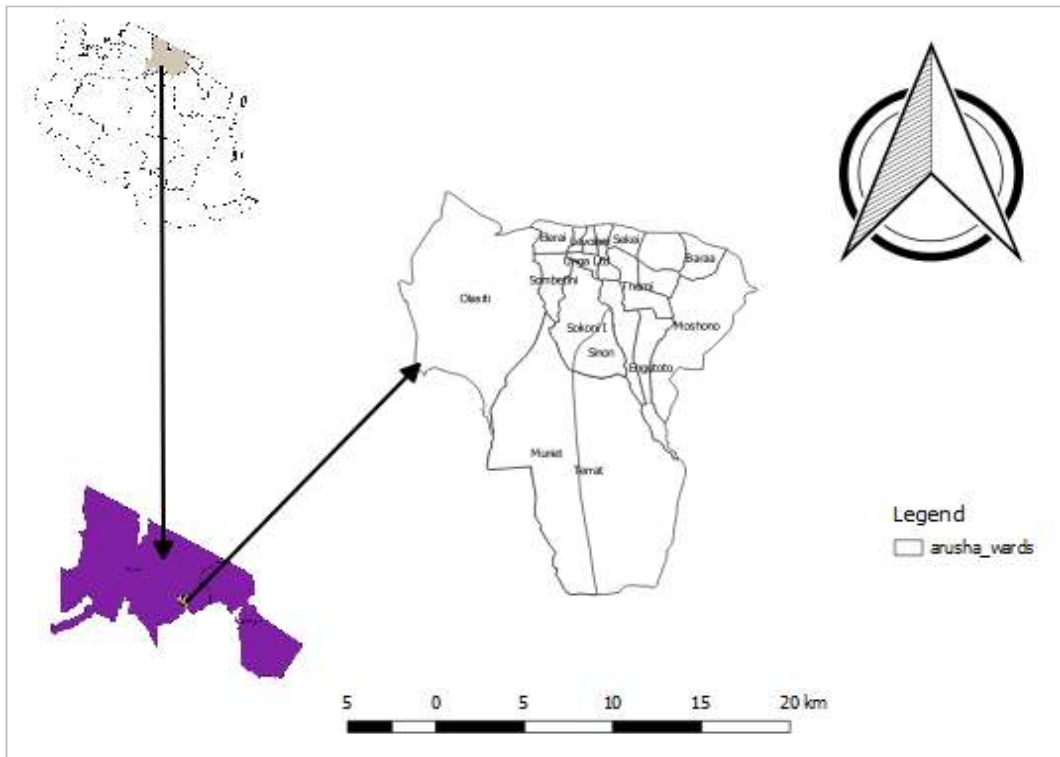
In Africa, indigenous chicken makes up over 70 % of the total chicken population [6] while in Tanzania, it accounts for most of the 27.8 million poultry present wherever there are community settlements [7]. The major production constraint in the indigenous chickens in developing countries is diseases [8, 9, 10] and Newcastle has been ranked as the major diseases [11, 12, 13]. Fowl pox and coccidiosis [14] and helminthes [15] have also been reported as infectious diseases of the poultry industry in many countries. Diseases are the main challenge influencing poultry production in Tanzania and Newcastle reported affecting a wide range of poultry [16,17]. Because of farmers' concern on low production and high mortality rate of chickens, this study was therefore conducted to assess the common diseases that influence chickens production in Arusha Peri-urban.

## 2. MATERIALS AND METHODS

### 2.1 Description of Study Area

The study was carried out in peri-urban areas of Arusha region (Fig. 1) with a total of 25 wards lying between Longitudes 34.5°- 38° E and Latitudes 2°- 6° S. The areas have high potential in poultry production especially indigenous chicken. According to 2012 National census, the areas had a human population of 416,442 (199,524 males and 216,918 females) with an average of 4 occupants per household. 4,900 indigenous chickens and 3,855 other birds were being kept in this study area (District Agriculture development plan (DADP), 2011).

This study comprised of descriptive data collected from both primary and secondary sources. Primary data collection comprised of several socio-economic methodologies; KI, face-to-face and semi-structured telephone interviews. The interviews involved central staff from the Department of Livestock and Fisheries Development in Arusha region, administrators from selected wards and their streets including wards' counselors and streets' chairperson, poultry specialists, extension officers, heads of groups and poultry keepers' households. FGD and semi-structured questionnaires were employed to 100 households in poultry production while transect walk involved with direct observation and dialogues at the farm level. Random simple sampling was employed by selecting at least 5 households from each of 15



**Fig. 1. Administrative wards in Arusha peri-urban as selected for study**  
(Source: Field Survey 2015)

wards potential in poultry production including Baraa, Engutoto, Kimandolu, Lemara, Olasiti, Muriet, Olorieni, Sekei, Sokon 1, Terrat, Daraja II, Elerai, Sinoni, Sombetini and Them. The pair wise ranking was employed to score largest to lowest identified factors that were behind the disease infestation problem.

## 2.2 Data Processing and Analysis

The data were analysed using the Statistical Package for Social Sciences (SPSS), Version 21 and Excel was used to produce figures.

## 3. RESULTS

### 3.1 Education Level

Results in Fig. 2 show the levels of education among farmers' households.

The results showed that almost half of the farmers (45 %) had basic primary education and 15 % with informal education. The rest of farmers had secondary and post-secondary education by 25 and 15 % respectively.

### 3.2 The Main Economic Activities

Result in Fig. 3 shows the main economic activities among farmers in peri-urban areas of Arusha region. The findings show that majority of community members (60%) relied on livestock keeping as their main economic activities. Mixed farming; livestock and horticulture and horticulture itself were also income-generating activities by 27 and 10% respectively. Only 3% of farmers were involved in non-agricultural activities such as commercial business, and institutional employment.

### 3.3 Types of Livestock Practices

Results in Fig. 4 shows which livestock were owned by the farmers. Majority of farmers (68 %) were keeping indigenous poultry mainly chicken and about 26 % keeping both dairy cows and goats. Few farmers (6 %) were keeping rabbits.

### 3.4 Common Poultry Diseases

Further assessment in Table 1 shows common diseases affecting poultry production as the main livestock practiced in the study area. The findings

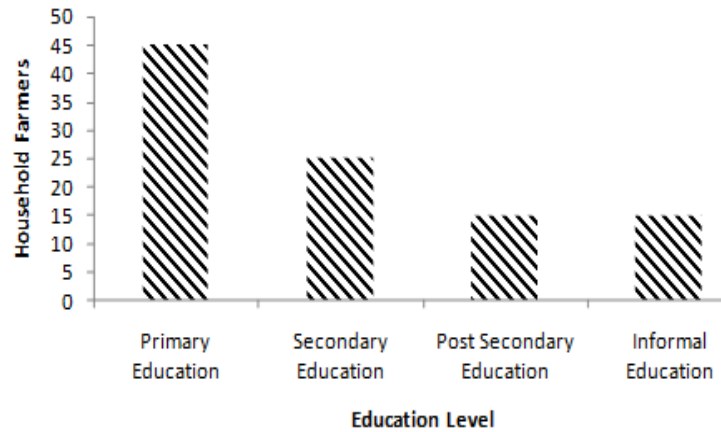


Fig. 2. Education levels among poultry farmers at Arusha peri-urban

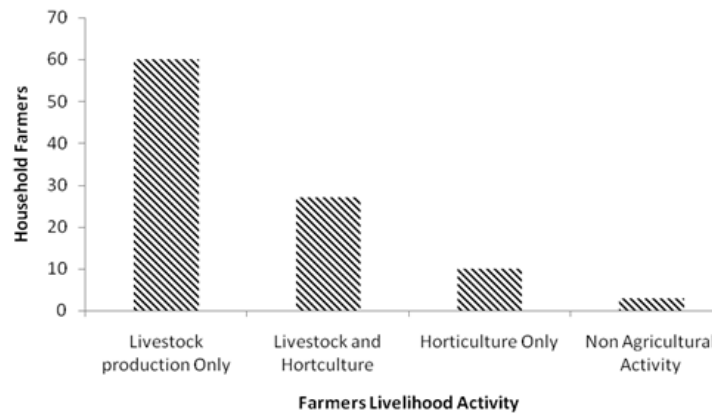


Fig. 3. Different economic activities among poultry farmers at Arusha peri-urban

showed that Newcastle, and both coccidiosis and respiratory infections were diseases causing high mortality in poultry by 44, and 28 % respectively.

Table 1. Common diseases in poultry ( $\chi^2=7.68$  and  $p$  value = 0.021)

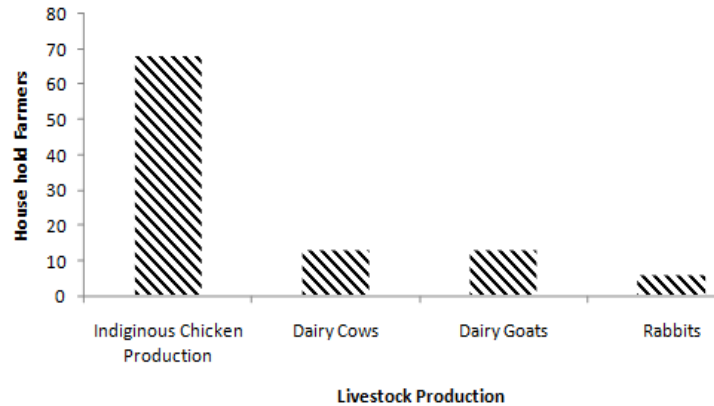
Disease type	Percentage	Cumulative percentage
New castle	44	44
Respiratory infection	28	72
Coccidiosis	28	100

### 3.5 Identified Factors Influencing Disease Infestation

From pair wise ranking in Table 2, lack of management skills, poor nutrition in poultry and inaccessibility of poultry drugs and vaccines were the factors behind the disease infestation problem by 41, 35 and 24 % respectively.

## 4. DISCUSSION

An increase in population and urbanization has forced majority of farmers to shift to poultry production because of lack of grazing land. In Tanzania, many movements of livestock have been decreased in many farming communities such as Arusha region. Instead poultry production has been increasingly practiced among former livestock owners [18]. Poultry industry has become an important source of livelihood to many farming communities and therefore a sensitive aspect of more attention [19]. One of the sensitive matters to consider is about limited knowledge many farmers possess and therefore great influence in production as seen in poultry farming. The poultry industry is greatly influenced by disease infestation partially contributed by lack of management skills [20]. Newcastle, and both coccidiosis and respiratory infections were diseases causing high mortality in poultry



**Fig. 4. Types of livestock production by farmers in Arusha peri-urban**

**Table 2. Pair wise ranking of problems that facing poultry production in the area**

	Lack of management skills	Inaccessibility of drugs & vaccination	Poor nutrition in poultry	Score in percentage	Rank
Lack of management skills		Lack of management skills	Lack of management skills	41 %	1
Inaccessibility of drugs & Vaccination	Lack of management skills		Inaccessibility of drugs & vaccination	35 %	2
Poor nutrition in poultry	Lack of management skills	Inaccessibility of drugs & Vaccination		24 %	3

production as reported from the study area. Farmers described lack of management skills, poor nutrition in poultry and inaccessibility of drugs and vaccination as reasons behind this disease infestation. Many farmers had no skills even on diseases identification. Drugs and vaccines and feeding materials were inaccessible to many farmers due to high purchasing cost, lack of utilization skills and storage facilities. Disease was also described as a main factor influencing many other poultry farming communities in Tanzania and this was due to lack of production skills among farmers [21].

**5. CONCLUSION**

The results of this research work have shown the presence of Newcastle, coccidiosis and respiratory infections as main diseases that influence poultry production in Arusha peri-urban. This was contributed by lack of management skills among the poultry keepers, poor nutrition in poultry and accessibility of drugs and vaccines. It is therefore concluded that local bylaws and quarantines should be adopted to minimize disease infestation and spreading of diseases to other farmers.

**6. RECOMMENDATION**

It is therefore recommended that farmers be informed on dangers of these diseases and trained on proper management practices such as the use of integrated health management practices, which include vaccination. The author suggested that more research is required to find out the prevalence of these pathogens in chicken.

**ETHICAL APPROVAL**

As per international standard or university standard written ethical approval was obtained by the authors.

**COMPETING INTERESTS**

Authors have declared that no competing interests exist.

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