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**PERFORMANCE AND CONSTRAINTS OF INDIGENOUS CHICKEN REARING
AMONG SMALL SCALE FARMERS IN MAU-NAROK WARD, NJORO SUB
COUNTY, NAKURU COUNTY, KENYA**

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Abstract

The potential benefit of Indigenous Chicken (IC) in Kenya is highly under exploited. Indigenous chicken in the country produces 55 and 47 percent meat and eggs respectively. Earlier studies indicated an increasing demand for IC meat due to its tenderness and taste as well as change in eating habits among Kenyan population. However, although over 90 percent of small-scale farmers in Kenya reared IC, very few if any engage in IC rearing as a commercial enterprise for household income. Mau-Narok Divisions' small-scale farmers are among those who predominantly rear IC and none of them ventured into the enterprise commercially. The reasons why commercial rearing of IC among most small-scale farmers was low despite their high demand in the market were not well documented. This study thus sought to determine the performance and constraints facing small-scale IC rearing farmers in Mau-Narok Division. The target population consisted of small-scale farmers who reared IC in Mau-Narok Division. A cross-sectional survey research design was used. Using the coefficient of variation method, a sample size of 120 respondents was randomly selected from a sampling frame of 10,479 households. Data were collected using a semi-structured questionnaire. Descriptive statistics used in data analysis were charts, percentages, frequencies, means, standard deviations among others. Statistical Package for Social Sciences (SPSS) was used for data analysis and all tests were computed at $\alpha = 0.05$. Study findings indicated that farmers used extensive, semi-intensive or intensive rearing systems. The number of birds kept across the three systems was very low making them uneconomical for commercialization and as a result majority of the farmers earned less than KShs. 10,000 from their enterprises per year. The worst constraint faced was disease and parasite attack followed by feed constraint then predators. This study recommends that agriculture extension agents need to step up training IC rearing farmers on modern technologies in disease control management. The government should also establish IC production villages to attract small-scale farmers into taking up the enterprise as a commercial venture.

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INTRODUCTION

Poultry farming is important for food security and poverty alleviation in developing countries (Moreki, Dikeme & Poroga, 2010). In Kenya poultry farming is an important livelihood activity particularly among small-scale farmers who produce 80% of the national poultry production (Ministry of Livestock and Fisheries Development, 2011). Seventy six percent of Kenya's rural households engaged in some kind of poultry rearing (Ndirangu, Birol, Roy &

Yakhshilikov, 2009). Indigenous chicken (*Gallus domesticus*) in Kenya are widely distributed in rural and peri-urban areas where they play an important role in income generation and food production (Moreki *et al.*, 2010; Thornton, Kruska, Henniger, Kristjanson, Atieno, Odero & Ndegwa, 2012). According to Kingori, Wachira and Tuitoek (2010), Kenya had an estimated poultry population of 28.5 million of which, 22 million (76%) were IC and produced about 55% and 47% of the total meat and eggs, respectively. Mwangi, Gikonyo & Chacha (2011) noted that, eggs and meat from IC contributed to the protein nutrition of various households in the country while sale of poultry products augmented and diversified revenue in the livestock sector. Poultry sub-sector creates employment and promotes overall economic development. Compared to other livestock species, poultry specifically chicken production have the advantages of having quick returns to investment and relatively simple management practices with numerous market outlets for their products. Ndirangu *et al.* (2009) also indicated that poultry contributed to farmers' income, wealth and insurance against shocks like drought, famine among others. A study by Kingori *et al.* (2010) further indicated that IC rearing was highly associated with women and the youth since it was viewed as a venture for the less fortunate.

Indigenous chickens are hardy, adapt well to the rural environments, survive on low inputs and adapt to fluctuations in available feed resources (Kingori *et al.*, 2010). Thus, about 90% of the small-scale farmers in Kenya rear IC (Akondo, 2012; Kingori *et al.*, 2010). Although IC rearing remains attractive to poor households as it requires low start-up capital and maintenance costs, most small-scale farmers rear IC as a subsistence enterprise. Available information from the District Agricultural Office Njoro showed that, very few or none ventured into commercial rearing of IC (District Agricultural Office, 2011). In addition, the rapidly growing competitive uses of agricultural crop products especially maize were increasing the demand for livestock products (Agriculture and Rural Development [ARD], 2012). Increased landlessness occasioned by the high population growth as indicted by UN (2011), makes IC rearing an investment of choice due to its low spatial requirements. However, IC rearing faces challenges like shortage of feeds, improper housing, disease outbreak, parasite menace, predation, lack of technical assistance from extension staff and use poor IC breeds (Moreki, 2010; Ndathi, Muthiani, Kirwa, Kibet & Cheruiyot, 2012).

In Njoro District, most IC are kept by farmers in the rural settings (District Agricultural Office Njoro, 2011). Rearing of IC appears to be the best alternative for most farmers since their feed demands and general cost of production is low (Kingori *et al.*, 2010). Data from Mau-Narok ward indicated that, majority of IC farmers have not given commercial IC rearing the attention it deserves as an important source of household income (Divisional Agricultural Office Report, 2011). Commercial rearing of IC among Mau-Narok small-scale farmers' would boost household income hence lowering the poverty index of the Sub-County which stands at 43% would also decline (District Development Office [DDO], 2011).

Besides the challenges farmers face in the IC rearing sector, they are able to produce 55% and 47% of meat and eggs respectively (Kingori *et al.*, 2010). Rearing of IC has been associated with many advantages, which include high, currently unmet market demand for IC meat and eggs (ARD, 2012; WSPA, 2012). This is due to the desirable characteristics of IC, which include leanness, good flavour, presumed organic product and changing feeding habits. Supply deficit for IC products worsens during the festive seasons like Easter and Christmas holidays. Though over 90% of small-scale farmers engage in IC rearing, very few of them consider it a commercial enterprise. This is evident in Mau-Narok Ward. The reasons why IC rearing is low and its potential under exploited are not well documented. This makes it harder for policy makers and other stakeholders to make important decisions on how to improve IC production. This study sought to provide information on the performance and constraints faced by small-scale IC farmers in Mau-Narok Ward.

FOCUS

Constraints Facing Indigenous Chicken Rearing as a Commercial Enterprise

Several constraints face IC rearing. A study by Hunduma, Regassa, Fufa, Endale and Samson (2010) indicated that poultry diseases especially Newcastle disease and predators are the major constraints facing IC small-scale farmers. They are responsible for high IC mortality. This agrees with the findings by Kingori *et al.* (2010); Ndathi *et al.* (2012) and Ndirangu *et al.* (2009). In these studies, other constraints were identified as poor feeding, labour shortage, low production by indigeous birds, neighbourhood conflict and theft, poor housing and poor marketing information. Efforts to replace IC with exotic chicken breeds were identified as a major threat in erosion of the IC

genetic resources. A study by Ochieng, Owuor and Bebe, (2013) found out that accessibility to credit, training and market information facilitates adoption of better management practices in rural areas in Kenya.

Indigenous chicken rearing is a fast growing animal production industry in the country thus extension services are crucial (Ministry of Agriculture [MoA], 2012). These services are provided by public sector, private sector and Non Governmental Organizations (NGOs). Agricultural extension department formulates and implements agricultural extension policies to improve technology and information flows to the farming community (Food Agricultural Organisation [FAO], 2010). These services are paramount for the better performance of the agricultural sector. The extension officers visit the farmers and disseminate practical and useful knowledge based on the needs and interest of the small-scale farmers rearing IC through workshops, chiefs' baraza, seminars and individual visitations. This is geared towards improving IC production efficiency. Such trainings which are relevant to IC farmers include, proper ways of disease and parasite control, proper feeding techniques, proper housing, breeding techniques, marketing techniques as well as preparation of poultry products for marketing like egg sorting and grading (MoA, 2012; Sorensen, 2012). Despite the crucial role played by the extension staff, their services to IC farmers are limited. For instance, Ndathi *et al.* (2012) and Sebushahu (2011) in their study found out that most veterinary personnel's would prefer attending to the bigger livestock like cattle and not chicken. This is attributed to the more money the person will make upon attending to such animals. Additionally, government allocation of budget to the extensions' is low incapacitating their ability to reach all farmers in their working areas (ARD, 2012; FAO, 2012).

METHODOLOGY

A cross-sectional survey research design was used. Two locations of Mau-Narok Ward in Njoro Sub- County, Nakuru County were purposively selected for the study. A total of 10,479 households were targeted of whom a sample of 120 respondents was obtained using a coefficient of variation method by Nassiuma, (2000). Simple random sampling was used to draw the required respondents according to the proportionate households in each location. One hundred households were sampled from Mau-Narok representing 83.3 percent compared to 20 households representing 16.7 percent from Sururu because Mau-Narok's households were proportionately higher than those of Sururu.

Both qualitative and quantitative data were collected using semi-structured questionnaires. These were then analyzed accordingly using SPSS. Simple descriptive statistics mainly; means, frequencies, percentages, standard deviations and bar charts were used to present data on IC rearing challenges.

RESULTS AND DISCUSSIONS

General Characteristics of the Respondents

Characteristics that were investigated included: gender, farm size, age, education level and IC rearing systems.

Gender of the Respondents

More than half of the respondents (55%) were female compared to 45% male. This seemed to indicate that most of the farm activities dealing with IC rearing were handled by women and agrees with the findings of Kingori *et al.* (2010). In their study, Kingori *et al.* (2010) found that IC rearing is highly associated with women and the youth as it was viewed as a venture for the poor. In addition although women are more active in most of the farm activities like IC rearing, they have limited access to productive resources. According to USAID (2011), if women had the same access to productive resources as men, they could increase yields on their farms by 20–30%. This increase could raise total agricultural output in developing countries by 2.5–4% and reduce the number of hungry people in the world by 12–17%, up to 150 million people. Given access to the same, the female respondents in this Ward could expand their IC rearing enterprises.

Age of the Respondents

The age of the respondents ranged between 21 years and 87 years with a mean age of 47 and a standard deviation of 15.3. The mean age of 47 years may imply that commercial IC rearing would be very productive since these are farmers in the productive age category. Young farmers below thirty years of age were very few, a situation that could be attributed to rural urban migration of the youth in search of white collar jobs. However, 40.9% of the farmers were tending towards old age. According to Kingori *et al.*, (2010), old farmers had little knowledge on IC

rearing and relied on experiences transferred from generation to generation. This was an indication that most of the respondents could be using traditional knowledge in commercial IC rearing. This traditional knowledge is however crucial and needs to be accumulated and passed on to the younger farmers.

Farm size of the Respondents

Most of the respondents surveyed (82.5%) had less than one hectare of land which agrees with the study done by UN, (2011), indicating that most small-scale farmers owned less than one hectare of land. Only 17.5% had more than one hectare of land. Among the 82.5% with less than one hectare of land, 9.2% did not own any land. These are farmers who were displaced from their farms during the 2007/2008 post election skirmishes that rocked the country. Being unable to buy alternative pieces of land they resulted to renting farms elsewhere or working as casual labourers in other farms and living in rented houses in the shopping centres where by using simple structures they are able to rear IC. The mean farm size was 0.7 hectares. Mau-Narok being a horticultural hub, the small pieces of land are fully utilised for horticultural activities with little or no room left for IC rearing. This has negative implications on IC rearing as a commercial enterprise for household income as well since most agricultural enterprises often give attention to farm size. A study done by Muiti (2008) found a positive correlation between farm size and production level.

Level of Education of the Respondents

Farmers had been asked to indicate the highest level of education they had attained. As per the results in figure 3, half of the respondents (50%) had attained primary education while a lesser number (22.5%) had secondary education. A lesser proportion of 5.8% had above secondary school level education while 26 of those interviewed (21.7%) had no formal education. Majority of the respondents had attended primary school contradicting the findings of Oyugi (2012), which established high illiteracy level of 77% among rural farmers. Respondents with secondary school level education and above were 28.3%. With high education level, farmers' intellectual capacity is expected to be high. This should enhance application of proper IC rearing practices hence improving the household income derived from IC.

Marital Status of the Respondents

Farmers had been asked to indicate their marital status and a large proportion of 89.2% were married, 8.3% were single and very few (2.5%) were windowed. According to FAO (2011), among the married households, women have limited control over decision making on agricultural resource allocation. Thus majority of the married women in this Division had little contribution in decision making on IC rearing resource allocation.

Indigenous Chicken Rearing Performance

Mau-Narok farmers use different rearing systems with the majority (61%) rearing their birds under extensive system while 26% and 13% rear under semi-intensive and intensive systems respectively. Ochieng *et al.* (2013) refers to the extensive rearing system as a low input-low output system and hence the returns obtained from the poultry enterprise will be low. The mean average number of birds reared across the three systems was less than twenty. Keeping few birds as is the case in each of the systems increased the cost of production per each unit of output hence reducing the profit earned (BayOn, *et al.*, 2012; Sahoo & Tone, 2012).

The study established that, of the 71 farmers using extensive system of IC rearing, 90.1% got an income of less than Kenya shillings 10,000 and only two farmers representing 1.4% each got incomes ranging between 20,001-30,000 and 30,001-40,000 respectively. Thirty one farmers used the semi-intensive system of which, 77.4% earned an income of less than Kenya shillings 10,000 and the rest got an income ranging between 10,001-20,000. Eighteen farmers practised the intensive rearing system out of which 72.2% got an income of less than 10,000 Kenya shillings while 22.2% got an income ranging between 10,001- 20,000. The remaining 5.6% got an income ranging 20,001-30,000. The highest level of income was KShs.34,900 recorded by a farmer under extensive system and majority of the farmers in the three systems obtained an income below KShs.10,000. This indicates that with proper management and increased stocking rate, farmers using extensive rearing system can realize high returns.

Constraints Faced

During the study, the following constraints were raised by the respondents as hindering their effort towards commercial IC rearing in the Sub-County. They included; diseases and parasite menace, poor housing, predators,

theft, low production of birds, lack of market information and difficulties in obtaining feeds. Others were; labour shortage, lack of agricultural credit and neighbourhood conflicts as birds are pests.

Disease and parasite menace come out as the greatest constraint among 92.5% of the respondents. This agrees with the study by Kingori *et al.* (2010) and Ochieng, *et al.*, (2013) but contradicts Melkamu and Wube (2013) ranked food shortage as constrain number one in Gondar Zuria Woreda, Ethiopia. Additionally, these farmers were found to use traditional concoctions for disease and parasite control. Use of ash, paraffin and cooking fat were also common among the IC rearing farmers. These are less effective compared to the use of conventional drugs in disease and parasite control. The second and third ranked constraints among most respondents were difficulties in obtaining feeds and predators respectively. Low production of birds was fourth with 78.3%, neighbourhood conflict as birds are pests was fifth with 74.2%, lack of agricultural credit with 73.3% was ranked sixth and poor housing was ranked seven with 66.7%. Others were theft with 61.7%, lack of market information with 60.8% and the least constraint among most farmers was labour shortage with only 22.5% facing this constraint. A study done by Ndathi *et al.* (2012), found out that constraints faced by small-scale farmers in IC rearing discourages them from rearing many birds in fear of losing all of them especially when a disease struck. Hence since more than half of the respondents were facing several constraints this could explain why most of them were keeping few birds which are economically less viable. The constraints faced were ranked as shown below:

Constraints Facing Small-scale IC Rearing Farmers

Constraint	Frequency	Percent
Disease and parasites menace	111	92.5
Poor housing	80	66.7
Predators	96	80.0
Theft	74	61.7
Low production of birds	94	78.3
Lack of market information	73	60.8
Difficulties in obtaining feeds	98	81.7
Labour shortage	27	22.5
Lack of agricultural credit	88	73.3
Neighbourhood conflict as birds are pests	89	74.2

Source: Survey data, Mau-Narok Division, 2012

Conclusions and Recommendations

Commercialization of IC rearing in Mau-Narok has a long way to go since these farmers keep very few birds incurring a higher production cost per bird hence lowering the income obtained from their enterprises. These farmers are faced by many challenges especially diseases which keep them off from taking a risk to keep many birds for the fear of losing them all and incurring huge losses whenever they strike.

The study recommends that extension service providers should educate small-scale farmers rearing IC on the importance of increasing number of IC kept and applying recommended management practices in order to reap commercial benefits from IC rearing. Farmers also need to be trained on how to control diseases perceived to be a threat to IC commercialization in this Division since majority of the farmers are still adopting traditional disease control measures which are slow and less effective. Farmers also need to be sensitised on the benefits of rearing many birds in order to reduce cost of production and in turn get maximum profit from their enterprises. The government and non-governmental development agents should facilitate small-scale IC rearing farmers to shift from subsistence to commercial IC rearing, which will go a long way in alleviating poverty and boosting food security among many households. The government should also establish IC production villages to attract small-scale farmers into taking up the enterprise as a commercial venture.

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