



The status of Indigenous chicken production systems in the Lango sub region of Northern Uganda

*Geoffrey Nviiri¹, S. Mugerwa², H. Okello¹, P. Nakyewa¹

¹Ngetta Zonal Agricultural Research and development Institute, P.O Box 52 Lira, NARO Uganda
gnviiri@yahoo.com hgnviiri@gmail.com

²National Livestock Resources Research Institute P.O Box Tororo, NARO Uganda

Abstract

This study was conducted in four districts in Lango sub region of Northern Uganda. A total of 320 households (HH) from 32 villages (eight villages from each district) were included in the study. The objectives were to assess the flock characteristics, production, productivity and related constraints of village chicken production in Lango sub region. A formal survey, using structured questionnaires integrated with participatory rural appraisal techniques relevant to rural chicken production system, was applied. Study districts and corresponding market sheds differed significantly in the flock characteristics. The mean number of Matured chicken, Hen/pullets, Cocks, and Chicks per household was 7.4 ± 0.22 , 5.4 ± 0.17 , 2.2 ± 0.09 , 8.5 ± 0.37 respectively, with a male to female ratio of 1:2.9. Purchase and exchange for labor were the main sources of foundation stock while hatching was the main sources of replacement stocks. Mean egg laying performance of hens was 17, 21 and 25 eggs for the first, second and third and higher clutches, respectively. Mean clutch number was 2.6 ± 0.06 per year. The mean number of eggs set per bird was 13.5 ± 0.19 . Hatching rate was 74.6 ± 0.86 ranging from 35.3-90% (n=320). High mortality of chicks (average survival rate of $51.6 \pm 6.3\%$, ranging from 12-71%.) were reported and occurred between hatching and the end of brooding at 8 weeks of age. About 86.5% of the eggs produced are incubated in order to replace birds that die. This makes the reproduction for replacement as the main focuses of chicken keepers. It is concluded that village chicken production is part of a balanced farming system and that there exists considerable opportunities for changing the inefficient system using the available animal and other resources.

Keywords: Indigenous chicken; Lango; production constraints and Northern Uganda.

Academic Discipline and sub-disciplines

Natural science

Subject classification

Local poultry

Type (approach)

Survey

Council for Innovative Research

Peer Review Research Publishing System

Journal: JOURNAL OF ADVANCES IN AGRICULTURE

Vol .4, No. 1

www.cirjaa.com, jaaeditor@gmail.com



1. Background

In nearly all African countries, poultry production in rural areas is predominantly based on a free-range system utilizing indigenous types of domestic fowl (Kitalyi 1998). The management system is characterized by a family ownership of the indigenous birds which are left to scavenge to meet their nutritional needs. The population of local chicken in the country has been estimated at 20 million or 80% of the national flock (MAAIF, 2005) with village flocks consisting of unimproved local chickens typically 5-20 birds per family (Okot 1990).

Generally, housing may not be provided and if it's done, usually rudimentary materials are used for construction (Atunb & Sonaiya 1994) and for the case of Northern Uganda the kitchens are used for chicks and trees for mature chickens. Management is minimal with some variations of gender roles in the activities (Achiemping 1992) and the health of the birds is not guaranteed because there are no disease control programmes. With village chicken most of the mortalities therefore are due to disease and predation hence too low and irregular poultry production (Kitalyi, 2006). The chickens are exposed to many disease conditions with Newcastle disease noted as the most prevalent and devastating poultry disease (Chabeuf 1990) especially in the rural areas of Northern Uganda (Ojok 1993). In spite of this low-input by rural farmers on their production, free-range birds play many socio-economic roles. In some parts of Northern Uganda, birds are also used in a livestock stocking process by a barter system and poultry keeping therefore can be considered as the beginning of livestock production.

Amidst the poor management, diseases, insufficient breeding and nutrition are seen as major components affecting rural poultry production. However, in Uganda, chicken is sold expensively compared to beef because poultry farming is practiced at a small scale and poor management methods are employed (Maggie, 2004). In spite of the current level of introduction of exotic chickens, local chickens have continued to be sold well in urban areas and demand for them still exceeds supply due to their pigmentation, organoleptic qualities, leanness and suitability for special dishes (Ssewanyana *et al.*, 2001).

It is well within our knowledge that poultry is one of the most important protein sources and income generating products in Northern Uganda. Unfortunately, the quantity of poultry and poultry products produced by farmers is small (Highlights CIAT Africa, 2002). To date, there are no detailed studies conducted targeting comprehensive description of the flock characteristics and associated performances of the village production system in Northern Uganda. Understanding the roles and function of local chicken as well as production constraints is of considerable relevance in envisaging future research and development directions and strategies.

1.1 Objectives

The study was conducted with the objectives of understanding flock characteristics, performance and related constraints of the local poultry production system in Northern Uganda "Lango sub region".

2. Materials and methods

2.1. Study areas

This study was conducted in the Lango sub region of Northern Uganda. Two sub counties per district, two parishes per Sub County and two villages per parish comprising of a total of 320 households were included. The selection of districts was made on the basis of information from previous studies regarding the importance of sub-regional poultry markets and in consultation with the livestock census reports and a total of 32 villages were selected.

2.2. Data collection

Structured questionnaires integrated with participatory rural appraisal methods relevant to rural poultry production were used. Information was gathered from individual farmers, extension officers, key informants and village groups using both methods. In addition, information on the poultry production and management system (organization, ownership, flock characteristics, flock performance, use patterns of poultry products and production management) and other related issues of poultry production (e.g. relationship between poultry keeping and wealth status of each household) were gathered. Problems prevailing in chicken production in each of the study villages, and opportunities for improving poultry production were assessed and attempts were made to closely examine other socio-economic aspects such as cultural roles of poultry production in the respective study areas. Finally, a transect walk was made involving 10 households in each of the study villages. Closer visits in and around the residential quarters of the villages were then made in order to obtain first hand observation on all aspects of poultry production in individual households, and to involve women in the households since their participation in the village meetings and other data collection activities were rather restricted. Based on the assumption that each woman farmer has an idea of the performance of her chicken a recall survey was conducted to establish specific hen performance history in relation to production and productivity. In addition, the sources of present breeding females (as replacement) and foundation stock in the household and use patterns of poultry products were assessed.

2.3. Statistical analysis

The qualitative and quantitative data-sets were analyzed using appropriate statistical analysis procedures. Statistical Package for Social Sciences (SPSS 1996), a computer-based statistical software program, was employed. Analysis of variance was carried out on some of the parameters (SAS 1987). The Duncan Multiple Range Test (Duncan 1955) was used to locate treatment means that were significantly different. Correlation analysis was also conducted to depict the



influence of wealth status on flock characteristics, performance indicators, use patterns of chicken and chicken products, and income from chicken farming (Steel and Torrie 1980).

3. Results and discussions

3.1. Social economic benefits

The survey indicated that chicken production is widely practiced in the Lango sub region by 96.5% of the households. It is used as a source of income for immediate household expenses. According to the survey result majority of village chicken production is done by women and children and 60.5% were jointly owned 35.5% owned by women and children and only 6% owned by men. 84.2% of the birds was acquired through purchasing and 15.8% obtained the birds through exchange for labor and gifts. 46% of the households had poultry rearing experience of less than 10 years and 51.3 % had reared for over 10 years.

3.2. Flock characteristics

Flock composition

Regions	Age and sex category					
	Sub counties	Matured chicken (n)	Hen/pullets (n)	Cocks (n)	Male: female (n)	Chicks (n)
Kole	Alito	9.8±0.67 ^a	8.1±0.5 ^a	2.0±0.28 ^{ab}	1:4.9	9.1±1.1 ^a
	Aboke	9.3±0.67 ^a	7.1±0.5 ^a	1.9±0.28 ^b	1:3.8	9.5±1.1 ^a
Lira	Ngetta	7.6±0.67 ^{bc}	5.7±0.5 ^b	2.5±0.30 ^{ab}	1:2.5	8.5±1.2 ^{ab}
	Agweng	6.5±0.67 ^{cd}	5.0±0.6 ^b	2.2±0.35 ^{ab}	1:2.2	8.1±1.3 ^{ac}
Amolatar	Muntu	6.9±0.67 ^c	4.8±0.6 ^b	1.7±0.32 ^b	1:2.8	9.4±1.2 ^a
	Aputi	6.2±0.67 ^{cd}	5.5±0.6 ^b	2.0±0.33 ^{ab}	1:2.7	10.1±1.3
Alebtong	Abiting	7.7±0.67 ^{bc}	5.6±0.5 ^b	2.2±0.29 ^{ab}	1:2.9	10.1±1.1 ^a
	Aloi	8.0±0.67 ^{bc}	5.2±0.5 ^b	2.8±0.29 ^a	1:1.92	9.6±1.1 ^a
Significance level		***	***	NS		*
Overall mean		7.4±0.22	5.4±0.17	2.2±0.09	1:2.9	8.5±0.37

^{abcd} Means within a column followed by different superscripts show the presence of significant differences, Significant * $P < 0.05$; ** $P < 0.001$, NS non-significant.

Least Squares Means (LSM±SE) of flock performance in the four districts of Lango sub region

	Districts					SE	Sig	Grand mean
	Kole	Lira	Amolatar	Alebtong				
Age at start of laying (months)	6.9	6.7	6.8	6.8	0.1	NS	6.8±0.0	
Mean hatching rate	72±1.7	75.6±1.8	73.1±1.8	76±2.4		NS	74.6±0.86	
Clutch number to set eggs	2.2	2	2.3	2.1	1.9	NS	2.1±0.0	
No. of eggs/set for hatching	14.7 ^a	13.2 ^b	14.5 ^a	12.8 ^b	0.4	***	13.5±0.19	
No. of chicks hatched /set eggs	9.5	9	9.8	9.1	0.5	NS	9.3±0.21	
No. of chicks survived at 8 wks	5	4.3	5.2	5.2	0.4	NS	4.8±0.16	
Number of hatched breeding females	5.6 ^a	2.9 ^b	4.1 ^{ab}	4.0 ^{bc}	0.6	***	3.8±0.25	

^{abc} Means within a row followed by different superscripts show the presence of significant differences, Significant * $P < 0.05$; *** $P < 0.001$; NS= non-significant

3.3. Management Practices in Village Poultry Production

3.3.1 Village Poultry Feeds and Feeding:

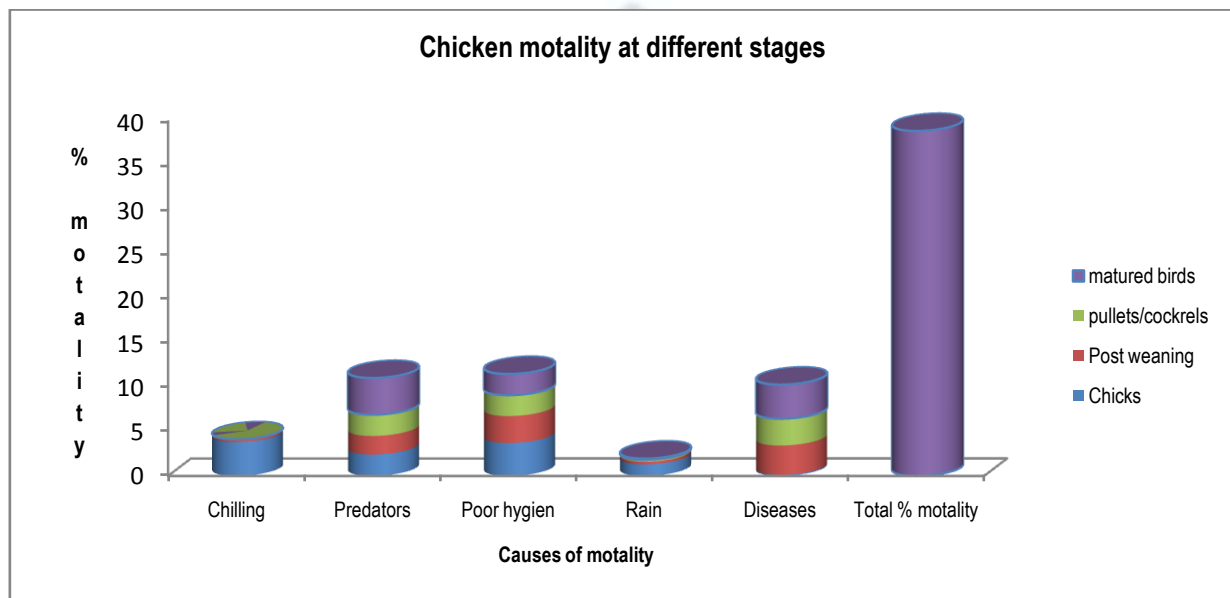


46.7% of the households had their birds under total scavenging system and 44.4% of the households seasonally supplemented the birds on maize, millet and sorghum and 8.9% under semi scavenging 60% of village chicken keepers cultivate feed suitable for poultry like maize, millet and sorghum; no village producer formulates chicken feed. Almost all farmers provide water for throughout the day, 14% once, 18% twice a day, 16% three times a day, 5% four times a day. However, improving the diet of scavenging birds is difficult since it hard to tell what they eat (Smith, 1990), it therefore requires nutrient profiling of the available feed resources to determine the most limiting nutrients using crop content analysis.

3.3.2. Village Poultry Housing

Only 17.1% prepared separate overnight houses for village birds. However, the majority (82.9%) of village chicken owners kept birds on various night sheltering places including; perches inside the kitchens (42.7%), on trees located on the courtyards (30.1%), on ceilings of the house (3.6%) and under locally constructed perching places (1.4%). Lack of attention to village birds (44.6%), lack of construction materials (15%), lack of knowledge and awareness (17.6%), risk of predators (13.1%) and shortage of labor and time (1.6%) were some of the major reasons mentioned by village chicken owners for not preparing a separate house for local chickens.

Production and productivity



3.3.3. Diseases and Predators

The major causes of death for village poultry production were commonly disease mainly New Castle Diseases locally known as “Geng”) a consequence of poor hygiene, followed by predation. Mortality of village chicken due to disease outbreak is higher during the short rainy season, mainly in April 46.6% and May 51.3% of the total annual mortalities. The observation is in agreement with that of (Serkalem *et al.*, 2005) who also reported that NCD is one of the major infectious diseases affecting productivity and survival of village chicken in the rural settings. Predators and chilling were listed alongside diseases as major cause of premature death especially in the rainy seasons. The major routes of contamination and spread of NCD from village to village are likely due to contact between chicken during scavenging and exchange of chicken from a flock where the disease is incubating and during marketing.

4. Marketing systems of village chicken and eggs

Village chicken and eggs are sold in local and urban markets to traders (collectors) or directly to consumers depending on the location. About 89.3, 2.7 and 8% of the egg produced are used for hatching, sale and home consumption, respectively; about 61.4% of chickens raised by the rural community are used for egg production while the rest 38.6% were used for meat production purposes. Smallholder village chicken owners sold chicken and eggs to purchase food items, to cover school fees, to get cash for grain milling services and meet other basic needs. The price of chicken is highly related to public holidays like Christmas Easter and Independence Day with size, age, sex, and market site and health status of chicken. The chicken marketing channels in the sub region are informal and poorly developed with some farmers in remotest locations exchanging their free range chicken for food and household items.

5. Conclusion and recommendation

Indigenous village chickens are raised mainly under minimum management conditions with little attention paid to housing condition, feeding or disease control. This condition ultimately results in small growth and poor egg production, late sexual maturity and high rearing mortality. However, the production of these birds is characterized by many advantages such as good egg and meat flavor, hard shells, high dressing percentages and especially low cost with little special care required



for production. They are therefore well suited to the very limited input that the mainly poor producers can provide. Although, it is an appropriate system, a periodic disease outbreaks and inadequacy of scavenging feed Source are common limiting factors that affect performances of village chickens the Lango sub region. There is a strong need for appropriate intervention in disease and predator control activities so as to reduce chicken mortality and improve productivity. Control of diseases, mainly NCD, could be achieved through vaccination and improvement in veterinary and advisory services. Efforts to increase productivity through improvements in health, feeding, housing, and daily management should be encouraged as they will result in increased economic returns. There is a need to design proper breed improvement programs in order to enhance the genetics potential through selective breeding and conservation of the huge genetic diversity of the indigenous chicken populations. Training for both farmers and extension staff focusing on disease control, improved housing, and feeding, marketing systems could help to improve productivity of local chicken.

6. Acknowledgements

The authors acknowledge the staff of Ngetta ZARDI and the farmers in Lango sub region for their participation. The authors also acknowledge the financial support from NARO under the ATAAS project funded by the World Bank and government of Uganda.

References

- 1) **Achiemping, C.K.** 1992 Women in poultry keeping for sustainability in Ghana. In: proceedings, 19th World Poultry Congress, Amsterdam, the Netherlands, 20-24 Sept. 1992 71-78.
- 2) **Chabeuf, N.** 1990 Disease prevention in smallholder village poultry production in Africa. In: proceedings, CTA Seminar on small holder rural poultry production. Thessaloniki, Greece 9 – 13 October 1990. Vol. 1 129-137.
- 3) **Katalyi A.J** 1998. Village chicken production systems in rural Africa household food security and gender issues. FAO Animal health and production series
- 4) **Kigozi, M and Ssekala, A.** 2004. Poultry association of Uganda communication.
- 5) **Kitalyi, A.J.** 1998 Village chicken production systems in rural Africa. Household food security and gender issue, FAO Animal Production and Health Paper 142. Rome, Italy 160 pp.
- 6) **Ojok, L.** 1993 Diseases as important factor affecting increased poultry production in Uganda, Trop. Landwirt. 94 37-44
- 7) **Okot M W** 1990. A co-operative Approach to smallholder Rural Poultry Production in Uganda. In: Smallholder Rural Poultry Production. Proceedings of a CTA Seminar, Thessalonica, Greece, October, 9-13, pp. 249-253
- 8) **SAS (Statistical Analysis Systems)** 1987 SAS/STAT user's guide, release 6.04. SAS Institute Inc. Cary, NC
- 9) **Serkalem, T., Hagos, A., Zeleke, A.** 2005. Sero-prevalence study of Newcastle disease in local chickens in central Ethiopia. *International Journal of Application Research Veterinary Medicine*, 3: 1.
- 10) **Smith, A .J.** 1990. Poultry-Tropical Agriculturist series. CTA, Macmillan Publishers, London. Pp. 184-185
- 11) **SPSS** 1996 Statistical Package for social Sciences. SPSS user's guide 10.0. SAS Institute inc., Cary NC.
- 12) **Ssewanyana, E., Onyait, A. O., Ogwai, J., Mukasa, B., Nsamba, P. and Masaba, J.** 2001. Characteristics of rural chicken production in Apac and Kumi districts of Uganda. Paper presented at *the NARO Scientific Conference, 5-10 December 2001, Kampala, Uganda.*
- 13) **Steel R G D and Torrie J H** 1980. Principles and procedures of statistics, 2nd edn., McGraw-Hill, New York, pp 633

Biography





Curriculum Vitae			
Family name: Nviiri		Given names: Geoffrey	
Title of address: Mr			
Job title at your institution: Animal production scientist			
Mailing address:	Institution: National Agricultural Research Organization (NARO)		
	Number and Street or PO Box: 52 Lira		
	District, City: Lira		
	Province/State: Lira		
Country: Uganda			
Telephone number:			
Office: +256 782 717 409			
Mobile: +256 782 717 409			
Email address: gnviiri@yahoo.com		Skype Address:	
Work experience			
Years	Position	Organization	Location
2012 - date	Animal production scientist	National Agricultural Research Organization	NgettaZARDI (Lira)
2009 - 2012	Agricultural Service provider.	National Agricultural Advisory Services	Mpigi district
2005 -2009	Field facilitator.	National Agricultural Advisory Services	Wakiso District
ACADEMIC BACKGROUND			
Year	School/institution	Award	
2013-to date	Makerere University	Msc Animal nutrition (still in progress)	
2008-2009	Kyambogo University	PGDE Agriculture Education	
2001 - 2005	Makerere University	Batchelor of science in agriculture	
1999 - 2000	Kyambogo College School	Uganda Advanced of Education	
1995 – 1998	Kyambogo College School	Uganda Certificate of Education	
1989 - 1994	Kamuli Primary School	Primary Leaving Examination	
Publications			



1. **Nviiri. G., Okello. H., Nakyewa P& G. A. Maiteki (2014).** *Extent of availability of major nutrients from selected cereal crop residues to dairy ruminants as alternative dry season forage in northern Uganda. Journal of advances in Agriculture 2349-0837. Vol 3, No 2*
2. **Nviiri. G (2013).** Brachiaria mulato planting material multiplication guide (brochure)
3. **Nviiri. G (2013).** Establishment and management of lablab for seed multiplication (leaflet)
4. **Nviiri. G (2012).** Establishment and management of Napier grass for sustainable forage production for small holder dairy farmers (brochure)

