Journal of Applied Biosciences (2008), Vol. 12: 661 - 664.
ISSN 1997 – 5902: www.biosciences.elewa.org

Strategies for improving meat and egg productivity of indigenous chickens in Kumi and Apac districts, Uganda

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ABSTRACT
In Uganda the majority of people live in rural areas. Despite the economic shortfalls of these areas, there exists potential for harvesting and utilizing the existing resources to improve productivity and living standards. Among the resources available to the rural farming community are indigenous chickens. These birds comprise 80% of the total poultry population of an estimated 23 million birds in Uganda (MAAIF, 2000). The major challenges in rural chicken production systems are: (i) the inherent low genetic potential for meat and egg productivity and (ii) the New Castle Disease (NCD), which is the main killer of indigenous chickens in the rural set up. This paper describes two strategies that were employed in tackling the above challenges in order to increase meat and egg productivity of indigenous chickens and to improve the economic and nutritional status of rural households. The strategies were (i) crossbreeding local hens with Bovans Brown cocks and (ii) monthly vaccinations of crossbred chickens against NCD. The interventions led to significant overall changes in the various parameters studied. Average flock size/household/year increased by 195.6%; average number of eggs/clutch by 90%, hatchability by 22.2% and average daily gain (gm/day) by 89.7%. The intervention of vaccinations against NCD reduced mortality by 89.3%. While chicken sales/household/year increased by 269.4%, offtake/household/year in Uganda shillings increased by 546.4%. Chicken consumption/household/year increased by 211.5% while the overall increase in egg consumption/household/year was an astronomical 510.7%. The interventions also caused shifts in gender roles. While more women became involved in constructing the chicken houses and decision making, more men got involved in caring for the chickens. All in all, the strategic interventions of crossbreeding and control of NCD increased chicken productivity per household and had positive economic and nutritional impacts on the individual households.

Key words: Indigenous chicken, New Castle Disease, crossbreeding, vaccination, impact

Citation: Ssewannyana E,Onyait AO. and Masaba J, 2008. Strategies for improving meat and egg productivity of indigenous chickens in Kumi and Apac districts, Uganda. *Journal of Applied Biosciences* 12: 661 – 664.

INTRODUCTION
In Uganda the majority of people live in rural areas where they practise subsistence farming which hardly meets their food requirements. In the rural areas there are also few opportunities for employment. Despite the economic shortfalls of those areas, there exists potential for harvesting

and utilizing the existing resources to improve productivity and living standards. Among the resources available to the rural farming community are the indigenous chickens, which comprise 80% of the total poultry populations of about 23 million birds in Uganda (MAAIF, 2000).

Indigenous chickens have, however, low productivity of meat and eggs caused by two major challenges; (i) Their inherent low genetic potential for those traits and (ii) the high mortalities due to New Castle Disease (NCD).

The objective of this study was to evaluate two strategies, namely, crossbreeding local hens with Bovans Brown cocks and monthly vaccinations of crossbred chickens against NCD, to increase meat and egg productivity of indigenous chickens and improve the economic and nutritional status of the rural households.

MATERIALS AND METHODS

A baseline survey to document the current farmers' chicken management practices and production indices was carried out using a structured questionnaire which was administered to 120 households in each of the districts of Kumi and Apac. Of the 120 households involved in the survey, only 100 were selected in each district, making sure that 40 of them were women. Then, the selected farmers were trained in various topics of modern chicken husbandry including housing, feeding, disease control, breeding and record keeping.

Each of the selected farmers was required to construct a big chicken house according to the design, which was provided and was also required to have at least 6 local hens to start with and dispose of any local cocks. All the local hens were first vaccinated against NCD and after a week each beneficiary was given a pure Bovans Brown cock to use in crossbreeding with the local hens. In order to avoid inbreeding, breeding cocks were changed every 6 months. Both production and reproduction data were collected on the crossbreed chickens and after 2 ½ years an impact assessment study was carried out.

Data was compiled, collated and analysed by descriptive analysis and presented as both absolute averages and as percentages.

RESULTS AND DISCUSSION

Generally, chickens reared under the improved system performed better than those in the traditional system in the two districts of Kumi and Apac. Overall, average number of eggs per clutch increased from 12 to 22.8 (90%), hatchability by 22.2% and average daily gain by 89.7% (Table 1). Mortality was generally reduced by 89.3%, leading to higher survival rates and increased flock sizes per household. These results attested to the fact that the two strategies, namely, crossbreeding local hens with Bovans Brown cocks and monthly vaccinations of crossbreed chickens against NCD were effective in tackling the challenges of inherent low genetic potential (increased average daily gain and average number of eggs/clutch) and NCD (reduced mortality and increased flock sizes per household). Our results colloborate previous findings in western Kenya indicating that vaccination against NCD could reduce mortality by 45.5% and that improved management alone could increase flock sizes by 12.5% (Okitoi, 2000).

Although the design of the current study could not for sure delineate the genetic (cock) from the environmental (management) effects, the enormous increases in average daily gain (89.7%) and average number of eggs per clutch (90%) reflect the genetic (cock) contribution because no such increases would be realized under improved management alone on-farm.

Table 2 presents the indices used to assess the economic and nutritional impacts at household level. The sales of chickens increased from an average of 9.3 to 34.5 per year (269% increase). Egg sales per year did not change which, confirming the earlier finding that most chicken farmers in Kumi and Apac districts preferred keeping eggs for hatching into chicks to selling them for cash. This is possibly based on the realization that a live bird would fetch more money than an egg in the long run.

While the consumption of chicken meat increased by 211%, that of eggs increased by an astrononical 510%. The implications of adoption of the technology are primarily vested in the sales and consumption of chickens and eggs. The findings reported here, therefore, demonstrate that the technology had been well adopted by the beneficiaries.

It should be noted that the baseline data on rural chicken production characteristics in Kumi and Apac had indicated that the farmers in those districts hardly ate an egg (Ssewannyana *et al.,* 2003). The technology availed surplus eggs through increased flock sizes and egg production for home consumption.

Table 1: Comparison of productivity in two poultry production systems in Uganda.

PARAMETER	TRADITIONAL SYSTEM		IMPROVED SYSTEM		% INCREASE/DECREASE OVER THE TRADITIONAL SYSTEM		
	KUMI	APAC	KUMI	APAC	KUMI	APAC	OVERALL
Average flock size/household/year	19.2	16.8	56.6	49.8	194.8	196.4	195.6
Average number of eggs/clutch	12	12	22	23.6	83.3	96.7	90
Hatchability (%)	66.7	77.5	85.4	90.2	28	16.4	22.2
Mortality (%)	25	32.3	4.5	1.1	82	96.6	89.3
Average daily gain (gm/day)	4.2	5.9	8.6	10.3	104.8	74.6	89.7
1-6 months	-	-	-	-	-	-	-

Table 2: Economic and nutritional impact at of poultry farming at household level in Uganda.

PARAMETER	TRADITIONAL SYSTEM		IMPROVED SYSTEM		% INCREASE/DECREASE OVER THE TRADITIONAL SYSTEM		
	KUMI	APAC	KUMI	APAC	KUMI	APAC	OVERALL
Chicken sales/household/year	10.2	8.4	38.8	30.1	280.4	258.3	269.4
Egg sales/household/year	6.7	5.2	5.7	4.8	14.9	7.7	11.3
Chicken consumption/household/year	4.4	5.3	12.8	17.6	190.9	232.1	211.5
Egg consumption/household/year	12.2	12	81.2	66.7	565.5	455.8	510.7
Offtake/household/year (Ug shs)	40,800	33,600	271,600	210,700	565.7	527.1	546.4

The monetary gains in a household increased by 546% from the sale of chickens. Since flock numbers had increased and the crossbred chickens were growing faster and thus reaching sale weight earlier, the offtake per year increased leading to more money per household. Income acquired from the sales of chickens provided the households with extra cash to buy other food commodities and meet their domestic needs. A combination of all these factors suggests that household nutrition and welfare in general had improved.

The technology had a fundamental and deliberate shift in ownership of chickens in that of the 100 beneficiaries in each district 40 were women (table 3). In the two districts, construction of houses is usually undertaken by the men. This may include construction of chicken houses also. The technology caused a major shift in that more women became involved in constructing chicken houses. In Kumi and Apac the shifts were 288 and 350%, respectively. Children were also relieved of the duty of constructing chicken houses and more houses were jointly constructed by the man and woman. Reduction in the number of children involved in construction could be based on the fact that a good chicken house requires some technology to build, which is better accomplished by adults.

The technology also caused a shift in the role of caring for the chickens. More men got involved in taking care of chickens, representing a major shift of 700 and 75% in Kumi and Apac districts, respectively. To a large extent, caring for the chickens was also appreciated as a family affair. This was an interesting finding bearing in mind that the primary beneficiaries were women in almost half of the total number of households.

Although the majority of decisions to sell the chickens and on the use of the cash proceeds were jointly taken by the man and woman, the technology increased the role of women into decision making in Kumi district by 32%. Children in Kumi district were also

relieved of the role of decision-making. These results indicated that technologies aimed at improving the productivity of indigenous chickens should be targeted through both men and women to optimise the involvement of the two parties.

Clearly, the strategic interventions of crossbreeding local hens with exotic cocks and the control of NCD increased chicken productivity per household and had positive economic and nutritional impacts on the individual households. The interventions (technology) also caused major shifts in gender roles, indicating that technologies aimed at improving the productivity of indigenous chickens should be targeted through all members of the household.

ACKNOWLEDGEMENTS: The study was carried out under the auspices of the NARO/DFID Client – Oriented Agricultural Research and Dissemination (COARD) project based at Serere.I.

Table 3: Impact of poultry farming technology on gender roles in Uganda.

PARAMETER	TRADITIONAL SYSTEM		IMPROVED SYSTEM		SHIFT IN GENDER ROLES CAUSED BY THE TECHNOLOGY	
	KUMI	APAC	KUMI	APAC	KUMI	APAC
Primary beneficiaries (ownership)	-	-	40F:60M	40F:60M	40% women targeted	40% women targeted
Construction of chicken house	8F:88M:2B:2C	8F:90M:2C	31F:52M:17B	36F:60M:4B	. More women got involved . More joint effort	. More women got involved
Care for the chickens	89F:4M:3B:4C	56F:32M:6B:6C	43F:32M:25A	30F:56M:14A	. More men got involved . Care became more of a family affair	. More men got involved
Control (decision to sell the chickens and decision on use of cash proceeds)	28F:25M:45B:2C	31F:33M:36B:0C	37F:21M:42B	30F:30M:40B	. Majority of decisions were jointly taken by man and woman . More women got involved in decision making	. Majority of decisions were jointly taken by man and woman

F= Female (woman); M= Male (man); B= Both male and female; C= Children; A= All family members.

REFERENCES

Ministry of Agriculture, Animal Industry and Fisheries, 2000. MAAIF, Uganda, Annual report, 2000.

Okitoi LO, 2000 Improvement of indigenous poultry production in western Kenya. Proceedings of the End-of-Project conference, KARI Headquarters, Nairobi, Kenya, 29 November – 1 December 2000, pp 227 – 236.

Ssewannyana E, 2003. Characteristics of rural chicken production in Apac and Kumi districts of Uganda. Uganda Journal of Agricultural Sciences 8 (10): 159-164.