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Strategies for improving the 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 are potentials for harvesting and utilizing the existing free range paultry existing resources for improved productivity and better living standards among the rural farming community. Free range chicken comprise 80% of the national poultry population of 23 million birds. The major challenges in rural chicken production system 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 how two strategies, namely, (i) Crossbreeding local hens with Bovans Brown cocks and (ii) monthly vaccinations of crossbred chickens against NCD were employed in tackling the above two challenges in order to increase meat and egg productivity of indigenous chickens and to improve the economic and nutritional status of the rural households. 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.

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. Desspite the economic shortfalls of those areas, there exist potential for harvesting and utilizing the existing resources for improved productivity for better living standards. Among the resources available to the rural farming community are the indigenous chickens. These birds comprise 80% of the total poultry populations of 23 million birds in Uganda (MAAIF, 2000).

Indigenous chickens have, however, low productivity of meat and eggs caused by two major challenges; (i) their inherently low genetic potential for those traits and (ii) the high mortalities due to New Castle Disease (NCD). This paper describes how two strategies, namely, crossbreeding local hens with Bovans Brown cocks and monthly vaccinations of crossbred chickens against NCD were employed in tackling the above two challenges in order 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 atleast 40 of them were women. 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 one 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 undertaken.

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

Results and discussion

Performance indices

Table 1 shows the comparative performance indices for both the traditional and improved production systems. 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%. 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). Studies on improvement of indigenous chickens in western Kenya revealed that vaccination against NCD could reduce mortality by 45.5% and that improved management alone could increase flock sizes by 12.5% (Okitoi, 2000). Our results collaborate the Kenyan findings.

Although the design of the 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.

Economic and nutritional impacts at household level

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 cash. Indeed they do realize 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 here reported, therefore, reflect 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). Now, this technology availed surplus eggs through increased flock sizes and egg production for home consumption.

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.

Impact of technology on gender roles

Table 3 shows the impact of the technology on gender roles. The technology had a fundamental and deliberate shift in ownership of chickens in that of the 100 beneficiaries in each district 40 were women. In the two districts, construction of houses is the work of the man. This may include construction of chicken houses. 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 woe jointly constructed by the man and woman. The fact that the technology demanded for a good chicken house built along a certain design could explain why children dropped out of this role.

The technology also caused a shift in the role of caring for the chickens. More men got involved in the care for chickens than before to cause a major shift of 700% and 75% in Kumi and Apac districts, respectively. To a large extent, care 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 man and woman jointly took the majority of decisions to sell the chickens and on the use of the cash proceeds, 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 aiming at improving the productivity of indigenous chickens should be targeted through both men and women to optimise the involvement of the two parties.

Conclusions

All in all, 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 aiming at improving the productivity of indigenous chickens should be targeted through both men and women in order to optimise the involvement of the two parties.

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Table 1. Productivity in two production systems

PARAMETER	TRADITIONAL SYSTEM		IMPROVED SYSTEM		PERCENT INCREASE/DECREASE OVER 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), 1- 6 months	4.2	5.9	8.6	10.3	104.8	74.6	89.7

Table 2. Economic and Nutritional Impact at household level

PARAMETER	TRADITIONAL SYSTEM		IMPROVED SYSTEM		PERCENT INCREASE/ DECREASE OVER 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 (UgShs)	40,800	33,600	271,600	210,700	565.7	527.1	546.4

Table 3. Impact of free range poultry improvement on gender roles in small holder households

	Traditional				Improved				
Target	**Female**	**Male**	**Both**	**Chilren**	**Female**	**Male**	**Both**	**Chilren**	**Comments**
Target beneficiaries									
- Kumi	-	-	-	-	40	60	-	-	Set project target
- Apac	-	-	-	-	40	60	-	-	Set project target
Participation in construction of chicken houses									
- Kumi	8	88	2	2	31	52	17	-	40% increase in women participation
- Apac	8	90	-	2	36	60	4	-	32% increase in women participation
Care for the chicken									
- Kumi	89	4	3	4	43	32	25	-	More men got involved
- Apac	56	32	6	6	30	56	14	-	Care became more of a family affair
Decision on sale of chicken and use of cash									
- Kumi	28	25	45	2	37	21	42-	-	51% increase in women
- Apac	31	33	36	-	30	30	40	-	More women got involved in decision making