



Evaluation of the Effect of Improved Chicken Housing, Feeding and Health Package on Local Chicken Production at Bona Woreda Sidama Zone, SNNPR

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Abstract

The study was conducted at around Bona woreda, Sidama zone, SNNPR. 20 Participant farmers were selected purposively from both kebeles (10 from each kebele) and grouped then in to two in each kebele means 5 farmers for intervention and 5 for non-intervention or as control per kebele. This means 10 farmers participated in each kebele on the basis of willingness to construct poultry house, cover all the associated package costs and record the required data. Under each household 10 laying pullets were used for the experiment. The experiment was conducted starting from onset of egg production to the pick of production and the body weight data was recorded on weekly base, egg production and any mortality and morbidity data in daily basis by participating farmers from the group, using Das' and research center technical assistants.

As a result indicated, no any significant difference between intervened and controlled/non-intervened research groups of chicken on initial body weight of chickens. However, starting from first month to the end of experiment, there was a significant difference between both research groups of birds on body weight gain. Also there was a significant difference of birds between both groups on egg production potential. That was birds at intervened research groups produced more eggs than the non-intervened group. Which indicates supplementation or intervention of feed, improved house and health care on indigenous chicken made more productive or enhance productivity incense, averagely 9 and 14 eggs/hen/month obtained at non intervened and intervened research groups respectively, as well as, birds kept at non intervened research groups has more exposed to predators and thieves.

Keywords: Indigenous Chicken; Farmer's Management; Intervention and Production

Introduction

The total chicken population of Ethiopia is about 57 million (CSA, 2015), and kept for both eggs and meat production purposes. Nearly all (99.27%) are raised under a traditional or extensive management system [1]. Local chickens in Ethiopia play a vital role in many poor rural households, they provide scarce animal protein in the form of meat and eggs and can be sold or bartered to meet essential family needs such as medicine, clothes, food items that are not grown under farmers' field, sanitary items like soap and school fees and they are required for special festivals and for many traditional ceremonies. They are generally owned and managed by women and children and are often essential elements of female-headed households.

In developing countries like Ethiopia, the overall standard of husbandry is mainly scavenging type and usually poor because of the low level of inputs and in addition, there are a considerable

number of constraints to village poultry production [2]. Farmers are reluctant to increase their level of inputs into local chicken production due to the high mortality normally encountered in their flocks [3]. The fertility of layers and hatchability are satisfactory as each hen usually hatches about 8 to 12 chickens, however on average only 2 to 4 chickens from each clutch raised to maturity Mavale [4]. There are many constraints that have to be solved in order to increase survivability and production of local chickens.

Chicken rearing in Ethiopia is characterized by inadequate feeding, poor housing and hygiene system and low health care which resulted in low output. In low income and food-deficient countries, surplus of cereals are generally not available and not advisable to develop a wholly grain-based feeding system (Aganga., *et al.* 2005). On the other hand, a well-balanced ration that contains required nutrients (CP, Energy, mineral and vitamins) for chickens to express their production potential are essential. Feed represents 60

to 80 percent of the input cost in the intensive commercial poultry sector (<http://www.fao.org/docrep/008/y5169el>), but access in terms of both availability and affordability of commercial feeds to smallholder poultry keepers is limited. Thus, lack of balanced and cost-effective poultry ration is a major limiting factor for increasing productivity and profitability of smallholder poultry enterprises.

According to the study made by Halima (2007), there are major constraints of local chickens such chicken mortality due to disease, out of which Newcastle disease (NCD) is the major killer, predators, chilling in the first 1-2 weeks of life, poor housing, and poor nutrition. More than 80% chicken mortality was reported at early age and one year after hatching. There was no attention given to improve indigenous chicken stocks. They were the most marginalized and unaddressed livestock species. In recent year's attention has been given to the characterization and classification of indigenous chicken types [1,5]. A recent study carried out on indigenous chickens in northwest Ethiopia showed that the growth performances of local chicken populations seemed are comparable with that of the exotic RIR chickens under intensive management conditions [6].

A study made in Amhara region on local chicken indicated that egg production increased from 52 eggs per year per hen to 102 eggs per year per bird on supplementation of 60 gr. maize and noug cake mix feed and NCD vaccine [7]. But there is no action research conducted to see the local chicken's response on improved housing, feeding and health package interventions. Therefore it is important to demonstrate improved management interventions on local chickens to see their response.

Objective

- To assess locally available chicken feed resources and formulate chicken feed from locally available feed ingredients.
- To enhance chicken productivity through demonstration of improved chicken management interventions for family poultry producers.

Materials and Methods

Location of the study

This local chicken improvement intervention was conducted at Bona zuria woreda. Two rural Kebeles Worancha and Olonso Hore were selected from the woreda.

Farmers selection

Five intervened and five non intervened farmers (with equal sex proportion) was selected from each Kebele and form FRGs based on the following criteria:

- Participant farmers' interested to accept the technology and able to provide necessary management.
- Farmers who have experience in rearing and currently have at least 10 local chickens.
- Their willingness to work with group, to participate on community meeting, visits and trainings and at least one family member is able to write and read.

One Farmers Research Group (FRGs) per kebele was established (a total of 2 FRGs in the woreda). Each FRG was select group leader and secretary. Group leaders were selected based on literacy level, acceptance in the community and willingness to serve on this position. The group members had regular meeting as per their schedule to discuss on the progress, problems and to set solutions for problems which may arise along the process. The activity and the groups were regularly be monitored by researchers and Development Agents (DAs).

Design of action research

The four interventions listed below were applied to the selected farmers who were served as 'intervention farmers' (see "farmer selection" section). To evaluate the effect of the interventions on flock productivity and farmers' income, a contemporary group of farmers who practice traditional poultry management in the neighboring village (Non-intervention farmers') were monitored. Similar data was collected on both intervention and non-intervention groups of farmers.

Interventions

Activity 1: Chicken feed resources assessment

The available poultry feed resources as well as the existing constraints was identified and prioritized using PRA technique by focus group discussion (FGD) in which 8-10 key informants were included (with 5-7 females) in the selected kebeles. The survey identified common types of feed ingredients, farmers use in their traditional/conventional rations, composition of the traditional rations including proportions of ingredients and farmers' opinion on their rations.

Activity 2: Ration formulation and feeding trial

The ration was formulated from locally available feed ingredients and applied as supplementary feed for layer birds. Birds have been given 60gr. of ration per day per bird. Water has been given adlibitum and available in shaded areas during the day time to avoid heat stress. The best time for supplementary feeding used during the experiment was in the morning (30gr) and in the evening around 3:00 o'clock (30gr).

Activity 3: Health intervention

For NCD, thermostable I-2 vaccine has been used from National Veterinary Institute (NVI). The vaccine was retain its activity for 8 weeks at 28°C when in freeze-dried form and stored in the dark place. The vaccine was administered via eye drop by using virus friendly plastic which is calibrated to ensure that one drop contains one dose. Calibration of the eyedropper and administration of the eye drop to the bird is done with the dropper in a vertical position to make sure that drops of a uniform size were produced. Birds were vaccinated in a shaded area in each site at community level on a scheduled vaccination time. All age groups of chicken will be given the same dose (from day 1 to adults). Birds were vaccinated twice a year (every 3-4 months). Vaccinations was given by health workers or by community vaccinators who were selected from the community and get training on how to vaccinate chickens against NCD. Community vaccinators were working on payment basis (as agreement made with community). The house was cleaned daily and smoking with local materials can be applied every month to control external parasites.

Activity 4: Housing intervention

Chicken houses has been constructed separately from locally available construction materials. The houses were equipped with egg laying nests at the corner side of the main house and perches for night stay. The house was constructed to allow people to clean easily. All materials and labor was covered by the participant farmers.

Training

After group formation, different capacity development activities had been undertaken. Training was given for the groups of farmers, Woreda livestock experts and DAs to create awareness on chicken management, feeding, feed formulation, watering, house construction and data collection.

Collected data

- Overall mortality and survival rates
- Number of eggs layed
- Cause of mortality
- Body weight at the commencement of intervention and every month until full maturity.
- Farmers perception on intervention.

Data analysis

Results of this experiment were examined using the descriptive statistics and General Linear Model (GLM) procedure, followed for Least Square Mean analysis of variance (ANOVA) in Statistical Packages for Social Sciences (SPSS).

Results

As indicated below, in table 1 there is no significance ($p > 0.05$) on the body weight of birds at the start of the intervention, whereas there is significant change ($p < 0.05$) on body weight of birds at the end of one month of the intervention and there is strong significance ($p < 0.05$) on the body weight of birds at the end of the second month of the intervention.

Parameters	Treatments		P. value	Significance
	Control (mean ± S.D)	Intervened (mean ± S.D)		
Initial weight of birds	1.445 ± 0.589	1.445 ± 0.072	1.000	NS
Weight of birds at the end of one month	1.446 ± 0.042	1.504 ± 0.066	0.030	*
Weight of birds at the end of second month	1.431 ± 0.053	1.431 ± 0.053	0.000	**

Table 1: Body weight of chickens under two treatments.

The result of the present study show that there is significance ($p < 0.05$) on egg production of the birds at the end of the first month of the intervention, and similarly there is significance ($p < 0.05$) at the end of the experiment. This means that average egg production of birds at the end of the first month was measured as 9.389 (mean ± S.D) at the control group and 13.161 ± 1.433 (mean ± S.D) at the intervention group per hen per clutch, and also at the end of the second month it was measured as 9.403 ± 0.973 (mean ± S.D) at the control group and 14.398 ± 1.131 (mean ± S.D) at the intervention group per hen per clutch. The result of this study was agree with the result of 14.9 ± 0.23 [8], 15.7, 13.2 and 14.9 in Bure, Fogera and Dale woredas, respectively [9].

Parameters	Treatments		P. value	Significance
	Control (mean ± S.D)	Intervened (mean ± S.D)		
Egg production at the end of one month of intervention	9.389 ± 1.358	13.161 ± 1.433	$p < 0.05$	**
Egg production ability at the end of second month of intervention	9.403 ± 0.973	14.398 ± 1.131	$p < 0.05$	***

Table 2: Egg production performance of birds under different treatments.

As indicated in table 3 above there is no significant change ($p>0.05$) on the mortality of birds at two different treatments during the whole period of the experiment.

Parameters	Treatments		P value	Significance
	Control (mean ± S.D)	Intervened (mean ± S.D)		
Average No of birds per HH at the start of intervention	10.00 ± 0.00	10.00 ± 0.00	.	.
Mortality of birds at first month	2.5 ± 1.35	2.1 ± 1.85	0.588	ns
Mortality of birds at the second month	1.7 ± 0.95	2.0 ± 1.41	0.584	ns

Table 3: Mortality of chickens under two different treatments.

Conclusion and Recommendations

Poultry production is highly practiced in the study area with local chicken breeds. But the production is hindered with low productivity due to poor housing, poor feeding condition and disease. The result of this study showed that the intervention of the improved chicken housing, feeding and health package has a significant effect on the body weight and egg production of local chicken production. All the intervened farmers were initiated by the result of this study and they have decided to use the packages by their own effort after the intervention. Therefore it is better to give an attention by the government to disseminate information and provide packages to farmers.

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