

# STRATEGIES FOR THE IMPROVEMENT OF RURAL CHICKEN PRODUCTION IN GHANA

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## Abstract

### STRATEGIES FOR THE IMPROVEMENT OF RURAL CHICKEN PRODUCTION IN GHANA.

Rural poultry production systems in Ghana and in Africa as a whole are based on the scavenging indigenous domestic fowl (*Gallus domesticus*), the predominant species in the poultry sector [1]. In most African countries scavenging chicken have no regular health control programmes, may or may not have shelter and usually have to scavenge around for their nutritional requirements.

In Ghana, the total poultry population is estimated to be over 20 million with 80% of this being rural scavenging chicken [2]. Out of this population, 80% is lost annually due to outbreaks of Newcastle disease and a number of other causes.

Reported here are the results of field surveys conducted in the wet and dry seasons in two selected ecological zones (Forest and Coastal) to establish the constraints to improvement of rural chicken production in the country. The survey covered only women farmers who engaged in rural poultry production. During the course of the survey, chicken flocks as well as chicken houses were examined for ectoparasites. Faecal samples were collected for laboratory diagnosis of endo-parasite infestation, as well as serum samples for analysis of antibodies using immunoassay techniques.

The survey revealed that Newcastle disease still remains the most important disease of the scavenging rural chickens.

## 1. INTRODUCTION

The traditional village poultry production systems in Africa are mainly based on scavenging indigenous chickens found in almost all households in the rural areas. They are characteristically an integral part of the farming systems requiring low-inputs with outputs accessible at both interhousehold and intrahousehold levels [3].

Rural poultry production is an important agricultural activity of almost all rural communities in Africa, providing scarce animal protein in the form of meat and eggs as well as being a reliable source of petty cash. Village chickens also fulfill a number of other functions for which it is difficult to assign any monetary value. These include the fact that rural chickens play an active role in pest control and are used for traditional ceremonies and festivals [2, 4]. The importance of rural poultry in the national economy of developing countries and its role in improving the nutritional status and income of many smallholder farmers and landless communities has been very significant [5, 6]. Strategic increases in the productivity of rural chicken flocks will, therefore, greatly assist in poverty alleviation, improve household food-security and protein intake of the rural communities and in the long term curb the massive urban migration of the youth.

However, rural poultry is not rated highly in the mainstream of national economies because of the lack of measurable indicators. Production levels of rural poultry in many African countries fall far below desirable levels. Outputs in terms of weight gain and the number of eggs per hen per year are very low with relatively high mortality rates [7]. Especially young chickens may die in large numbers. Several reasons for the high mortality and low productivity have been suggested, such as mismanagement, malnutrition, diseases and predation [8, 9].

## 2. MATERIALS AND METHODS

Two ecological zones (a Coastal and a Forest zone) have been selected for the field surveys. The project was introduced in both zones through durbars (traditional meetings) of chiefs, opinion leaders and the people of various villages within each zone.

In each zone three separate villages were selected and four female farmers who were also engaged in rural chicken production were individually interviewed on questions concerning the health status and husbandry practices of their flocks.

In the course of the surveys/interviews the chickens were closely examined for any signs of diseases and/or ectoparasite infestations. Faecal samples were collected for parasitological examination back at the Accra Veterinary Laboratory as well as blood samples for serological analysis

in immunoassay-based techniques to establish baseline levels of antibodies to Newcastle disease and Gumboro disease.

The surveys were conducted in the dry and wet seasons in both ecological zones. All households involved in the project were visited on a regular basis to monitor the performance of the rural chicken flocks. In the event of an outbreak of any disease, dead birds and/or moribund birds were collected or purchased for necropsy to establish the cause of death. No intervention measures were implemented.

### 3. RESULTS

#### 3.1. Production characteristics

The flock size, flock dynamics and production performance of the birds kept in the households of the various villages in each ecological zone that participated in the surveys are shown in Tables I, II and III.

TABLE I. FLOCK SIZE IN THE HOUSEHOLDS SURVEYED

Zone	Village	Household	Flocksize: dry season			Flocksize: wet season		
			C	D	T	C	D	T
Coastal	Adentan	Janet Addo	54	20		45	9	
		Margaret Ameyya	31			52		
Forest	Amanfro	Martina Youri	23	8		15	4	
		Jamila Osumanu	25	19		21	19	
		Felicia Annan	22	0	12	25	0	6
		Alice Davordzie	16			21		
		Emelia Hammon	32			29		
	La	Lydia Adabah	24			17		
		Caroline Oddoye	30			23		
		Philis Akosua Sackey	31			24		
		Getrude A. Boye	23			17		
		Mabel Apen	46			35		
Forest	Odankwah	Joana Dankwah	45			16		
		Ama Achaempong	19			26		
		Comfort Badu	28			26		
		Hanna Quaye	30			39		
	Okwabena	Adjoa Adjo Dai	50	20	4	20	3	2
		Mary Abeka	56	15		32	5	
		Juliana Quaye	62			51		
	Otopease	Comfort Tetteh	42			35		
		Regina Essiah	47			34		
		Ama Kumah	50			20		
		Elizabeth Yamoah	75			53		
		Mary Darkua Manyo	39			32		
	Afua Otoo	48	13		25			
		Total	948	95	16	733	40	8

C = Chicken; D = Ducks; T = Turkeys.

There was no significant difference in the total number of rural chickens between the dry and wet seasons in each zone. The cock to hen ratio was on average 1:3 in both zones.

TABLE II. FLOCK DYNAMICS IN THE FARMS PARTICIPATING IN THE SURVEYS

Zone	Season	Flock	Cocks	Hens	Growers	Chicks
		Total				
Coastal	Dry	30	4	7	5	14
	Wet	27	3	10	5	9
Forest	Dry	46	6	17	4	17
	Wet	31	4	9	6	12

TABLE III. PRODUCTION PERFORMANCE CHARACTERISTICS OF THE RURAL CHICKEN FLOCKS

Zone	Season	Production performance				
		Clutch/year	Eggs/clutch	Eggs incubated	Eggs hatched	Eggs reared
Coastal	Dry	3.7	10.0	9.3	7.1 (76%)	4.3 (61%)
	Wet	4.0	8.7	8.7	5.0 (53.2%)	2.3 (45%)
Forest	Dry	3.0	9.2	9.0	7.2 (79.7%)	4.1 (56.9%)
	Wet	4.0	8.9	8.3	5.4 (65%)	3.0 (55.3%)

There was a significant lower percentage hatchability of eggs incubated in the wet season than in the dry season in both zones with a correspondingly very low chick survival rate (53.2 % and 45 % as compared to 76% and 61% for the Coastal zone; 65% and 55.3% as compared to 79.7% and 56.9% for the Forest zone).

### 3.2. Housing

Housing facilities for rural chicken are usually made of small wooden structures aimed at keeping the birds at night. The survey revealed that 91.7% of farmers in the Coastal zone provided these types of structures for their chicken flocks with the remaining 8.3% leaving their birds to stay in the kitchen or store room. In the Forest zone just 38.9% of the farmers had properly constructed housing facilities for the rural chickens, 33.3% used the kitchen/store room and the remaining 27.8% left the birds to sit in treetops at night.

### 3.3. Feeding

The farmers in the Coastal and Forest zones reported that the bulk of the scavenging feed resource consists of harvest leftovers, which are abundant in the dry season (i.e. at the end of the wet season) and of termites and other insects during the wet season.

For supplementary feeding, all farmers in the Forest zone used farm produce with a little bit of household scraps. In the Coastal zone the supplementary feed was mostly maize with 58.3% of the farmers using farm produce and 41.7% purchasing it.

### 3.4. Ownership

The management of rural chicken in both zones was normally a family affair with the construction of chicken houses and major decision-making issues such as sale of chickens and eggs and consumption of poultry products under the control of the men. The other family members assisted in the management of the flock.

### 3.5. Health status

All farmers in both zones mentioned that the following symptoms and diseases were of great importance: swollen head, cough, diarrhea, twisted neck, fowl pox especially among the chicks and ectoparasites. However, they did not implement any control measures against these diseases.

TABLE IV. RESULTS OF POST MORTEM EXAMINATIONS CONDUCTED ON CHICKEN CARCASSES

Confirmed diagnosis	Number of birds
Newcastle disease	7
Infectious coryza	1
Northern mites infestation	1
Fowl cholera	3
<i>Escherichia coli</i> septicaemia	12
Midgut coccidiosis	6
Yolk peritonitis	2
Diffused enteritis	4
Fowl pox	24
Helminthiasis	3
Total	63

Most of the mortalities of the rural chicken were recorded during the dry season in both zones. In the Coastal zone it was as high as 90% with 50% of chicks and 60% of growers dying. In the Forest zone, 75% of the chickens died during the dry season out of which 80% of the chicks and 60% of the growers were lost. The results of post mortem examinations on some carcasses are shown in Table IV.

### 3.6. Faecal examinations

A total of 99 faecal samples were collected and examined at the Accra Veterinary Laboratory by the method of flotation with saturated sodium chloride and glucose [10]. The results are shown in Table V and VI.

TABLE V. RESULTS OF FAECAL EXAMINATIONS ON A SEASONAL BASIS

Parasite species	Number of birds affected		Total
	dry season	wet season	
<i>Ascaridia galli</i>	14	10	24
<i>Raillietina</i> spp.	7	5	12
<i>Coccidia</i> oocyst	10	14	24
<i>Strongyloides avium</i>	2	1	3
<i>Cappilaria</i> spp.	0	4	4
<i>Heterakis</i> spp.	0	4	4
<i>Syngamus traechae</i>	0	1	1
No parasites detected	14	13	27
Total	47	52	99

TABLE VI. RESULTS OF FAECAL EXAMINATIONS ON A ZONAL BASIS

Parasite species	Number of birds affected		Total
	Forest	Coastal	
<i>Ascaridia galli</i>	12	12	24
<i>Raillietina</i> spp.	8	4	12
<i>Coccidia</i> oocyst	14	10	24
<i>Strongyloides avium</i>	1	2	3
<i>Cappilaria</i> spp.	2	2	4
<i>Heterakis</i> spp.	2		4
<i>Syngamus traechae</i>	1	0	1
No parasites detected	14	13	27
Total	54	45	99

## 4. DISCUSSION

Results from the present survey showed similar flock sizes and management practices in the village chicken production systems in the Coastal and Forest zone. Flock size ranged between 16 to 54 in the Coastal zone and 16 to 75 in the Forest zone. The data also showed an average ratio of one cock to three hens.

Village chicken production is usually determined by key parameters such as clutches per year, number of eggs per clutch, hatchability and chick survival. Our study revealed a maximum of four clutches per hen per year in almost all villages in both zones with the number of eggs per clutch up to ten. Farmers usually used all eggs for incubation. However, hatchability was very low with an equally low chick survival rate. Predation (dogs eating eggs) and high ectoparasite infestation which greatly discouraged brooding were the major reasons for the poor hatchability rate. At the same time poor management practices such as poor housing facilities especially for chicks, exposed the hatched chicks to the adverse effects of weather (torrential rains) and predation.

All the farmers interviewed acknowledged diseases as the biggest constraint to improvement of their rural chicken flocks. Among the diseases of village chickens, farmers rated Newcastle disease as the most devastating. Table IV showed that fowl pox was a major cause of mortalities especially among chicks with *E. coli* septicaemia and coccidiosis being of equal importance. However, farmers

never implemented any measures to control disease except for using ashes in chicken houses against ectoparasites with little effect.

In conclusion, it should be stressed that improvement of village chicken production requires a holistic approach focusing on both husbandry practices as well as health and disease control especially a strategic control programme of Newcastle disease.

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