

## Rural Poultry Keeping in South Gezira, Sudan

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### ABSTRACT

A study on rural poultry production, management and health was conducted at six randomly selected villages in the south district of Gezira state in central Sudan. Hundred rural farmers were interviewed using a set of questionnaire. A scavenging system is commonly practiced by the farmers in all villages. Females contributed significantly the highest percentage of the farmers, with 64% versus 46% (males). The farmers prefer local breeds (77% of farmers). The majority of the farmers who rare local breeds are illiterate or with merely primary education (43/77), and they also do not use proper housing or feeding the chickens, vaccination against diseases, and with no use of medication and are not willing to vaccinate. Moreover, they also do not provide water, and even if they do, it is usually dirty as they do not clean it. Meanwhile, the farmers who keep cross breeds are mainly secondary school or university graduates (13/23). This particular group provide a better managerial aspect in constructing a poultry house that provides poultry rations or household withdrawal plus grains or poultry ration. In addition, they are also vaccinated against Newcastle disease, use medication against external and internal parasites, provide feeders and drinkers and clean them periodically. The highest flock size (more than 70 chicken including young chicks) was found to be owned by more literate farmers who keep cross breeds as compared to the local breed kept by illiterate farmers (13/23 and 3/23 cross breeds were kept by more literate and illiterate farmers, respectively). The farmers keep local breeds mainly for self sustain (eggs and meat) and others keep cross breeds for income and mainly egg production. Hatchability percentage is slightly high in local breeds compared to cross breeds and is preferred during winter.

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## INTRODUCTION

Poultry keeping in the rural areas of Sudan is one of the most ancient household activities which are practised in both transhumant and in settled life areas. A family usually keeps a variable number of birds, from local breeds, around the homestead and no distinct system of poultry management is followed. The birds are kept free around the house compound and use the same shelter as that utilized by the family. The importance of village poultry keeping in the Sudan, as a factor contributing to the nutritional level of the family, is fully realised. Therefore, efforts are being made to promote poultry production under village conditions and to control diseases. These efforts were started by the establishment of demonstration units at provincial veterinary headquarters, educational centres and at agricultural pumping schemes. Then, a model poultry farm was established in Khartoum North, with the objective of providing good quality hatching eggs, graded cockerels and extension services to village poultry keepers. An advisory programme was also implemented to deal with the breeding, housing, feeding and management aspects of poultry production. Despite the government's efforts, no improvement has been made in the rural poultry production and the official attention has attracted commercial intensive poultry production and research work for improving the production of local breeds under an intensive system. This article reviews the information available in Sudan on the

performance of the local breeds under intensive and traditional husbandry systems.

In nearly all African countries, poultry production in the rural areas is predominantly based on a free-range system utilising indigenous types of domestic fowl (Kitalyi, 1998; Host, 1988). The system is characterised by a family ownership of the birds. The birds are then left to scavenge in order to meet their nutritional needs. The feed resources vary depending on the local conditions and the farming system. Housing may not be provided (Huchzermeyer, 1973; Kuit *et al.*, 1986; Atunbi & Sonaiya, 1994) and even if it is provided, local materials are usually used (Atunbi & Sonaiya, 1994). Management is very minimal with some variations of gender roles in the activities (Olayiwole, 1984; Achiempong, 1992). The health of the birds is not guaranteed because there are no disease control programmes. The birds are exposed to many disease conditions. Among other, the Newcastle disease has been noted as the most prevalent and devastating poultry disease in many African countries (Chrysostome *et al.*, 1995). Parasites are also prevalent due to favourable conditions (Permin & Hansen, 1998). It was concluded that the major constraints affecting the rural poultry production are Newcastle disease and parasites, inadequate housing and poor feed supplementation, especially in the dry season (Illang *et al.*, 2000). Women have important responsibilities in the rural poultry production in the two zones. A research work targeting at studying the rural poultry production in six villages in South

Gezira District was carried out with the overall objective of developing integrated and appropriate management and health interventions.

## **MATERIALS AND METHODS**

### *Study Design*

Six villages located in South Gezira District, Gezira State were randomly selected for this study. The total number of the farmers was 100, and these ranged from 14-20 per village.

### *Study Population*

The study population included all the village chicken reared at the villages. The target groups were the local or indigenous fowl and the hybrids of exotic breeds and the local ones.

### *Data Collection*

#### **Questionnaire Survey**

Information related to chicken management was obtained by interviewing the farmers or stakeholders in their homes, using a structured pre-tested questionnaire. The information included more than 32 parameters. The most important of which were the gender of the stakeholder, education level, flock type or breed, and flock size (hens, cocks, pullets and chicks). The managerial aspects included the housing system, as well as the uses of proper feeders and drinkers and cleaning them. The feeding system of chickens was also considered, while care and feeding of hens sitting on hatching eggs. The

selection of hatching eggs, the best season of hatching, the days the hen sits on eggs and the chicks brooding time. The health questions involved the vaccination and medication against diseases and the farmers' willingness to vaccinate. The questionnaire also included the socioeconomic aspect in the purpose of chicken keeping, the most preferred product, the laying interval or the number of clutches, as well as the number of eggs per clutch and marketing availability.

#### **Remarks**

The farmers were given the opportunities to tell their problems and give any suggestions.

### *Data analysis*

The data obtained were managed, collated, and analysed using SPSS Version-15 statistical software (SPSS Inc. Chicago). Meanwhile, a descriptive analysis was used to describe the sampled population in the study. The differences between the proportions were tested using the Chi square ( $\chi^2$ ) analysis at the significance level of  $\alpha = 0.05$ . In addition, a cross tabulation concentrating on the level of education versus all the managerial aspects and health was also done in the study.

## **RESULTS AND DISCUSSION**

As shown in Table 1, the females represented the highly percentage of poultry keepers in South Gezira district (77%). These are in agreement with that of Illang *et al.* (2000). Nonetheless, no significant differences ( $P > 0.05$ ) were observed in the level of

TABLE 1  
The effects of farmers' education level on the different managerial aspects of poultry keeping in South Gezira

Parameters	Level of Education					Total	Level of Significance
	Illiterate	Primary	Intermediate	Secondary	University		
Sex of Interviewer							
Male	7	11	5	6	7	36	0.722
Female	16	16	8	16	8	64	
The flock type and breeds							
Cross Breeds	3	6	1	6	7	23	0.092
Local Breeds	20	21	12	16	8	77	
The Total Flock Size							
Less than 30	5	3	1	2	0	11	0.003
31- 50	11	5	4	3	0	23	
51- 70	4	6	0	5	2	17	
More than 70	3	13	13	12	13	49	
System of Housing							
No access to housing	15	9	5	4	1	32	0.001
Backyard small poultry pen	8	17	7	12	8	52	
Proper poultry house	0	1	1	6	6	14	
Purpose of Poultry Keeping							
Home consumption	18	18	7	9	3	55	0.01
Income	0	1	2	4	5	12	
Both purposes	5	8	4	9	7	33	
The most preferred product							
Eggs	15	18	7	12	2	54	0.01
Meat	3	5	2	5	5	20	
Both products	5	4	4	5	8	26	
System of feeding							
No proper feeding	10	7	5	6	0	28	0.003
Household withdrawal	11	16	6	9	5	47	
Poultry ration	2	4	2	7	10	25	
Proper cleaning of feeders and drinkers							
Yes	5	6	1	8	13	33	0.001
No	18	21	12	14	2	67	

Table 1 (continued)

Care and feeding of hens sitting on hatching eggs							
Yes	16	22	11	20	14	83	0.275
No	7	5	2	2	1	17	
Hatchability (%)							
Less than 60	1	2	0	3	0	6	0.551
60- 70	6	6	3	5	4	24	
71- 80	4	8	1	4	6	23	
More than 80	12	11	9	10	5	47	
Vaccination and medication against Diseases							
Yes	4	6	3	9	12	34	0.001
No	19	21	10	13	3	66	
Willingness to vaccinate against Newcastle disease							
Yes	15	22	10	20	15	15	0.05
No	8	5	3	2	0	18	

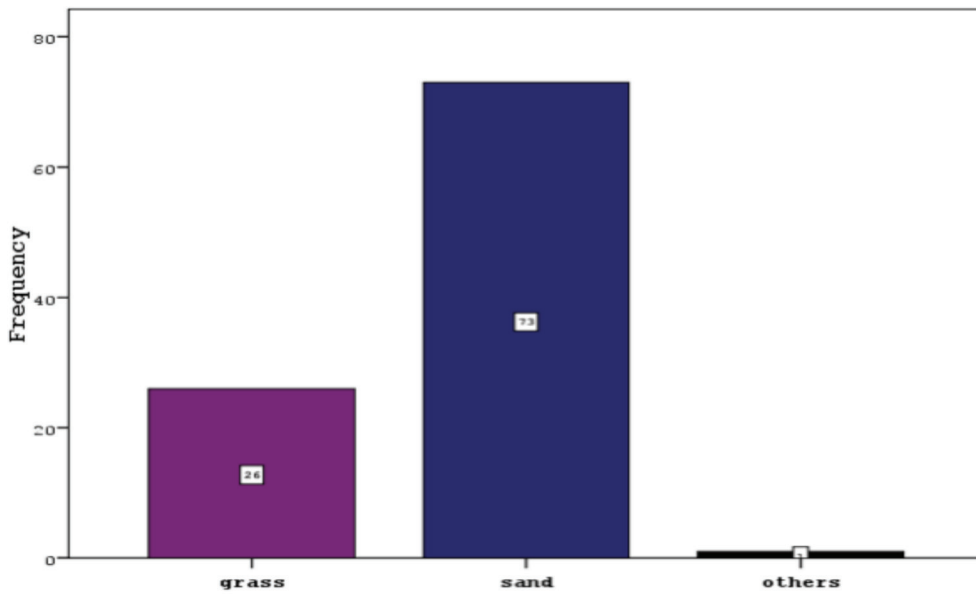


Fig.1: The materials used in the hatching nest

TABLE 2  
The effects of flock type on the different managerial aspects of poultry keeping in South Gezira

Parameters	Flock type and breed		Total	Level of significance
	Cross breeds	Local breeds		
Total Flock Size				
Less than 30	0	11	11	0.010
31 – 50	2	21	23	
51 – 70	3	14	17	
More than 70	18	31	49	
System of Housing				
No Housing	3	31	34	0.008
Backyard small pen	13	39	52	
Proper poultry house	7	7	14	
System of Feeding				
No proper feeding	1	27	28	0.002
Household withdrawal and grains	1	36	47	
Commercial poultry ration	11	14	25	
Regular Cleaning of Feeders and Drinkers				
Yes	14	11	25	0.001
No	9	66	75	
The Most Preferred Product				
Eggs	11	43	54	0.786
Meat	5	15	20	
Both products	7	19	26	
Purpose of Poultry Keeping				
Home consumption	5	50	55	0.001
Income	8	4	12	
Both purposes	18	23	33	
Number of Eggs per Clutch				
Less than 10 eggs	0	5	5	0.455
11 – 12 eggs	18	56	74	
More than 12 eggs	5	16	21	
Hatchability Percentage (%)				
Less than 60	2	4	6	0.793
60 – 70	4	20	24	
71– 80	6	17	23	
More than 80	11	36	47	
Marketing Availability				
Available	6	10	16	0.133
Not available	17	67	84	

Table 2 (*continued*)

Vaccination against Newcastle Disease				
Yes	15	19	34	0.001
No	8	58	66	

TABLE 3

The effects of farmers' gender on the different managerial aspects of poultry keeping in South Gezira

Parameters	Farmers' Gender		Total	Level of significance
	Males	Females		
Flock Type and Breeds				
Cross Breeds	11	12	23	0.178
Local Breeds	25	52	77	
Total Flock Size				
Less than 30	2	9	11	0.472
31 – 50	7	16	23	
51 – 70	7	10	17	
More than 70	20	29	49	
System of Housing				
No Housing	11	23	34	0.745
Backyard small pen	19	39	52	
Proper poultry house	6	8	14	
System of Feeding				
No proper feeding	12	16	28	0.465
Household withdrawal and grains	14	33	47	
Commercial poultry ration	10	15	25	
Regular Cleaning of Feeders and Drinkers				
Yes	28	48	76	0.755
No	8	16	24	
The Most Preferred Product				
Eggs	18	36	54	0.640
Meat	9	11	20	
Both products	9	17	26	
Purpose of Poultry Keeping				
Home consumption	18	37	55	0.745
Income	5	7	12	
Both purposes	13	20	33	

Table 3 (continued)

Hatchability Percentage (%)				
Less than 60	3	3	6	0.793
60 – 70	3	21	24	
71- 80	9	14	23	
More than 80	21	26	49	
Vaccination against Newcastle Disease				
Yes	14	20	34	0.439
No	22	44	66	
Willingness to Vaccinate against Disease				
Yes	33	49	82	0.059
No	3	15	18	

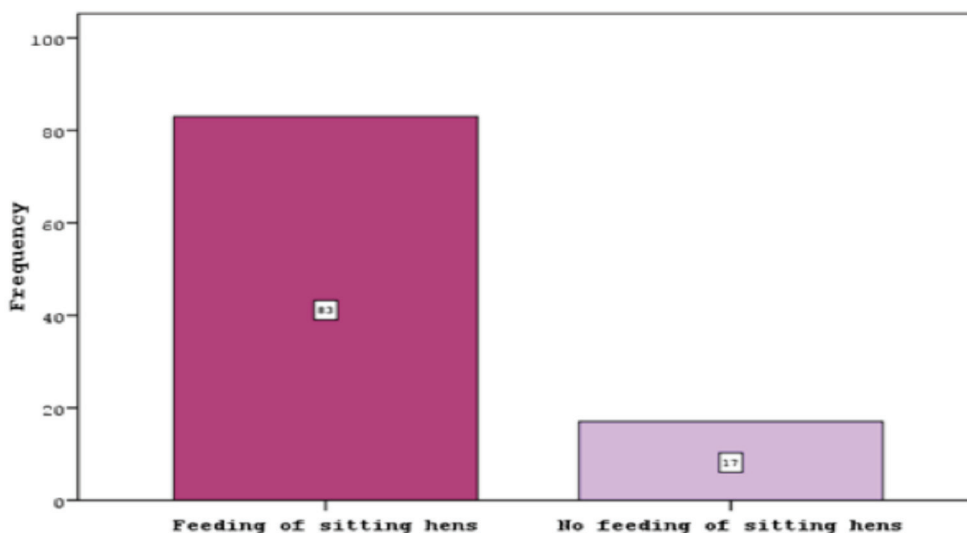


Fig.2: Care and feeding of sitting hens

education between the male and female farmers. Irrespective of the farmers' gender and the flock breeds, more literate farmers (secondary and university) were found to be undertaking good managerial aspects that have positive results on their production (proper poultry houses, poultry rations, big flock sizes, number of eggs per clutch, vaccination and medication against diseases,

etc.). Most of the males were shown to keep cross breeds (23 farmers out of 36), and out of this number, 13 farmers had secondary school and university education. When the different managerial aspects were compared with reference to the flock type, the cross breeds significantly obtained the highest value ( $P < 0.05$ ) for the best managerial aspect, except for the number of eggs/



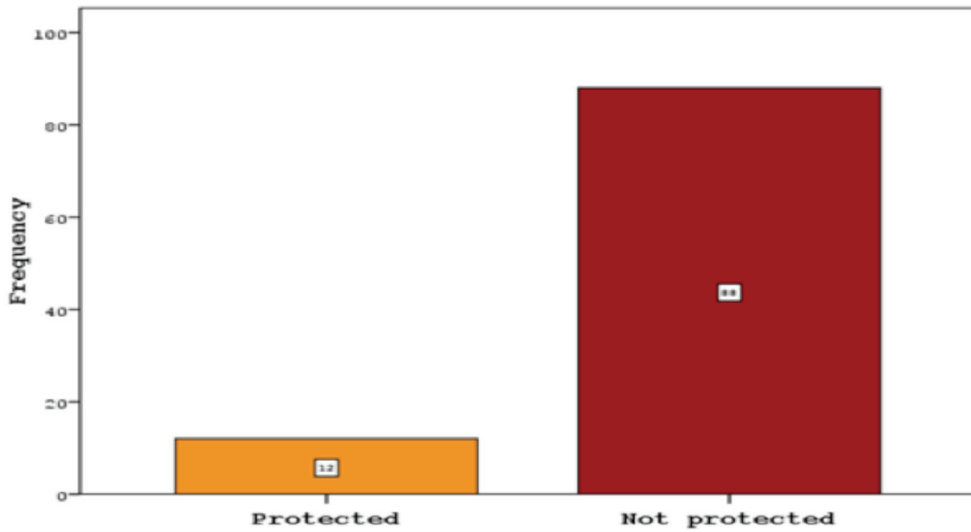


Fig.3: Protection of chicks against environmental conditions

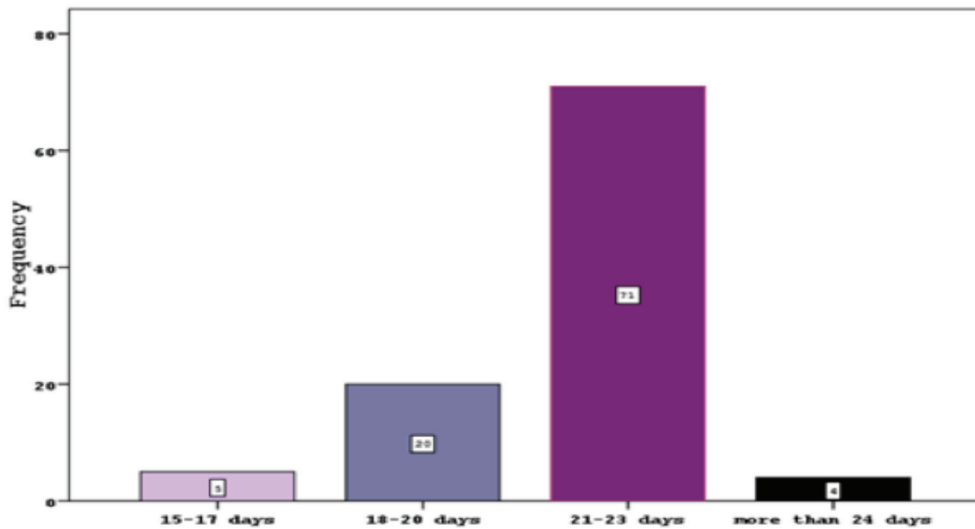


Fig.4: The numbers of days a hen takes in brooding chicks

clutch, which was shown to be fairly better in the cross breeds; inversely, however, the hatchability percentage was found to be fairly better for the local breeds (Table 2). Similarly, no significant difference ( $P > 0.05$ ) in term of the managerial aspect (Table

3) was found for another cross tabulation comparison to study the effect of farmers' gender on the different managerial aspects of poultry keeping in this district.

All the farmers agreed that winter is the best season for egg hatching and about 77%

of them used sand (Fig.1); meanwhile, 83% of the farmers stated that they took care of the hens sitting on eggs and fed them (Fig.2). Nevertheless, the majority of the farmers (88%) did not protect the chicks against environmental conditions (Fig.3), which resulted in increasing chick mortality. Most farmers (71%) showed that hens took around 20-21 days in brooding newly hatched chicks (Fig.4).

The results of this study confirm that of Sulieman (1996) who found that the native Baladi hen lays on average of 40–50 eggs per year because there are four clutches of egg laying with an average of 11 eggs per clutches. Under controlled conditions and improved management, however, the average egg production could increase to 172–177 (Sulieman, 1996; Mekki, 1998), and these were apparently attained by more literate farmers who used both proper poultry houses and poultry ration.

Meanwhile, production of eggs for consumption is the principal function of chickens reared in most regions, and these also served as sources of income and meat for home consumption. The production system in all the geographic regions undertaken in the study also revealed similar features that were generally characterized by extensive scavenging management, absence of immunization programs, increased risk of exposure of birds to diseases and predators, and reproduction entirely based on uncontrolled natural mating and hatching of eggs using broody hens. These results are on accord with all the authors reviewed (Host, 1988; Kitalyi, 1998), who had

found scavenging fowls as predominating. Housing may not be provided, especially for small size flocks reared by illiterate farmers. These results also confirm those of Huchzermeyer (1973), Kuit *et al.* (1986), Atunbi and Sonaiya (1994) and Illang *et al.* (2000).

The average flock size in this study considered the number of chicks with 20 - 300, and this finding disagrees with that of Khalafalla (2002) who found that the average flock size was 18.8 birds, which included hens (44.3%), cocks (10%), growers (20%) and chicks (24.8%). The hen to cock ratio ranged from 3-6; however, this result coincides with that of Khalafalla (2002) who reported a ratio of 4.4:1.

The remarks and suggestions given by the farmers are summarized as follows:

1. Farmers need packages of poultry keeping.
2. They are looking forward for vaccination against Newcastle disease that is prevailing throughout the year, mainly during the summer, which wipes out more than 90% of their flocks.
3. Farmers complained about the unavailability of the market for them to sale their produce.
4. Some farmers want co-operative societies to help them solve the problems of vaccination and marketing, apart from other constraints that are faced by them.

The major constraints that hinder village poultry production in Sudan have been identified and these included inadequate

health care, poor production, inappropriate housing, as well as poor knowledge of poultry management and poor marketing. In addition, they also do not have access to extension.

## CONCLUSION

Based on the results of this study, it is concluded that:

1. Rural poultry production is to be more considered as being an important item in providing animal protein to rural people.
2. Periodic and comprehensive extension packages should be provided to rural poultry keepers so as to cover a more pronounced way of poultry management.
3. Adoption of more research work to find suitable solutions for the constraints that are faced in rural poultry keeping (e.g. housing, feeding, health, hatching egg care, chick brooding and care, vaccination and natural medication).
4. Creation of adequate markets for the farmers to sell their produce, as well as to attract and encourage production of village poultry products.
5. Encourage the establishment of production and consumption co-operatives.
6. Encourage family producers and motivate farmers to become best producers.

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