

**The University of Zambia
School of Agricultural Sciences
Department of Animal Science**

**The Survey of Village Chicken Production in Mumbwa
District.**

**“Report submitted in partial fulfillment of the requirements for the award of the
Degree of Bachelor of Agricultural Sciences of the University of Zambia”**

23rd January 2004



LOCAL CHICKENS FEEDING ON NSHIMA LEFTOVERS

DEDICATION

Dedicated to my mother Tives Kumwenda and the late father Timothy Kumwenda.

ACKNOWLEDGEMENTS

I am grateful to my supervisor, Mr. J. Mwenya for his tireless technical advice and guidance without which this research project would not be a success. Thanks are also due to Dr. P. Sinyangwe, Director for Research and Specialist Services, MACO for financial support.

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Special thanks go to my brothers; Boyce, Shadrick, Luckson and Solon, friends and workmates who had assisted me in the collection of data; Mr. Zimba, Mr. E. Mulikita, Mr. B. Katongo, Ms. Doreen, Ms. M. Botha of Mumbwa District.

Finally I would like to thank Jehovah for providing life which is behind every successful Operation and actually better than the best things we can ever imagine.

ACRONYMS AND ABBREVIATIONS

C	-	Cattle
CKLS	-	Cockerels
D	-	Donkey
Du	-	Ducks
DIZIZ	-	Disease
FLS	-	Fleas
G	-	Goats
GF	-	Guinea fowls
GP	-	Guinea pigs
HHH	-	Household per head
HH	-	Households
HO	-	Horses
HSING-		Housing
Km ²	-	Kilometer squared
MACO-		Ministry of Agriculture and co-operatives
P	-	Pigs
PULTS-		Pullets
MIZE	-	Maize
PF	-	Pigeons
PRDT	-	Predators
R	-	Rabbits
SAS	-	Statistical Analysis System
SPSS	-	Statistical Package for Social Scientist
VC	-	Village chickens
VCFA	-	Village chicken farmers association

ABSTRACT

A survey was conducted in Mumbwa District to evaluate the village chicken production with special attention to their phenotypic characteristics. The survey was carried out in the months of July to August 2003. The exercise involved the use of questionnaires in which 96 randomly selected HH, were interviewed. Four strategic camps were chosen i.e. Nalubanda (424 HH), Mumba Scheme (300 HH), Kayanga (320) and Mumbwa Central (915). The questionnaires were used to obtain demographic data, local names of the chicken breeds, flock structures, flock sales, management aspects which included feeding, housing and disease control. The family sizes are in the range of 1 to 19 persons. The number of children per family is 1 to 12 and average number of children per family is 5 and 6. It was observed that 50% of the households do not keep dependants. The number of chickens kept ranges from 10 to 80. Based on the phenotypic characteristics of the local chickens, the breeds identified are naked necks (Kalukuluku), Dwarf (Chifuli), Frizzled (Chinese), Spotted (Mabala-ankanga) and feathered legs. It is evident that there are phenotypic variations in local chickens in Mumbwa, which can be made use of to improve the productivity of these chickens. The chickens are left to scavenge for food and only supplemented when food is plenty. 60%HH feed maize grain, 27%HH nshima, 23%HH sorghum, 22%sunflower, 6%HH maize meal and 3%HH termites to their local chickens. The main constraints identified are poor housing structures, unreliable health and disease control methods, inadequate feeding due to low feed-resource base, theft and predators.

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CHAPTER 1

1.0 INTRODUCTION

In Zambia, village chicken rearing is an important agricultural activity at rural household level. According to the Department of Animal Production and Health -Provincial Veterinary Office (Annual Report 2002), poultry production has been estimated at 16 million broiler birds, 5 million layers and the traditional sector with substantial number of birds as well of 12 million. Surveys of farming systems carried out by the Ministry of Agriculture, Food and Fisheries (Research Extension Action Plan, 1992) and other workers (Kean and Singogo, 1989; Lungu *et al.*, 1995; Chisanga and Mulenga, 1996) indicate that more than 80% of the rural households in Zambia rear indigenous poultry. These birds are kept under extensive management in the mixed crop-livestock farming systems.

One of the peculiarities of the crop-livestock farming systems of Zambia is the virtual dependence on the indigenous fowls for poultry products (Research Action Plan, 1992). The rural smallholder farmers depend upon village chickens for their supplies of eggs and meat. They also derive good income from sales of chickens and eggs. The modern intensive broiler chickens and egg production is an urban animal production system mainly benefiting town and city consumers. These urban-oriented producers are generally located adjacent to the large towns and cities of Zambia.

Despite the importance of indigenous village chickens to the rural communities and urban consumers, little is known and is being done to assess the productivity of these birds under smallholder crop-livestock farming systems. The potentials, major constraints and possible solutions for improved production need to be identified.

The results of this study will provide baseline data on many aspects of village chicken production and management in Zambia. It is expected that the data generated would help appreciate the socio-economic importance of village chickens in Zambia. This will enable to develop a standard production model of village chickens in Mumbwa District.

Since local chicken rearing is mainly the responsibility of women and children in the household, there is some hope that increasing incomes from village chicken enterprises will improve the income levels of women in the rural society. The development of the village chicken industry in the rural areas of Zambia would therefore improve the economic status of rural areas.

1.1 OBJECTIVES

The main objective of this survey is to evaluate the productivity of local chickens in Mumbwa District with special attention to their phenotypic characteristics.

1.2 Specific objectives

1.2.1 To describe key aspects of chicken production in Mumbwa such as feeding, housing, disease control measures and marketing of the chickens

1.2.2 To identify major local breeds of chickens by their phenotypic characteristic such as plumage color, comb shapes, body sizes and female laying characteristics.

1.2.3 To identify and list factors impeding local village chicken production in Mumbwa District.

CHAPTER 2

2.0 LITERATURE REVIEW

2.1 Origin of poultry rearing

According to the literature available (Williamson and Payne, 1978), the modern fowl is believed to have originated from four wild species, the Red jungle fowl (*Gallus gallus*), the Ceylon jungle fowl (*G. lafayetti*) the grey jungle or sonnerat fowl (*G. sonneratti*) and the Java jungle fowl (*G. varius*), although it is likely that of the four wild species *G. gallus* is the main ancestor. Williamson and Payne (1978) explained that the four species are closely related, known to interbreed and are probably no more than somewhat divergent geographical races.

The idea to keep chickens is not known as it dates way back in the Bible times (Matt 26 v 74). Payne (1978) has stated that domesticated fowls had been reported in Indus valley around 2000 BC, in what is now Iran and that the Persians probably spread them throughout Western Asia and to the shores of the Mediterranean around 600 BC. They were common in Italy by 100 BC and were introduced into northern Europe by 100 BC. They were used for different purposes in different cultures. Their use in cock fighting has an early origin and their first economic impact was probably as egg producers. They were also used both in Greece and in Rome for sacrificial and soothsaying purposes. Details of the spread of fowls eastwards and northwards into Asia from their centre of origin in south or Southeast Asia are unknown at present. They were imported into the America and Australia by the early European explores and immigrant (Williamson and Payne, 1978).

2.2 Uses and economic importance

Zambia is in a transition period as a result of economic restructuring and a rapidly growing population. The economic restructuring being experienced in Zambia today has resulted in increased urbanization leading to an increase in the demand for animal protein. Poultry like other short cycle animal stock can be a solution for sustained food production and poverty alleviation. Poultry production, particularly eggs and broiler business constitutes the largest single agricultural enterprise accounting for 30 % of Zambia's gross marketed agricultural output (Mid Term Review Report of the Agricultural Sector Investment Plan, 1998).

These local chickens remain predominant in African villages despite the introduction of exotic and crossbred types, because farmers have not been able to afford the high input requirements of introduced breeds (FAO, 1996).

2.3 Village chicken production

In Zambia quite a number of cross breeding programs have been done in an effort to increase the productivity of the local chickens. In 1982 one hundred Star Cross-585 breeding cockerels were purchased and distributed in each district of central province (Serenge, Mumbwa, Kabwe, Kapiri, Mukushi and Chibombo) to cross breed with the local hens (Department of Agriculture, 1982). Cockerel exchange programs in which hybrids are exchanged for any chickens in a HH have been used widely for improvement of village stocks. The approach to improve local productivity by cross breeding has been done in many other countries. In Malawi there has been cross breeding programme; using the Australop, a dual purpose breed, black in color and capable of laying up to 200 eggs in a year and has good meat characteristics (Bray and Moffat, 1990). However the set back is its non-broodiness when used commercially. These chickens can therefore perform well under the free-range or traditional production systems where they are not under controlled environment. The cross breeds of local and Australorp chickens have been observed to forage for themselves, withstand diseases, breed readily and provide many eggs than original local chickens (Bray and Moffat, 1990).

It must be noted that cross breeding is not remedy for poor management and nutrition nor will cross breeding work to the same degree in all situations. The effectiveness of cross breeding depends on the skills employed in utilizing the resources at hand. The poultry production systems of Africa are mainly based on the scavenging indigenous chickens found virtually all villages and HH in rural Africa (FAO, 1996). This system is characterized by small flock sizes, usually of less than 20 per HH and is a low input output system (Oldenbroek, 1998).

2.4 Phenotypic characteristics

According to Horst (1988), the genetic resource base of the indigenous chickens in the tropics is rich and should form the basis for genetic improvement and diversification to produce a breed adapted to the tropics. Horst (1988) described nine major genes of the indigenous chickens (Appendix 1) that can be used in genetic improvement programmes. There is little information on the genetic make up of indigenous chickens of Zambia and none has been documented in Mumbwa District.

Local chickens can be described as having a variety of feather colours ranging from multi-coloured to single colours such as white, black, grey and brown (Mushota, 2001). Bray and Moffat (1990) have also observed the same trend in other parts of Zambia. The skin colors also vary considerably from white yellow and blue black. The comb types can be described as compact and pea type.

Apart from the Fayaumi breed developed in Egypt (Hossary and Galal, 1995), there appears to be no record of a tropical adapted breed developed from indigenous chickens in Africa. A programme to produce such a breed in Nigeria failed after introducing a systematic approach of upgrading the breed by replacing the local cocks with Rhode Island Red (RIR) cocks (Oluyemi, Adene and Ladoye, 1979). The RIR cocks in the Nigerian programme succumbed under the poor rural conditions (Adegbola, 1988). Similar observations on genetic improvement programmes based on the introduction of exotic genes in local populations through cockerel exchange, supply of pullets or hatching eggs have been reported in Malawi (Safalaoy, 1997). Bessei (1989) has

expressed fear that continued cross breeding programmes in rural poultry, which do not consider gene preservation aspects, would lead to erosion of the indigenous germplasm and he is in support with (National Research Council, 1993, Crawford and Govara, 1993). Many authors like (Rege, 1995) have emphasized the importance of local chickens and he has defined it as the distillation of knowledge both published and unpublished, which contribute to the reliable prediction of the genetic performance in a defined environment and provides basis for assessing existing diversity.

CHAPTER 3

3.0 MATERIALS AND METHODS

3.1 Location

The survey was carried out in Mumbwa District with an estimated number of 25404 inhabited in a total area of 23800 Km squared of which 22800 Km squared is arable land and 11200 Km squared is national parks as the protected forest reserves (2002 Annual Report, Mumbwa).

3.2 Data collection

Field data were collected through interviews from 96 randomly selected HH. Structured questionnaires were used as detailed (Appendix c). The exercise took Two (2) months (July-August 2003). Four camps were selected based on the intensity of village chicken activities from which the 96 HH were randomly selected. In each selected camp, the Government extension officer was involved in the survey. One of the most important tasks for these people was to inform the headmen a week before the exercise commenced. This was done to avoid suscepicions so that accurate data could be accessed. The Four camps selected are Nambala (424 HH), Mumba Scheme (300HH), Kayanga (320 HH) and Mumbwa Central (915). These camps are far spaced and made mobility not easy. Transport at the district was used to accomplish the survey. Some important data collected include chicken ownership pattern, decision making in village chicken management aspects, hen production data based on hen history per HH (App. C)

3.3 Data analysis

The qualitative data collected were subjected to the process of data reduction to obtain an organized assembly of information, which was stored in a spreadsheet program. The summarized information was classified and analyzed using SPSS and subjected some aspects to statistical test.

CHAPTER 4

4.0 FINDINGS OF THE SURVEY

4.1 Demographic Characteristics

4.1.1 Family Size

The family pattern in Mumbwa ranges from 1 to 19 people per household. The majority of the households consist of 6 members in one household.

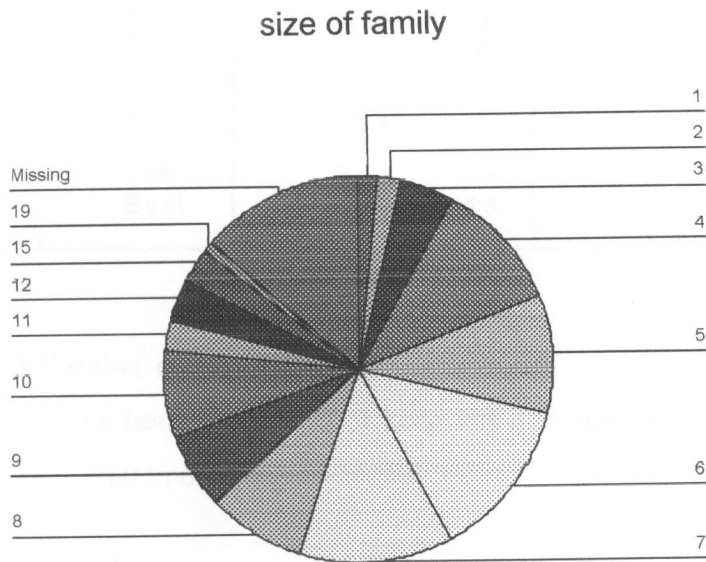


Figure 1: Size of family.

The number of children per family is in the range of 0 to 12. Most of the families have no children. However, 5 to 6 children per family ranks second.

Table 1: Number of Children.

		Freque	Perc	Valid	Cumula Perc
Valid	0	1	10.	12.	12.
	1	1	9.	10.	22.
	2	1	12.	14.	37.
	3	9	8.	9.	46.
	4	1	9.	11.	58.
	5	1	9.	10.	68.
	6	1	9.	10.	79.
	7	7	6.	7.	86.
	8	6	5.	6.	92.
	9	3	2.	3.	95.
	1	3	2.	3.	99.
	1	1	.	1.	100
	Tot	9	86.	100	
Missi	Syst	1	13.		
Tot		11	100		

4.1.2 Number of dependants

50% of the households do not keep any dependants at all. The number of dependants ranges from 0 to 8.

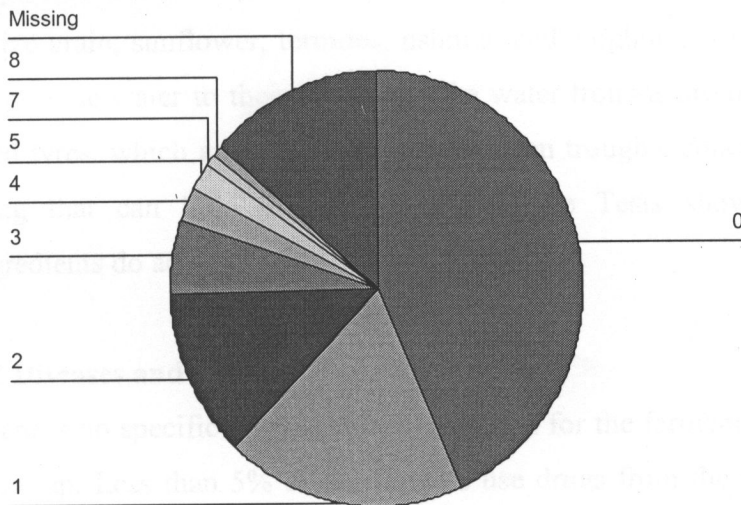


Figure 2: Number of Dependants.

4.2 Housing

The chickens are housed at night in various types and forms of structures.

7% households do not provide shelter

4% share their houses with chickens

3% let their chickens spend nights on trees

47% use Chitombo structures

21% use Chichinka structures

15% use Chitele structures

3% use Chicken pens

The structures that are not raised off the ground are poorly ventilated. These are prone to fleas, mites and flooding during the rain season. Structures that are plastered give very bad ventilation. The cracks in the poorly plastered structures provide ideal sites for the external parasites. These structures enhance the spread of respiratory diseases. Some types of housing structures (App. Figures 1 and 2).

4.3 Feeding Practice

The chickens are left to fetch for feed around the houses. Chickens feed on anything they can; they scavenge on insects, lizards, vegetation, worms and any other type of feed that they come across. On certain occasions the chickens are supplemented with maize meal, maize grain, sunflower, termites, nshima, and sorghum. It was observed that all farmers do provide water to their chickens. The water troughs are of various types such as pots, used tyres, which are cut, small tins, wooden troughs, concrete molded troughs and any thing that can hold water. The Chi-Square Tests showed that the different feed ingredients do act dependently (App. Table 2).

4.4 Diseases and Control

There is no specific disease control program for the farmers. They wait for the disease to show up. Less than 5% of the farmers use drugs from the recognized shops to cure the disease. The majority of the farmers treat their chickens using anything they have heard to be effective. They can use hot chili, washing detergents, salt, paraffin, and even some painkillers. The most prevailing disease identified show signs of Newcastle disease. The

birds go round in circles, backward and sideways twisting of the neck. The time observed for this disease is in the cold months of June and July, and the hot months of September and October. The other threatening health hazard for the chickens is external parasite infestation. These include lice, fleas, and mites commonly known as Tubalebale. These mites can infest the ears, eyes, and the comb. These are treated by pouring paraffin on the affected sides. Infestations are highest in the households where the chickens are housed in mud-plastered structures. These infestation cases are far less in the households where the chickens roost in trees at night.

4.5 Phenotypic Characteristics

4.5.1 Plumage preference

The majority of the farmers (52%) keep chickens, which have black plumage. They like these because they are not usually caught by the birds of prey. 30% indicated that they prefer mixed color, 10% showed that white is good while 7% said spotted is the best.

4.6 Management Patterns

4.6.1 Chicken ownership trends

About 33% of chicken ownership is by either the male or female house head. In married households, 22% of ownership is by the wives. Daughters, sons and relatives came third with 11% each. It is for this reason that either the wife or husband and the whole family are involved in decision making on sales of chickens.

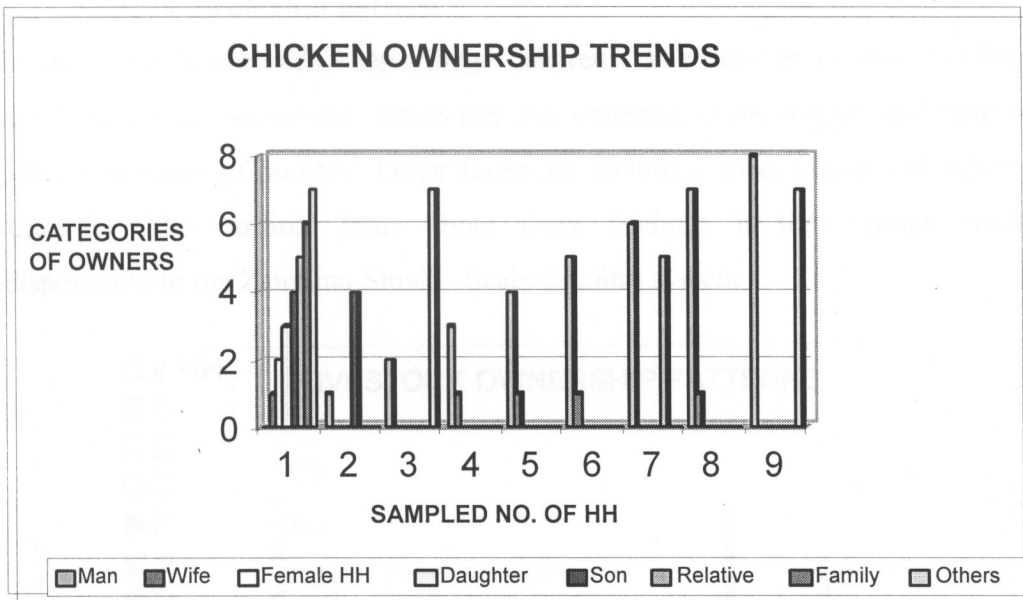


Figure 3: Chicken Ownership Trends.

4.6.2 Livestock ownership pattern

Almost all the households keep village chickens. The number of chickens kept ranges from 10 to 80 per household. Goats are also common in the district and rank second to chickens in terms of number. Other livestock include Cattle, Sheep and pigeons as per (figure 4) .The cardinal issue about these findings is that village chickens are indispensable in the Zambian Small - Scale farming system.

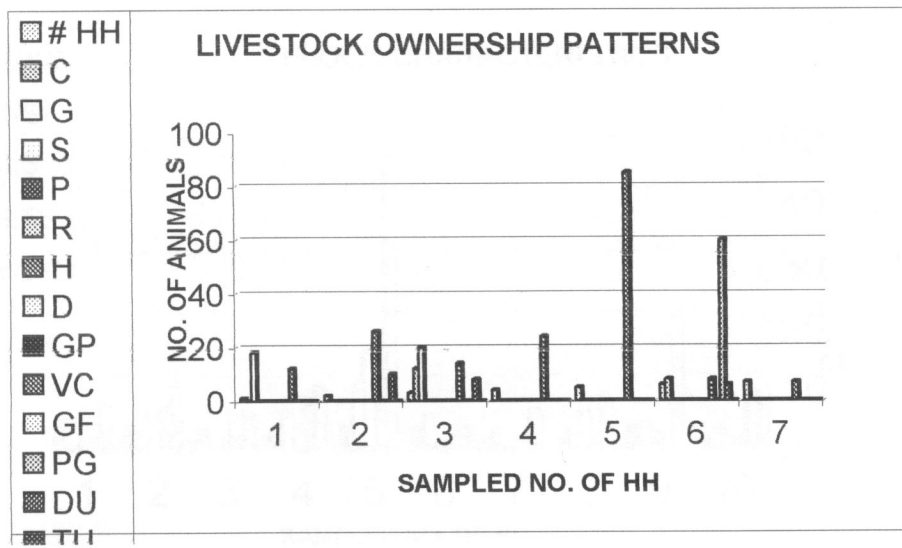


Figure 4: Livestock ownership pattern

4.6.3 Flock characteristics/structure

It was found that 90% of the households have more chicks than any other category of chickens. The second highest are pullets, which are followed by the hens and cockerels. The least number reared are the cocks. These findings suggest that hatchability of village chickens is not much of the problem. The major problems and constraints are as mentioned under item 4.9 of this report. These problems have led to high mortality rates, low reproductive rates and product quality loss during marketing.

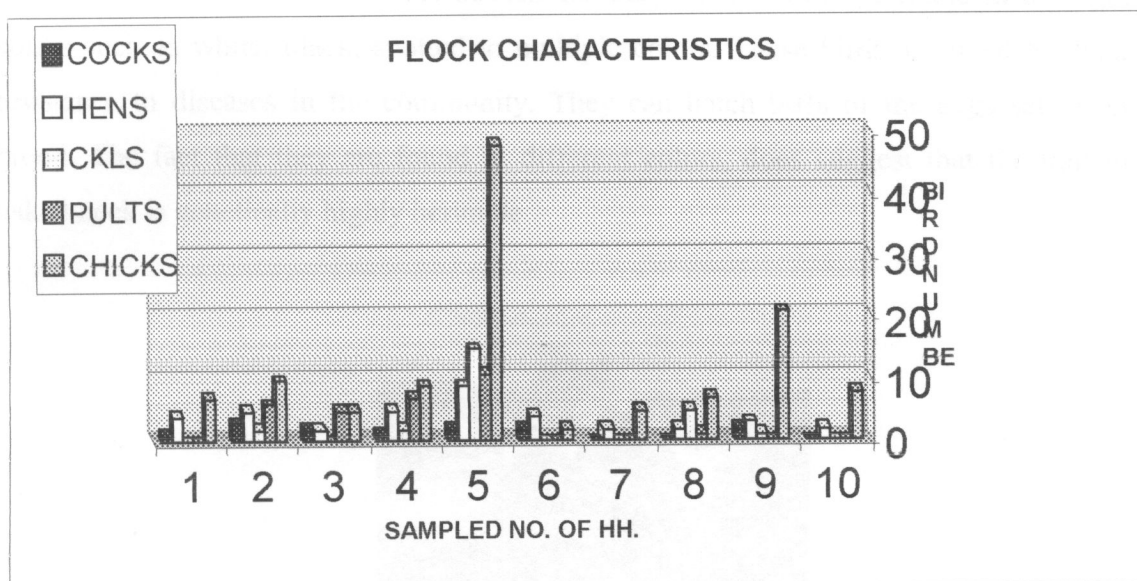


FIGURE 5:Flock characteristics

4.6.4 Egg laying

The average number of eggs laid per hen per clutch is 10. The average pause period is 2-3 days. It was found out that a hen can only give 2-3 clutches in a year.

4.7 Local breeds

4.7.1 Naked-neck (Kalukuluku)

These chickens have no feathers around their necks. Kalukuluku is a local name given to these chickens and 28% of the households keep them. They are found in different colors such as white, black, spotted to multiple colors. These birds are liked for their resistance to diseases in the community. They can hatch 90% of the eggs set under brood. The fact that they are found in different colors, does suggest that the trait of naked neck is genetically highly heritable.



Figure 6: Naked neck

4.7.2 Dwarf (Chifuli)

These are short-legged birds. They are dwarf and the body sizes can be small or medium. Most of them have pea combs. 28% of the households keep these chickens. The problem with these chickens is that they are vulnerable to predators, as they cannot run as fast as those of long legs. They also find problems to climb high set off the ground housing structures.

4.7.3 Chipita Bushiku

These chickens are large with long legs, pea comb and bright eyes. They are found in all colors; black, spotted, white, brown, gray and ash-like. These chickens are mostly found in the Eastern part of the district (Kayanga Camp). Generally 25% of the households keep these chickens.

4.9 Frizzled, (Chinese) or ‘Wet look’

The frizzled chickens are locally known as Chinese or ‘Wet look’. The reason for giving them the name of Chinese is not well known but it is believed that some Chinese brought them in the area. They are called ‘wet look’ because the feathers resemble the human hair, which has been treated in a hair salon. It is reported that the meat from these birds is tender.



Figure 7: Frizzled

4.7.5 Feathered legs

Only 2% of the households keep these chickens.

4.7.6 Mabala-ankhanga (Spotted)

These birds are steadily increasing in numbers among the households in Mumbwa. At present only 27% of the households keep these birds. They have specific spotted colors of gray and black like those of Guinea –fowls. These chickens look like the barred Plymouth Rock. The reported problem of these birds is their low egg productivity. They are known for their fast growth rate due to the exotic genetic material that was introduced in 1982 in Central Province under the cockerel distribution campaign.

4.8.0 Chicken uses

The chickens are kept for various reasons. They serve as table birds. The chicken droppings are used as organic manure in the fields for crops. The eggs are rarely sold to traders and neither are they consumed often. They are reserved for brooding purposes. Chickens, which are black or white, are used in traditional healing.

4.9 Constraints to production

Feed and diseases are the most outstanding problems in Mumbwa. The chickens are given supplementary feed in time of plenty and this is after the harvest period. The chickens are left to scavenge around the houses to survive.

The most prevalent disease in the area shows the signs of the Newcastle disease such as neck twisting, coughing and paralysis of legs. External parasite infestation is also a big problem in the area. The external parasites mentioned and seen were lice, fleas and mites. Locally, these parasites are referred to as *Tukulukunyemba* or *Tubalebale*. Theft came to be the third most limiting problem to chicken production.

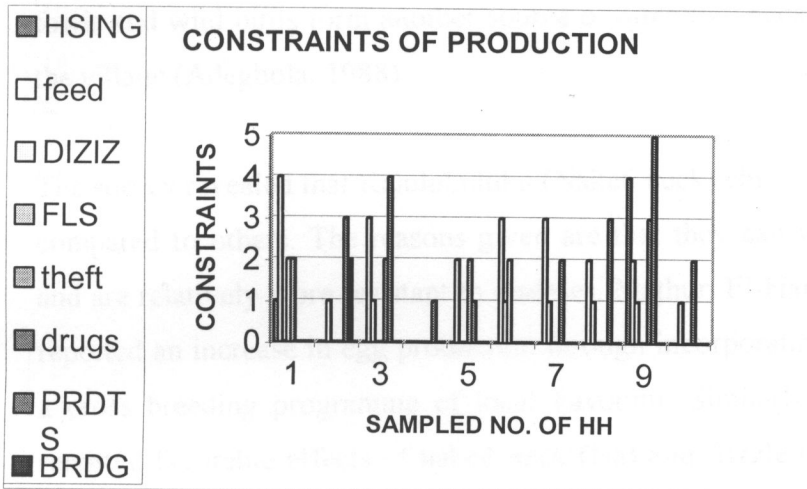


Figure 8: Constraints of production

CHAPTER 5

5.0 RESULTS AND DISCUSSION

The results or findings of the survey show that little attention is given to the chickens in terms of housing, feeding and medication. The flock structure shows that more than 50% of the HH can keep up to 50 chickens of less than one month (figure 5) but not more than 10 chickens reach maturity stage. This shows that the chicks are exposed to stress conditions so early. The mother hens scavenge for food with the young ones in the heat of the day and cold periods of May June and July. This situation is compounded by the interactions of different entities at HH level. At village level the high mortality of chickens is due to contacts between flocks of different HH, the exchange of birds as gifts or entrusting sales and purchases. Similarly, other domestic fowls and wild birds form another source of infection, because chickens roam freely in the village (Adegbola, 1988).

The survey revealed that Kalulukuluku (Naked neck) chickens are a better breed to keep compared to others. The reasons given are that they can withstand high temperatures and are relatively more resistant to diseases. Mathur, El-Hammandy and Sharara (1989) reported an increase in egg production through incorporating naked neck (Na) genes in a cross breeding programme of local Fayoumi. Similarly, Horst and Mathur (1992) reported favorable effects of naked neck (Na) and frizzle (F) genes on egg production and egg weight and of the dwarf gene (dw) on feed efficiency of chickens under heat stress.

The dwarf breed is liked for their good mothering ability in the district. They are found in different sizes (small, medium and large). Gondwe (1999) specified the weights of the Malawian local chickens to be 1.5 Kg to 1.7 Kg.

In this survey it came out that 27% HH keep the spotted breed of chickens. They like this breed of more meat other than for egg production. Gondwe (1999) reported similar findings on the Malawian local chickens. It can be stated in this case that the spotted

chickens are more of meat producing birds than other indigenous chickens. These birds have the potential for further development. The frizzled chickens are disliked for their susceptibility to cold weather and do not protect the chicks adequately from the cold. The local chickens are exposed to harsh weather as only 47% of the HH provide shelter to their chickens. The farmers could be realizing better income than at present if they took village chicken rearing as a business.

If the recommendations laid down in this report could be put into practice, there can be an improvement in local chicken production. Special attention should be paid to all the members of the family when solving problems involving local chickens as decision-making is done as a family and that the whole farming system is affected. This may mean that the larger the family the longer period to come to a decision. It was found out that the average age of the HH per head was 43.3. It was identified that the family size was dependent on the age of the HH. The older the age of HHH, the larger the family size.

CHAPTER 6

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Recommendations

6.1.1. Formation of village chicken farmers associations.

- The groups so formed to be registered so as to be legally recognized and be able to source funds from lending institutions.
- The groups to be in constant contact with the Agriculture Extension staff for technical advice as and when required.
-

6.1.2 Government Extension staff to conduct mobile courses (short term training) in poultry husbandry.

- To be conducted at the Farmers Training Centers.
- To be targeted at Team Leaders and
- Contact farmers.

6.1.3 Construction of improved structures, which can achieve the following;

- Protect the chicks from predators and bad weather.
- Protect the birds from theft, predators parasites and fast spread of diseases.

The structures should be able to be locked to keep away thieves.

6.1.4 To improve Market Structures at sites of trading chickens.

- This is aimed at reducing weight loss before the chickens are sold.
- To reduce the distance between the source and the selling point.
- To achieve organized prices which are stable and satisfying to the farmers.

6.1.5 The village chicken association groups to integrate the chicken rearing business into the whole farming system by growing specific crops for feeding chickens.

6.1.6 To design and construct a village chicken pilot project at selected focal point.

- To be spearheaded by the extension staff in Mumbwa.

- To source funds from the district
- To involve the local people and
- To use the local available construction materials as far as possible.

6.2 Conclusions

- 6.1 The survey has shown that local chickens are an indispensable component of the farming systems in Mumbwa District. Among the livestock production, indigenous chickens are the most affordable and most common. Virtually all the households keep village chickens. The most common breeds are Frizzled, Spotted, Dwarf, Feathered legs and naked neck.
- 6.2 The chickens are kept under the free-range system in which they are left to scavenge for food during the day and provided with night shelters. They keep the chickens for multiple purposes, which include income, consumption, Organic- manure and traditional healing.
- 6.3 Highly interrelated production constraints have been identified among which, diseases, theft, predators and poor housing are leading. It has also been observed that veterinary services are inadequate.
- 6.4 There are adequate phenotypic variations among the local chickens found in Mumbwa, which can be used in breeding programmes for genetic improvement of the local chickens. This can easily be achieved by careful selection of the chickens that perform relatively better than others as seed stock.

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APPENDICES

Appendix A

Table 1: Effects of predators on chicken rearing

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.906	2	.453	.309	.735 ^a
	Residual	136.334	93	1.466		
	Total	137.240	95			

a. Predictors: (Constant), total number of livestock, total number of poultry

b. Dependent Variable: thef

Table 2: Chi-Square Test on feed types

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1079.929 ^a	1040	.190
Likelihood Ratio	321.625	1040	1.000
Linear-by-Linear Association	6.365	1	.012
N of Valid Cases	96		

a. 1107 cells (100.0%) have expected count less than 5.

The minimum expected count is .01.

Appendix B



Figure 1: A Cut Drum used for housing Chickens

APPENDIX B:



Figure 2: Chinchinkha

Appendix C

Sample questionnaire for phenotypic characteristics survey on village chickens in Mumbwa District

A GENERAL ATTITUDE OF FARMERS

1. What is your most important agricultural activity? (Tick where appropriate).
Cropping---; Livestock production---; both have the same importance---
2. Do you think that village chickens are important in relation to other farm enterprise? (Tick where appropriate).
Very important---; quite important---; Not very important---

B DEMOGRAPHY AND FAMILY CHARACTERISTICS

- 1.Number of family members living in the farm---
- 2.Number of family members that are absent---
- 3.Number of children below school age (7years); Boys---; Girls---
- 4.Number of non family members living in the farm---
- 5.People over 7 years on the farm

Family members relationship	Sex M/F	Year of birth	Education level Grade in years	Living on the farm Y/N	Economic situation (Use key)

KEY: 1=Working in the farm; 2 Working outside the farm; 3=Student/Pupil;

5. Work off farm

Family member	Work off farm Y/N	Sector of activity (use key0)	P/T (use key)	Day per year	Contribution to household income

KEY: 1= other farm activity; 2=Handcraft; 3 = Trade; 4 =Transport; 5= Public Administration; 6 = Civil Service; 7= others specify
 *P= Permanent employment and T=Transport

C. LIVESTOCK AND POULTRY PRODUCTION

1. Do you keep cattle, sheep, goats or pigs? Indicate in the table below

Species	Breed	BM	C	BF	RM	RF	SM	SF	Total
Cattle	Angoni								
	Barotse								
	Tonga								
	Crosses								
Total									
Goats	Local								
	Boar								
	Crosses								
Total									
Sheep	Local								
	Improved								
	Crosses								
Total									
Pigs	Improved								
	Local								
	Crosses								
Total									

KEY: BM=Breeding males; C= Castrated; BF=Breeding females;
 RM/RF=Rearing male or female; SM/SF=Suckling male or female.

2 Indicate other species of livestock kept in the table below.

Class of livestock	Species of livestock			
	Rabbits	Horses	Donkeys	Guinea pigs
Breeding males				
Breeding females				
Rearing males				
Suckling males				
Suckling females				

3. Do you keep any poultry species? Y/N. Indicate in the table below

Species	Class of poultry	Type or name	Number in the flock
Village chickens	Cocks		
	Hens		
	Cockerels		
	Pullets		
	Chicks		
Total			
Guinea fowls	Cocks		
	Cockerels		
	Hens		
	Pullets		
	Chicks		
Total			
Pigeons	Cocks		
	Hens		
	Cockerels		
	Pullets		
	Chicks		
Total			
Turkeys	Cocks		
	Hens		
	Cockerels		
	Pullets		
	Chicks		
Total			
Ducks	Cocks		
	Hens		
	Cockerels		
	Pullets		
	Chicks		
Total			

3. Indicate the reasons for keeping poultry using the figures indicated in the key

Species of poultry	Reasons for rearing (a)	Who owns them? (b)	Who looks after them? (b)	Who decides on sales? (b)
Village chickens				
Guinea fowls				
Pigeons				
Ducks				
Turkeys				

KEY: a) 1=Income; 2=Consumption; 3=Social occasions; 4=Social status; 5=Ritual Ceremonies

b) 1=Man; 2=Wife; 3=Female head of household; 4=Daughter; 5=Son; 6=Relative; 7=Family.

5. Do you sell the poultry species that you are rearing? Y/N

Species	Live animal	Carcass	Feathers	Other uses of feathers
Village chicken				
Guinea fowls				
Pigeons				
Turkeys				
Ducks				
Geese				

6. Do you employ people to look after your poultry? YES/NO? If yes which species of poultry? -----
 -----When? -----
 -----Type of payment? Kind-----Cash-----

D. MANAGEMENT OF VILLAGE CHICKENS

Housing and shelter

Do you provide any housing for your village chickens? YES/NO If yes
 What shelters or housing do you provide (indicate in local names)-----
 -----?

c). When do you provide housing or shelter?

--	--

3. Indicate the reasons why you prefer them

Type of village chicken kept		Reasons why they are preferred
Time when housing is provided	Tick where appropriate	
Stage of brooding		
At night		
During the day		
During the rainy season		
During the dry season		
During the cold season		
During the disease out break		

2.FEEDING MANAGEMENT

Do you provide any feeds for your chickens? Y/N If yes

Indicate the type of feed provided below.

a) -----

B)-----

C)-----

D)

3.BREEDING AND PRODUCTIVITY OF VILLAGE CHICKENS

1. What is the most common type of village chicken found and kept in your area?

Type	Description

2. Which type/breed of these village chickens do you keep?

Type of breed of local chickens	Local name or description

Do you practice any selection of cockerels or pullets? YES/NO .If yes

What qualities do you look for when selecting breeding stock?

Cockerels -----

Pullets -----

5. Do you practice any seasonal breeding? YES/NO

6. If yes in which seasons do you local chickens lay and brood eggs? Indicate in the table below.

Activity	Season
----------	--------

Laying eggs	
Brooding	

7. Do you prefer any special colors? YES/NO .If yes what functions do these colors perform or why do you prefer them?

Color type	

8.Indicate the productivity levels in the table below.

Total # of eggs laid per cluch	
Duration of laying period before brooding	Days
Total # of eggs brood per cluch	
Duration of brooding	Days
Number of eggs hatched per brood	
Number of chicks weaned per brood	
Number of brooding per year	

DISEASE AND HEALTH CONTROL

1.Indicate the common diseases found in your area

Disease	Time of prevalence	Description of symptoms	Methods of control or treatment

2. Parasites and their control

Parasite	Time of prevalence	Description of symptoms	Method of control or treatment

MARKETING OF VILLAGE CHICKENS AND EGGS

1. Where do you sell your village chickens? Tick where appropriate.

Market -----; Traders -----; Local sales -----; Middlemen -----
-;

Where do you sell your eggs? Tick where appropriate.

Market -----; Traders -----; Local sales -----; Middlemen -----.

CONSTRAINTS TO VILLAGE CHICKEN REARING

List and rank in order of importance the major constraints you face in rearing village chickens.

No.	Constraints to poultry production	Rank in order of importance
1		
2		
3		
4		
5		
6		
7		
8		