THE PRODUCTION OF GUINEA FOWL IN NIGERIA

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ACKNOWLEGEMENT

Animal protein intake of an average Nigerian still falls short of the Food and Agricultural organization (FAO) recommended level. The demand for animal protein far exceeds the supply. In order to meet the increasing demand for animal protein, other non-conventional sources need to be exploited. This is the driving force behind this bulletin. Guinea fowl, is largely unimproved in Nigeria, but has great potentials to bridge the demand supply gap in animal protein intake.

We wish to express our gratitude and to acknowledge the scientists, researchers and authors, whose work and relevant data were pooled to make this booklet a complete information package for all those interested in the production and consumption of Guinea fowl.

The contribution and cooperation of NAERLS staff, particularly the staff of Livestock and Fisheries Programme are highly appreciated.

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INTRODUCTION

Guinea fowl belongs to the pheasant family. The bird is commonly found in the Western, Central and Southern parts of Africa. The name "Guinea fowl" is derived from the Guinea coast of Africa, which is where the birds are believed to have originated. In West Africa the grey breasted and helmeted varieties are common the areas bordering the Sahara. In Nigeria, many households in the North keep guinea fowls, and the meat and eggs are very popular. The flesh is white and delicate with distinctive game flavour and the carcasses weigh between (0.5-1.0kg) at ten weeks, which make them suitable table birds for the small family.

Advantages for Keeping Guinea Fowls

· The guinea fowls are always more capable of coping with the effects of dry weather conditions prevailing in the Northern Guinea Savanna and Sahelian ecological zones than other domestic poultry.

· Guinea fowls are apparently free from the poultry diseases that are worrisome to most farmers and scientists.

· In many urban homes the guinea fowl meat is used as substitute for game birds. The flesh of young guinea fowl is tender and has a fine flavour resembling that of wild game.

· The guinea fowl egg commands premium market prices because of the gammy flavour and has better storage ability than the chicken egg. The egg shell does not crack easily due to thickness. The eggs are believed to enhance virility and sexual potency.

· Guinea fowls with their eggs are used for scientific research, notably in physiology studies.

· The birds are less expensive to buy by a beginner and are less of financial risk to maintain on the farm.

· The over 50 million semi-domesticated guinea fowls in Nigeria constitute about 25% of the entire domestic poultry population in Nigeria, making it a variable source of animal protein which is socially acceptable.

VARIETIES OF GUINEA FOWL

The wild Species

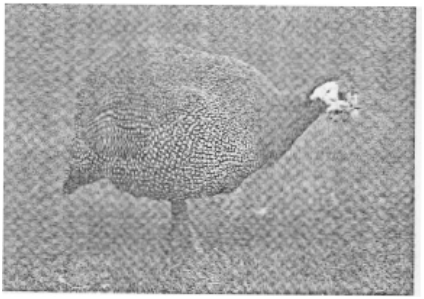
Many species of wild guinea fowl are found in Nigeria. The common domesticated guinea fowls descended from one of these wild species (Numida Meleagris). They exist in the grass land areas spreading form derived savanna to the northern guinea savanna vegetation zone. The forest dwelling crested guinea fowls (Guttera edouardi edourdi) also exist in Nigeria particularly to the Southern region. In the wild about 15-20 eggs are laid during the breeding season .

Branches of trees are usually utilized as roosting sites at night and as places of escape from hunters during day light period. Breeding is largely restricted to the wet season.

Domesticated Varieties

Guinea fowls have been domesticated for many centuries; they were raised as table birds by the ancient Greeks and Romans.

There are two main species of guinea fowl in Nigeria, which have been described; the crested guinea fowl (Guttera edopuardi) which is found in the rain forest zones and derived savanna and the helmeted guinea fowl found in the savannas. However the commonly known varieties are five, they are namely:



1. Pearl Variety

This guinea fowl has a purplish gray plumage, regularly dotted or splashed with white. The bird is so handsome that the feathers are often used for ornamental purposes. See fig 1 below

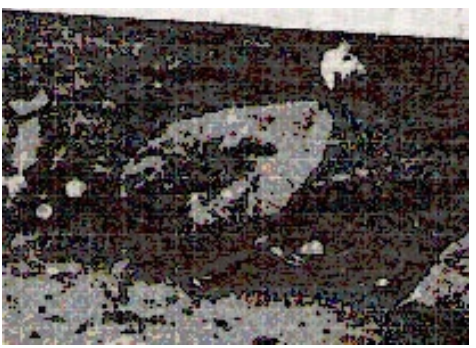


Figure 1: The Pearl Guinea Fowl.

The Pearl variety of guinea fowl is the most popular in this country.

2. The Grey Breasted Variety

This guinea fowl has grey or white breast feathers with the plumage like that of the pearl variety (Fig. 2)

These two varieties are the most common guinea fowls in Nigeria and do have great potentials for commercial production in the poultry industry because of their wide acceptability.

3. The Lavender Variety

This guinea fowl also resemble the pearl variety, but the plumage is light gray or lavender regularly dotted with white markings (Fig 3)

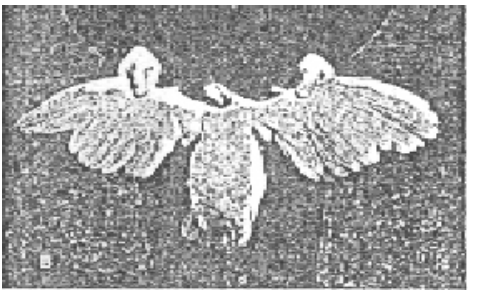


Figure. 3 The Lavender Guinea Fowl

4. The White Variety

This variety like the name indicates, has pure white plumage. Its skin is lighter in colour than that of the pearl variety (Fig. 4)

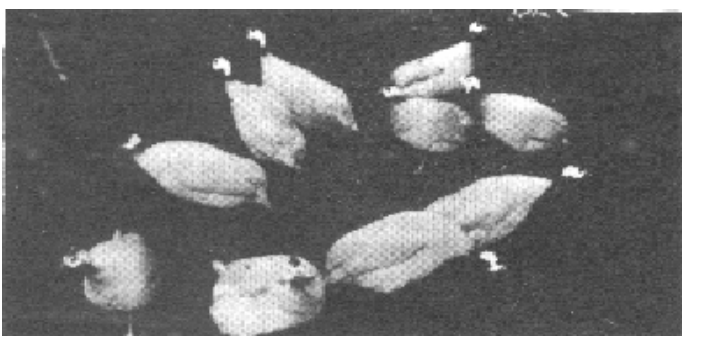


Figure 4: The White Variety of Guinea Fowl

The pure white colour of this variety is definitely an advantageous with respect to minimizing heat stress during the excessive heat period.

PRODUCTION SYSTEMS

The systems of keeping guinea fowls like in the other poultry species refer to the extent to which the birds are allowed access to green runs (pasture) and exposure to sunshine. The different management systems for raising guinea fowls are as below:

1. Extensive (Free Range) System

This system of guinea fowl management is the most common in Nigeria, and suitable for those farmers with lot of land and fields of pasture. In this management system, the birds are not confined and thus are free to fend for their own feed and roost, as well as ridding the field of insect pests and weed seeds (Fig 5). Because the birds find their own food and shelter, the management is almost at no cost to the farmer. However, the free-range management system cannot be practiced on an intensive commercial scale as the birds could easily revert to the feral state and might not be easily caught when needed.

Figure**. 5: Guinea Fowl on Free-Range**

Also, on free range the birds are exposed to extremes of climatic conditions, which often results in heavy losses predatory beast, parasites and infections diseases. This system of production is therefore, not recommended for intensive commercial scale, but for the small-scale back yard production.

2. Semi Intensive System

This system requires a permanent housing with attached fenced runs or pasture. They should be in the minimum, two pasture areas (Fig 6). The birds should have access to each plot in turn, while the other pasture is rested, and the number of birds raised depends on the amount of land available. This method is particularly suitable where land is limited and small holder farms. Under the semi intensive system, disease conditions could be common and therefore, requires close monitoring and control. At the present levels of guinea fowl production in Nigeria, this system seems suitable and therefore recommended.

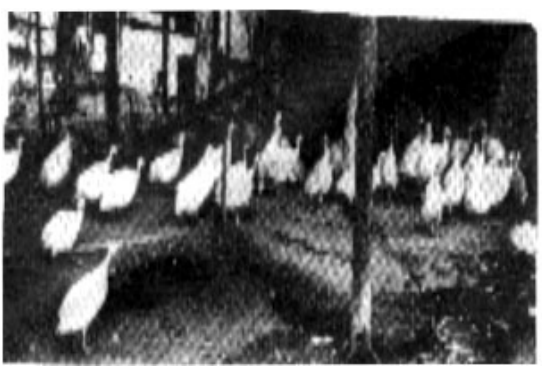


Figure**. 6: Semi-Intensive Management of Guinea Fowl**

3. Intensive System

This is the system, which is used commercially and involves confining the birds in doors either in battery cages or on deep litter within a large controlled environment.

The food and water requirements of the birds are made available all the time. See figure 7 below.

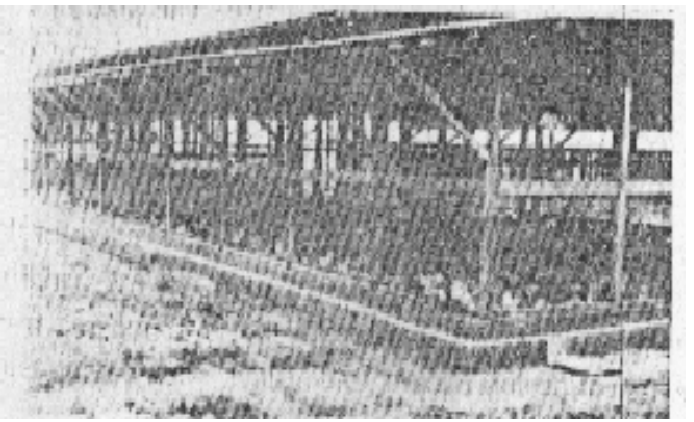


Figure. 7: Intensive System of Guinea Fowl Keeping

In Nigeria, rearing guinea fowl on the deep litter at commercial level of production is common. The deep litter system consists of solid buildings with suitable litter materials such as wood shavings; dry maize cobs and chopped straw. The system affords effective insulation of the birds from outside atmospheric conditions while Perches are provided for the birds as from the fourth week of age.

This system is recommended for large scale commercial guinea fowl production, because it allows high stock density, efficient management of resources and labour, resulting in high production output.

Selection of foundation stock

Selection of foundation stock is one of the first decisions to be made by the starting guinea fowl farmer. It is recommended that the beginner purchases his foundation stock form very reliable guinea fowl raisers within the locality.

On commercial farm it is advisable to purchase day old keets (young guinea fowls). But be sure that the birds have steady legs, alert eyes, healthy looking and with no physical defects. Do not buy guinea fowl, which look 'sleepy'. This could be an indication of ill health.

Sexing Guinea Fowls

It is difficult to differentiate the male guinea fowl from the female one. This is because there is so little difference in their appearance that many farmers find it not easy to distinguish them particularly in the young ones. Farmers who are inexperienced in keeping these birds may unknowingly keep all males or all females as breeding stock.

However, sex may easily be distinguished between the cocks from the hens by the difference in the cry of the birds and by the larger helmet and wattles and the coarser head of the males. See figure 8a and b below.

Fig 8a Guinea Cock

Fig. 8b Guinea Hen

The cry of the hen sounds like "buckwheat, buckwheat' or put rock, put-rock" which is quite different from the one syllable shriek of the cock. When frightened both the cock and the hen make one-syllable cries, but at no time does the cock's cry sound like "buckwheat, buckwheat". Sexing the birds by this way is possible when the birds are about 8 weeks of age.

In keets (between 12-15 weeks of age) the wattles have thicker edges than do those of the females.

Mating

Guinea fowls are naturally seasonal breeders because of their monogamous characteristic. And so for a commercial breeding programme artificial insemination would be of great advantage. However, for the small scale farmer who keeps the birds on the range, the practice of keeping fewer number cocks in a flock is better. This is because the cock often prepares the nests for a group of guinea hens that flock with him. This is why it is common to find 20 to 30 eggs in a single nest during the egg producing season in the wild. The nests are usually located in well hidden places making it difficult for the farmer to locate the nests when many males are kept. Such eggs also may be of poor fertility due to the monogamous tendency of the males. Once the egg nests are located, farmers are advised to leave at least three newly marked or dummy eggs in the nests during each collection to encourage the guinea fowl hen to continue using the same nest during the breeding next season.

In the wild reproductive pairs are established during the rains, the pairs and their offsprings merge together with others to form larger groups at the end of the breeding season. Thus in improved husbandry programme, efforts should be made to ensure continuous breeding and elimination of permanent pairs bonds between reproductive adults.

Egg Production

Guinea fowls come into lay at about 25 to 28 weeks of age and will continue to lay for about 8 months producing between 150 to 160 eggs during the first laying period. The second laying period may start at 12 to 14 weeks after the end of first and may last for 4 to 5½ months producing slightly higher number of eggs than that produced during the first cycle. The egg production efficiency however, depends on breeding stock and management.

Egg collection should be done daily but do not disturb the hens while they are laying.

Guinea fowl eggs are smaller than chicken eggs. They weigh between 35 to 40 grammes as compared to between 45 to 55 grammes in the chickens fig 9. The eggs collected should be stored in cool dry place.

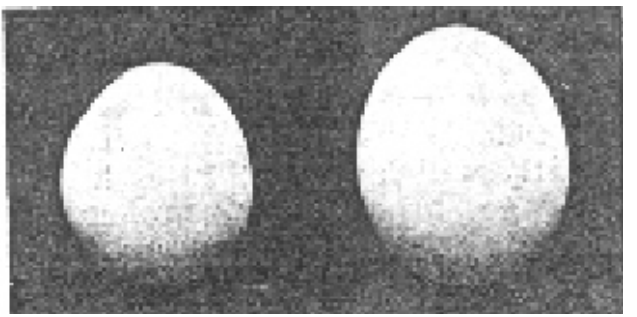


Fig 9: Egg of G/Fowl (Left) and Chicken egg (right)

Egg Incubation

Guinea fowls are not particularly good mothers and the eggs are best hatched under broody chicken hens naturally or by artificial incubation using incubators.

i. **Natural Incubation**

The incubation period of guinea fowl egg is between 26 to 28 days. The natural incubation method is commonly used by farmers with small flocks. The chicken hens are usually used because they are more adaptable than guinea fowl hens which are too wild to be set anywhere except in the nests where they have become broody. From 12 to 15 eggs may be set under a guinea hen, while 20 to 28 eggs can be set under a large chicken hen. See figure 10 below.

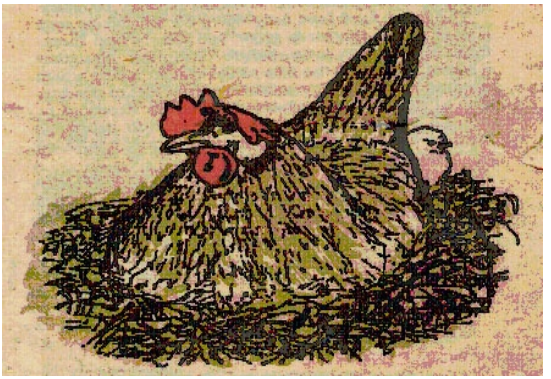


Figure. 10: Natural Incubation

Hens should be treated against lice before they are set. Also ensure adequate food and water for the broody hens.

ii. Artificial Incubation

The artificial method of incubation is by the use of machines called incubators. The incubators which are of different types have in-built devices for the production of controlled heating at recommended temperature, controlled humidity level and egg turning ability. Fig 11.

Recommended temperature and humidity of the air within incubators are about the same for both guinea fowl and turkey eggs. Temperature level of 38°c with 58% humidity for the first 3 weeks are recommended. But the temperature should be lowered to 36°c while the humidity be raised to 75% for the last week in the incubator. Each egg should be turned at least 4 to 5 times daily for the first 24 days of incubation.

Kerosene incubators are recommended for rural farmers who keep small flock and have no access to electricity.

The Nigeria Veterinary Research Institute (NVRI) made kerosene incubators at Vom Plateau state is good enough for Nigerian guinea fowl small holder egg hatching. See figure 10

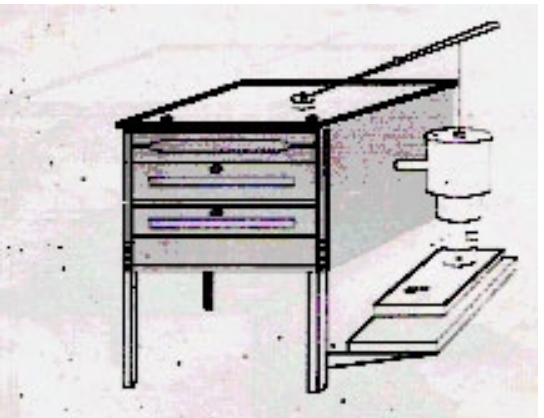


Figure. 11: The Kerosine Incubator

Keets Brooding

Brooding of keets could be done by the natural method or by artificial brooding.

a) Natural Brooding of Keets

Guinea fowl hens are not highly reputed for the care of their young ones. It will be necessary to separate the newly hatched keets from their mothers. Guinea hens are likely to take their keets through wet grass and lead them too far from the home. The common practice, is to give out newly hatched keets to a broody chicken hen to raise. A large chicken hen will brood as many as 25 keets. For the first 2-3 days the hen and keets should be confined to an enclosure, after that time they should be allowed to range (fig. 12). However, shelter should be provided at night to keep out predatory animals.

Figure. 12: Natural Brooding

Keets raised by natural method will usually leave the brooders house from the age of 6 to 8 weeks and will begin roosting at night in a near by trees in the open air. But if they have been accustomed to going into the house at night in company of the chicken mother hen they are so trained and will not be so difficult to catch when they are wanted for the market.

b) Artificial Brooding

The newly hatched keets may be raised with the same kinds of brooders and brooden houses as are used for chickens or turkeys. The recommended brooding methods and temperatures are similar to those used for chickens.

Artificial brooding using electric bulbs can be started at a temperature range of 34-40^{0}c for the first 3 weeks. This should be reduced under the brooder to 30-35^{0}c between 4th and 6th weeks and 28-32^{0}c as from 7th to 8th weeks. Thereafter, heating can be discontinued except during the cold seasons. These temperatures can be attained using 12 x 60 watt bulbs per 50m^{2} floor space or 18 x 40 watts bulbs at about 15cm above the floor. Kerosene lamp could also be used as a cheap and readily available source of producing warmth for young guinea fowls.

The brooder house should be constructed to provide both warmth and adequate ventilation for the keets and located where there should be the least disturbance, which could cause losses due to pilling up as a result of frights. Over crowding should be avoided and any form of disturbances e.g. noise, too frequent visits and sight of other animals. Corner guards are useful to prevent pilling up while pinioning of wings helps to reduce flightiness. Fig 13 below gives an example of artificial brooding system.

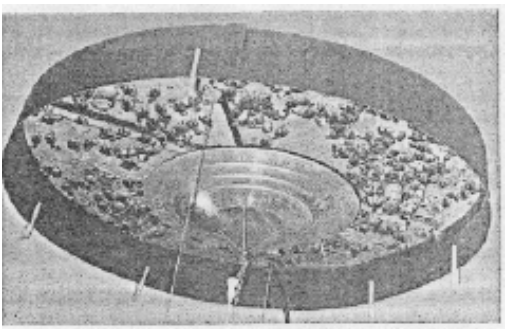


Figure. 13: Artificial Brooding of Keets.

HOUSING AND EQUIPMENT

Commercially, guinea fowls are kept confined in suitably adapted buildings on a 75mm litter of wood shavings. Adequate ventilation is important because the droppings are much drier than those of other poultry and this leads to a dustier atmosphere and therefore to an increased risk of respiratory diseases. Over stocking should also be avoided.

Rearing Pen

- The floor of rearing pen should be cemented and slightly slopped to facilitate easy cleaning and washing.
- Dwarf walls (1m high) made of block or dried brick or mud are adequate.

On top of the wall should be a chicken wire mesh of 2.5m high supported by wooden frames.

- Ventilation holes should be made into the walls but with movable cover of plank to regulate heat.
- Roof could be made of asbestos to ensure cooling
- Perches may also be provided.

Space Requirement/Stock Density

Floor space requirement of about 0.06m^2 should be allowed per bird from day old till maturity. Stocking density is at the rate of 100 birds per 55-65m^2. A stocking rate of more than 16 birds per meter is over crowding and can result to heavy losses. Up to 50% of the entire flock could be lost through such over stocking. Over stocked birds also look unthrifty and do not normally grow well.

It is also advisable not to under stock, as the birds, especially when young tend to wonder far away from sources of heat, food and water, which often cause death due to starvation. In order to ensure optimum performance, rearing size should not exceed a thousand birds.

Equipment for rearing of guinea fowls are the same with that of chickens which includes drinkers, feeders, and nest boxes, while lighting devices are optional.

FEEDS AND FEEDING

In the wild, guinea fowls diets are naturally rich and include grass seeds, crop wastes, and about 60 species of insects. In the villages, free range guinea fowls feed along with the local chickens and scientists tend to believe that the nutrient requirements of guinea fowls are similar to those of the chickens.

However, in captivity, adequate feeding of birds with balanced diets is very important for the production of fast growing healthy guinea fowls. The guinea fowl being a range bird could be allowed access to the pasture with good fresh plants e.g. stylo, tridax and water leaf.

Guinea fowls have relatively small crops and therefore, need feeding more frequently than other poultry. Commercially, guinea fowls are fed much the same as turkeys. Also, a broiler type ration is known to support good body weight gains in guinea fowls. However, some coccidiostat additives in poultry rations are toxic to guinea fowl if they exceed certain levels. You should check this point with your feed supplier before giving your birds such rations.

For rapid growth rate, it is recommended to start guinea fowls on high protein diets containing 25% - 26% crude protein and about 3200 kcal/kg for the first 6 weeks of life. Between 6 to 12 weeks of age a diet containing 20% crude protein and 3200kcal/kg is best. Above 12 weeks of age till market size is attained, the protein levels in the diets may be reduced to 18%, (see tables 1 & 2 below).

The feed intake of guinea fowl is between 25-30g; 50-60g and 70-80g per bird per day, between the ages of 0-6, 6-12 and 12-16 weeks respectively. Feed consumption record of guinea fowl is apparently high because of the tendency to waste the feed due to their manner of scooping and picking of the feed. This feed wastage could be minimized by feeding the required feed twice daily rather than ad lib and using deeper feeders for adults. Feed in pelleted form can also solve the wastage problems. Clean water should be made available always. It is also advisable that finely chopped tender green leaves be scattered a little on guinea fowl rations. Feeding the guinea fowl on range in late afternoon has the advantage of making them to return to their coop (shelter) at night.

Table 1: Feed and Feeding Requirement for Broiler Guinea Fowl

Age (Weeks)	**Protein (%)**	**Energy Value Kcal/kg**	**Amount of Feed needed per day (g)**	**Lysine**	**Meth**	**Meth + cystine**	**Ca**	**P**
0 – 5	25.5	3200	25 – 30	1.38	0.55	1.00	1.00	0.39
5 – 8	20	3100	50 – 60	0.99	0.42	0.88	0.90	0.35
8 – 12	18	3100	70 – 80	0.79	0.33	0.66	0.80	0.33

Sources: Tewe (1983)

Table 2: Nutrient Levels for Breeders

Age (Weeks)	Protein (%)	Energy Kcal/kg	Amount of Feed Needed (g)	Lysine	Methcytst	Ca (%)	P (%)
1 – 6	22	3000	25 – 27	1.20	0.81	0.70	0.40
6 – 28	14.0	2800	55 – 60	0.65	0.59	0.60	0.35
Breeder	17 – 18	2800	70 – 80	0.90	0.59	2.70	0.55

Source: Offiong (1983)

However, as from the ages of 8-10 weeks rearing guinea fowls on free range may be combined with confinement if the birds are pinioned or wind clipped. Two fenced range or pasture areas on either side of the fixed building with tender and fresh greens are highly recommended. The two fenced range conditions will allow pasture grazing rotation and reduce the incidence of diseases.

Feeder and Drinker Requirement

In intensive method of production, few hours (2-3hrs) before the newly hatched keets are received on the farm, feed should be placed on pieces of paper or flat trays, while drinkers should be placed around to get the birds familiar with them. The drinkers should be filled with clean cool water, and positioned about 1m from the wall but away from sources of heat. Coloured feeders and drinkers are preferred. Red colour is favoured because it attracts the keets. Drinking spaces of 1cm, 1.5cm - 3.0cm and 3.0-5cm per bird should be allowed for the first 4 weeks, 5-12 weeks and 12-16 weeks old respectively Table 3.

Table 3: Feeder and Drinker Requirement/100birds

Age (weeks)	Drinker Requirement	Feeder Requirement
0-4	2 x 4 liter - size	2 x 1.2m size
4-8	4 x 4 liter size	3 x 1.2m size
8-16	4 x 4 liter size	4 x 1.2m size
16 and above	6 x liter size	5 x 1.2m size

Source: Offiong (1983)

HEALTH CARE AND MANAGEMENT

It is generally believed that guinea fowls are more resistant to parasitic infestations than the domestic chickens. However, with high stocking density, on large intensive farms, there could be occasions when ailing guinea fowls are noticed on the farm. Often, it is nothing serious, but there is the chance that it could be. It is therefore important to be able to recognize general and specific symptoms and develop the 'stockman's eye' which will help spot any unusual behaviour in the birds at an early stage.

The major parasites that have been reported infecting guinea fowls in Nigeria are such like Heterakis spp and Ascaridia galli while Eimeria spp are the most important gastro intestinal protozoan parasites. It is also known that A. galli, Heterakis spp and Eimeria spp are responsible for deaths especially among the young ones. The practice in most farms, with considerable success had been to treat guinea fowls with the same drugs as those recommended for the treatment of other poultry, particularly chickens. However, in Nigeria, no viral disease has been incriminated in local guinea fowls.

In guinea fowl, like other domestic birds, prevention is obviously better than cure and you can avoid diseases a great deal by good sanitary conditions. This can be attained by the following health management practices.

a) Cleanliness

Ensure that all feed and drink containers are kept clean. Clean stock house regularly and place fresh litter in nest boxes. This litter material replacement could be done monthly along with a clean surrounding and proper drainage systems.

b) **Adequate Feeding**

The issue of a balanced diet cannot be over emphasized in themanagement of guinea fowls. They should be allowed access to fresh, clean water at all times. For guinea fowls on pastures, the principle of rotational grazing should be applied to avoid over grazing and access to fresh greens.

c) Action Against Lice, Mites and Other Pests

Houses, perches and nest boxes should have regular dusting with powder to control infestation. Treat the birds and pay particular attention to the areas under the wings, at the back of the head and around the vent. (Figure 13).

Fig 13: Dusting Guinea Fowl against Parasites.

Also, sick and decaying dead bodies should be removed as soon as they are observed while veterinary attention should immediately be drawn to any disease condition.

MEAT PROCESSING AND UTILIZATION

Work on the nutritional value has revealed that the meat and eggs of guinea fowls are tastier than those of chickens. It is also known that the meat contained higher levels of protein and some minerals than those of exotic chickens. However, from the farm to the table, the guinea fowl carcass needs to go through processing. This involves steps like slaughtering, scalding or feather picking, evisceration and meat cutting.

Slaughtering

Guinea fowls that are earmarked for slaughter should be deprived of feed for a period of 24 hours, but clean cool water should be given. This is to ensure easiness of cleaning during evisceration. To slaughter; severe the jugular vein by the neck to ensure thorough bleeding. Severing of the neck by cutting should be by the use of a sharp knife and should be done quickly to avoid unnecessary suffering by the bird. (Figure 15):

Figure. 15: Slaughtering.

Scalding/Dry Picking

Guinea fowl feathers can be removed by scalding which actually is done by dipping the slaughtered bird into a bowl of hot water as soon as the bird is confirmed dead but before the carcass gets cold. This takes a period of about 6-12 minutes for easy removal of the feathers. The feathers can also be dry picked. To do this successfully, the mouth of the bird is severed first to ensure good bleeding, and the knife is then thrust through the groove in the roof of the mouth into the brain. When the brain is pierced, the feathers are loosened by a convulsive movement of the muscles, this makes them easier to pick. (Fig. 16)

Fig. 16: Dry Picking Guinea Fowl Feathers.

Evisceration

This is the removal of the gut content of guinea fowl after scalding. The process is by cutting open the neck muscles close to the body leaving a flap of skin to close the hole through which the crop is removed along with gizzard, lungs, heart and liver through the rear of the carcass. The intestines can thereafter be removed out of the body.

Carcass Cut and Use

After going through the processes indicated above, the next step is cutting the carcass into pieces of meat for family use. This is achieved by first removing the leg sinews and drawing them out from the entire limb. Then cut out the legs off from below the knee joint. The wings and head could be removed from the body. Finally, the carcass is pieced into standard meat cuts (Figure 17).

Figure. 17: Guinea fowl Meat Cuts

These meat cuts can then be converted into different food dishes by frying, roasting or boiling in stew and soup. These are regarded as delicacies, particularly with respect to the gummy flavour and taste of guinea fowl meat.

MARKETING

There is no organized guinea fowl market in Nigeria. Farmers sell their birds as the needs arise in the household particularly in times of urgent petty-cash needs. The market channel is such that the middle men pick up the birds at the farm gates, sell to retailers from where it gets to the consumers. Sales of such birds by hawkers along major high ways is common. Also sales of dressed roasted whole guinea fowls by road sides in urban centres are common place in the northern part of the country.

SUMMARY

· Start guinea fowl farm with good foundation stock purchased from good and reliable local farmers.

· The grey breasted helmet guinea fowl variety is well adapted in Nigeria and it is recommended.

· The guinea fowl house should be situated in properly drained area with free flow of air. The house also should be rat and snake proofed, and in a noiseless environment. Avoid any situation that causes panic especially during brooding.

· Ensure provision of adequate balanced diet and clean water at all times.

· Keep one male to between 4 – 6 guinea fowl hens.

· Ensure a very clean environment around and inside the guinea fowl house and remove all decaying bodies.

· Keep good farm record for easy assessment of farm operations.

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