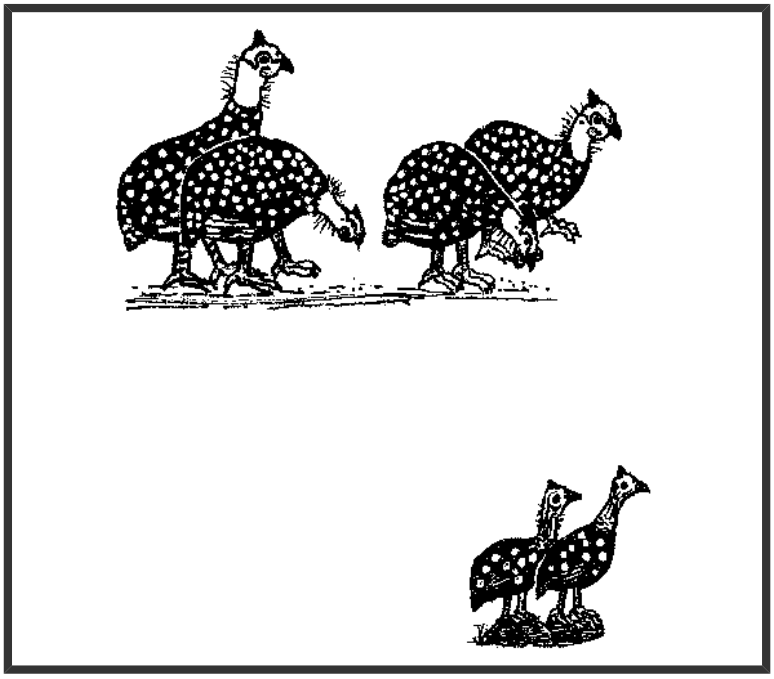
Department of National Parks & Wildlife
PO Box 30131, Lilongwe 3, Malawi

A GUIDE TO GUINEA FOWL FARMING IN MALAWI



By Anne Downes

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1 This facsimile edition was produced by the Rural Poultry Centre in Malawi with permission from the author.

INTRODUCTION

This booklet was printed using funds from the Wildlife Utilisation Project of the Government of Malawi/United Nations Development Programme (UNDP) 1st Country Co-operation Framework.

The Wildlife Utilisation project in the Department of National Parks and Wildlife has been working with local communities in Malawi since 1994. The project is primarily concerned with problems of low income levels and food insecurity at household level. Domestic guinea fowl farming was identified by local communities as a solution to these problems. Fifteen guinea fowl farming groups have since been established in six districts around the country. From our experience in the Department of National Parks & Wildlife, it is clear that guinea fowl farming is an appropriate and sustainable income-generating activity for rural communities in Malawi. It has been shown to have wide social acceptance and high marketing potential.

Much of the information in this booklet stems from practical experience at project level. The guinea fowl farming groups and the guinea fowl breeding centre, at the Lilongwe Nature Sanctuary have provided valuable practical lessons. Additional useful information has been compiled through personal correspondence with many individual guinea fowl farmers in Malawi.

I hope that this booklet will be useful to individuals and groups interested in starting guinea fowl farming in Malawi.

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May 1999.

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1. Guinea Fowl in Malawi

Guinea fowl are indigenous African birds and derive their name from the West African country of Guinea. Eight different species of guinea fowl are found in Africa. There are two types of guinea fowl in Malawi: indigenous (or wild) guinea fowl, and domestic guinea fowl.

Indigenous guinea fowl

These birds cannot be tamed and kept by people for breeding because they are completely wild. There are two species of indigenous guinea fowl found in Southern Africa; helmeted guinea fowl and crested guinea fowl. Both species have grey to purple feathers, regularly dotted with white. Helmeted guinea fowl have a horn (called a casque) on top of their heads, a bright blue face and blue wattles (long droopy pieces of skin hanging down), with red tips. Crested guinea fowl have an odd looking curly black "wig" (called a crest) on top of their heads and no wattles. Helmeted guinea fowl are more common than crested guinea fowl and are found in all protected areas in Malawi. The helmeted guinea fowl is familiar to most Malawians as "Nkhanga".

Domestic guinea fowl

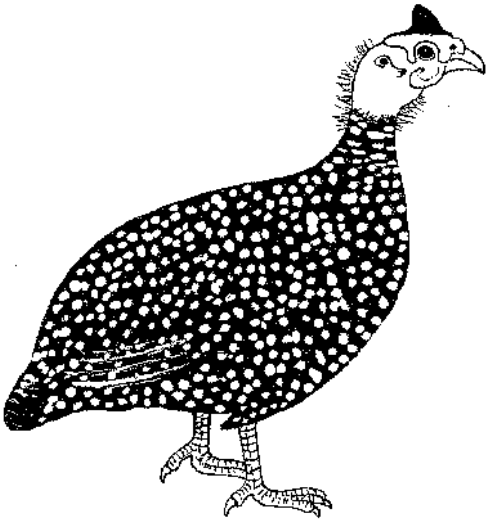
These are the guinea fowl commonly kept by people in Malawi. They are not indigenous guinea fowl - they were bred from indigenous helmeted guinea fowl, for domestic purposes. Guinea fowl have been domesticated for many centuries. The first domestic guinea fowl probably came to South Africa from Europe with the Dutch settlers in the 16th and 17th centuries. All of the guinea fowl raised by people in Malawi are of the domestic type. The information in this booklet relates to domestic guinea fowl only, (and not to indigenous guinea fowl).

1. Availability

Domestic guinea fowl are available in Malawi. They are commonly sold at in markets and at the roadsides. They are particularly plentiful in Mchinji, Mangochi, Karonga and Chitipa districts.

2. Varieties

Guinea fowl are distinctive and handsome birds. They have been domesticated for many centuries - they were raised for food by the ancient Greeks and Romans. Different varieties have been bred, each variety having its. own distinctively coloured feathers. These varieties were bred just to look pretty. There are three varieties of domestic guinea fowl, Pearl, Lavender and White. Pearl and Lavender guinea fowl are found in Malawi. All of these varieties can breed but different varieties should not be mixed with each other.



The **Pearl** variety of domestic guinea fowl is most familiar in Malawi. Its feathers resemble the indigenous guinea fowl. It has purple to grey feathers which are regularly dotted with white.

The **Lavender** variety of domestic guinea fowl is paler in colour. Its feathers are light grey or lavender regularly dotted with white. Lavender guinea fowl are so light grey in colour that they look white from a distance. There is nothing wrong with the lavender domestic guinea fowl, (it breeds well), but some people may not like its pale colour.

The **White** variety of guinea fowl has pure white feathers and is not found in Malawi.

Differences between domestic indigenous guinea fowl and domestic guinea fowl

DOMESTIC guinea fowl	INDIGENOUS guinea fowl
Are tamer than indigenous guinea fowl and are used To staying close to people. Will not run off into the bush. Can be left on free range during the day.	Are completely wild and are not used to being close to people. Will run off info the bush. Need to be kept confined.
Do well in captivity and normally produce many eggs.	Will not usually breed in captivity.
Are larger and heavier than indigenous guinea fowl. Have more meat on them.	Are smaller and lighter than domestic guinea fowl. Have a smaller body frame.
Have white faces.	Have bright blue faces.
Wattles (red droopy bits of skin on face) are larger and thicker.	Waffles are long and Thin and hang down vertically.
Male and female birds look different (see picture, next page)	Male and female birds look the same (see picture, next page).
Have poor anti-predator skills.	Have good anti-predator skills.

Indigenous (wild) Guinea Fowl
(male and female)

- Small body frame.
- Male and female look the same.
- Bright blue face.
- Long, thin wattles which hang down vertically in both sexes.

Domestic Guinea Fowl
(male and female)

- Large body frame.
- White face.
- Male and female look different.
- Male's wattles and casque (horn on top of head) are larger than the female's.

2. Why Raise Guinea Fowl?

Guinea fowl can be raised for fun, for food or for profit. Many people like to have guinea fowl around their houses for ornamental purposes. Guinea fowl are bigger than chickens. The meat tastes good and has less fat than that of a chicken; Guinea fowl farming is a viable and profitable business in Malawi.

Guinea fowl farming is profitable for many reasons:

- Guinea fowl do not suffer from many pests and diseases when compared to chickens.
- Guinea fowl do well on free range and move large distances to find their own food. They can therefore be fed quite cheaply.
- Guinea fowl are prolific layers (ie. they produce many eggs). Each guinea fowl hen can lay an average of 100 eggs in each year. These eggs can be incubated using chickens or an incubator to produce guinea fowl chicks or keets.
- Guinea fowl provide protein. The flesh of young: guinea fowl is tender and has a flavour like indigenous game meat. Guinea fowl flesh is firmer and tastier than chicken. The yield of edible meat after cooking is high (80%), compared to 65% for chicken. The meat is lean (ie. has less fat) than chicken.
- Guinea fowl are popular birds in Malawi. Because of their size and their attractiveness, they can be sold for more than double the price asked for chickens.

3. Housing

Guinea fowl housing

Domestic guinea fowl are not fully domesticated and are still a bit wild. They are not used to staying inside a house. They should be kept on free range during the day and kept inside a house at night (to protect them against predators and thieves). If there is a risk of attack from predators such as dogs, the guinea fowl should be kept in the adjoining play area during the day.

Guinea fowl will get sick and die if they are kept in a wet or dirty house. Therefore their house should be spacious and well ventilated. The recommended design and dimensions of the guinea fowl house and play area are given in the drawing opposite. This guinea fowl house (3m x 3m) is large enough to keep as many as twelve adult guinea fowl comfortably.

The house should have a well maintained grass thatch roof, covered with plastic sheeting to ensure that it does not leak. It should be well ventilated - with two opposite windows, each 0.75m x 0.25m (only one window is shown in the design. In order to protect the birds from predators, the windows of the house and the play area should be covered with chicken wire mesh or closely spaced bamboos. The birds need perches. At least one bamboo perch should be faced to the walls of the house at about 1 metre from the floor.

The floor of both the house and the play area should be covered with a thick layer of river or dambo sand (15 cm deep). Sand is the best bedding material for guinea fowl as it provides them with a source of grit. Grit is needed for a healthy diet. Sand is also easier to clean, Droppings should be swept out once a week using a broom. The sand should be changed once a month. :

Getting dry sand is difficult during the rainy season, so it would be a good idea to collect and store sand in September. This sand can be used to change the sand in the guinea fowl house each month during the rainy season.

Bundles of soft, dry long-stemmed grass should be placed up against the walls in two corners of the house in September (before the start of the guinea fowl breeding season). There should be sand on the floor in the corners. Grass provides nesting sites for guinea fowl and effectively encourages the birds to lay their eggs inside the guinea fowl house and not in the bush.

Housing for chickens and keets

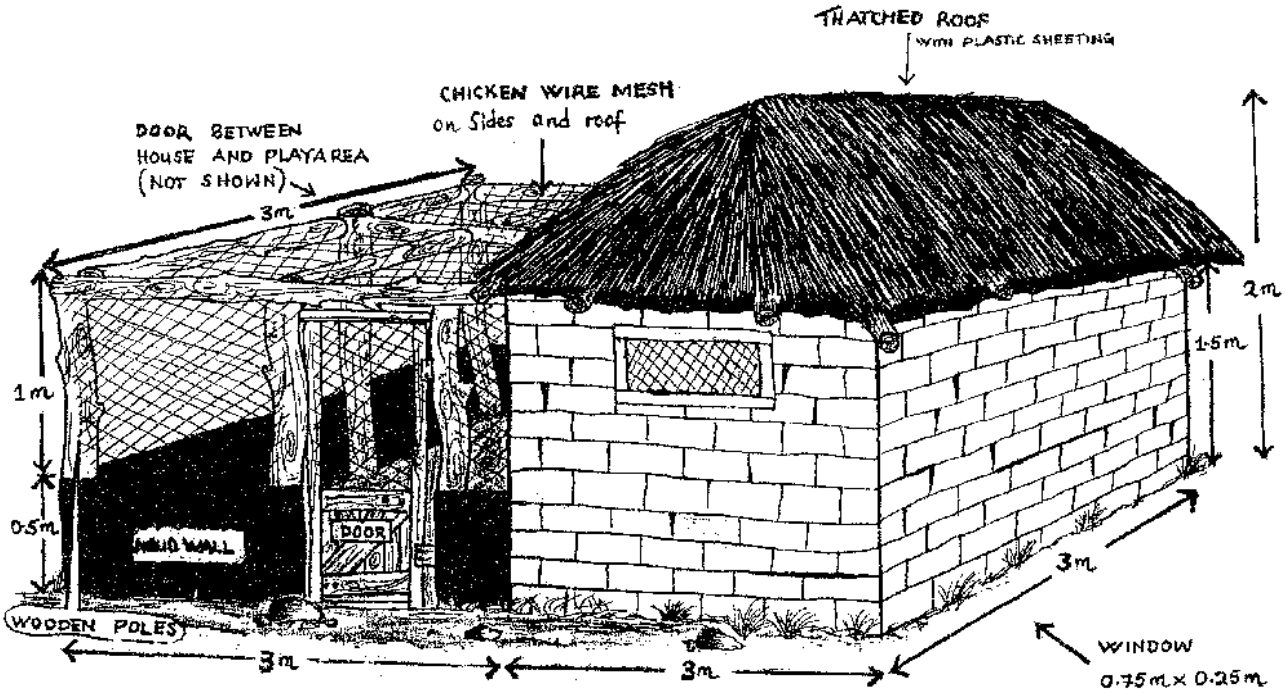
Suitable housing for chickens is important for successful guinea fowl farming. Your chickens need to be well looked after as they will be used to incubate guinea fowl eggs and raise the guinea fowl chicks (called keets). If chickens are housed in a small, badly ventilated, dirty house, they are likely to get sick and die. Keets are less tolerant of crowded and dirty conditions and will die also.

Young keets are very vulnerable to wet conditions and will certainly die if they get wet. They need to be kept inside the house if it is raining or if the ground outside is wet.

They do not have anti-predator skills and are very likely to get killed by dogs in their first two months of life, so they need to be kept confined (in the play area).

A chicken house should be constructed next to the guinea fowl house. The chicken house should be the same design as the guinea fowl house, with a play area. A chicken house which is half the size of the guinea fowl house will be adequate for up to 5 chickens.

Guinea fowl house and play area - recommended design



4. Diet and Feeding

Domestic guinea fowl thrive and breed well when they are allowed on free range during the day. They usually move together in groups and scratch for food such as insects, snails, seeds and berries with their feet or their bill.

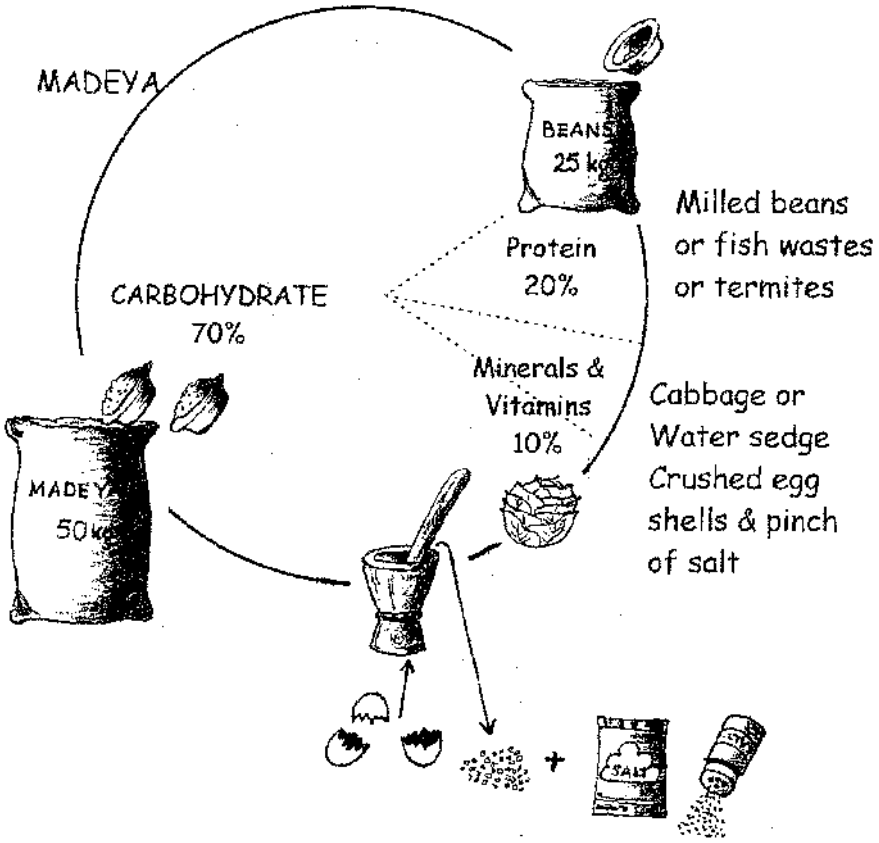
Although they do pick up food while on free range, they should still be fed each day. Feeding your guinea fowl ensures that they remain healthy and productive. By providing food and water inside the guinea fowl house, the guinea fowl are trained to return to their house each evening.

Ideally, food for guinea fowl should be easily available, relatively cheap and nutritionally balanced. Guinea fowl need to be fed a well-balanced diet in order to gain weight and produce many eggs. You will not have a healthy virile population of guinea fowl if they are fed madeya or maize (ufa) only. A diet of madeya or ufa (i.e. carbohydrate, a type of starch) is not adequate for these birds. They will not produce many eggs if they are fed madeya or ufa only.

In order to have healthy birds which produce a lot of eggs and healthy chicks, they must be fed a balanced diet. A balanced diet consists of a mixture of different types of food which contain protein, fats, carbohydrates, minerals, vitamins and water. All of the foodstuffs needed for a balanced diet for guinea fowl can be found locally in Malawi.

The diet of guinea fowl should consist of different proportions of the different nutritional constituents (see diagram overleaf).

Proportions of carbohydrate, protein and minerals & vitamins in the diet of guinea fowl



Choose from any of the 3 daily diets suggested below:

Diet 1: Madeya and beans

Each day:

2 bowls of madeya or ufa

1/2 bowl of beans (pounded or milled household waste beans or roasted soya beans)

Diet 2: Madeya and fish

Each day:

2 bowls of madeya or ufa

1/2 bowl of fish wastes (pounded)

Diet 3: Madeya and termites

Each day:

2 bowls of madeya or ufa

1/2 bowl of termites (pounded)

And each week add:

2 egg shells (pounded chicken, duck or guinea fowl eggs which have gone bad) and a pinch of salt

1 cabbage (chopped up) or 3 bundles of water sedge

Fresh clean water should always be available.

Feed adult birds once a day.

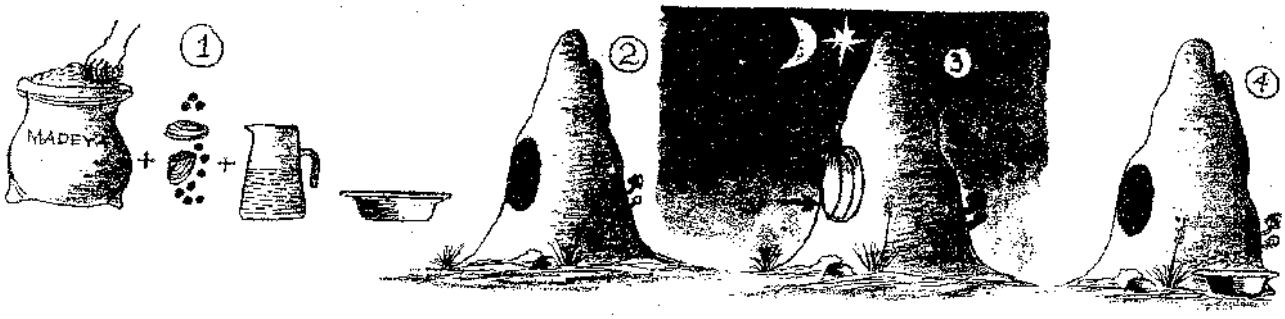
Feed chicks twice a day.

Alternatives to madeya or ufa

If you don't have madeya or ufa, you can use any one of the following alternatives:

- cassava
- sorghum
- millet
- rice

How to get a supply of termites



1. Identify an active termite mound nearby. Mix cow or 'goat dung with a handful of madeya. Add water so that the mixture is moist but not wet. Put the mixture into a small bowl.
2. Dig a hole in the side of the termite mound which will fit the size of the bowl.
3. Place the bowl upside-down in the hole so that the mixture is in direct contact with the inside of the termite mound. Leave it there overnight.
4. The next morning collect the bowl. Inside the bowl you will find many termites because the dung/madeya mixture attracted them. These termites can be used to feed the guinea fowl.

Supply of vegetables

Guinea fowl love cabbage. If you have a vegetable garden, you should consider growing plenty of cabbages to feed. your guinea fowl. Water sedge can be found locally around» rivers and dambo areas.

Commercial feeds,

Commercial chicken feeds are suitable for feeding guinea fowl, both adult birds and chicks. Commercial feeds are generally more expensive but have the advantage that they are complete foods i.e. they contain all of the vital nutritional constituents needed for a balanced diet. Therefore, no additional feeding of beans or cabbage for example, is necessary if the birds are on free range. However, it is recommended that during the breeding season, adult birds, and chicks are given one cabbage and some form of protein (beans/fish/termites) once a week.

Commercial feeds may increase egg production in adults. For example, Layers Mash has a high concentration of calcium, a mineral needed for egg production. Commercial feeds will increase weight gain in young guinea fowl chicks if they are confined to a small area and have limited space to seek alternative foods.

Feed adult birds Layers Mash during the breeding season (from October to March). "Growers Mash" can be used for feeding adult guinea fowl outside the breeding season. Guinea fowl chicks do well on "Broilers Starter" or "Chick Mash" for the first three months. Thereafter they can be fed "Growers Mash". "Broilers Finisher" is not necessary.

5. Breeding, Sexing and Sex Ratio

Indigenous guinea fowl and domestic guinea fowl are closely related and behave in similar ways. Knowing about how indigenous guinea fowl behave gives us clues as to how to care for our domestic guinea fowl. This is very important for breeding purposes.

Breeding behaviour of indigenous guinea fowl

Indigenous guinea fowl are sociable birds and generally like to stay together in large groups of both males and females. However, they stay together in large groups only when they are not breeding. The breeding season for indigenous guinea fowl is from October to March in Malawi. At the end of September, males begin to fight and by early October the birds will pair up (one male and one female). Each pair will stay together throughout the breeding season to breed and raise their young.

Remember that Indigenous guinea fowl cannot be kept by people for breeding purposes.

Breeding behaviour of domestic guinea fowl

Domestic guinea fowl are domesticated i.e. they are used to staying near to people and will breed well, if managed properly. The behaviour of domestic guinea fowl is similar to that of their wild ancestors. They stay together in large mixed groups outside of the breeding season. They have a similar breeding season to indigenous guinea fowl in Malawi, but their breeding season is longer, usually starting earlier and finishing later than indigenous guinea fowl (i.e. September to April). The male birds usually pair up with one to three females at the start of the breeding season. This small group of two to four birds stay together for the duration of the breeding season to bred and raise their young collectively.

Encouraging guinea fowl to breed

1. Proper housing

Domestic guinea fowl will not breed if they are not housed properly - use housing design recommended. If grass and sand are not provided inside the house they will lay their eggs wherever they like in the bush. The birds may fail to return to their house at night. Eggs will not be collected and will go bad and be wasted.

2. Free range

If they are kept confined they will not breed well - they need to be on free range during the day.

3. Good diet and treatment for pests and diseases

They will not lay many eggs if they are not fed adequately or if they are not treated for pests and diseases - see diet and pest and disease sections.

4. Correct sex ratio

If the ratio of male to female birds is not correct, the number of fertile eggs will be low and male birds may die because of fighting. The recommended sex ratio for guinea fowl is 1:3, one male to three females. This will ensure that the maximum number of fertile eggs will be produced while guarding against the problem of too many males in the population.

Size of breeding stock

The breeding stock is the number of adult birds kept for breeding purposes. The size of your breeding stock will depend on your resources and the scale of production intended. The sex ratio should always be one male to three females.

- For small scale production, you need a breeding stock of four birds (one male and three females).
- For medium scale production, the breeding stock should consist of eight birds (two males and six females).

- For large-scale production, you need to consider alternative housing arrangements. More than two breeding groups of 4 birds each housed together can cause problems of fighting amongst the males and low egg fertility. Open-air aviaries housing 4 birds each can work well for large scale production. In large-scale production the incubation of eggs using chickens is not feasible because of the large numbers of eggs produced. A commercially made egg incubator will be needed to incubate the eggs.

When to change your breeding stock

You need to change your breeding stock for fresh birds after about six years of continuous breeding. Try to buy birds which are less than two years old.

Number of chickens required

The major problem with small and medium-scale breeding of guinea fowl is lack of chickens for incubation of guinea fowl eggs. You need to make sure that you have an adequate number of healthy chickens which are breeding and laying their own eggs so that they can sit on your guinea fowl eggs. The local Malawian chickens are recommended for this purpose. Improved or imported types of chicken (e.g. broilers/layers) are not suitable.

The number of chickens required depends on the size of your guinea fowl breeding stock.

- If you have 4 guinea fowl (small-scale production), then you will need 5 chickens (4 hens and 1 cockerel).
- For medium-scale production (8 guinea fowl), you need 10 chickens (8 hens and 2 cockerels).
- For large-scale production (more than 8 guinea fowl), you need an incubator.

Prevention of inbreeding

Inbreeding is when breeding takes places between birds which are closely related to each other over many generations. Inbreeding results in weak and deformed chicks which are likely to die soon after hatching.

Inbreeding can be a problem for domestic guinea fowl in Malawi. Inbreeding of guinea fowl has been going on in Southern Africa for many years, therefore you cannot be sure of the quality of the breeding stock you may have. You should take steps to guard against this problem from the start of your breeding programme.

1. Buy from different places

In order to have a healthy breeding stock, you should try to buy your guinea fowl from different places. Buy relatively young birds (less than 2 years old).

2. Sell/exchange chicks

When your guinea fowl chicks are grown up they should be kept separately from the parent breeding stock. They should not be kept and allowed to breed with the parents in the following breeding season. You should sell them or exchange them for new birds from different places.

Sexing of guinea fowl

Sexing of guinea fowl means being able to distinguish a male guinea fowl from a female guinea fowl. Male and female guinea fowl look very alike to the untrained eye. Telling the difference between a male and female guinea fowl is NOT EASY.

Adult male and female guinea fowl are the same size so they can't be sexed like chickens are. Guinea fowl chicks cannot be sexed like chicken chicks are. The differences between male and female guinea fowl can only be seen in fully grown birds (i.e. more than 8 months old).

Male and female guinea fowl differ in the size, shape and position of the wattles (red droopy pieces of skin on the sides of the face). They also have differences in the size and shape of the casque (horn on top of the head).

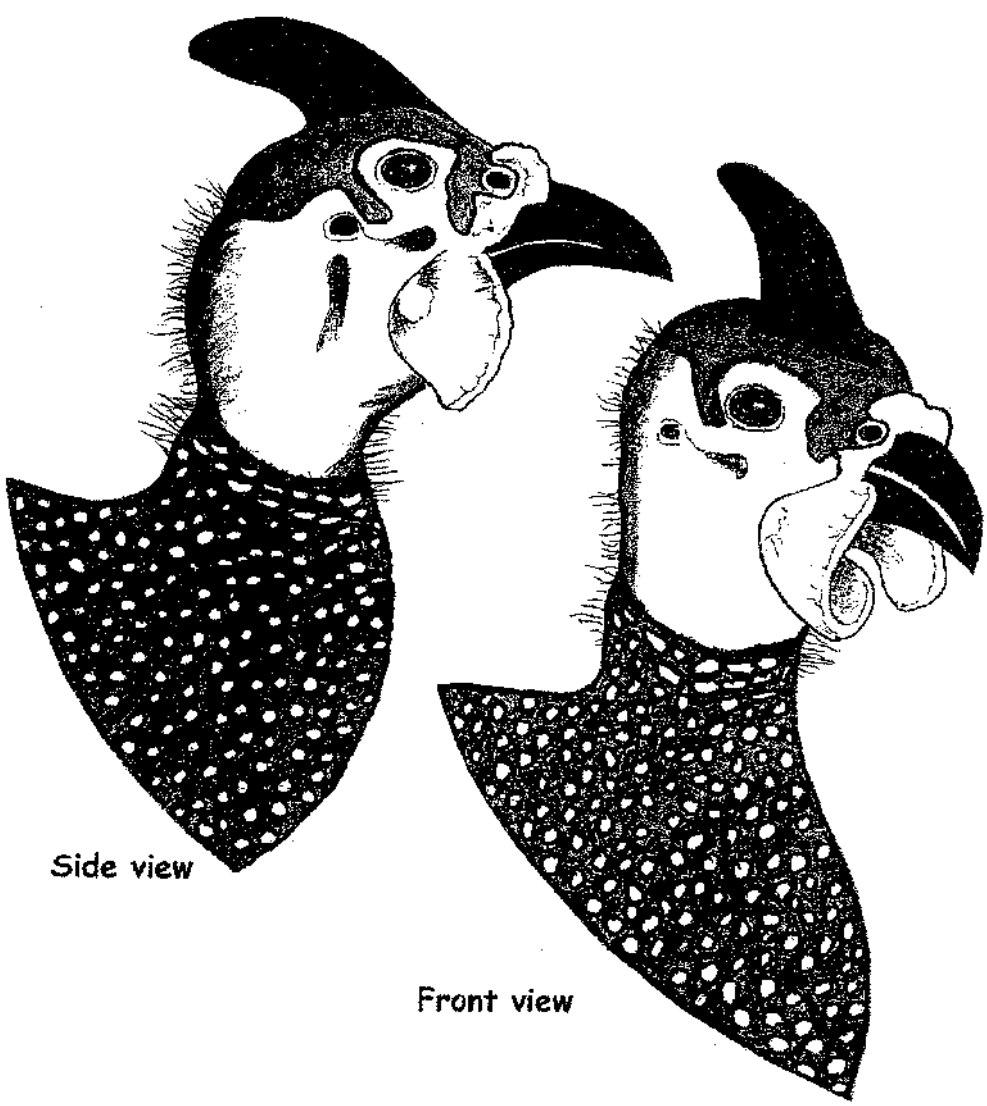
Male and female guinea fowl make different sounds but this can only be noticed when you have stayed with them for some time. This approach doesn't work when trying to sex birds before buying them!

You need to have one adult male and one adult female together to note and compare the differences between them.

A word of caution!

Don't try to tell the sex of young guinea fowl which are not fully grown. They are more brown than grey in colour and have a more fluffy neck than adult birds. An immature guinea fowl's wattles and casque grows as it grows, so a young male can easily be mistaken for a female!

Male Guinea Fowl



Wattles[2]

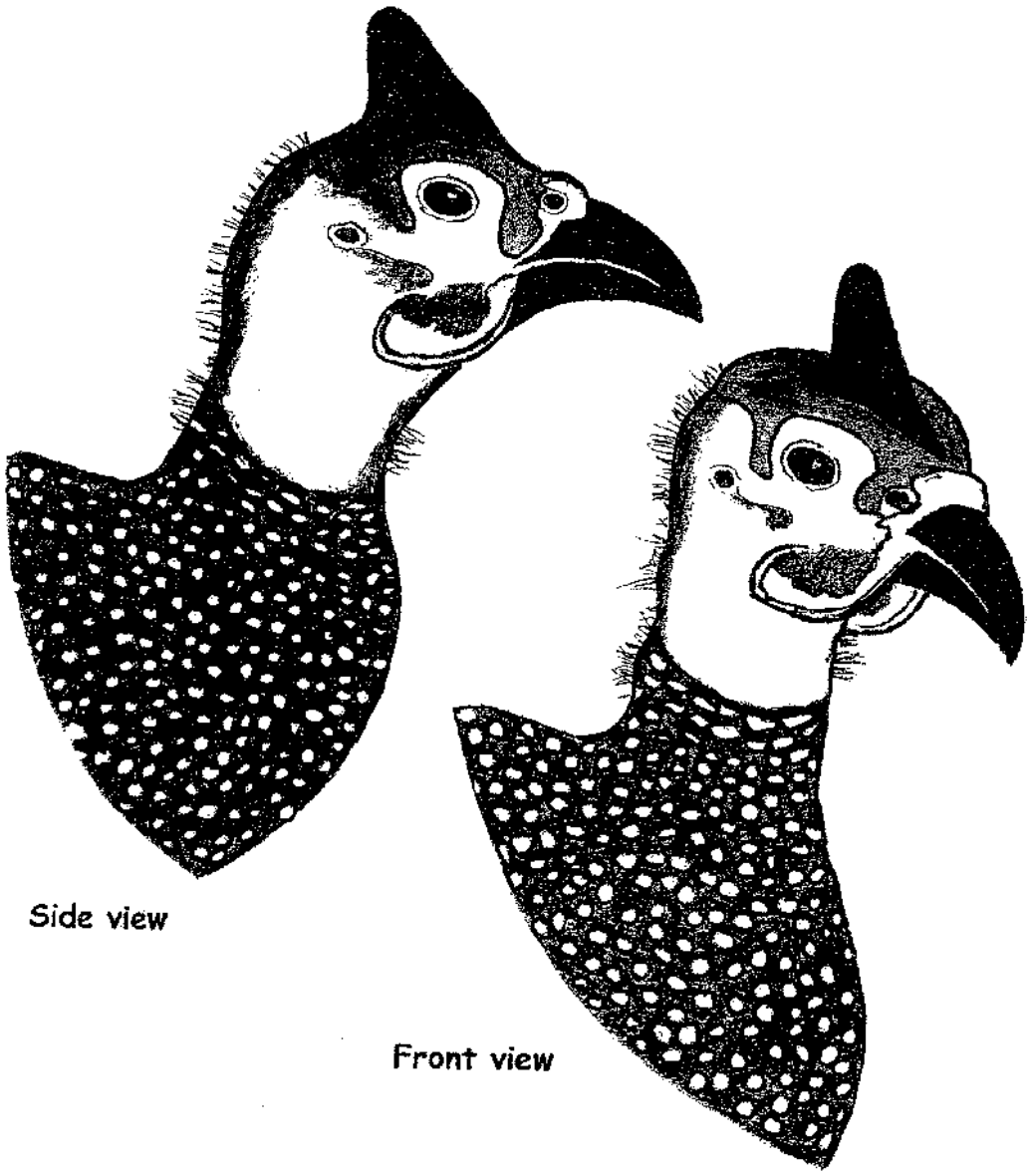
- He has large wattles which point forward and hang down on either side of his face.
- They are curly.
- They are loosely attached to the face.

Casque

- His casque is much bigger than the casque of the female.
- It curves backwards like a ram's horn.

2 Wattles = red pieces of skin on the face
Casque = horn on top of the head

Female Guinea Fowl



Wattles

- She has much smaller wattles than the male bird.
- They are closely attached to the face.
- They point backwards.

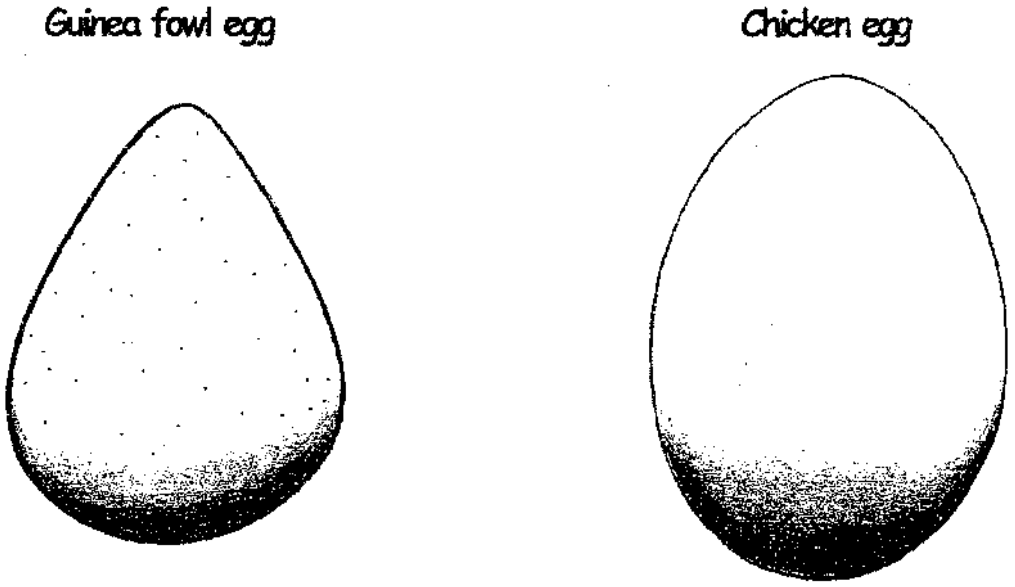
Casque

- Her casque is smaller than the male's.
- It points directly upwards.
- It does not point backwards.

6. Collection and Storage of Eggs

Differences between chicken and guinea fowl eggs

- Guinea fowl eggs are smaller than chicken eggs.
- Guinea fowl eggs are more pointed at one end whereas chicken eggs are rounded at both ends.
- Guinea fowl eggs have thicker shells than chicken eggs. They also have larger pores (holes in the shell) so they go bad in a shorter time when compared to chicken eggs.
- Guinea fowl eggs vary in colour from deep creamy white to light yellowish brown. Sometimes the eggs are finely speckled (dotted).



Laying capacity

Guinea fowl only lay eggs in the breeding season which is from October to March. Sometimes guinea fowl start laying eggs in September and continue until the end of April. Most eggs are laid between the months of November and January.

Guinea fowl are prolific layers and will lay many eggs if they are encouraged to keep on laying eggs by removing their eggs each day. Each female guinea fowl lays on average about 4 eggs a week or 17 eggs each month. As the breeding season normally lasts for six months, the total number of eggs which one female can produce can be as many as 100. With a breeding stock of 4 guinea fowl (3 female birds), you can expect to get an average of about 50 eggs each month and a total of about 300 eggs for the whole breeding season.

How to maximise egg production

1. Proper housing

Domestic guinea fowl will not lay many eggs if they are not housed properly -use housing design recommended. If grass and sand are not provided inside the house they will lay their eggs wherever they like in the bush. Eggs will not be collected and will go bad and be wasted.

2. Free range

If they are kept confined they will not lay many eggs. Keep them on free range during the day.

3. Good diet and treatment for pests and diseases

They will not lay many eggs if they are not fed adequately (see section 3). If they are sick and are not treated for pests and diseases (see pests and disease section), they will not produce any eggs. Male guinea fowl will not mate it they have fleas or lice. Females will stop laying eggs.

4. Correct sex ratio

If the ratio of male to female birds is not 1 male to 3 females, low numbers of eggs will be produced. The proportion of fertile eggs will be very small i.e. the number of non-viable eggs will be high. Incubation of these eggs will result in few chicks hatching out.

Collection of eggs

If you have put sand and grass inside the guinea fowl house, your guinea fowl are likely to lay their eggs behind the grass in the corners of the house. It is common for all the female guinea fowl to lay their eggs in one corner of the house.

If egg production is lower than expected then it may be because your guinea fowl have chosen to lay their eggs outside in the bush. Watch the birds to see where they go to lay their eggs. Each guinea fowl will return to her chosen nesting place each day. Remember that many guinea fowl often share the same nesting place.

Eggs should be collected from the house (or from the bush) each afternoon after the guinea fowl has left the nesting place. Never disturb a guinea fowl when she is laying eggs, otherwise she may stop. laying altogether. Handle the eggs very carefully. Take care not to jar them. Collect all of the eggs except one egg. Mark that egg with an "X" and leave it behind in the nest each day. Leaving one egg behind encourages the birds to keep on laying eggs. Write the date on which each egg was collected (i.e. laid) on the eggs in pencil.

Many of the eggs collected in the first and last weeks of the breeding season are unlikely to be fertilised. You should expect a low number of chicks to hatch out from these eggs.

Storage of eggs

Guinea fowl eggs should be stored in an egg carton (tray) with the pointed end of the eggs facing downwards. This is done to protect. the air cell inside each egg from damage. The air cell is always at the blunt end of the egg and it can burst if the egg is stored with the blunt egg facing downwards. The air cell helps the development of the guinea fowl embryo inside the egg.

Handle the eggs carefully. Do not shake them. Never let them come into contact with grease, oil, petrol or paraffin as these petroleum products will seal the tiny holes in the egg shell which allow air through to the developing chick inside. It the eggs get covered in paraffin or petrol the chick inside will suffocate and die.

Store the eggs in a cool dry place (i.e. inside your house) until you find a chicken to incubate them. If the eggs are stored in a room which is too warm, or which varies in temperature; then they may begin incubating (premature incubation), or they will be spoiled.

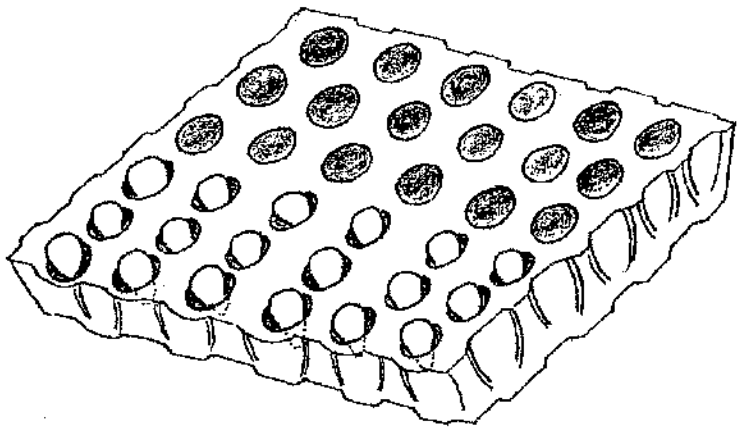
Storage time of 7 days

Guinea fowl eggs go bad after only seven (7) days! So you can store guinea fowl eggs for up to one week only.

If you keep your guinea fowl eggs for longer than 7 days after they were laid then they are useless. Even if you give them to a chicken to sit on, no chicks will hatch out. If you put these eggs which are more than a week old into an incubator, the same thing will happen - no chicks will hatch out.

- Give your chicken fresh guinea fowl eggs (less than one week old) to sit on.
- You will know how old your eggs are because you wrote the date on each egg on the day it was laid (and collected).

Storage of guinea fowl eggs



Too few eggs?

Even if you have few guinea fowl eggs, count all the eggs you have after a week and give them to a chicken to sit on (see Section 7 Incubation of Eggs Using Chickens). A chicken can sit on any number of guinea fowl eggs, up to a maximum of 15.

Too many eggs?

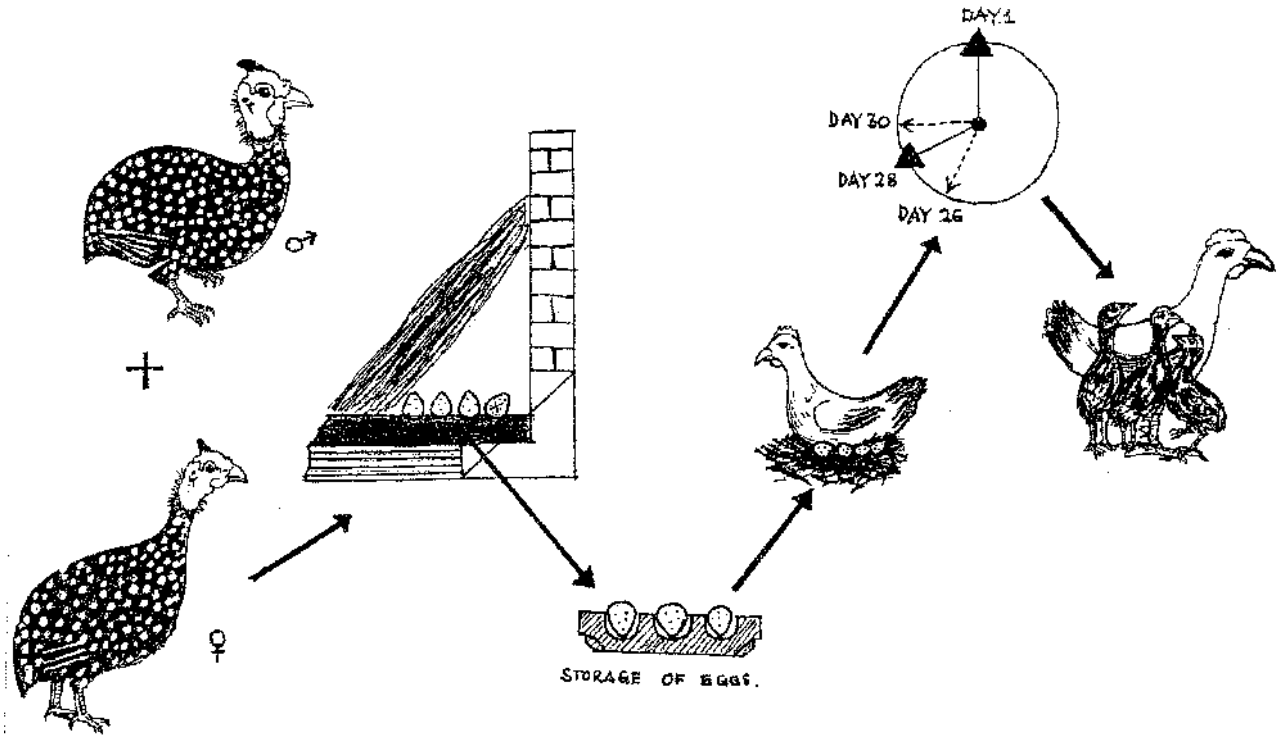
Excess guinea fowl eggs can always be sold.

Guinea fowl eggs are superior to chicken eggs. They have a distinctive taste and can be eaten just like chicken eggs. They are good for cake-making because the whites of guinea fowl eggs are lighter when whipped than chicken eggs.

7. Incubation of Eggs Using Chickens

Incubation of guinea fowl eggs using chickens

Guinea fowl eggs are collected from the guinea fowl house each day. One marked egg is always left behind to encourage the guinea fowl to lay more eggs. The collected eggs are stored, pointed egg facing down in an egg carton, for a maximum of seven days. The fresh guinea fowl eggs are given to a chicken to sit on for 26 to 28 to 30 days, The guinea fowl chicks hatch out and are cared for by their chicken foster mother.



Why not let the guinea fowl sit on their own eggs?

If you allow your guinea fowl to sit on their own eggs the following can happen:

- The guinea fowl will not lay eggs for the time she is sitting on the eggs (1 month) and she may not lay any more eggs during that breeding season. Guinea fowl egg production will be reduced.
- The guinea fowl may stop sitting on the eggs after one or two weeks and the eggs will not hatch out.
- The other female guinea fowl can kill the young guinea fowl chicks once they hatch out.

- The young chicks are likely to die because of lack of care. Guinea fowl are not good mothers.

Number of chickens required

The number of chickens required depends on the size of your guinea fowl breeding stock.

- Small-scale production (breeding stock of 4 guinea fowl) : need 5 chickens (4 hens and 1 cockerel).
- Medium-scale production (breeding stock of 8 guinea fowl) : need 10 chickens (8 hens and 2 cockerels).
- For large-scale production (more than 8 guinea fowl), you really need an incubator. You can use an incubator and chickens.

Care of chickens

Your chickens need to be well looked after as they will be used to incubate guinea fowl eggs and raise guinea fowl chicks. Treat your chickens for fleas and lice and for roundworms. You can also get them vaccinated against Newcastle disease (refer to the nearest Veterinary Office). Vaccination is strongly recommended.

Suitable housing for chickens is important for successful guinea fowl farming. If chickens are housed in a small, badly ventilated, dirty house, they are likely to get sick and die. The chicken house should be the same design as the guinea fowl house, with a play area. A chicken house which is half the size of the guinea fowl house will be adequate for up to 5 chickens.

Remember that chickens are more dirty than guinea fowl. Their house will need to be cleaned more often (twice a week). Use sand as bedding material inside the house and play area. Place grass in two corners to encourage the chickens to lay their own eggs. Line the nests with dry grass.

Incubation time for guinea fowl eggs

Guinea fowl eggs take longer to hatch out than chicken eggs. Chicken eggs usually hatch out after 21 days. Guinea fowl eggs take between 26 to 28 to 30 days (or 28 days on average), to hatch out.

Never mix guinea fowl and chicken eggs in the same nest. If your chicken sits on both chicken and guinea fowl eggs at the same time, the chicken eggs will hatch out before the guinea fowl eggs. Once the chicken chicks hatch out, the chicken will stop sitting on her eggs and abandon the nest. The guinea fowl eggs will not hatch out.

How to encourage your chicken to sit on guinea fowl eggs

If you have a chicken which is laying her own eggs, you can trick her so that she sits on guinea fowl eggs instead of her own eggs.

1. Don't remove all the chicken eggs and replace them with guinea fowl eggs all at once. Guinea fowl eggs look different to chicken eggs. The chicken will know that the guinea fowl eggs are not hers and will refuse to sit on them.
2. Do exchange chicken eggs for guinea fowl eggs gradually over a
3. four or five day period.
4. When you notice your chicken has started to lay her own eggs, check her each day. When there are 5 chicken eggs in the nest start your trickery! Remove 2-3 chicken eggs and replace them with 2-3 fresh (i.e. less than one week old) guinea fowl eggs each day. Remember to leave 2 chicken eggs behind in the nest each time.
5. Do this two or three times again over the following five days. After five days, the chicken should be finished laying her eggs and be it ready to sit on the eggs. Watch her carefully. If she looks as if she has started to sit on the eggs, you must remove any remaining chicken eggs from the nest on that day. The nest now consists of guinea fowl eggs only (a maximum of 15 eggs). The chicken thinks that she is sitting on her own eggs when she is sitting on guinea fowl eggs!
6. Do not disturb the chicken once she has started to sit on the eggs (otherwise she may stop sitting).

If incubation time difference for guinea fowl and chicken eggs is about 7 days, can you still mix guinea fowl and chicken eggs after 7 days? No.

Don't try to put chicken eggs in the nest after she has been sitting for one week. This usually doesn't work - the chicken gets confused and abandons the nest.

No chickens for incubation of eggs?

If you have lots of guinea fowl eggs and:

- your chickens got sick and died, or;
- your chickens are not laying their own eggs,

don't panic!

Make a business arrangement with other people who have laying chickens. Give them fresh guinea fowl eggs (i.e. less than 7 days old) for incubation by their chickens. When the guinea fowl chicks hatch, they can be divided between you and your friend.

Sell some guinea fowl eggs and use the money to buy more chickens.

8. Incubation of Eggs Using an Incubator

Why use an incubator?

Large-scale production of guinea fowl results in large numbers of eggs produced. For practical reasons, it is more convenient to use an incubator than chickens in these circumstances. If the incubator is not large enough to house all of the guinea fowl eggs produced, chickens can be used as a back-up to incubate the remaining eggs.

Disadvantages of incubators

1. Problems in supply of electricity

An incubator is an expensive investment and requires a constant supply of electricity. If there is a chance that there may be long interruptions in the supply of electricity to the incubator, the guinea fowl eggs will not hatch out. In these circumstances you are strongly advised to purchase a backup generator also.

2. Hand-rearing chicks

An incubator only incubates eggs. After the chicks hatch out they will need to be reared by hand. As there are no foster mother chickens to look after these chicks they will need to be carefully managed, i.e. kept clean and warm and fed regularly.

Types of incubator

An incubator is basically a box which kept at a particular temperature and humidity and insulated against temperature changes outside. There are two main types of incubator available: still air and fan assisted.

1. Still air incubators

Most small to medium sized incubators are of this type. They have a thermostatically controlled heating element which is either above or at the side of the eggs. The air in a still air incubator does not remain static. It circulates slowly and leaves the incubator by convection. These incubators are usually well insulated in order to hold a constant temperature and are better if power cuts may be a problem.

2. Fan assisted incubators

Most large incubators are of this type. They are similar to still air incubators except they have a fan. The fan helps the air to circulate around the inside of the incubator and ensures that there is a flow of warm air around all or

the eggs at the same time. These incubators are not as well insulated as still air incubators and therefore cool down very quickly after a power out.

No incubator is completely perfect. Both types of incubator can have cold and warm spots inside, which will affect if or when the chicks will hatch.

The incubation process

Cleaning and sterilisation of incubator

Any incubator is a good environment for the growth of bacteria. You need to clean and sterilise your incubator thoroughly before using it for the first time (if it is second-hand} and after each batch of eggs hatches out. If you don't keep the incubator very clean then your eggs will not hatch out because of the build-up of bacteria inside the incubator. Take the incubator apart as much as you can. Use a sterilising agent such as "Virkon S" or "Milton Sterilising Fluid". Soap powder such as "Surf" or scouring powder such as "Vim" will not work. Don't get the electrical parts of the incubator wet.

Location of incubator

The incubator needs to be kept in a place where the temperature doesn't change very much. Keep it in a room in a brick house away from doors and windows. Put in on a secure table.

Collection, cleaning and setting of eggs

Collect, date and store guinea fowl eggs pointed end facing down in egg cartons inside the incubation room. Handle the eggs gently at all times. Clean the eggs with tepid (warmish) water. Once incubator temperature and humidity has been set and has stabilised, place the clean eggs in the tray inside the incubator, They can be placed close together but don't overfill the tray. Remember to put only fresh eggs (i.e. less than 1 week old) inside the incubator. The temperature will decrease once the eggs have been put into the incubator. This will stabilise after 1 hour and then you will need to reset the temperature again.

Temperature

Set the temperature to 39°C (still air incubator only). If the incubator is continuously opened, the temperature will drop: If there is a rise in temperature outside then the temperature inside the incubator may also rise. Environmental temperature is higher before the rains start. Once the rains have started the temperature outside falls. Note that you may have to reset your incubator temperature at this stage. The incubator temperature should be regularly monitored. It should never be allowed to rise above 39°C or below 38.5°C.

Note that a temperature of 39°C is only relevant for medium-sized still air incubators. Fan assisted incubators need to be set at a lower temperature (37.5°C). In the case of any doubt, contact the manufacturers for advice.

Humidity

The humidity (amount of moisture in the air) inside the incubator should be high. It should be set at between 83-85% for the first 25 days of incubation and raised to 90-94% for the last 3 days. Use a wet and dry bulb thermometer to measure the humidity, if your incubator has one. Always use a measuring jug to add water and record how much you add.

You will still need to add water to it the water trays of the incubator even if there is no humidity control. Knowing exactly how much water to add and when to add it will depend on how wet or dry your surroundings are, the altitude you live at and the weather conditions at the time of incubation.

Ambient (environmental) conditions in Malawi are very different from the weather conditions in the countries where these incubators are made. Manufacturers will therefore find it difficult to give specific advice.

As a general rule, if there are two water trays, fill one tray from day 1 to day 25 of incubation, then fill both trays on day 26.

Note that environmental humidity changes before, during and after the rains. As you will be incubating eggs throughout this time (i.e. from October to May), the amount of water you should add to the incubator trays may be different in different months. For example, it may be necessary to fill one and a half trays on day 1 of incubation of eggs in early October (before the rains). In January (during the rains) filling one tray on day 1 may be sufficient.

Don't expect good results for your first few batches of eggs. Keep good records and build on your experience. Note that fully grown chicks found dead in their shells on the last day of incubation is a sign that the humidity has been too high.

Turning the eggs

Frequent turning of the eggs inside the incubator is necessary to ensure that all parts of the egg gets the same amount of heat and moisture. Natural incubation using a chicken is effective because a brooding hen turns her eggs at least once an hour. If your eggs are not turned then the chick embryos will die inside the egg and no chicks will hatch out.

Most small and medium sized incubators are not designed to turn the eggs mechanically, If your incubator does not have an automatic turning facility you will need to turn the eggs yourself. Mark each egg with an "X" on one side and an "O" on the other" side. Gently turn them at least 3 times each day (in the morning, at lunch-time and in the evening). Don't turn them in the same direction all the time. You must turn them one way (e.g. towards the "X") and then in the other direction (e.g. towards the "O") and repeat each time.

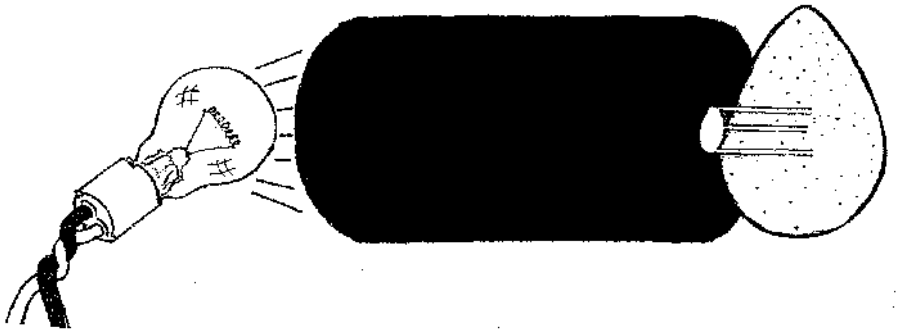
Candling of eggs

Candling is a technique which is used to test eggs for the presence of a chick embryo. Unfertilised eggs can be discarded. Candling saves space inside the incubator and ensures efficient incubation. It is called "candling" because originally candles were used to shine light through the egg in a dark room.

Hand-held electric candlers are now available and have the advantage of reducing the transmission of disease (bacteria) because you do not have to touch the eggs.

Candling of eggs should be done when the eggs have been in the incubator for 14 days. You can make your own candling lamp with an old tin can and a 100W electric light bulb. Make a small hole in the base of the tin can. Shine the light through the can and hold the guinea fowl egg against the hole. If the egg is fertile, you will be able to see tiny red veins inside the egg shell. Infertile eggs will be completely clear inside. Don't leave the egg against the candler for long (otherwise the heat of the bulb may harm the embryo). You only need a few seconds to check each egg. Discard any clear eggs.

Candling of eggs



Records

Record-keeping is very important. Any slight variations you might make, (for example in the amount of water added to the incubator), can affect the hatch. If the chicks hatch out earlier than expected then this should be recorded as it may indicate that for example, the temperature inside the incubator is too high. If there is a power failure and you have no back-up generator then you will need to record when the power cut occurred and how long it lasted for. I if it lasted for some hours, it is likely that your eggs will be adversely affected and you will probably get poor hatching results.

Example of information recorded in hatching record

No. of eggs set & date								
Latest expected date of hatch								
Actual date of hatch								
No. of hatched &% hatched								
No. of sick or deformed chicks								
No. of deaths & date								
Possible cause of death								
Total number of healthy chicks								

Hatching problems

Don't expect all of your eggs to hatch out (even after candling). Even the commercial hatcheries do not get 100% hatching each time. Collect unhatched eggs and open them to find out why they didn't hatch. Note:

- Clear (i.e. infertile) eggs do not smell.
- Eggs which started developing and then stopped (for some reason) will smell bad when you open them.

Egg Problems

1. Clear (infertile) eggs

- Male guinea fowl not mating with the females. Check him for lice and fleas and treat if necessary. Otherwise, consider changing the male bird.
- Poor storage.
- The eggs were stored in a dirty environment or come into contact with paraffin or petrol.
- Power failure at early stage of incubation.

2. Embryo died inside the shell of early stage

- Temperature inside incubator not constant.
- Power failure.
- Eggs not fresh - stored for more than 7 days.
- Hot or cold spot in incubator.

3. Embryo died mid-term

- Temperature too high or too low.
- Infrequent or incorrect turning of eggs.
- Dirty incubator. Build up of bacteria.
- Hot or cold spot in incubator.
- Eggs stored for longer than a week.
- Eggs damaged during collection.

4. Dead in shell

- Humidity too high or too low.
- Dirty incubator.
- Temperature too high or too low.
- Incorrect or infrequent turning of eggs.

5. Early hatching

- Temperature too high.
- Eggs stored in a room which was too warm (premature incubation)

6. Overdue hatching

- Temperature too low.
- Humidity too low at hatching time.

Chick problems

1. Sticky chicks

- Temperature in incubator too high or too low.
- Humidity too low.

2. Chicks with crooked toes

- Poor diet in breeding stock (parent birds).
- Temperature in incubator too high or too low.

3. Chicks with splayed legs

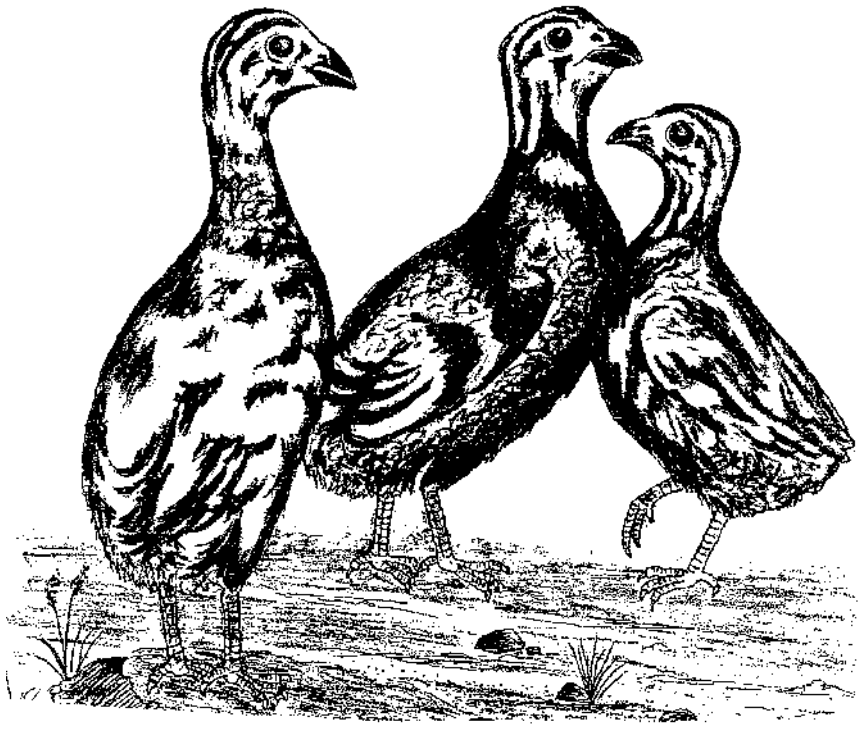
- Surface inside incubator is too smooth. Correct it by tying a small string to both legs for up to 2 weeks.

9. Care of Keets

Keets (guinea fowl chicks)

Guinea fowl chicks are called "keets". They are very attractive and look like young quail, They are brown in colour, the underside of the body is lighter than the rest and the beak is red. The head is light brown with dark stripes. The first feathers which are brown are gradually replaced by the pearled (or spotted) feathers when they are about 2 months old. At this age the wattles and casque begin to grow.

Guinea fowl chicks or "keets"



Keets versus chicken chicks

Keets need to be well cared for as they are more delicate than chicken chicks. They have fewer feathers than chicken chicks and so they have little protection against cold and wet conditions. If young keets (less than one month old) get wet or cold they will certainly die.

If they are being housed in dirty and overcrowded conditions they will get sick and die. If they are not confined they are likely to get killed by predators as they have no anti-predator skills.

Keets are even more vulnerable if they have hatched out in an incubator and have to be hand-reared as they do not have a foster chicken mother to look after them. They will need to be expertly cared for by yourself from the moment they hatch out.

Keets From Eggs Which Were Naturally Incubated

Keets who have been hatched through natural incubation using a chicken are more likely to survive than keets hatched using an incubator. Chickens are very good mothers and look after their chicks well. The foster chicken mother thinks that the keets are her own chicks and looks after them from the moment they hatch out. The keets will stay with the chicken until they are fully grown. If you take the keets away from the chicken the chicken will become very stressed and try very hard to get them back.

1. Care of newly hatched keets

Once all of the keets have hatched out, remove the empty shells and any unhatched eggs from the nest. The chicken should be given food and water and left undisturbed with the keets for 24 hours. Keets do not need feeding for the first 24 hours after hatching. For the first week, the keets should be fed twice daily with madeya and provided with clean water in a small shallow container. If the water container is too large and deep, keets will get wet and die or even drown in the water.

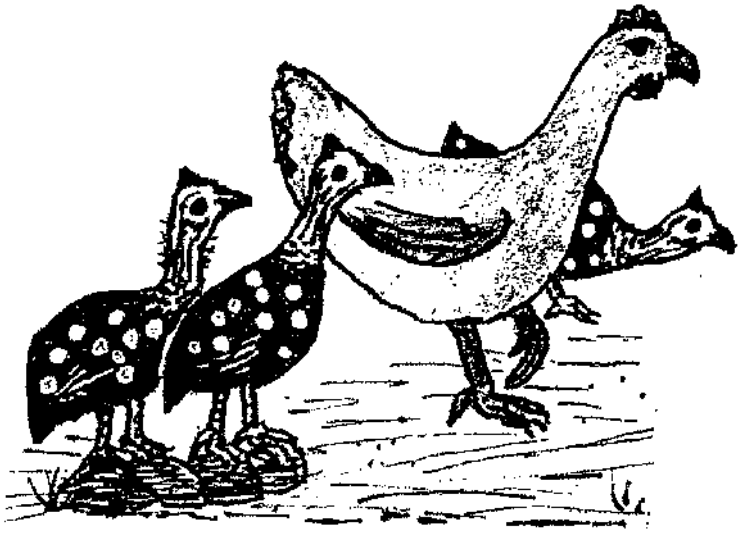
2. Care of keets older than 1 week old

Housing

Keets should be kept with the chickens in a suitable chicken house. If the keets are housed in a small, badly ventilated, dirty house, they will get sick and die. The chicken house should be smaller and the same design as the guinea fowl house, with a play area. Sand should be provided as bedding material. Chickens are quite dirty so the chicken house will need to be cleaned at least twice a week, to prevent the keets getting sick.

Keets and the chicken mother should be kept inside the chicken khola for the first month. Once the keets have reached one month old they can be allowed into the play area when it is not raining and the ground is dry. The keets and the chicken mother should only be allowed out of the, chicken khola on free range once the keets have reached 2 months old.

Three month old keets with their chicken mother



Feeding

The food supplied to keets must be dry and the drinking water must be very clean. When the keets have reached one week old, they should be fed twice daily a diet similar to that of adult birds (i.e. madeya/bean or madeya/fish or madeya/termite mix). Finely chopped cabbage should be provided twice a week for the first two months when they are not on free range. Once they reach two months old, their diet of madeya/bean/fish/termites should be supplemented with cabbage and crushed-egg shells and salt once a week, just like the adult birds).

Commercial chick feeds such as "Chick Mash" or "Broilers Starter" can be used as an alternative food for keets until they are 3 months old. They should be fed twice a day. As well as the commercial feed, they should also receive chopped cabbage and some dried fish (e.g. usipa) twice a week for the first two months when they are not on free range. When they reach 2 months old and are allowed on free range, they should be given chopped cabbage and usipa once a week as a supplement to the commercial feed. When they reach 3 months old, they can be fed "Growers Mash" only, with no supplementary feeding required, once a day.

If resources allow, a vitamin supplement (in powder form) for chicken chicks can also be used. It is added to the drinking water. It improves the health of keets.

The sand on the floor of the chicken house and play area is important for keets as it provides them with a source of grit. Keets have a very small crop compared to other chicks and need grit to grind and digest their food. Alternative bedding material such as sawdust or wood shavings will not work as the keets will eat it and choke on it.

Keets From Eggs Which Were Incubated in an Incubator

Keets which have hatched from eggs in an incubator need to be hand reared and managed carefully. They are more likely to die than keets who have a chicken mother.

Care of newly hatched keets

Keep them inside the incubator until they have dried out and become fluffy (about 4 hours after hatching"). Remove them from the incubator and transfer them into a small carton lined with a towel or a piece of cotton cloth (chitenje). The carton should be kept inside a house. Pierce three small holes in each side of the carton for air ventilation for the keets. One or two 100W red light bulbs should be placed over the top of the carton to provide heat for the young keets. The top of the carton should be covered with a chitenje. The light bulbs should be positioned just inside the carton so that they lie above the heads of the keets. Young keets will shiver, flap their wings and huddle together in groups when they are cold. If there is adequate heat the keets will stop this behaviour. If they still continue then there is not enough heat. You should reposition the light bulbs closer to the keets or you may have to add another light bulb.

The light bulbs must be coloured. A white light bulb will cause the A keets to go blind. The light bulbs should be switched on day and night until the chicks are one week old. The two light bulbs should be spaced apart from each other to avoid all the keets crowding together in one place and suffocating each other.

The number of light bulbs and the size of the carton required obviously depends on the number of keets in each batch. Use your common sense in judging this. Don't use a carton which is too small for the number of keets, otherwise they will die because of overcrowding. It is better to separate keets of different ages into different cartons. Weak chicks should be kept separately in one carton. If weak and strong keets are kept together in one carton, the weak keets will be killed by the stronger keets through pecking.

The carton will require cleaning every day. The chitenje covering the floor of the carton can be removed after 4 days and replaced with dry sand as bedding material.

Keets do not need feeding for the first 24 hours after hatching. For the first week, the keets should be fed twice daily with madeya and provided with clean water in a small shallow container. If the water container is too large and deep, keets will get wet and die or even drown in the water.

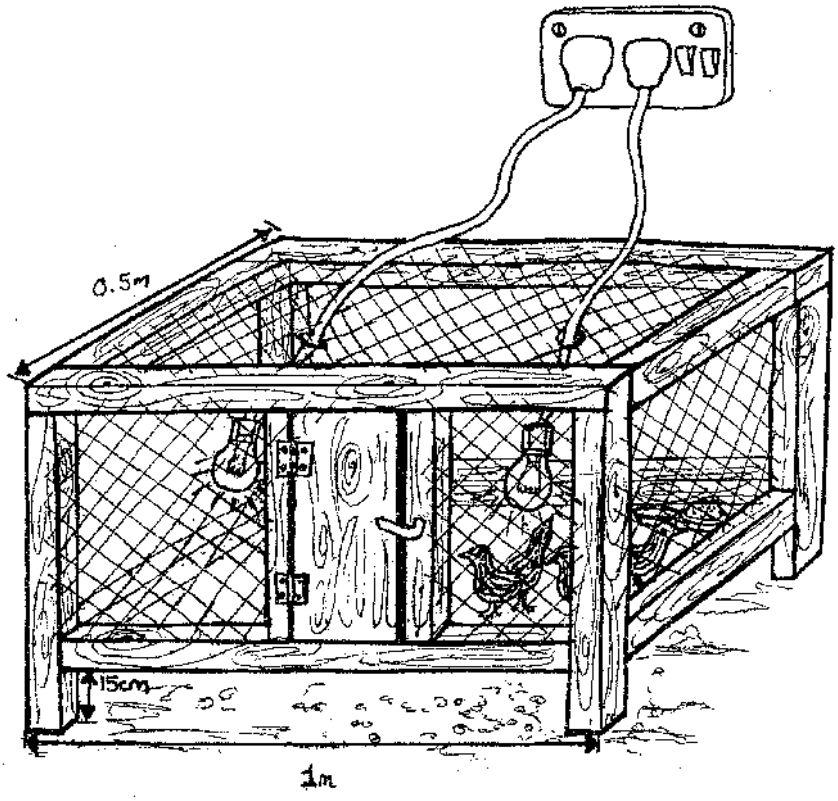
Newly hatched keets are very weak. They will not start to run around the carton until they are about 2 days old. Once they reach one week old they can be transferred into a rearing cage inside the same house.

Care of keets older than 1 week old

Housing

Keets should be kept in a rearing cage until they are 2 months old. Then they can be allowed outside on free range and housed at night. A rearing cage is basically a rectangular wooden frame (1m x 0.5m) with short legs covered with chicken wire mesh. A small door should be made in one side. The cage is raised off the ground on short legs so that the droppings fall through the chicken wire mesh to the ground below. In that way, the cage is always clean and the young keets are less likely to fall sick. The floor of the rearing cage must be made of two overlapping layers of chicken wire mesh so that the wire mesh space is halved. Keets have very small feet and will fall through or get caught in the holes in the chicken wire mesh. Alternatively, you could use a wire mesh which has smaller holes than chicken wire mesh (but not as small as mosquito netting).

Rearing cage for young keets



Small holes should be made in the roof of the rearing cage to fit at least two red light bulb holders. They should be hung inside the cage just above the heads of the keets and placed at two sides of the cage. Food and water should not be put directly under the light bulbs. The light bulbs should be switched on day and night until the chicks are 3 weeks old, to give them heat. Once the keets have reached 3

weeks of age, the light bulbs can be switched on only at night. Continue doing this until the keets are ready to leave the rearing cage at 2 months old.

Feeding

The food supplied to keets must be dry and the drinking water must be very clean. Use small shallow bowls for food and water. Deep water bowls are dangerous because the keets can fall in and get wet. They can even drown! When the keets have reached one week old, they should be fed twice daily a diet similar to that of adult birds (i.e. madeya/bean or madeya/fish or madeya/termite mix). Finely chopped cabbage should be provided twice a week for the first two months when they are in the rearing cage and not on free range. Once they reach two months old and are allowed on free range during the day, their diet of madeya/bean/fish/termites should be supplemented with cabbage and crushed egg shells and salt once a week, just like the adult birds.

Commercial chick feed such as "Chick Mash" or "Broilers Starter" can be used as an alternative food for keets until they are 3 months old. They should be fed twice a day. As well as the commercial feed, they should also receive cabbage and some dried fish (e.g. usipa) twice a week for the first two months when they are in the rearing cage. When they are released from the rearing cage at 2 months old and allowed on free range during the day, they should be given chopped cabbage and usipa once a week as a supplement to the commercial feed. When they reach 3 months old, they can be fed "Growers Mash" only, with no supplementary feeding required, once a day.

NOTE:

Guinea fowl keets:

- are fully fledged (in. they can fly) when they are one month old.
- are good to eat as a delicacy (ie their flesh is very tender) when they are six months old. They taste like quail.
- are fully grown and weigh from 1.4 kg to 1.8 kg when they are twelve months old. They are good to eat. They taste like pheasant. They can be sold for meat or for breeding of this stage.

10. Treating for Pests and Diseases

What makes guinea fowl sick?

Domestic guinea fowl have not yet been fully domesticated, so they have kept the hardiness of their wild relatives (i.e. indigenous guinea fowl). Therefore they don't suffer from many pests and diseases as compared to fully domesticated species like chickens and other poultry. For example, guinea fowl do not suffer from Newcastle disease.

The pests and diseases which affect guinea fowl are not many but if they go untreated, they can cause the birds to die. If guinea fowl are not on free range and are kept in overcrowded conditions they are more likely to get sick. Keets are more susceptible to disease than adult guinea fowl and therefore must be housed in clean, warm and spacious conditions.

Guinea fowl suffer from:

1. Fleas and lice
2. Roundworms
3. Coccidiosis
4. Trichomoniasis (only affects keets)

Prevention is best! - Some General Rules:

1. Good housing. Clean, dry, spacious.
2. Sand in house changed once a month.
3. Dry food and clean water.
4. Check birds daily and treat immediately.

Fleas and Lice

Guinea fowl don't cope well with fleas or lice. If a guinea fowl has fleas or lice and this is not treated, it will certainly die, (whereas a chicken will survive). Many guinea fowl pick up fleas or lice from chickens in the first place.

Symptoms

If your guinea fowl or chickens are suffering from fleas and lice they will have the following symptoms:

- Anaemia (weakness)
- Loss of weight
- Females stop laying eggs
- Males stop mating

Prevention

- Good housing for guinea fowl adults, chickens and keets.
- Regular cleaning and changing of sand in both houses.
- Daily checking of guinea fowl adults, chickens and keets for presence of lice and fleas.
- Treatment of guinea fowl adults and chickens with Actellic powder at the beginning of the guinea fowl breeding season.

Treatment

If you notice lice or fleas around the head and neck area of your guinea fowl adults, keets or chickens, treat all birds immediately.

- Birds

  Dust with Actellic powder. Apply plenty of powder and rub it in. Apply to the head and neck and under the wings of each bird.
- Houses

  You need to also treat the inside of both the guinea fowl house and the chicken house. Actellic powder doesn't kill all of the fleas and lice on the birds. Some of them drop off and remain inside the houses.
- For light infestations (less than half the birds affected):-

  Dust the floors and walls inside both houses and play areas with plenty of Actellic powder.
- For heavy infestations (more than half the birds affected/some deaths):-

  Remove and burn the sand in both houses and play areas. Pour hot water on the floors and inside walls. Allow to dry and smear with clean mud. Apply clean sand. Dust the walls and floor with Actellic powder or spray with concentrated Actellic liquid.

Roundworms

This disease is common in both guinea fowl and chickens. It is caused by parasitic worms which live in the stomach and gut of birds. It is mainly a problem where birds are kept in dirty houses and/or where birds are being fed on a poor diet. The eggs of roundworms are passed out in the droppings of infected birds. If the houses and play areas are not cleaned regularly, then the birds are likely to pick up infected droppings with their food and get sick.

Symptoms

If your guinea fowl or chickens are suffering from roundworms, they will have the following symptoms:

- Weakness.
- Diarrhoea (watery droppings).
- Females stop laying eggs.

Prevention

- Feed birds a well balanced diet.
- Good housing.
- Regular cleaning and changing of sand in both houses.
- Allow birds on free range and do not keep too many birds in one house (avoid overcrowded conditions).

Treatment

If you notice that your birds are weak, have watery droppings and the females have stopped laying eggs, then you must treat them for roundworms.

Treatment is easy. Use roundworm treatment for poultry (e.g. "Ascarex", "Ruzine", which can be found in most pharmacies in Malawi. The treatment is in the form of white powder. A small amount of powder is added to the drinking water of the birds for one day. Follow the instructions on the packet carefully. It is a good idea to take away food and water from the birds on the day before treatment. The birds will be thirsty the following day and will drink enough treated water to make them well.

Repeat the same treatment three weeks later. It is important to remember to do so as just one day's treatment will not be enough to kill all of the worms inside the gut of the birds.

You should not just wait until your birds get sick with roundworms, it is better to treat them on a regular basis i.e.

Adult guinea fowl and chickens:-

- Treat twice a year, before and after the guinea fowl breeding season.

Keets:-

- Treat keets at one month old and again at 6 months old.

Coccidiosis

Coccidiosis is a common disease of guinea fowl and chickens. It is a more serious disease for guinea fowl than for chickens. Keets are especially vulnerable and will certainly die from this disease. Coccidiosis occurs in wet and dirty conditions.

Coccidiosis is not usually a problem for small and medium-scale guinea fowl farmers who keep their guinea fowl on free range and in spacious, clean houses. Coccidiosis is more common for large-scale guinea fowl farmers. Usually, birds are confined and tend to get overcrowded. Hand reared keets are especially susceptible. Guinea fowl usually get this disease from wet, dirty overcrowded conditions and from eating wet food.

Symptoms

If your birds are suffering from coccidiosis they will have the following symptoms:

- Watery droppings with blood in them.
- Loss of weight.
- Have rough feathers.
- Huddle together in groups.

Prevention

- Dry food and clean drinking water.
- Dry play area and house. Fill in and level off any areas where water stays in the play area. Ensure the roof of the house does not leak.
- Regular cleaning and changing of sand in both houses.
- Allow birds on free range and do not keep too many birds in one house (avoid overcrowded conditions).

Treatment

Coccidiosis is a serious disease in guinea fowl. Guinea fowl who get coccidiosis will die very quickly. Guinea fowl, adults and keets should certainly be treated for Coccidiosis, whether they show the symptoms or not. You are basically treating your birds to ensure that they don't get the disease. If they do get it, they will get a very mild version and will respond well to treatment. This approach is called prophylactic treatment.

Use "Amidiostat" which is readily available from most pharmacies, to treat Coccidiosis. Amidiostat is also a white powder which is put in the drinking water of the birds. The treatment schedule is complex. Follow the instructions given on the packet very carefully. Treatment is for a 3 week period, with a higher dosage in the first week than in the following 2 weeks.

Adult guinea fowl

Guinea fowl adults should be treated for coccidiosis twice each year, before and after the breeding season. If guinea fowl get sick with coccidiosis during the breeding season and are treated, the guinea fowl eggs will be contaminated with the drugs during the treatment and for one month after treatment is finished. These eggs should be discarded and not incubated or used for food.

Keets

Treat keets for coccidiosis when they reach one month old and again at 6 months old. If guinea fowl chicks show symptoms of coccidiosis at any time, they should be treated. However, keets less than 3 weeks old will not respond well to treatment and will probably die anyway.

Trichomoniasis

This disease is closely related to Coccidiosis and only affects keets. Keets which are two to three months old are most vulnerable. If they are kept in wet and dirty conditions, they are likely to get this disease. "Amidiostat" (the drug used to treat Coccidiosis), also treats Trichomoniasis.

Symptoms

If keets are suffering from Trichomoniasis they have the following symptoms:

- Loss of weight.
- Drooling from the mouth.
- Smell bad.
- Wattles get darker in colour - remember the Wattles are small in keets.

Prevention

- Dry food and clean drinking water.
- Dry play area and house. Fill in and level off any areas where water stays in the play area. Ensure the roof of the house does not leak.
- Regular cleaning and changing of sand in both houses.
- Allow birds on free range and do not keep too many birds in one house (avoid overcrowded conditions).

Treatment

Treatment is the same as for Coccidiosis. Treat keets with "Amidiostat" when they are one month old and again when they reach six months of age.

Summary of Pests/ Diseases

Symptoms	Pest/Disease	Treatment
Birds lose weight and are weak. Low egg production. Most eggs are infertile. Presence of lice or fleas around The head and neck of guinea fowl.	Fleas or lice	"Actellic Powder" or "Actellic liquid"
Birds have no energy. They have watery droppings (with no blood in them). Low egg production.	Roundworms	"Ruzine" or "Ascorex"
Birds lose weight and are weak. They have watery, bloody droppings. Their feathers are rough. They huddle Together in groups.	Coccidiosis	"Amidiostat"
Keets lose weight. Keets waffles get darker in colour. They drool from the mouth and smell bad.	Trichomoniasis	"Amidiostat"

11. Predators

Domestic guinea fowl may make a lot of noise when disturbed but they don't have anti-predator skills (ie. they don't run away quickly enough from predators). They are easily caught and killed. Many animals predate on guinea fowl. Dogs are the worst problem for guinea fowl in Malawi. Dogs who don't usually chase chickens will attack guinea fowl. Wild predators such" as snakes, wild cats, and hyenas will also kill guinea fowl, and keets. Large birds such as the pied crow and the white necked raven often kill young keets.

Prevention

1. Build a guinea fowl house and play area as specified in design. Build a chicken, house and play area as specified also. Make sure the whole play area (including the roof) as well as the windows of the house are covered with chicken wire mesh or closely spaced bamboo.
2. Train your guinea fowl to return to their house each evening by 4 or 5pm - keep food and drinking water inside the house.
3. Keep keets less than 2 months old confined in the chicken house and play area. Older keets should be confined if there is a risk of attack from birds.

Keep your dogs under control and tie them up if necessary. Check for any stray dogs that may appear. Keep your guinea fowl and keets in the play areas if there are stray dogs around.

12. How to Cook Guinea Fowl

Guinea fowl flesh is firmer and tastier than chicken. The yield of edible meat after cooking is high (80%), compared to 65% for chicken. The meat is lean (i.e. has less fat) than chicken. Young adult guinea fowl taste better than older guinea fowl. Pick a young bird for cooking. It should have:

- a flexible breast bone;
- soft, tender feet and short, sharp claws.

Guinea fowl can be cooked in a number of dishes, just like chicken but tastes best when roasted in an oven.

Kill the bird. Pluck the feathers (they are easy to remove). Remove the innards and clean thoroughly.

Roast Guinea Fowl

1 adult guinea fowl (1.4 kg to 1.8 kg in weight)

2 tablespoons of butter or margarine

1 medium sized onion and 1 green pepper

2 strips of pork (bacon)

2 tablespoons of flour

1 teaspoon of salt and a pinch of pepper

Cut the onion and green pepper into quarters. Place the onion, green pepper and butter (or margarine) inside the body of the bird. Close up the bird (use a piece of bread) and lay it down on a baking tray with its breast facing down. Place the strips of bacon over the back of the bird. Roast in a very hot oven (500°F) for 15 minutes. Then reduce the heat to medium (350°F). Remove the fat from the baking tray and turn the bird on its back. Roast in the oven for 40 to 50 minutes. Blend together the flour, salt and pepper and rub it over the bird. Baste (spoon hot water and butter/margarine over the guinea fowl) three or four times during the roasting. Use half hot water and half butter/margarine to baste.

Serves 4-6 people.

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