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Department:  
Agriculture  
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PROVINCE OF KWAZULU-NATAL

# Household Chicken Production



Produced by  
**KwaZulu-Natal Department of Agriculture  
and Environmental Affairs and Mdukatshani  
Rural Development Programme**





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NDA  
National  
Development  
Agency

## **Household Chicken Production**

2013

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training posters in Zulu or English

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# Purpose of this book

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This book is aimed mainly at rural households keeping chickens within their homes, mainly for their own use. It will provide simple tools and lessons on how to improve the productivity of these chickens so as to add to household food security.

This book is to be used as a training resource for extension staff and practitioners supporting farmers in the field and it covers the fundamentals of keeping household chickens. There are numerous books on commercialisation of chickens or small-scale commercial production. This book will only cover the basics of household chicken production, so if you need more information you should go to the last page to see references for books and websites that would provide more detail.

Each topic covered in the book is available at [www.mdukatshani.com/posters](http://www.mdukatshani.com/posters) as a training poster to support practitioners in the field. There is also a section on training techniques in the final chapter.

## Introduction

### Why keep household chickens?

Household chickens (also known as rural village chickens, indigenous chickens, traditional chickens, scratch fowls and – in KwaZulu-Natal – Zulu chickens) are an existing agricultural production system (chickens were domesticated about 8000 years ago!) that provides a source of high-quality protein. This fact is often neglected when considering rural food security, with the emphasis often being on vegetable gardens.

These chickens are the true free-range birds, in the full sense of the term, and are found in nearly every rural home. Household or village chickens find most of their own feed, are good at hatching and mothering young chicks and have the ability to survive under harsh conditions.

The existing village chicken production system is a low input/low output one. This means that they rely on low inputs of feed and medicine, but outputs are also low. This means that the chickens do not grow fast like broilers, or lay as many eggs as layer hens. However the chickens are valuable because without having to spend a lot of money on inputs, they have the potential to contribute meat and eggs to the diets of the families that keep them.

Chickens are sometimes sold or exchanged for other goods but, due to the low productivity of the existing system, this is usually not on a large scale. They are also of socio-economic importance to rural communities, being gifted to other households and slaughtered for traditional and ceremonial purposes.

Household chickens are, however, generally a neglected resource and many rural families seldom eat chickens and almost never eat eggs. This is because the mortality rate of chicks is high

(most of them do not become adults), relatively few eggs are produced and many of these do not hatch for various reasons, so households find it difficult to stop their flock from shrinking, which prevents them from using the chickens or the eggs regularly.

It is possible to improve the productivity of these chickens with simple management interventions that require little or no cash input, only some time and attention. Ultimately this can improve the health and livelihoods of the families that keep them, especially for women and children who care for the chickens.

The idea behind this book is to try to transform households from passive to active chicken producers, using basic chicken management knowledge and skills.

### **The nutritional value of eggs**

Eggs provide essential nutrients to human diets. They are rich in fat, provide an excellent source of protein and also contain reasonable amounts of calcium, iron, Vitamins A and D, thiamine and riboflavin. They are easy to prepare and are easily digestible, making them suitable for children of six months of age or older.

Eggs are sometimes blamed for contributing to health problems as cholesterol, which mainly affects adults, so should be eaten in moderation. People with no health problems such as cholesterol or heart disease can eat one egg per day but people with such problems should not eat more than two eggs/week.

Eggs (including both the yolk and the albumin) are good for children – they provide a good amount of energy as well as protein and children should eat at least 2 eggs per week. The eggs should be cooked to kill any pathogens such as Salmonella.

## Contents of this book

This book is laid out so that each topic is a stand-alone section that can be used as training material.

**Topic 1** covers different types of chickens so that farmers are aware of the implications of introducing new types to a household flock. It also explores different types of production systems under which chickens are kept.

**Topic 2** provides information about housing and nests for chickens. It also discusses the reasons for confining chickens – and the added costs, especially for feeding chickens that cannot scavenge.

**Topic 3** builds on the discussion about feeding confined chickens and discusses feeds and feeding practices.

**Topic 4** covers Newcastle Disease, which is a major threat to household chicken production. It talks about the causes, symptoms and importantly, the prevention of the disease by having a strict vaccination programme.

**Topic 5** covers a number of other diseases that can affect chickens, namely Fowl pox, Gumboro, two diarrhoea-causing diseases and Bumble foot, which affects the feet.

**Topic 6** looks at various external parasites that infect chickens, including ticks, mites and lice. It provides information about how to prevent or treat these parasites.

**Topic 7** covers internal parasites or worms, which also affect chickens and reduce their productivity.

**Topic 8** explores a range of additional ways to increase the production of high quality eggs and chickens for using in the house or selling. It includes some examples of record sheets that can assist a household to monitor and increase the productivity of their flocks.

**Topic 9** covers some basics about storing and transporting medicines (especially vaccines, which are very sensitive). It also includes a list and pictures of essential items that every household should have access to in order to be able to care for their chickens properly.

The last section in the book covers training methods and gives some ideas about how a field-worker or extension officer can make use of the information contained in this book and share it effectively with households that keep chickens.








## Topic 1:

# Types of chickens and production systems

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Table 1: Summary of different types of chickens and their characteristics

Different types of chickens	Characteristics of the different types
<p><b>Local/household/indigenous chickens</b></p> 	<ul style="list-style-type: none"><li>• Many colours, shapes and sizes – some with bare necks.</li><li>• Tougher meat from outdoor lifestyle</li><li>• Can live off the land by scavenging, so low cost</li><li>• They are 'smart' and sleep off the ground, are good runners and can fly when they need to, thus avoiding predators</li><li>• They find/make nests and brood well</li><li>• They can be hard to control/catch/handle</li><li>• They are not as efficient at putting on weight as exotic or commercial breeds and do not lay all year round, even when fed expensive high protein feed They can be selectively bred for certain colour which makes them suitable for specific traditional purposes.</li></ul>
<p><b>Improved indigenous breeds</b> (For example the Potchefstroom Koekoek)</p>  <p>Source: <a href="http://www.undp.org.ls">http://www.undp.org.ls</a></p>	<ul style="list-style-type: none"><li>• They have been selectively bred to be better than indigenous chickens in terms of growth rates and laying potential.</li><li>• They need more care and feeding than unimproved local chickens and cannot scavenge as well.</li></ul>

<p><b>Exotic/introduced breeds (for example Black Australorps)</b></p>  <p>Source: <a href="http://www.chaoticfarms.com/">http://www.chaoticfarms.com/</a></p>	<ul style="list-style-type: none"> <li>• These are generally birds bred in Europe or the UK and they are not well adapted to local conditions, especially our rural areas.</li> <li>• There are many different types of chickens that have been bred for different purposes. For example Black Australorps are kept for meat, while Leghorns are kept for eggs. Some breeds are called dual purpose – they have been bred for meat and egg production.</li> <li>• Generally these breeds need more food than local household chickens and do not scavenge nearly as well.</li> <li>• They are vulnerable to predators as they have not learnt to survive by roosting off the ground.</li> <li>• Breeds that are egg layers will not be good at brooding or raising their chicks.</li> </ul>
<p><b>Commercial Hybrid Layers</b></p>  <ul style="list-style-type: none"> <li>• These are chickens that have been specially bred to produce eggs and they are normally kept in cages or in sheds.</li> <li>• You cannot breed your own replacements – you have to buy new 'point of lay pullets' from a proper supplier when your hens get old.</li> </ul>	<ul style="list-style-type: none"> <li>• These hens can lay almost continuously for more than a year (almost one egg per day for a year)</li> <li>• They need a lot of expensive high protein food (special layer diet) to lay eggs like this.</li> <li>• If they are not kept in cages and are allowed to free-range, they sometimes lay eggs on the ground and they do not always return to the same nest.</li> <li>• Commercial layers are normally de-beaked (the tip of their beak is removed) on hatching so they are not good at scavenging outdoors and cannot compete with other chickens.</li> <li>• They have been bred not to become broody so that they will continue to lay eggs. This also means that they will not be good mothers.</li> <li>• They are more easily handled, cannot fly as well as local household chickens and often roost on the ground at night. This also makes them very vulnerable to predators.</li> </ul>
<p><b>Commercial Hybrid Broilers (For example Ross)</b></p> 	<ul style="list-style-type: none"> <li>• Broilers have been bred specifically for meat production.</li> <li>• They grow very fast and can be sold at 6 weeks of age for slaughter.</li> <li>• They need to be fed a proper broiler ration for the full 6 weeks (as much as they can eat).</li> <li>• Broilers get too heavy if they are kept for much longer than 6 weeks and they develop leg problems.</li> <li>• They cannot scavenge and must be provided with all their food.</li> </ul>

## Intensive versus extensive systems

Hybrids have been bred to be highly productive (to grow fast or to produce lots of eggs per year) and they are normally farmed in very intensive systems. This means that the density of chickens is high (lots of chickens in a relatively small space) and they need special housing and special feed that supplies all the nutrients that they need for high levels of production.

Exotic dual purpose breeds such as Black Australorps are also normally kept under more intensive systems than our local household chickens and are generally less hardy.

## The complications of introducing exotic chickens into the household flock

Indigenous/household chickens as defined above are the best chickens for low input household chicken production but farmers sometimes introduce breeds to their flocks in an attempt to improve their flocks. This is rarely successful and can have serious negative effects on the flock (such as hens no longer going broody).

### Characteristics of household/village chickens

Some key characteristics of household chickens and their production systems are:

- They are usually 'indigenous' or 'local' stock.
- They are raised in small numbers (flocks of 1-50) but commonly flocks consist of 5-15 chickens.
- They are generally not confined and scavenge for most of their food.
- They are usually only fed household food scraps or maize/sorghum.
- They require minimal veterinary inputs.
- They mainly use family labour and are usually cared for by women and children.
- Production is geared mainly towards home consumption and savings (they provide a living bank) and for small expenses such as school fees.



- Hens normally start to lay eggs at 24-30 weeks (6-7.5 months) of age.
- At any given time only half of the hens are productive and 8-10% never lay.
- Most birds produce 2-4 clutches of eggs a year, which they brood.
- There are on average 10-12 eggs per clutch.
- A hen will lay for about 12-20 days until she has a full clutch of eggs and will then start brooding.
- She will incubate (brood) the eggs for 21 days and the chicks will then emerge (hatch).
- 70-90% eggs will hatch varying with the season.
- The chicks will stay with their mother for about 2 months but the hen will not start laying again for some 4-6 months after the previous clutch.
- Only 20-50% chicks reach adulthood (and 85% of mortalities occur in the first 3 weeks of age).



*Adapted from: Ahlers et al. 2009*



## Topic 2:

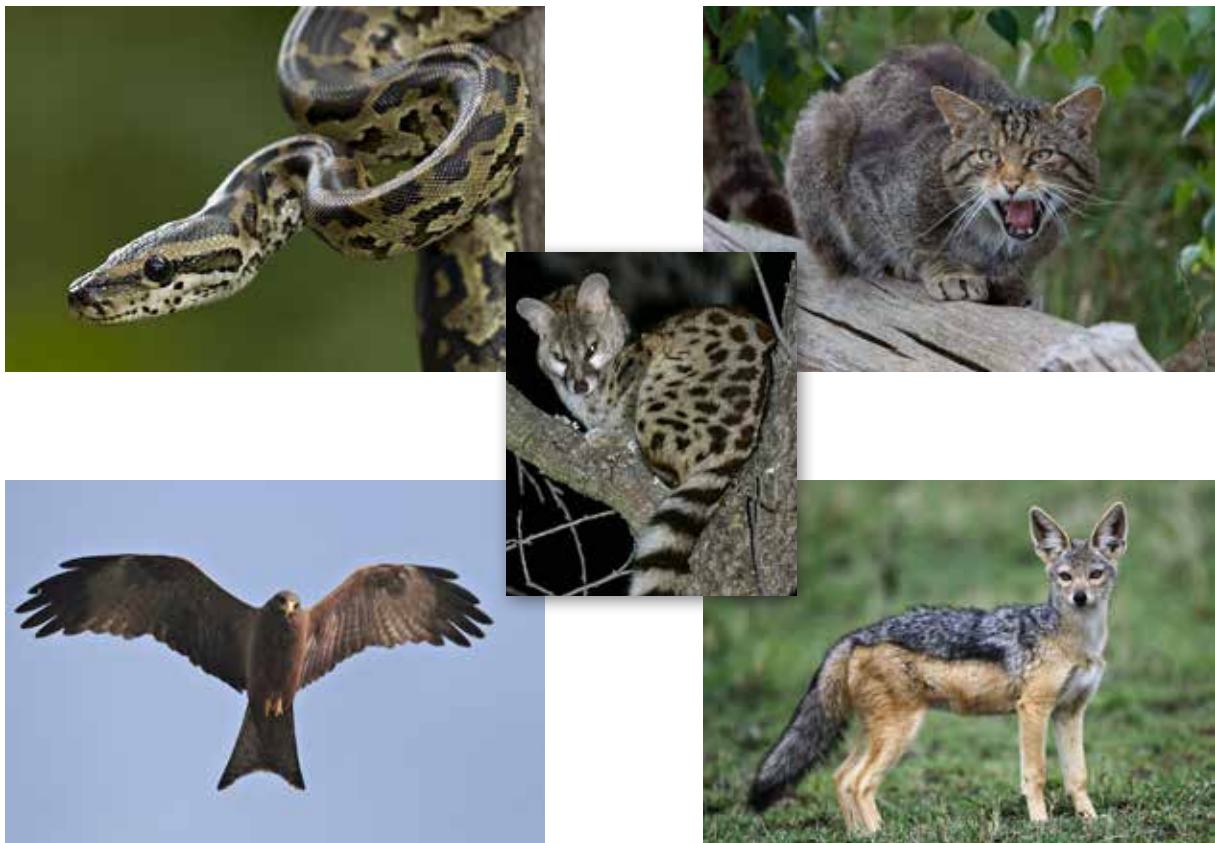
# Housing and nests

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Generally household chickens should not be confined as most of the advantages of these chickens are as a result of their free ranging habits.

## Reasons for confining household chickens

In some areas farmers sustain large losses of their chickens due to predators. There are often local methods of avoiding some of these losses (such as stringing wires across yards or tying pieces of coloured plastic to chicks to discourage hawks) but where farmers feel that these losses are unsustainable, confinement of young chicks is often the only option.



*Figure 1: Types of predators (snakes, cats, gennets, hawks and jackals).*

In very hot or very cold environments or seasons, young chicks sometimes die from exposure to the weather and confinement can also help to prevent these losses.



However, there is always a cost to confinement that a farmer needs to understand and plan for. This is the cost of constructing a suitable cage, the cost of feeding the chickens and the labour required to care for the confined chickens. There is also a greater need for veterinary products to control diseases once you confine your chickens. This is because there are more chickens in a smaller space.

## Confinement options

The best option is to enclose the chickens at night with a little food and plenty of water but let them scavenge through the day so that they can find their own food. It is also important to make sure the cage/structure protects the chickens effectively from night predators as they will be helpless once you confine them.

Another good option is to only confine and thus feed those chickens that are most vulnerable such as the hens with chicks and the hens that are brooding eggs. It is better to confine chicks with their mothers rather than separating them as the hens are the teachers regarding what to eat, what to be scared of, and so on.

If chickens are confined continuously, rather than only at night, you also have to make sure that you provide them with a complete diet (See the next section) because they can no longer scavenge and find the nutrients that they are lacking. This means you have to supply all the chickens' food requirements – the right nutrients and the right amount. You can either buy commercial chicken feed, which is very expensive, or you can buy different ingredients to make a complete diet or you can use locally available feeds to make up a complete diet.

**Note:**



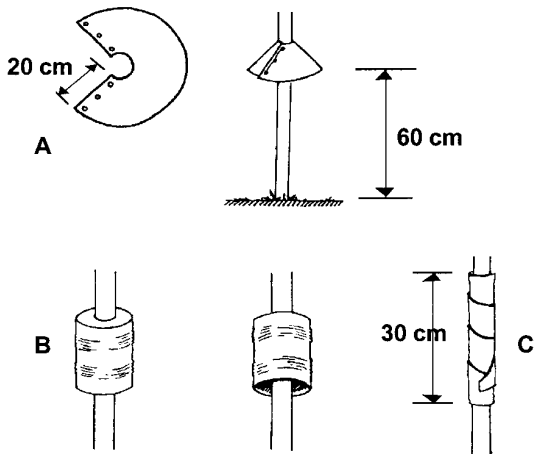
*It is very expensive to feed chickens that are kept confined at all times. If you are going to do this, then it may be more worthwhile to invest in some hybrid broilers or layers as their high productivity justifies the investment in feed. If you are confining your household chickens, it should only be for short periods of time, for example while the chicks are small and very vulnerable to predation. However, if you have access to urban markets that will pay high prices for traditional chickens then it might make a caged/housed system economically viable.*

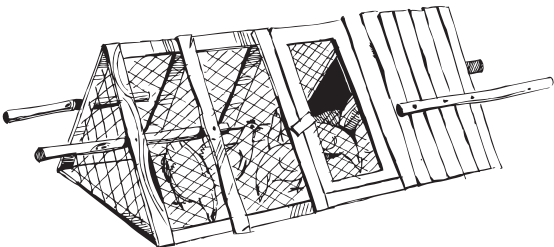

This book is not covering housing for broilers as it is only focusing on household chickens and not commercial small scale chicken production.

## Building a suitable cage or house for household chickens

Where possible, farmers should use locally available skills and materials to make shelters or houses for their chickens. Here are some examples of housing systems with the relative advantages and disadvantages.

**Table 2: Summary of some ideas for building cages and houses for chickens**

<p><b>A basic mud walled enclosure with a door, a netting front, and a thatch roof.</b></p> 	<p>Inside, it could be separated into compartments so that you can separate different hens so that they cannot peck and kill other hens' chicks.</p> <p>It is cheap to make and uses local skills and locally available materials. It protects against cold and rain.</p> <p>Remember that tin roofs can get very hot in summer and do not protect chickens from cold during winter.</p>
<p><b>A hut on stilts provides protection against predators.</b></p> 	<p>Metal cones can be fitted on the legs of the hut to stop rats or snakes climbing up into the hut.</p>  <p>The same system of cones can be used on the trunks of trees in which chickens roost at night or on the legs of the stands that hold the nest boxes. This will prevent snakes and rats from stealing eggs.</p>

<p><b>This is a cage known as an 'A' frame because of its shape. Sometimes people call them 'chicken tractors' because you can place them on a garden bed before planting and they help to prepare and fertilize the soil.</b></p> 	<p>A-frames are usually used for chicks or for a few hens and should be moved daily so that the chickens have a new place to scratch.</p> <p>If they are not moved regularly this can lead to chicken deaths as a result of disease build up.</p> <p>Normally chickens kept in these cages require some supplemental feeding because they cannot get enough from the small area on which they are confined.</p>
<p><b>Here is a layer cage that has been placed inside an unused hut. This provides security and protection from the elements.</b></p> 	<p>The room needs to be cleaned thoroughly and disinfected regularly.</p> <p>All the food and water needed by the chickens must be provided so it will be expensive to maintain this system, especially if you are confining adult chickens.</p> <p>It is also important to make sure that there is adequate ventilation (air flow) for the chickens.</p>

## Nesting systems

Chickens will make nests or lay eggs anywhere if not provided with suitable nest sites. This makes the eggs and the brooding hens very vulnerable to predators, while damage from other animals in the homestead (e.g. dogs stealing eggs) contributes to low productivity of the flock. Thus it is important for a farmer to provide safe and clean nesting options for his/her hens. Below are some options.

**A nest cluster made out of a number of discarded plastic and metal containers placed on a wooden framework.**



The height of the nest avoids predation by dogs and cats.

Putting cones on the legs of the structure will stop snakes accessing the nests.

In very hot or cold conditions the lack of insulation with these types of containers can cause embryos to die during incubation which results in many eggs not hatching.

The containers need to be cleaned and disinfected between broods to prevent disease and build-up of parasites.

Many farmers place ladders for their hens to access the nests easily or a ledge or pole in front of the containers for them to fly up on to.

**Here is a chicken enclosure with a netting front and nest boxes placed above it.**

The ladder can be taken away at night to improve protection of the nests.

This system protects the nests and the chickens.

The enclosure and the nests need to be regularly cleaned and disinfected to prevent outbreaks of diseases and parasites.



**Using local knowledge is a very good option as the skills and materials are locally available and thus cheap.**

Examples of such nests include woven grass baskets and nests made from the base of sisal stems.



**Here is another example of nests inside the chicken house constructed from locally available materials.**





*Agave tequilana*

### Chicken Nests



The agave is a pest plant in South Africa, it lives 5 years, forms a flower then dies. MRDP farmers use it to make chicken nests.



the wooden heart is harvested, dead leaves chopped off, the bottom sawn off, the fluffy inside cleaned out, and inside burnt to get rid of left over fibre



it insulated eggs and hens against heat and cold much better than traditional tins





## Topic 3:

# Feeds, feeding and nutrition

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When chickens are not able to find enough food, they will not grow properly and their egg production will also drop. They will also become susceptible to diseases and parasites.

## Essential nutrients

The following five groups of nutrients are essential to life, growth, production and reproduction in all types of poultry. With chickens that are free to scavenge, nature supplies most of these essentials in the form of grass and leafy plants, insects and other small animals such as worms, gravel, grains, seeds and sunshine, etc. You need to make sure that your chickens have access to different feedstuffs that provide sufficient amounts of these five groups of nutrients.

### Water

Chickens can live longer without food than without water. Growth of young chickens as well as egg production of hens will decline if they are not provided with a continuous supply of clean water.

### Protein

This is usually the most expensive feed material, but the one most likely to bring profitable results if properly used because the diets of scavenging chickens often do not have enough protein for chicks and growers.

Protein from animal sources – milk, liver, fish scraps, eggs, meat or meat meal – is more effective in promoting growth and egg production, than protein from most vegetable sources. Grains alone are entirely inadequate in amount and kind of protein. Growth and survival rates of chicks are greatly improved if they are given preferential access to household scraps supplemented with protein.

### Carbohydrates

These are the starchy materials found in grains and grain products such as maize meal. They supply energy to the chickens and the excess forms fat in the body or the egg.

### Minerals

Calcium carbonate (from limestone, gravel, snail shells, bone, etc.), in the presence of Vitamin D, forms most of the egg shell. Bone contains mostly calcium and phosphorous.

Salt supplies some essential minerals. Green feed contains small amounts of certain highly important minerals. You can also dry egg shells in an oven or over an open fire and crush them and feed them back to your hens. The drying process removes all egg content and ensures that they do not start eating their own eggs.

## Vitamins

These occur naturally in fresh foods, especially vegetables and leafy plants, or can be added as a supplement. They keep your chickens immune systems healthy.

### Why is nutrition important?

**If chickens are put in cages or houses they will not be able to scavenge for the nutrients that they need. Feeding them crushed maize alone will not be enough and they will be unproductive and may even die. Chicks will grow very slowly and will be susceptible to disease.**

***THIS IS WHY IT IS IMPORTANT TO SUPPLEMENT CHICKENS – ESPECIALLY IF THEY ARE CONFINED***



## How do you recognise nutritional problems?

Where the chickens have nutrient deficiencies, the farmers will notice that their chickens' feathers are looking untidy and not smooth. They hang their wings and are listless. They will often start cannibalizing each other. Normally this starts with them pecking feathers of other birds and then pecking at the wounds that form.

Hens with calcium deficiencies will sometimes start eating eggs and may eat old shells that are left in nests after hatching. Feeding boiled egg shells to hens can help prevent egg eating behaviour.

## Options for feeding your household chickens

For chickens to be healthy and productive, they can be given a diet made up of:

- Fresh plant material (For example vegetables, fodder crops such as lucerne or vetch, weeds, grass, kitchen scraps)
- Grains (For example maize, sorghum, sunflower, millet)
- Protein (For example beans, fish meal, worms, maggots, termites, eggs)
- They also need a constant supply of clean water!



**Figure 2:** Different sources of carbohydrates and protein (Grasshoppers, lucerne, termites, beans, maize, sorghum, sunflowers).

## Some examples of basic diets for chickens

### Confined chickens

If growing hens with chicks are confined completely then you should provide a diet made up of either:

- Layer starter mash (plus some maize for the hen – preferably with some sunflower), or
- Your own mixture (Crushed maize/millet/sorghum + a protein source (e.g. cooked eggs, termites, maggots, sunflower seeds) + plant material (e.g. weeds, leafy vegetables, Lucerne, vetch)

### Supplementing free ranging chickens

If you are giving all your chickens crushed maize and they are free-ranging and you are just supplementing the diets of small chicks, you should supply them with some additional protein to help them grow. You should also make sure that the maize is finely ground so that they can eat it easily.

## Topic 4:

# Newcastle disease (virus – paramyxovirus)

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The biggest constraint to homestead chicken production is Newcastle Disease. Newcastle Disease is caused by a Paramyxovirus that occurs in a range of types (or strains) of widely variable strength (virulence). Sometimes, the strain of virus that is present will cause very few deaths in chickens; at other times, the virus strain involved may cause many deaths (losses of up to 90% can be experienced).

## Signs of Newcastle Disease

- The chicken fluffs/ruffles its feathers and appears to 'have its coat dragging on the ground'
- The chicken looks sleepy (lethargic/listless) and does not eat.
- The chicken has difficulty breathing and gasps.
- The head and neck are swollen.
- There is greenish diarrhoea.
- The chicken may have its head twisted backwards onto its back.
- Normally the sick chickens will die after 3 or 4 days.



Source (drawings): Ahlers et al. 2009 (pg 111)



Source: <http://www.poultryhub.org/>



Source: <http://www.ecofriend.com/>

**Figure 3:** Some signs of chickens having Newcastle Disease



The only way to reduce or prevent deaths from Newcastle Disease is to vaccinate your chickens against the disease.

This topic looks at effective ways of vaccination of indigenous or free range chickens in rural areas.



Source: <http://www.flickr.com/photos/51683351@N05/4842066368/>



Source: <http://aci-ar.gov.au/project/AS1/1996/096>

*Figure 4: Different ways commonly used to give Newcastle Disease vaccine (you can spray, give eye drop or place in drinking water).*



Source: <http://www.micron.co.uk/>

## Vaccination

If households are within built-up areas or if there are in an area where there are commercial chicken farms or points of sale (e.g. pension pay points), all the chickens in the household flock (and any new chicks) should be vaccinated monthly.

In more remote, less settled areas where there is less risk of infection, vaccination can take place every three months.

Vaccination against Newcastle Disease is done in four ways (see pictures above):

- **By eye dropper** – with this method, the vaccine is more effective but you need to catch each chicken and place the drop in an eye which can be difficult and time-consuming. ND La Sota vaccine can also be applied as an eye drop if mixed with 30ml sterile water (you can also use bottled water – but still not sparkling). You then apply a drop per eye (one eye per chicken).
- **By spray** – this usually is used in broiler production where the chickens are in a closed shed. A fine mist of vaccine mixed with water is sprayed over the chickens. The spray is absorbed into the nostrils, throat and eyes. Unless the birds are in a closed environment, this method is difficult to implement.
- **Through drinking water** – this is effective for households with large flocks because you do not have to handle each chicken, but they need to be starved of water before the vaccination to make sure they drink the treated water. WE RECOMMEND THIS FOR HOUSEHOLD CHICKENS BUT IT MUST BE DONE PROPERLY!



- **By needle** – This method means that each chicken needs to be caught and injected which can be difficult and labour intensive.

## Vaccination through drinking water using 1000-dose ND Clone or ND La Sota Vaccine

### Mixing up the vaccine properly

Group vaccination can be done using a 1000-dose vial:

- Mixed into 5 litres for less than 50 chickens
- Mixed into 10 litres for 50-100 chickens
- Mixed into 20 litres for 100 – 200 chickens
- Mixed into 40 litres for over 200 chickens

If farmers are mixing vaccine collectively to save money, then each farmer should take home the necessary amount of treated water to give to their chickens at home.

### Using the right containers for mixing and giving vaccine

Metal containers must not be used for mixing, holding or transporting the vaccine mixture – and farmers must also make sure that they use a plastic container when giving the vaccine mixture to the chickens.

### Keeping vaccination records

Farmers, or the staff who work with them, should keep records of dates when the chickens are vaccinated so that you can be sure an outbreak does not occur because the chickens have been left unvaccinated for too long.

*Example of a recording sheet*

**Vaccination Diary**

Project \_\_\_\_\_

Place \_\_\_\_\_ Year \_\_\_\_\_

Name of farmer	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Johannes Pietersen												
MaMbatha Msomi												

## Instructions for giving Newcastle Disease vaccine correctly

### Transporting and storing the vaccine

After buying the vaccine, store it in a closed steel vacuum flask with some ice in it until you get home or to the office, then put it in a refrigerator at 2 – 8°C. **DO NOT STORE IT IN A FREEZER!**

If you are going into the field to work with farmers, again carry the vaccine in the steel thermos flask with some ice in it.

The vaccine should never be out of a fridge or cold flask or in direct sunlight – not even for a few minutes.



### Finding a source of water to mix the vaccine

Most water sources can be used but it may be necessary to treat the water before adding the vaccine.

It is best to use clear water.

### Preparing the water before adding the vaccine

The water needs to be left in an open plastic container such as a dish or plastic drum for at least an hour before you add the vaccine.

**DO NOT USE A METAL BOWL OR CONTAINER!**

Put in half a cup of skim milk (fresh or pasteurised) or two tablespoons of skim milk powder into the bowl of water. This stabilises the water and boosts the vaccine.



### Adding the vaccine to the water

Place the container in the shade or inside a building so prevent exposure of the vaccine to sunlight.

Put the glass bottle containing the vaccine pill under water.

While under water, pull out the rubber stopper and rinse until the vaccine has dissolved out of the bottle.

## Distributing the vaccine to farmers

This mixture must then be decanted into farmers' containers as soon as possible.

The mixture must be drunk within 4 hours of mixing.

Once the mixture has stood for 4 hours or more, the vaccine will be dead and it will not protect the chickens against Newcastle Disease.



## Transporting the vaccine mixture

The size of the household flock will determine how much mixture they need.

For farmers with approximately 20 chickens, a 2-litre container of vaccine mixture will be sufficient.

The vaccine should be carried in a glass or plastic container.

If the container is not coloured, then it should be put inside a bag (preferably a brown paper bag) to avoid exposure to direct sunlight, which can kill the vaccine.

## Giving the vaccine mixture to the chickens

As soon as the farmers get home they must give the vaccine mixture to their chickens.

They must not use a metal container but can either use a plastic bowl or local options such as a cut tyre or a grinding stone.

When the chickens drink the mixture, they will be vaccinated.



## Making sure the vaccine mixture works properly

The vaccine mixture becomes weaker from the time it is first mixed until it no longer works.

The mixture must be drunk by the chickens within an hour of being poured for them, otherwise it must be thrown away.

It is important to starve the chickens of water overnight so that you can be sure that they will drink the mixture quickly.

Starve the chickens of water by locking them up overnight without any water so that they drink the vaccine mixture quickly when it is given to them the next day.



## Topic 5:

# Other common chicken diseases

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## Fowl Pox (Avipox virus)



Source: <http://www.backyardchickens.com/>

Symptoms	Prevention	Treatment	Management
<p>Sores/swellings occur on the wattles, comb and skin of the face.</p> <p>They start as a pale spot and become yellowish and swollen before drying out to form a thick dark scab.</p> <p>Swellings around the nostrils can cause a nasal discharge.</p> <p>Sores/swellings on the eyelids may cause complete closure of the eyes.</p> <p>Fowl pox can also develop in the mucous membranes of the mouth and this called wetpox or fowl diphtheria.</p>	<p>Prevent the disease by vaccinating with fowl pox vaccine.</p> <p>Use a syringe to mix the diluent (fluid) and the vaccine and then dip a 14/15 gauge needle into the vaccine mixture and shallowly pierce the skin on the outside of the chickens thigh (to a depth of 3 mm).</p> <p>It is recommended that birds be vaccinated in the first few weeks of life and again at 12-16 weeks. Older chickens can also be vaccinated. Vaccination should result in life long immunity.</p> <p>Isolate sick birds to prevent spread of the disease.</p> <p>Do not vaccinate during, or shortly after, an outbreak of the disease.</p>	<p>There is no treatment for fowl pox but a farmer can use an Iodine spray or black shoe polish (which contains iodine) on the sores to help them dry out and to prevent secondary infections.</p>	<p>Exclude fleas and mosquitoes from the environment as they are the vectors that transmit the disease between chickens.</p> <p>Apply carbodust in the sleeping areas and where they "sand-bath".</p> <p>Apply carbodust to standing water to control mosquitoes.</p>




## Gumboro (Birna virus)

Source: <http://gumborodisease.blogspot.com/>



Symptoms	Prevention	Treatment	Management
<p>This disease is also known as Infectious Bursal Disease and causes inflammation of the cloaca.</p> <p>Chickens have watery diarrhoea and soiled vent feathers.</p> <p>Gumboro results in a weakened immune system and the infected chicken will show signs of secondary infections.</p>	<p>Vaccinate against Gumboro.</p>	<p>Treat the secondary infections with antibiotic products such as Consumix plus or Coliprim.</p>	<p>It is spread in the faeces so keep infected birds separate and prevent healthy chickens coming in contact with the infected faeces (practice bio-control).</p>

## Bumble foot (bacterial infection)

Symptoms	Prevention	Treatment	Management
 <p>Source: <a href="http://www.upc-online.org/">http://www.upc-online.org/</a></p> <p>The chickens become lame in one leg and the pad of that foot is found to be swollen and painful.</p> <p>A brownish corn is usually found over the centre of the swelling.</p> <p>Pus may come from the side of the corn.</p>	<p>Bumble foot often develops in wet or moist environments and is initiated by cuts in feet which provide entry to bacteria.</p> <p>General cleanliness is important. Keep infected chickens separate from the rest of the flock.</p> <p>Dispose of the pus properly if you clean the foot in order to prevent spread.</p>	<p>Remove the corn and clean the wound with iodine or salt water to remove the pus.</p> <p>Spray the cavity with wound spray and cover it if possible to keep it clean.</p> <p>Inject 0.5 ml long acting oxy-tetracycline such as Terramycin LA into the chicken's upper leg muscle.</p> <p>Burn the pus to prevent spread to other chickens and disinfect any tools you have used.</p>	<p>General cleanliness in the area where the chickens roam is important. This includes preventing contamination of the area with pus from abscesses on other animals.</p>



## Diarrhoea in fowls (bacterial)

Here we consider two main causes of diarrhoea in chickens.



Source: <http://www.backyardchickens.com/>



Source: <http://www.bellsouth.com.au/>

Symptoms	Prevention	Treatment	Management
<p><b>Fowl Cholera</b></p> <p>Infected chickens are hot and shiver. Slimy mucous comes from the mouth.</p> <p>They have watery diarrhoea with specks of blood in it.</p> <p>Chronic cases show symptoms of a cold and develop swellings of the joints of the wings and/or legs and the wattles. Lameness and drooping of a wing may result.</p>	<p>Vaccination and isolation of the sick chickens to prevent spread to healthy chickens.</p>	<p>Treat infected chickens with an antibiotic powder mixed with water.</p>	<p>Rats carry this disease so prevent rats in the chicken cages/houses.</p>
<p><b>Coccidiosis</b></p> <p>This is due to an infection in the gut, which results in bloody diarrhoea.</p> <p>The birds are also listless and not interested in eating or drinking.</p>	<p>The organisms that cause coccidiosis are always present in chicken flocks so it is hard to treat or manage.</p>	<p>Treat sick chickens with an antibiotic powder mixed with water.</p>	<p>Coccidiosis can be set off by stress and nutritional problems so try to avoid these.</p>

## Topic 6:

# External parasites that infect chickens

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## Scaly Leg Mites (Knemidocoptes mutans)

Source: <http://boisebackyardchickens.blogspot.com/>



Symptoms/problem	Prevention	Treatment	Management
Scaly leg mites burrow underneath the scales on the feet and legs causing roughness and lameness.	Mites are spread by contact so it is important to treat and isolate the infected chickens.	Rub Benzyl Benzoate over the legs. This can be bought at chemists where it is known as Ascabiol, which is usually used for treating scabies in children.	Houses or cages should be cleaned regularly and, if possible, disinfected.

## Chicken Mites (Dermanyssus gallinae)

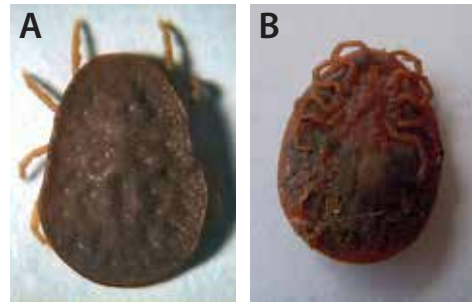
Source: <http://sjwigglywoo.hubpages.com/>



Symptoms/problem	Prevention	Treatment	Management
Red mites are very small and can appear blue or red after feeding on chicken blood.  They infest houses, often hiding in cracks.	They are carried by chickens, so buying infected chickens can cause infestation of your flock.  Wood ash can also be placed in an old tin bath for the chickens to 'bath' in to discourage parasites.	Dust the chickens with Karbadust or similar.  Put the chicken in a packet/bag with its head sticking out. Put Karbadust in the bag/ packet and shake it gently to dust the bird thoroughly.	Houses or cages should be cleaned regularly and, if possible, disinfected.

## Tampan Fowl ticks (Argus persicus)

A source: <http://escalera.bio.ucm.es/>  
B source: <http://www.backyardchickens.com/>



Symptoms	Prevention	Treatment	Management
<p>The bird is pale/ anaemic and is often paralysed.</p> <p>It has red spots where the tampan ticks have been feeding.</p> <p>Tampan ticks only feed at night so cannot be seen on the chicken in daylight, which makes them hard to identify.</p>	<p>Do not buy new chickens from infected flocks.</p> <p>Wood ash can be placed in an old tin bath for the chickens to 'bath' in to discourage parasites.</p>	<p>Dust the chickens with Karbadust or similar.</p> <p>Put the chicken in a packet/bag with its head sticking out. Put Karbadust in the bag/packet and shake it gently to dust the bird thoroughly.</p>	<p>Houses or cages should be cleaned regularly and, if possible, disinfected.</p> <p>The tampan ticks hide deep in the wood so the house or cage needs to be thoroughly cleaned.</p>

## Avian Lice (Argus persicus)

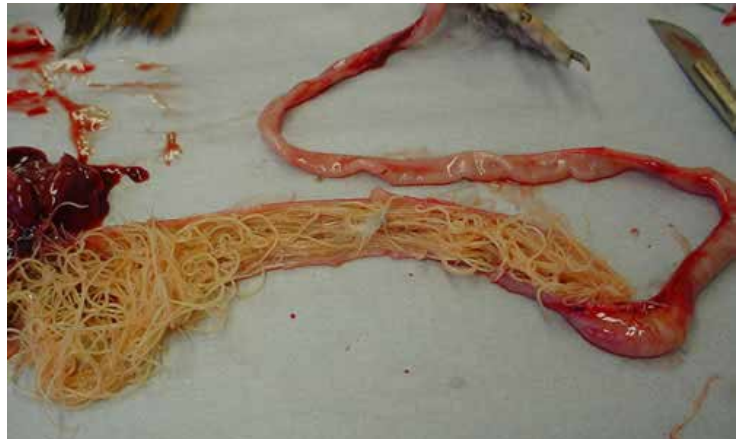
Source: <http://purplemartin.org/>



Symptoms	Prevention	Treatment	Management
<p>Ruffled feathers falling out from all over the body.</p>	<p>Do not buy new birds from infected flocks.</p> <p>Wood ash can be placed in an old tin bath for the chickens to 'bath' in to discourage parasites.</p>	<p>Dust the bird with Karbadust or similar.</p> <p>Put the chicken in a packet/bag with its head sticking out. Put Karbadust in the bag/packet and shake it gently to dust the bird thoroughly.</p>	<p>Houses or cages should be cleaned regularly and, if possible, disinfected.</p>

## Topic 7:

# Internal parasites (worms) that infect chickens



Source: <http://forum.backyardpoultry.com/>

Symptoms	Prevention	Treatment	Management
<p>The chickens may not be growing properly or may show signs of anaemia (pale wattles and combs)</p> <p>There may be worms in the intestine when you slaughter the chicken.</p> <p>There may also be signs of diarrhoea.</p> <p>Severe infestations can lead to death of the chicken.</p>	<p>Treat whole flock twice a year with a dewormer.</p> <p>Commercial products are available for poultry such as the Bayer product Flubenol, which is a broad spectrum product for pigs and chickens</p> <p>You can also use products registered for pigeons.</p> <p>Some rural farmers try putting pieces of aloe in water to control worms.</p>	<p>Catch and dose individual chickens that show signs of being infected with worms.</p> <p>Deworming can also be done in the drinking water if you are treating the whole flock.</p>	<p>Prevent the build-up of manure in the chicken house or in the area where they roost.</p> <p>Keep your chickens healthy by feeding them properly so that they are not susceptible to parasites.</p>



## Topic 8:

# Adding value to your chicken flock

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A household can add value to their chicken flock by improving the production of chickens, meat and eggs, improving the quality of the products and marketing them more effectively. Entrepreneurship is a key aspect of improving your chicken production – the family needs to make decisions about how to maximise the income from their flock based on the market opportunities they identify.

Even if a household only keeps chickens for their own use, they should find ways to ensure that they have more eggs and meat available to eat, which will improve their diets and their health.

Some management interventions that can reduce mortalities, improve saleable egg production and improve chickens' growth rates include:

## Managing the flock numbers

The family should decide how many hens and roosters they need to meet their household needs or marketing aims. Chickens cost money to keep because when there are a lot of them they cannot rely on scavenging and the family must actually supply them with food. When flocks grow, they are also likely to get sick more often and thus more money must be spent on medicine.

So, the family must decide how many hens they need to supply eggs and to produce chicks. Then they can work out how many roosters they need (1 rooster for 5 hens). All other roosters should be sold as soon as they reach a good size as they just cost money to keep.

Older hens and roosters also become less productive as they get older so the family should replace them once they are more than 2 years of age. They might need to keep records to know how old their chickens are.

With minimal improvements, a flock of 5 good hens and a rooster could produce 50 marketable offspring per year (5 hens x 2 hatchings x 5 chicks raised/batch).

## Producing a more marketable chicken

Because of their flavour and texture, the meat of household chickens is highly sort-after even in big towns and cities – people are prepared to pay well over R100 for a chicken! If small farmers have such a market, it makes it worthwhile to feed them properly.

If there is a demand by the market for certain types or colours, then the family can try to select for these characteristics. They can keep hens and roosters that have the favourable characteris-

tics and get rid (slaughter or sell) the ones that do not. Over time they will produce more of the favourable types of chickens.

## Improving egg production

Besides feeding their hens properly so that they increase the number of eggs they lay in a year, here are some interventions that can ensure that a family gets more high quality eggs from their flock.

### Collecting and marking eggs

The family should collect eggs on a daily basis so that they have eggs to eat and fresh eggs to put under a hen that becomes broody. If eggs are left in the nests, they sometimes go bad before a hen incubates them, and sometimes they are stolen by dogs.

The family can put marks (for example a star with a pencil) on the eggs to help them manage them. For example, when they see a fresh egg in the nest, they can mark it. The next day when there is another egg in the nest, they can take out the one that has a mark and store it indoors. They can then put a mark on the new egg so that they will recognise it the next day. In this way they will know which eggs have been laid each day. This means that they can remove the older eggs and leave the freshest one so that the hen continues to use the same nest.

The family can also write on each egg the date when it is laid. This will help them to always eat the older ones first. It will also allow them to give a broody hen a set of fresh eggs that are more likely to hatch.

### Producing unfertilized eggs

Some people prefer eggs that have not been fertilized by a rooster. A family can produce eggs without a rooster but this would require confining the hens and providing all their food needs. It might be better to keep commercial layers if the family plans to produce unfertilized eggs.

### Improved storage of eggs

It is best to store eggs in a cool place. Eggs that are to be eaten can be kept in a fridge but if the family plans to use them for hatching then they should just keep them in a cool room.

If the family is selling eggs, they need to be sure that they are fresh and of a high quality. It is possible to check for freshness by placing the eggs in a container of water and seeing how they float. Fresher eggs float well, old eggs less well, while rotten eggs will not float at all.

## Record-keeping

Record keeping allows the family to monitor their flock. They can tell whether their flock is growing or shrinking and will know exactly how many eggs they are getting and how many chickens they are selling or slaughtering. They will know what challenges they are experiencing and will know exactly how many chickens are dying or being taken by predators. The family will also

have a record of what it is costing them to keep their chickens. Examples of a monthly chicken record sheet and a daily egg record sheet are provided below.

*Example of a flock record*

<b>Date:</b>		<b>Farmers name:</b>		<b>Area:</b>	

	amount	Feeding expense	amount	Other expenses	amount
Veterinary expenses					
total					

Describe mortalities	
Describe symptoms that you saw	
What interventions did you try	

Increases in the flock +					Decreases in flock -							
	Number in flock previous month	change	Hatched	bought	Swapping/gifts	Other increases	Sales/ amount	Slaughtered	Gifts	Consumed at home	Deaths- causes?	Current numbers
Roosters												
Hens												
Growers												
Chicks												
<b>Total</b>												
No. of hens laying												
No. of hens brooding eggs												
No. of hens with chicks												

Other issues noted
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*Example of a record sheet for eggs*

[illegible]



## Topic 9:

# Basic vet kit essentials

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All farmers should have access to a basic kit so that they can keep their chickens healthy. Either they can have all these items as individuals or they can be members of groups that keep a kit. The following is the minimum that such a kit should contain.

### Basics of medicine storage/cold-chains

All medicines are vulnerable to sunlight and heat so farmers need to keep them cool (but not frozen!) and out of direct sunlight. This is especially important with vaccines, which are very vulnerable to temperature changes. Farmers must maintain vaccines at cold temperatures (approximately 5°C) till the moment they are used. If they get warm during transport or storage, even just for a few minutes, they must be discarded as they will not work.

### Biosecurity

Most chicken diseases and parasites spread between chickens. Farmers that have healthy flocks must be very cautious of bringing in new chickens from elsewhere as it is likely they will bring in new parasites or diseases with these chickens.

**An insulated cooler bag** – for holding medicine. Most medicine needs protection from excessive heat and sunlight.



**A metal vacuum flask** – to maintain the cold chain for vaccines from the shop's fridge to the local fridge up until it is actually used.

Putting ice blocks in the flask helps extend the time you can maintain vaccines in the field.

**Antibiotic powder** – Consumix or Terramycin powder or a similar product for treating bacterial infections.



**Ascabiol (Benzyl-benzoate)** available from chemists – to treat scaly leg-mites.



**Iodine spray** – to treat fowl pox scabs.



**Black shoe polish** – to treat fowl pox sores and scabs when iodine spray is not available.



**Karbadust** – to treat chickens infested with mites, tampans and lice.



**Skim milk powder** to stabilise water for mixing Newcastle Disease vaccine.



# Training methods

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Have a series of printed posters per topic based on this chicken book

## Training methodology with each module

- Plan trainings to be at a time when the topic is most relevant – for example if there has been an outbreak of Newcastle Disease or people are aware of outbreaks in the area then it will be a good time to share information about how to prevent it.
- Meet the farmers at a home where you have access to chickens that you can use for demonstrations.
- Get farmers to agree beforehand on the problem or issue to be discussed.

With each topic (disease/parasite/management problem):

- 1. Have discussion about the problem being focused on for the session.** For example, if it is a disease, discuss:
  - a. The symptoms
  - b. The impact on the flock
  - c. The causes
  - d. How it can be prevented
  - e. How it can be controlled or treated
  - f. Local or indigenous solutions/remedies/ways of managing the problems.
- 2. Work through the information** on the training poster and discuss them.
- 3. Depending on the topic, either catch a chicken** and talk about how to look for healthy/unhealthy signs, or use the chicken cage/ house at the homestead to discuss issues such as confinement, nests, etc.
- 4. When looking for signs of good health/problems, focus on the following aspects:**
  - Check the comb and wattles for signs of anaemia (paleness) that may show presence of worms.
  - Check the feet for signs of bumble foot
  - Check under the wings for mites
  - Check for signs of diarrhoea
  - Check for other symptoms of disease
  - Feel the body for condition and fatness

**5. Preparation for the training session:**

- a. If you are not familiar with homestead where you are having the training session, you should visit it beforehand to become familiar with the chicken-related infrastructure and equipment.
- b. Find out where you can buy the medicines, equipment needed to address the problem and find out about prices and how to use the medicines.

**6. Give farmers the chance to ask questions** and write down those you can't answer so you can go away and get the answers to bring to the next training session. If they raise a problem, take a look at the chicken records or speak to neighbours to see how big/widespread the problem is.



# References

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Here are some sources of additional information that contributed to this handbook:

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Van Eekeron N., Maas A., Saatkamp, H.W. and Verschuur M. 1990. *Small-scale chicken production*. Agrodok 4. ISBN Agromisa: 90-8573-069-4. ISBN CTA: 978-92-9081-347-7

Backyard Chickens Website (<http://www.backyardchickens.com/>)



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& environmental affairs

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