

Small scale chicken production

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Summary

This practice gives some general information on small-scale chicken production and explains the benefits of producing at a smaller scale with minimum risks but improved output.

Description

1. Introduction

Chickens in extensive and semi-intensive poultry production systems account for more than 75% of all poultry in the South. Owned by smallholders in rural areas, these birds provide food security and family income and play an important role in socio-cultural events.

Poultry is an important farm species in almost all countries. It is an important source of animal protein, and can be raised in situations with limited feed and housing resources. Chickens are 'waste converters': they 'convert' a scavenged feed resource base into animal protein. They are therefore by far the most important species for generating income for rural families.

People raise chickens all around the world under widely varying circumstances. Their main objective is generally the same: maximum production for minimum costs and with minimum risks. The two main forms of keeping small-scale chicken are small-scale

subsistence farming and commercial farming. If poultry is mainly kept for home consumption of eggs and meat, costs and effort can be kept to a minimum. But for a poultry enterprise to be successful, it must have a reliable market for its products and a steady supply of reasonably priced quality feed. It is important that feed resources are locally available. This Agrodok refers mainly to semi-intensive farming. It can help beginners and experienced poultry raisers to solve problems that come up. Its focus is on keeping layers. Keeping broiler poultry presents different problems and requires particular expertise. Nevertheless some attention will be paid to keeping cocks as these have to be fattened too.

Figure 1. A chicken breeder



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1.1 Chicken breeds

All over the world, more than 300 breeds of the domestic chicken species (*Gallus domesticus*) exist. We distinguish three main categories of chicken breeds: pure commercial breeds, hybrid breeds resulting from cross-breeding, and local breeds or land races.

We can roughly divide commercial breeds according to their main production aim:

- Egg laying, mainly with lightweight laying breeds or layers;
- Meat production, mainly by heavyweight breeds or broilers; and
- Both egg-laying and meat production by so-called dual-purpose breeds.

Layer, broiler and dual purpose breeds can be distinguished according to their shape. See figure 2.

2. Commercial and hybrid breeds

A well known lightweight layer breed is the White Leghorn (figure 3). White Leghorns are known for laying lots of white eggs. They need less feed, due to their small size. White Leghorns are therefore very efficient layers. At the end of the laying period they give relatively little meat.

Some heavier layer breeds are meatier and still lay many eggs. These are hence fit for dual-purpose production. These chickens

lay brown eggs and usually have brown feathers, but this can vary per breed. We mention the brown-coloured Rhode Island Red (figure 4) and the light-brown New Hampshire (figure 5). These are kept for both meat and egg production and can hence be categorized as dual purpose breeds. Heavier dual-purpose breeds are very suited to small-scale chicken raising in the tropics. They are usually sturdier than the light breeds.

Medium-weight and heavy chicken breeds are raised for meat production. Cocks of medium-weight chicken breeds can also be kept for slaughtering. Breeds like White Cornish and White Plymouth Rock are important meat producer breeds and hence better suited as pure broiler chickens.

These heavier birds have more muscle. They grow fast and can quickly reach a high slaughter weight. This requires plenty of high quality feed. It requires special skills to keep this in good supply and balance.

Hybrids or cross-breeds result from combining special lines or strains of chickens developed for this purpose with e.g. a local breed. The hybrids are more productive. In countries in the South, cross-breeding between pure breeds is also common, e.g. White Leghorn crossed with Rhode Island Red. Nowadays hybrid breeds have become very common.

Figure 2. Typical breeds: (a) layer (b) broiler (c) dual purpose (Poultry Network)

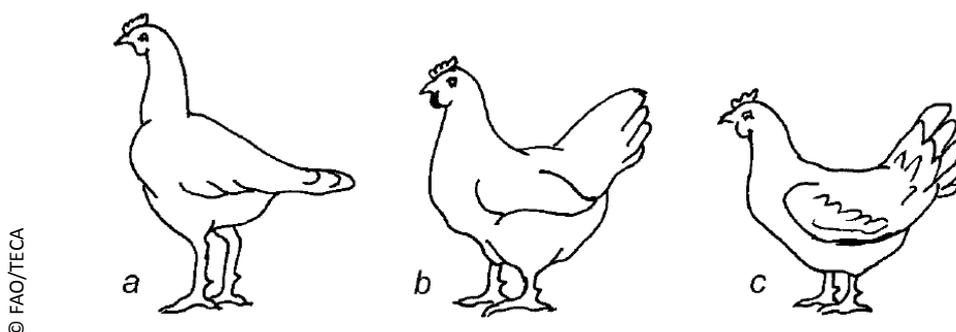
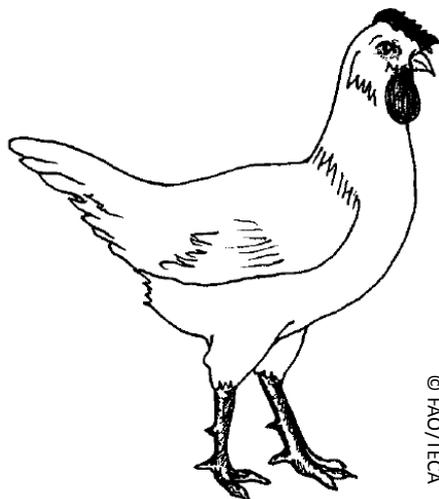


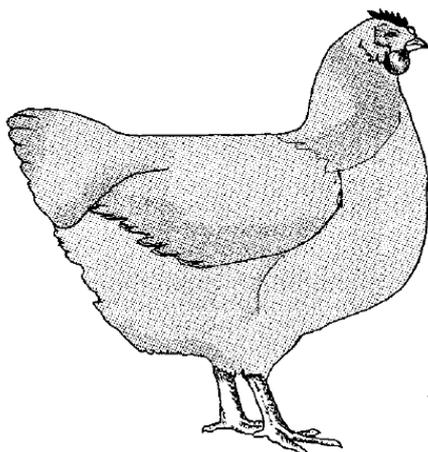


Figure 3. White leghorn



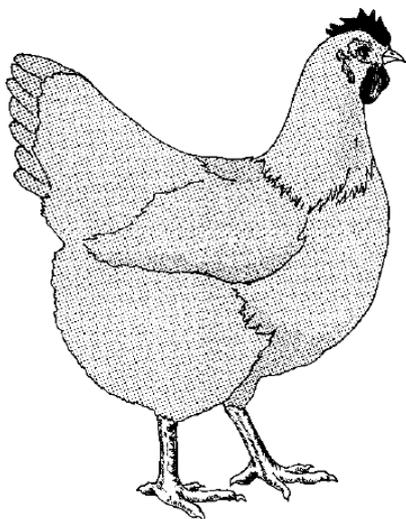
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Figure 4. Rhode Island red



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Figure 5. Newhampshire



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3. Local breeds

If you want to breed your own stock of chickens, you cannot go on using the hybrid breeds, as their high productivity will go down. You can only get high production with hybrid layers if you buy chickens regularly. It is therefore advisable to use local breeds, which are often much cheaper to keep. Another advantage of local chicken breeds is that they are better adapted to local conditions and are less susceptible to diseases than the more fragile hybrids. Local breeds are usually lighter in weight and have smaller eggs than those of hybrid breeds.

Local breeds can be distinguished according to their appearance. See figure 6. However, local chickens are far less productive in terms of egg numbers.

In rural areas, local chickens lay about 50 eggs per year, while hybrids can lay 250 - 270 eggs a year under favorable conditions. On the other hand, local breeds make better use of waste material than hybrid chickens do, so they are more suitable for keeping around the house.

3.1 Choosing a chicken breed

Important factors when choosing the best breed of chickens for your situation are: price, market situation, experience, farm management, local preference and availability.

The price will determine your choice. Modern hybrids are very expensive. They also need very good care and high quality, balanced feed to be productive. Local breeds are cheaper and better adapted to local conditions. With adequate care, they are reasonably productive.

However, if you want to raise chickens on a larger scale and decide to buy balanced feed, it is better to choose the



more expensive hybrids. It is important to consider the local market situation. Medium-weight hybrids should only be chosen if there is a good market for eggs and meat and a steady supply of good, balanced chicken-feed. If you want to concentrate on selling eggs, consider buying lighter, white layers.

In all other situations, the heavier, usually brown breeds would be a better choice. If you live far from a market and mainly want to produce for home consumption, only selling extra eggs and meat locally, you are best off with a local breed.

If you have no experience of raising chickens, it is best to start with a cheaper, local breed. If farm management is good, you can buy the more expensive and profitable hybrids. In some countries local preference favours brown eggs.

Hybrids are not always locally available, so you will be dependent on what can be obtained in your area.

3.2 Housing

We distinguish three forms of chicken farming:

- Extensive farming;
- Intensive farming; and
- Semi-intensive farming.

In this Agrodok, we mainly refer to the extensive and semi-intensive farming. Intensive farming with e.g. battery cages will not be treated. When chickens are free to roam and scavenge, we talk about extensive, free-range chicken farms.

The level of capital and labor investment is low. Housing is not important. Intensive systems, developed for specialized breeds, are estimated to be in use for about 30% of the poultry population in Africa. These are

mainly found in and around urban areas with good markets for eggs and chicken meat. Intensive chicken farms require more investment of both capital and labor, e.g. special poultry houses with runs or roaming space. Flock sizes in intensive production are normally in the thousands.

This has been made possible by research developments in artificial incubation, nutritional requirements and disease control. In the semi-intensive production system, also known as backyard production, flocks range from 50 to 200 birds. A lot of techniques and expertise developed in intensive systems can be applied in semi-intensive poultry raising systems, adapted to the adequate scale. In both the semi-intensive and intensive production systems, housing is very important for optimal production levels.

4. Free-range chickens

In the free-range system, chickens are free to roam the farm in search of food. Eggs are laid outside in simple nests and are mainly used to maintain chicken numbers. In many cases, up to 75% of the eggs have to be hatched because the mortality rate among baby chicks is high. Few eggs remain for consumption and the chickens themselves do not give much meat.

The advantages of this system are that little labor is needed and waste food can be used efficiently. Very low costs can offset low production levels so that keeping chickens around the house can be profitable if certain improvements are made.

The free-range system is most suitable if you have a lot of space, preferably covered with grass. At night, the chickens can be kept in any kind of shelter, as long as it is roomy, airy and clean. This will minimize the loss



of chickens to illness or theft. If you have enough space for the chickens to roam freely, a mobile chicken house is best. One example of this type of housing is shown in figure 7.

The spread of infection by parasites in chicken faeces can be prevented by using a raised night shelter with an open floor made of chicken-wire, wooden slats or bamboo sticks 5 cm apart. This will also keep the chickens safe from predators.

If you want to maximize the number of eggs, train mature layers to use laying nests in the chicken house early in the laying period. Place the laying nests in the chicken house before the chickens start laying, and keep them in a bit longer in the morning. Remember to provide fresh drinking water. To limit mortality among baby chicks in the free-range system, take steps to protect the mother hen and the chicks from predators, thieves and rain.

Put them in a simple, separate shelter that is roomy and airy and can be closed securely. Draughts and low temperatures during the first few days are particularly dangerous for the baby chicks. Although a run is handy, it is also risky, due to possible worm infections. It is important to move the run regularly, especially in wet weather. Fold units are very suitable mobile housing units for young chicks (figure 8 and figure 9).

These cages can house 20 young hens, and contain feeders, drinkers and a perch. Obviously, you will need enough space to move the fold units around regularly. In areas where dogs or predators are a problem, it might be worth building a shelter well above ground level (e.g. 1.20 m high).

Tin rat baffles around the supporting poles will keep out rats and other small animals (figure 10; also displayed in figure 7). The

baffle must fit tightly to keep even the smallest rodent from climbing between the baffle and the pole. Always ensure a steady supply of clean, fresh drinking water.

Figure 6. A simple modern chicken house

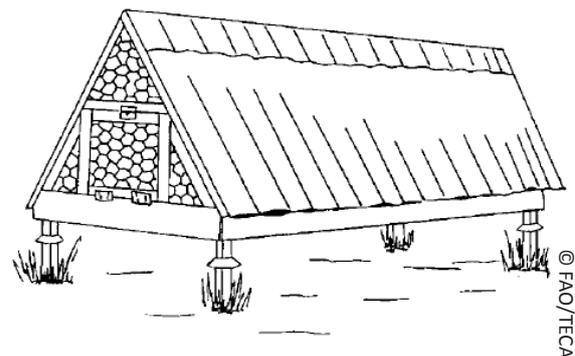


Figure 7. Fold unit for housing young chicks. 1. Boarded section 2. Wooden framework 3. Wire mesh 4. wired floor

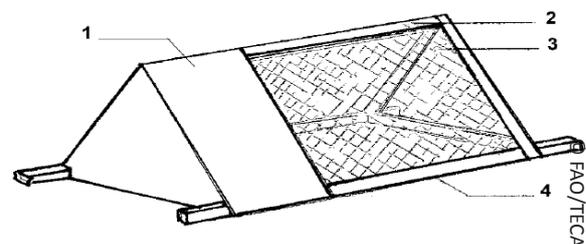
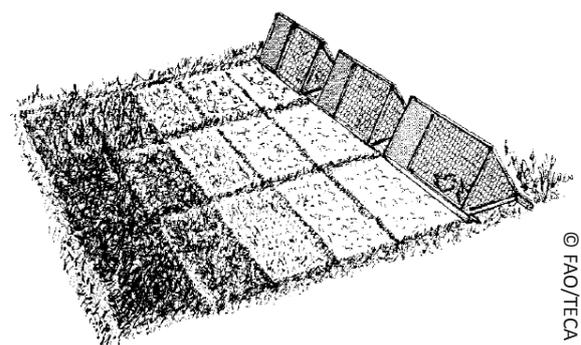


Figure 8. Systematic daily movement of folds



Give your chicks extra feed, including greens which are rich in vitamins. If, vaccinate the chicks against the most common contagious viruses, such as Newcastle Disease.



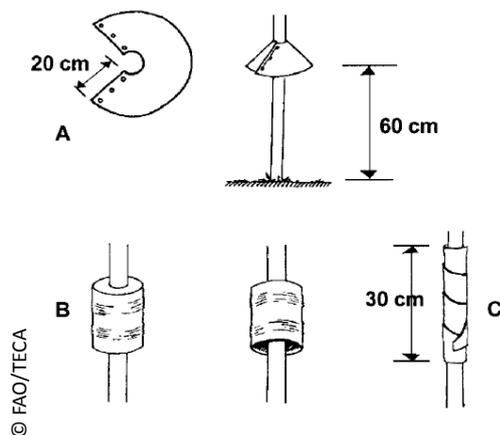
4.1 Advantages of the free-range system

- Exercise in the open air keeps chickens healthy.
- Feed, even if it is not well balanced, presents few problems.
- Parasitic infections can be kept to a minimum if there is enough space.
- Little or no labor input is needed.
- The chickens help limit the amount of rubbish in a productive way.
- The direct costs of the system are low.

4.2 Disadvantages of the free-range system

- Free - range chickens are difficult to control.
- The chickens, especially young chicks, are easy prey for predators.
- Chickens may eat sown seed when looking for food.
- A large percentage of the eggs can be lost if the laying hens are not accustomed to laying nests.
- Mortality rates are usually high.

Figure 9. Examples of rat baffles. A. metal collar B. metal can upside down C. metal band around post



5. Small - scale housing

In both the intensive and semi-intensive production systems, housing becomes very important for improving working conditions and minimizing risks. Adequate housing facilitates the feeding and egg laying and

thus is a primary condition for optimal production levels.

If you decide to keep your chickens in a special poultry house, consider the following:

- You will certainly incur extra costs.
- Make sure that necessary materials are locally available.
- Should your chicken have a run? If you opt for a run, check that there is enough space to change its position regularly.
- Decide whether to continue to breed own chicken stock or to buy new stock. If you breed your own stock, you need to build more houses for separating chicks of different ages.

5.1 Optimizing climate in the house

Chickens can tolerate high temperatures but react negatively if they are too warm. Try the following as guideline when designing the poultry house.

Build the house in an east-west direction, so the chickens are less exposed to direct sunlight. Place the house where there is grass, herbs or other vegetation. Plant trees around it to keep its roof shaded.

Make sure that the roof has a large overhang of 90 cm or more to limit direct sunlight and keep out the rain. Build the roof as high as possible above the floor. The chicken house will then be cooler and better ventilated.

Keep the bottom 50 cm of the side walls closed and the rest open to allow enough fresh air into the house. Close the top part of the sidewalls with chicken wire or some other suitable material. A chicken house can have a corrugated metal roof, but in a sunny place, this will certainly overheat the house. In this case cover the roof with leaves or some other material.



A disadvantage of this is that rodents like rats and mice can nestle in the covering. Do not keep too many chickens in the chicken house. Doing so can make the house too warm and help to spread parasitic infections. In hard-floor housing, there should be no more than 3 chickens per square meter. In houses with wire netting or slatted floors, a higher chicken density is possible.

Finally, to stimulate feeding in cooler weather, turn on a light in the house before sunrise and after sunset. This also helps to keep a steady level of egg production.

5.2 General prerequisites for a chicken house

When building a poultry house, it is not just the climate that is important. The house should also be easy to clean and to disinfect, and should therefore have a concrete floor. In permanent, closed housing, feed should always be available. A constant supply of fresh water is also essential.

If the housing is to contain a large number of chickens, a separate working space in front of the house is necessary. Feed can be stored there and eggs can also be kept there temporarily. To prevent the eggs from deteriorating, they should not be kept here longer than one week. It is best to keep the eggs in a cool place, at about 20°C.

This can be done by minimizing the number of windows in the storage space and only ventilating at night when the air is cooler.

5.3 Some housing options

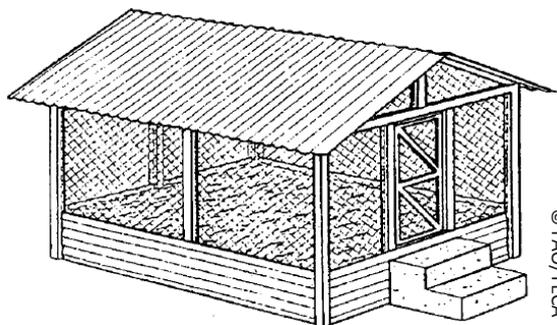
Apart from the extensive free-range systems, there are three main types of chicken housing in extensive and semi-intensive farming:

- Housing with a run;
- housing with litter but without a run; and
- housing with slatted flooring.

In semi-intensive systems chickens are confined in a wired-in run. There is a small house attached in which chickens can be locked up at night. The owner provides most, if not all, of the feed, water and other requirements.

The main function of litter is to prevent leaching of minerals from the manure by providing organic material on which microorganisms can settle that absorb the minerals. Litter also dries the manure and gives the chicken something to scratch around in. The number of chickens per category that you can keep is determined by the floor type: see table 1.

Figure 10 A deep litter house with corrugated metal and welded mesh



5.3.1 Housing with a run

This type of chicken house has one or more fenced-off runs where the chickens can roam. The run is attached to the house, to which the birds have access day and night. We strongly recommend that you have more than one run so that access to the runs can be changed every two weeks. This enables grass or other vegetation to recover from the chickens' pecking and scratching, and reduces the risk of parasitic infections.



Table 1. Number of animals per square meter and per floor type

Floor type	Chicken category		
	broilers	layer growers 0 – 18 weeks	layers
full slats	15	9	7
2/3 slats, 1/3 litter	--	8	6
1/3 slats, 1/2 litter	--	7	5
full litter	10	6	4

Source: FAO 2010

Secondly, it is important that the run stays dry. The house must of course also meet the general criteria and suit the local climate.

5.3.1.1 Advantages of a limited run

- The chickens can move in the open air;
- you have more control than with free-range chickens;
- protection against predators is better than without fencing;
- the risk of infection is smaller than with permanently closed coops; and
- housing density can be a bit higher than it can without a run.

5.3.1.2 Disadvantages of a limited run

- A limited run can get too wet and increase the risk of infection with parasites; and
- it is still possible for predators to get at the chickens.

5.3.2 Housing with litter but without a run

Chickens stay in this type of house day and night. The floor is covered with litter to absorb the moisture of the chickens' faeces. The most important condition for this type of housing is that the litter must remain dry. Moist litter produces too much ammonia, which damages the health of the birds. It also encourages all kinds of parasites. To keep litter dry, use litter

which absorbs moisture in its particles.

Wood shavings are best but if they are not available, chopped up straw, dry leaves, wood shavings and other organic materials are also suitable. Avoid spilling water on the floor. It is best to place the drinkers on a small platform covered with slats or wire mesh. Turn the litter regularly and replace it once a week. Make sure the house is well ventilated.

5.3.2.1 Advantages of housing with litter

- There is complete control over the chickens: the feed, the eggs, etc.; and
- the birds are well protected against predators.

5.3.2.2 Disadvantages of housing with litter

- Litter cages are more expensive than a range or cages with a run;
- the risk of infection is higher;
- you are dependent on the amount and kind of litter that is available locally; and
- you must store some litter in a dry place.

5.3.3 Housing with a slatted floor

In many countries with a temperate, moist climate, a large part of the floor area is covered with slats, which carry less risk of wet litter and therefore of parasitic infections. The housing density with this



kind of housing can be higher, e.g. 7 birds per square meter instead of 4. The slats can be made of wood or bamboo. The space between the slats must be wide enough for the bird droppings to drop through, but they should not hamper the movement of the birds. Thin slats stay cleaner than wide slats. Slats of 1.5 cm wide and 4 cm high, laid 2.5 cm apart, give good results. These slats are generally laid in sections of 120 cm by 120 cm. has a mesh of 2.5 cm by 7.5 cm, and is laid in sections of 250 cm by 200 cm. The wire should be about 3 mm thick. Perches are fixed onto the wire netting so that the birds can move comfortably and have a place to sleep at night.

To collect as much of the manure as possible under the open floors, the drinkers and feeders are best placed on the slats or wire. You can cover one third to a half of the floor with slats or wire netting. Sometimes the entire floor is covered with slats or wire but this can damage the feet of the chickens and cause loss of eggs. To make it easy to remove the manure regularly, place netting or slats at the sides of the housing.

5.3.3.1 Advantages of wire or slatted floor housing

- The chickens have less contact with their own manure, which reduces the risk of parasitic infections.
- Housing density (birds per square meter) can be increased.
- Litter costs are lower.

5.3.3.2 Disadvantages of wire or slatted floor housing

- This type of housing requires a higher investment than houses with litter.
- Cleaning the housing is more work.
- There is a higher risk that the chickens'

feet will get damaged.

6. Minimum requirements for the successful implementation of the practice

- Capital to build a simple housing for the chickens, first stock of breeds to start.

7. Objectives fulfilled by the project

7.1 Women-friendly

- Rearing of chicken is a practice that favors women as it is not labor intensive.