

## Animal Husbandry in Organic Agriculture

<b>Source</b>	International Federation of Organic Agriculture Movements (IFOAM - Organics International)
<b>Keywords</b>	Organic agriculture, organic farming, sustainability, animal husbandry, animal housing, sweet flag, animal health, pastures, animal feeding, sheds
<b>Country of first practice</b>	Uganda
<b>ID and publishing year</b>	8378 and 2015
<b>Sustainable Development Goals</b>	No poverty, zero hunger, decent work and economic growth, sustainable cities and communities and life on the land

### Summary

Integrating animal husbandry into crop producing farms is one of the principles of organic farming. In temperate and arid zones, animal husbandry plays an important role in the recycling of nutrients, while it is less emphasised in the humid tropics. The caring, training, and nurturing of animals is considered an art in many farming communities.

- serve as an investment or a bank;
- help in pest control (e.g. dugs);
- help in weed management (e.g. grazing on barren fields);
- have cultural or religious significance (prestige, ceremonies, etc.); and
- produce young stock for breeding or sale.

Figure 1: Animals integrated into the farm, showing the flow of fodder, dung and products



### Description

Integrating animals into a farm help creating a closed or semi-closed system where energy and nutrients are recycled. Animals can convert non-edible biomass (e.g. grass, straw, kitchen waste) into food while increasing soil fertility with their manure.

The significance of each role will vary from animal to animal and from farm to farm. It will also depend on the individual objectives of the farmer.

Many farm animals have a multi-functional role, for example, animals:

- produce dung, which is of great importance for soil fertility;
- yield products such as milk or eggs for sale or own consumption continuously;
- recycle by-products such as straw or kitchen waste;
- serve as draught animals for tillage or transport;
- produce meat, hides, feathers, horns, etc.;

### 1. Deciding on animal husbandry

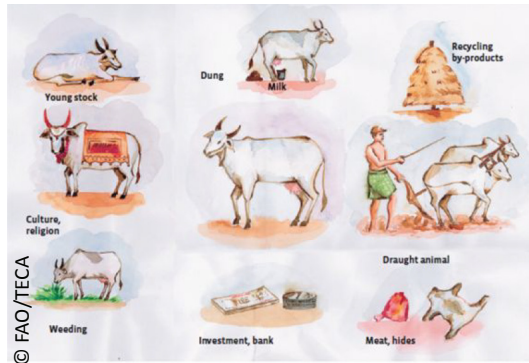
There are several reasons for taking up animal husbandry



# Livestock Production

as a part of your farming activities or even as the main one.

Figure 2: Reasons to keep farm animals - A cow is not just a cow! Farm animals can have many functions for a farmer



There are also some critical aspects to be taken into consideration. To decide on whether and how to get involved in animal husbandry, you should ask yourself a number of questions:

## 1.1 Is my farm suitable?

Do I have sufficient space for shedding and grazing, fodder or by-products to feed, enough know-how on keeping, feeding, and treating specific kind of animals?

## 1.2 Will the animals benefit my farm?

Can I use the dung in a suitable way? Will I get products for my consumption or sales? Will the animals somehow affect my crops?

## 1.3 Can I get the necessary inputs?

Is sufficient labour available within or outside my farm? Is enough fodder and water of good quality available throughout the year? Will remedies and veterinary support be available, if needed? Can I get suitable breeds of animals?

## 1.4 Will I find a market for the products?

Does anyone want to buy my milk, eggs, meat etc.? Is the price worth the effort? Am I able to compete with other farmers?

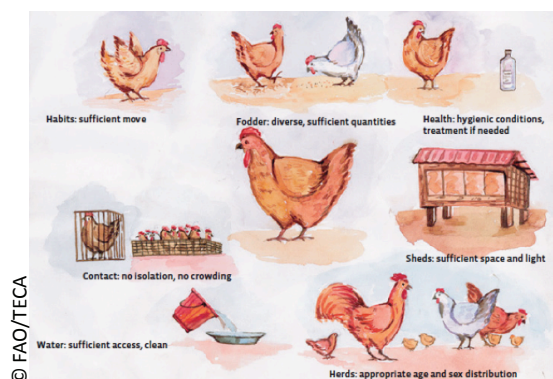
## 1.5 What do animals need?

Organic farmers try to achieve healthy farm animals which can produce satisfyingly over a long period. To achieve this goal, various needs of farm animals have to be considered:

- fodder in adequate quality and quantity;
- for non-ruminants: diversity in fodder is usually required;
- sufficient access to clean drinking water;
- clean sheds of sufficient size and with adequate light and fresh air;
- sufficient freedom to move around and perform their natural behaviour;
- healthy conditions and veterinary follow-up, when needed;
- sufficient contact with other animals, but no stress due to overcrowding; and
- for herd animals: an appropriate age and sex distribution within the herd.

Organic animal husbandry means not only feeding organic food and avoiding synthetic food additives and synthetic medicines (e.g. antibiotics, growth hormones) but also focusing on satisfying the various needs of the farm animals. Good health and welfare of the animals are among the main objectives.

Figure 3: What farm animals need - For example chickens have various needs which should be fulfilled simultaneous



For example, sufferings from mutilation, permanent tethering or isolation of herd



animals must be avoided as much as possible. For various reasons, landless animal husbandry (i.e. fodder purchased from outside the farm due to lacking grazing land) is not permitted in organic farming.

### 1.6 How many animals to keep?

To identify the appropriate number for a specific kind of animal on a farm, the following points should be considered:

- availability of fodder on the farm, especially in periods of scarcity (e.g. dry season);
- carrying capacity of pastures;
- size of existing or planned sheds;
- the maximum amount of manure the fields can bear; and
- availability of labour for looking after the animals.

In tropical countries, farm animals are frequently found to be underfed. When defining the number of farm animals, keep in mind that the economic benefit will be higher when fewer animals are kept, but fed well. Not only the amount but also the quality of the available food must be taken into consideration.

## 2. Animal housing

The type of shed should be specific to the type of animals to be sheltered. Poultry, for instance, should be housed in sheds that do not get too hot. Contact of the animals with their faeces should be avoided as much as possible.

### 2.1 Planning sheds

Except for nomadic lifestyles, most farm animals are temporarily kept in sheds. The combination of animal husbandry and farm activities requires control of their movements to avoid damage to crops. For the welfare and health of the animals, sheds must be cool and aerated and

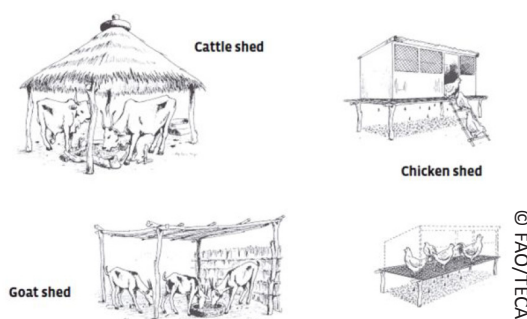
protected from rain.

They should be constructed in a way ensuring:

- sufficient space to lie down, stand up, move and express natural behaviour (e.g. licking, scratching, etc.);
- sufficient light (as a rule, one should be able to read a newspaper in the shed);
- protection from sunlight, rain, and extreme temperatures;
- sufficient aeration, but no draught;
- appropriate beddings (see section below);
- elements to exercise natural behaviour (e.g. for poultry: perching rails, sand baths and secluded laying nests); and
- sheltered pits or heaps to collect and store manure.

For economic reasons, sheds can be built with simple, locally available materials. Many countries have a rich tradition of shed constructions and have developed the most efficient and appropriate shed systems for the conditions of the region. If techniques of this heritage are combined with the above principles, a locally adapted and at the same time animal-friendly system may be obtained.

Figure 4: Traditional simple sheds in Senegal (cattle shed, goat shed, chicken shed)



### 2.2 Beddings

Beddings are materials used in sheds for



keeping the floor soft, dry, and clean, which is important for animal health. They absorb the excrements of the animals and need to be replaced from time to time. Beddings can be of straw, leaves, twigs, husks or other locally available material. They can be replaced daily or kept for several months while adding fresh material on top.

### 3. Animal Feeding

The availability of fodder is one of the limiting factors in animal husbandry. Unlike landless systems in conventional farming, organic husbandry should be mainly based on the fodder produced on the farm itself. As it is the case with humans, there is a direct link between the quantity and composition of the food and the health status of the animals.

#### 3.1 Food Requirements of Animals

If farm animals are to be productive (milk, eggs, meat, etc.), it is important that they get suitable food in sufficient quantities. If the fodder production of one's farm is limited (which usually is the case), it might be economically valid to keep fewer animals but supply them with sufficient food. The appropriate quantity and the mix of feed items will, of course, depend on the type of animal, but also on its main use (e.g. chicken for meat or egg production, cattle for milk, meat or draft, etc.). In milk production, for example, cows producing milk should be given fresh grass and possibly other feed items of sufficient protein content. On the same diet, draught animals would rapidly become exhausted.

A balanced diet will keep an animal healthy and productive. Whether or not a farm animal receives the appropriate amount and kind of fodder usually can be seen by the shine of its hair or feathers. For ruminants, a majority of the fodder should

consist of roughage (grass, leaves, etc.). If concentrates or supplements are used (e.g. agricultural by-products and wastes), they should not contain growth promoters and other synthetic substances.

Instead of buying expensive concentrates, there are a variety of leguminous plants rich in protein which can be grown in the farm as cover crops, hedges or trees. If the mineral content in the available fodder is not sufficient to satisfy the animal's requirements, mineral salt bricks or similar feed supplements can be used as long as they do not contain synthetic additives.

#### 3.1.1 Grazing versus shed feeding

In many regions of the tropics, favourable periods with abundant fodder alternate with less favourable periods when there is almost nothing to feed to the animals. However, keeping animals means providing fodder throughout the year. Fodder can be produced on the farm as grazing land or as grass or tree crops used for cutting.

Figure 5 (b): A variety of fodder grasses, both for shed feeding and pasturing



Figure 5 (b): Leaves and twigs of leguminous trees that are rich in protein and commonly available in the dry season



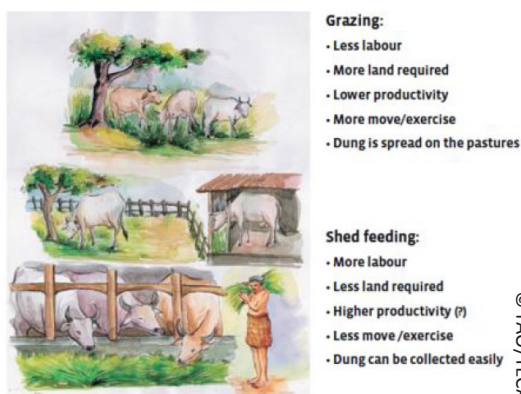


While grazing requires less labour than shed feeding, more land is needed, and appropriate measures to keep the animals away from other crops must be undertaken.

Grazing may lead to lower productivity (milk, meat, etc.) but usually is the more favourable option concerning health and welfare of the animals. Shed keeping, however, has the advantage that the dung can be easily collected, stored, or composted and applied to the crops. Whether grazing or shed feeding is the more suitable option will mainly depend on the agro-climatic conditions, the cropping system, and the availability of land.

A combination of shed feeding and grazing in a fenced area may be an ideal combination of high productivity and animal-friendly husbandry. In extensive grasslands of semi-arid areas, however, grazing may be the only suitable option.

Figure 6: The pros and cons of grazing and shed feeding, and the combination of both systems as a promising option



### 3.2 Integrating fodder cultivation in the farm

In most smallholder farms, fodder cultivation will compete for space with the cultivation of crops. Whether fodder cultivation (and thus animal husbandry) is

economically more beneficial compared with crop production must be assessed case by case. However, there are some options for integrating fodder crops in farms without sacrificing much land. Below are some examples:

- grass or leguminous cover crops in tree plantations;
- hedges of suitable shrubs;
- shade or support trees;
- grass on bunds against soil erosion;
- grass fallows or green manures in the crop rotation; and
- crops with by-products such as paddy straw or pea leaves.

### 3.3 Management of pastures

The management of pastures is crucial for good herd management. It is also important to practice appropriate management throughout the year. There are many different types of grasses, and every climatic region has grasses, which are specifically adapted to the conditions.

In some cases, it may be worth considering to till the grazing site and sow grass varieties that are more appropriate to the animal's needs. Overgrazing is probably the most significant threat to grassland. Once the protective grass cover is destroyed, the top soil is prone to erosion.

Degraded pastures or land with little plant cover is difficult to re-cultivate. Therefore, it is important that the use and intensity of grazing on a particular piece of land are appropriate to its production capacity. Sufficient time must be given to pasture to recover after intensive grazing.

Fencing off areas and rotation of the grazing animals on several pieces of land is the best option for managing the farm and the overall landscape. Creating grazing



cells restores overgrazed pastures, reduces the incidence of intestinal parasites encountered while the animals graze, and increases land productivity. The intensity and timing of grazing, as well as the cutting of the grass, will influence the varieties of plants.

#### 4. Animal health

Disease-causing germs and parasites are present almost everywhere. Like humans, animals have an immune system, which is usually able to cope with these germs. As with humans, the efficiency of the immune system will be disturbed if animals are not properly fed, cannot practice their natural behaviour, or are under social stress.

Health is a balance between disease pressure (i.e. the presence of germs and parasites) and the resistance (i.e. immune system and self-healing forces) of the animal. The farmer can influence both sides of this balance by reducing the number of germs by maintaining good hygiene and strengthening the animals' ability to cope with germs.

Figure 7: Cattle grazing on a pasture in Cuba



Organic animal husbandry puts its focus on improving the living conditions of animals and on strengthening their immune systems. Of course: if an animal gets sick, it must be treated. Nevertheless, the farmer should also think about why the immune system of

the animal was not able to fight the disease or the parasite attack. Also, the farmer should think of ways to improve the animals' living conditions and hygiene in order to strengthen it.

#### 4.1 Prevention before curing

Similar as in crop health, organic animal husbandry puts the main emphasis on preventive measures in order to keep animals healthy, rather than on curative methods.

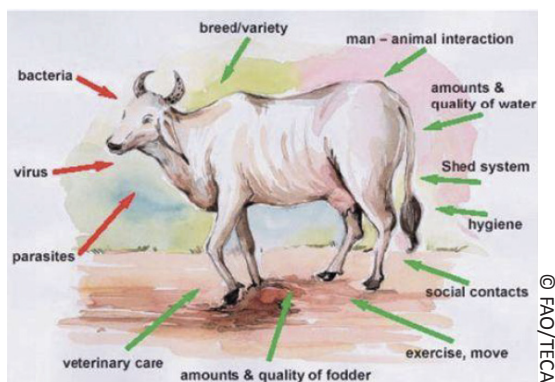
This starts from keeping robust rather than high performing but very susceptible breeds. Next, the conditions in which the animals are kept should be optimal, providing sufficient space, light and air, dry and clean bedding, frequent exercise, e.g. grazing, and proper hygiene. The quality and quantity of fodder are of crucial importance for the health of the animal. Instead of feeding commercial concentrates, which make animals grow faster and produce more, a natural diet appropriate to the requirements of the animal should be achieved. Where all these preventive measures are taken, animals will rarely fall sick. Veterinary treatment thus should play only a secondary role in organic farming.

If treatment is necessary, alternative medicine based on herbal and traditional remedies should be used. Only if these treatments fail or are not sufficient, synthetic medicines (e.g. antibiotics, parasiticides, anaesthetics, etc.) may be used; in these cases, the treated animals must be separated from non-treated organic stock and excluded for a period of time, e.g. at least 3 weeks, from organic certification. The principal reason for veterinary treatment in organic animal husbandry is exploring the causes of (or



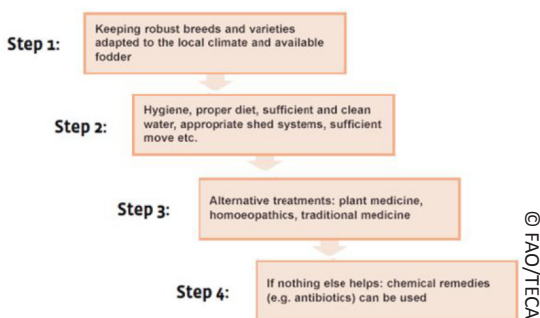
factors that favour) diseases in order to enhance the natural defence mechanisms of the animal (and to prevent its manifestations in the future). Unlike in crop production, synthetic means are allowed to cure sick animals if an alternative treatment is not sufficient. Here, reducing the suffering of the animal is given priority over the renunciation of chemicals.

Figure 8: Factors influencing animal health



However, the standards of organic agriculture clearly demand that priority is given to management practices, which encourage the resistance of the animals and thus preventing the outbreak of a disease. Therefore, an outbreak of disease shall be considered as an indicator that the conditions under which the animal is kept are not ideal.

Figure 9: Prevention before curing - Only when all preventive measures fail animals should be treated, preferably with alternative remedies



The farmer should try to identify the cause (or causes) of the disease and prevent future outbreaks by changing management practices. If conventional veterinary medication is applied, withholding periods must be adhered to before the animal products can be sold (as organic). This shall ensure that organic animal products are free from residues of antibiotics, etc. Synthetic growth promoters are not allowed in any case.

#### 4.2 Controlling parasites with herbal remedies

Herbal medicines are widely used in many countries. Some traditional farming communities have a vast knowledge of local plants and their healing properties. Plants can definitely support the healing process, even if they do not eliminate the germ of the disease directly.

Still, farmers should not forget to identify the cause of the disease and also to re-think their management practices. For parasite problems, changing the living conditions or the management of pastures will be more effective in the long run than any treatment.

#### 4.3 Example: Using Sweet Flag against parasites

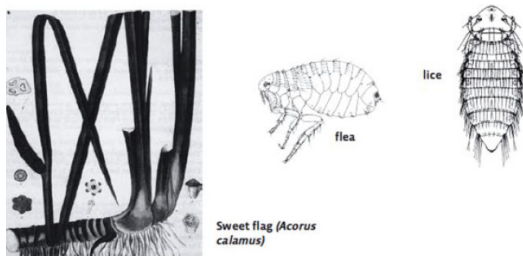
One example to use a herbal remedy against parasites is the sweet flag (*Acorus calamus*). This plant grows both in tropical as well as subtropical regions and is found on the banks of rivers and lakes and in swampy ditches or marshes. The powdered dried rhizomes (thick root parts) act as an effective insecticide against fowl lice, fleas and houseflies.

Treating fowls infested by lice: Use around 15 g of powdered rhizome for an adult bird. For dusting the bird with the powder, hold it



by its feet upside down, so that the feathers open and the dust will work its way to the skin.

Figure 10: Using sweet flag (*Acorus calamus*) against parasites



Source: "Ectoparasites in the Tropics", Matzigkeit, 1990

The treatment is reported as being safe to the birds. The sweet flag powder is also reported to be effective against house flies when dusted on fresh cow dung infested by fly maggots. It further shall protect newborn calves of vermin infection if washed with a water infusion.

Attention! Herbal remedies against parasites can also have a toxic effect on farm animals! Therefore, it is important to

know the appropriate dose and application method!

#### 4.4 Principles and methods

As preventive measures for maintaining good animal health are of high relevance in organic farming, the selection of breeds suitable to local conditions and to organic feeding, is of crucial importance.

This requires that suitable breeds are available. Traditional breeds of farm animals may be a good starting point for organic animal breeding. Animals can be improved by the selection of individuals especially suitable for organic conditions. They can be crossbred with suitable new breeds, thus achieving an animal with the positive aspects of traditional breeds and the satisfying production capabilities of the new breeds.

For breeding, organic farming uses natural reproduction techniques. While artificial insemination is allowed, embryo transfer, genetic manipulation and hormonal

Figure 11: Breeding goals

##### The «ideal» organic poultry breed

- Feeding on kitchen wastes and farm by-products
- Satisfying egg production
- Useful as meat
- Good health, good resistance against diseases



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##### The «ideal» organic cattle breed

- Utilising roughage and farm by-products
- Satisfying milk production
- High fertility
- Good resistance against diseases
- Long life with continuous production

Organic animal breeding should optimize the overall use of farm animals, with consideration given to the local conditions and available fodder: breeding goals for poultry and cattle breeding.





Table 1: Example Table for comparing the economic performance of two different breeds

Item	Breed A	Breed B
Investments		
Costs of a calf		
Costs of a cow		
Maintenance		
Fodder purchases per year		
Veterinary costs per year		
Milk production		
Litres per day		
Litres per year		
Productive years in life		
Litres per life		
Other uses		
Meat		
Draught		
Dung		

Source: IFOAM 2015

synchronisation are not permitted according to the IFOAM standards.

## 5. Breeding Goals

Over the last decades, traditional ones have been replaced by high performing breeds in many regions. Similar to high yielding plant varieties, these new breeds usually depend on a rich diet (e.g. concentrates) and optimal living conditions.

As high performing breeds, in general, are more susceptible to diseases than traditional varieties, they need frequent veterinary interventions. Thus, these new breeds might not be the right choice for small farmers, as the costs of food concentrate and veterinary treatments are too high compared to what can be earned by selling the products.

In addition, for organic farmers, the main animal product (e.g. milk) is not the only reason to keep animals. Breeding activities, therefore, should try to optimize the overall

performance of the animal, taking into consideration the different goals of an organic farmer.

For example, a poultry breed suitable for organic smallholder farms might not be the one with the highest egg production, but one in which meat production is good, and kitchen waste and whatever is found on the farmyard can be used as feed.

Suitable cattle breeds would produce sufficient milk and meat while feeding mainly on roughage and farm by-products (e.g. straw), be of high fertility and good resistance against diseases. If required, they can also be used for draught and transport.

### 5.1 Maximum performance or life production?

When comparing the production of different breeds of cows, usually, only the production per day or year is taken into consideration.



However, high performing breeds usually have a shorter lifespan than traditional ones with lower production capabilities.

The life milk production of a cow giving, for example, 8 litres per day, but over 10 years, therefore would be greater than the one of a high-breed cow yielding 16 litres per day, but dies after 4 years.

As the investments to get milk-producing cows are quite high, i.e. the rearing and feeding of a calf or the purchase of an adult cow, continuous production over a long lifespan should be of high interest to the farmer.

This should be reflected in the breeding goals, which so far mainly focused on the maximum short-term production.

## 6. Background

This is part of a training guide on Organic Agriculture. Further reading is available on the following topics:

- Introduction to Organic Agriculture (FAO-TECA ID 8359);
- Considerations for Conversion to Organic Agriculture (FAO-TECA ID 8363);
- Step by Step Conversion to Organic Agriculture (FAO-TECA ID 8364);
- Mulching in Organic Agriculture (FAO-TECA ID 8365);
- Water Management in Organic Agriculture (FAO-TECA ID 8366);
- Crop Planning and Management in Organic Agriculture (FAO-TECA ID 8367);
- Nutrient Management in Organic Agriculture (FAO-TECA ID 8368);
- Pest and Disease Management in Organic Agriculture (FAO-TECA ID 8372);
- Weed Management in Organic Agriculture (FAO-TECA ID 8375);
- Soil Cultivation and Tillage in Organic Agriculture (FAO-TECA ID 8376); and
- Plant Propagation in Organic Agriculture (FAO-TECA ID 8377).

All these techniques have been compiled by Ilka Gomez thanks to the collaboration of IFOAM, FiBL and Nadia Scialabba (Natural Resources Officer - FAO).

## 7. Further reading

- IFOAM. 2003. Training Manual for Organic Agriculture in the Tropics. Edited by Frank Eyhorn, Marlene Heeb, Gilles Weidmann, pp 190-209, <http://www.ifoam.bio>

## 8. Agro-ecological zones

- Tropics, all
- Subtropics, warm/mod cool