



African Organic Agriculture Training Manual
A Resource Manual for Trainers

5 ANIMAL HUSBANDRY

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Ready for field testing

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5 ANIMAL HUSBANDRY



BOOKLET 11: ANIMAL HUSBANDRY

Learning targets for farmers:

- › Understand that the selection of animal species and breeds should depend on the capacity of the farm and the farmer to manage the animals well.
- › Understand that locally adapted animal breeds are easier to manage and increase the chance of successful animal production under local conditions.
- › Realize that providing an appropriate environment for the different animal species is the basis for proper health management.
- › Understand why proper integration of animals into farm production is so important for best farming results.

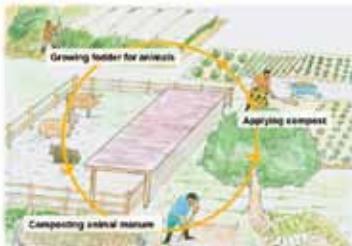
1. Introduction

Organic animal husbandry implies keeping animals in a natural way and promoting their welfare and health. This does not mean that animals need to be kept in an entirely natural environment, but that they are offered enough opportunities to perform their natural behaviour and way of living. All animal species have certain specialized organs, which give them special abilities and features and a distinct way of living. This distinction is intrinsic and cannot be changed, and must be respected. This means that farmers should promote species-specific features and abilities by providing favourable environments. For example, ruminants have a very special digestive system enabling them to feed on and metabolize great amounts of roughage. They get sick when they do not get enough roughage in their diet. Their limbs are as well quite specialized for long walks. These animals typically suffer if they are not given the opportunity to walk outside and exercise their legs. The same is true for horses and donkeys, whose limbs are even more specialized. Their need to walk, trot and gallop outside is even greater. Ruminants, however, do not need anything to keep them busy or to play with as pigs or dogs do. It is, therefore, very important to know the animals' intrinsic features very well and handle them accordingly, by keeping them in the appropriate environment.



ANIMAL HUSBANDRY AND NUTRIENT CYCLE

Animal husbandry and the nutrient cycle



African Organic Agriculture Training Manual

VS-Africa/Holistic

Besides respecting the basic species-specific needs, finding a good balance between the animals' demands based on their production and their environment is very important, too. High production animals need very good feed and a favourable environment in terms of species appropriate temperature and humidity, availability of water, space, and the possibility to maintain relationships to other animals and to humans. If any of these environmental conditions is not appropriate, the susceptibility of these animals to parasite and disease infections increases. The higher the animal production is, the higher their susceptibility. Low producing animals are more robust and can better adapt to changing, unstable environments. Therefore, farmers are recommended to choose the types of animals that fit well into the environment that is available.

1.1 Reasons for keeping farm animals

There are several reasons for keeping farm animals:

- › Farm animals provide nutritious food in form of meat, milk, eggs and, therefore, contribute to a balanced diet of the farm family.
- › They provide useful products that can be sold to the manufacturing industries such as horns, bones, hides and skins, giving the farmer extra income.
- › Animals are a source of financial security; in urgent cases, the farmer can sell some of the animals to get money.
- › Oxen, donkeys and horses provide draught power for soil cultivation and transport.
- › Sheep and goats can be utilized to graze on range lands that are not suitable for soil cultivation, hence increasing utilization of space on the farmland.
- › Animals provide manure that is rich in nutrients and makes a highly valuable farm own fertilizer or a valuable source for making compost.
- › On a farm that produces crops, animals can feed on crop remains and other waste products from harvesting, and thus contribute to recycling nutrients within the farm to feed the soil.



1.2 Common animal management systems in Africa

a. Traditional animal management systems

Traditionally, animals are kept either in small numbers under tethering, free-range systems or in large, pastoral systems. Under tethering systems, animals are confined to a location with a rope for some time where food naturally exists or is provided. This system is common with all animals including poultry. In free-range systems, for example with poultry, the animals are left to look for their own food during the day and housed only during the night. Cattle, goats and sheep are also kept under free-range grazing on confined extensive pieces of land during the day, during the night, however, they are often confined into crowded kraals.

Large pastoral extensive systems are common among pastoral communities, for example, the Maasai, Turkana, Boran, or Rendille in Kenya or the WoDaaBe and Tuareg in Niger. Although such production systems are extensive, animals are carefully bred and strategically moved across the grazing lands in order to take advantage of the unpredictably variable concentrations of fodder that are characteristic of dryland environments. As a result of selective feeding and moving patterns, the animals in pastoral systems enjoy a diet which can be significantly higher than the average nutritive value of the pastures they graze on. To further optimise utilization of available pastures, herders often keep combinations of different species, including cattle, sheep and goats, and sometimes camels. Communal land ownership helps herders to match their production strategies with the changing concentrations of fodder on the range. The animals in dryland pastoralism can withstand extreme conditions. They can lose weight during the dry season, without significant health effects and quickly gain it back during the wet season. In specialized pastoralism, productivity is higher than outsiders would expect from the rangelands. Pastoral systems are actually the most efficient and suitable way to exploit the changing environments of rangelands.

b. Intensive animal management systems

In most intensive systems, animals are kept with the main objective of achieving the highest production levels possible of different animal products. This system has the following characteristics:

- › A lot of feeds are purchased, including concentrates. Fodder is also produced using high quantities of synthetic fertilizer to achieve quick growth.
- › Synthetic medicines and antibiotics are routinely used to avoid animal infections.





TYPICAL ANIMAL PRODUCTION SITUATION IN AFRICA

Common animal husbandry



IMPROVED SITUATION

Improved animal husbandry



- > High efficiency breeds are mostly targeted.
- > Farm nutrient cycles are often not closed; manure turns to be a waste product instead of a fertilizer.
- > Large numbers at high stocking rates are kept, with limited space for exercise and exhibiting other innate behaviours.

1.3 Common challenges facing animal production in Africa

Irrespective of the management system, animal production in Africa faces some common challenges. These include:

- > **Limited amount of feed** - Availability of feed is low, especially during the dry season. Preservation of animal feed is very rarely practised.
- > **Susceptibility to parasites and diseases** - Due to a lack of closer management attention, insufficient feeding, and unfavourable weather and housing conditions common in many systems, animals are very susceptible to disease and parasite infections.
- > **Limited knowledge on proper animal breeding** - In many situations, animals move together in mixed groups of females and males. They mate randomly without much control from the farmer hence propagating inferior traits.



Assessment of the local situation

Inquire among the farmers about the local situation of animal production by asking the following questions:

- > Do you keep any animals? If not, why?
- > If yes, which kinds of animals do you keep and for what benefits?
- Do you face any of the above or other challenges with managing those species?

In view of the challenges, animal production needs to be improved and managed in a more sustainable way. This chapter aims at presenting good animal production practises based on organic principles, which can be adapted to prevailing local conditions. The discussions in the following sections will focus on management of poultry, goats, sheep, cattle and pigs mainly. Specific requirements of the different species are discussed in module M10.

2. General approach to organic management of animals

Managing animals organically implies keeping animals in good health and under good living conditions by carefully selecting locally adapted animal species and breeds, using adequate organic materials for feeding, providing good animal care and housing and protecting them against parasites and diseases without depending on the use of chemical drugs and antibiotics.



GENERAL APPROACH TO ANIMAL MANAGEMENT

General approach of organic animal management

- Efficient use of resources to fertilize the crops
- Integration of animal production into the farm systems
- New born animals get used to being touched by humans
- Care and respect towards the animals
- Use of locally adapted breeds to prevent diseases and parasites
- African Organic Agriculture Training Manual
- 100% Animal husbandry

Organic farmers have a distinctively different approach to animal management from traditional and intensive farmers. Organic farmers aim at having good animal productivity by applying the following principles:

1. They show care and respect towards the animals by protecting their well-being and avoiding harmful and stressful conditions. The farmers provide spacious housing that allows the animals to express their natural behaviour such as moving freely and having social interactions. They feed the animals properly to enable natural growth and good health.
2. Through the use of strong and locally adapted breeds and providing appropriate feeding and housing, organic farmers strive to prevent infections with diseases and parasites rather than focusing on treatment.
3. Organic farmers further ensure that suitable types of livestock and appropriate numbers are kept depending on the size of the farm, type and amount of feed available, availability of labour and the market for the surplus animal products. Availability of labour is very important because it is required for preparing feed and for feeding, periodic cleaning of the animal house, collection of the products and regular observation of the animals. In the beginning, considerable labour is also needed for building the animal house and clearing of the grazing paddocks.
4. Organic farmers strive to properly integrate animal production with other enterprises on the farm to ensure that the different enterprises complement each other. For example a farmer may decide to combine poultry and aquaculture. The poultry manure can be used to fertilize the pond so that the growth of algae is enhanced, which serves as food for the fish. Vegetables can be grown along the banks of the pond to feed the poultry. After harvesting the fish, the fish bones can be roasted and mixed into the poultry feed.
5. Organic farmers avoid pollution of the environment by ensuring appropriate collection and storage of animal manures and other waste products. Manures are prepared into compost and efficiently used to fertilize the crops.
6. Organic farmers make new born animals get used to being handled and touched by humans, as this will tame the animals and make handling easier at later stages in their lives.



3. Proper animal selection and breeding

Organic farmers aim to use breeds that are adapted to the local conditions, both in their ability to tolerate the stresses of local climate, the feeding requirements related to locally available feed and the commonly prevalent parasites and diseases.

Introducing large exotic breeds with a high production potential may not succeed, and may lead to heavy losses in the form of abrupt deaths. Exotic breeds need high quality feed, a well-constructed animal house and frequent treatment to avoid infections, in order to achieve their high production potential. Cross-breeding indigenous and exotic breeds has been employed by many farmers as a strategy to combine the good characteristics of adaptability to local conditions from the indigenous breeds with improved performance from the exotic breeds. This strategy has been successful especially where management conditions in terms of feed supply and health management have also been improved. Although cross breeding is a good way to improve animal traits, further cross breeding of crossbred animals usually leads to higher variation with the 2nd generation not yielding similar results as the 1st generation.

Natural mating is common in all animals including poultry. The most common method is allowing properly selected males to mate in order to promote good and favourable traits. The males should be alternated or exchanged regularly to avoid problems of inbreeding. Animals should not mate with their own daughters or sons.

Artificial insemination is also widely being used as an alternative to keeping own bulls on the farm. For appropriate results, the semen must be carefully chosen using semen from bulls of well-adapted breeds and with good health traits only. It is not recommended to use semen from bulls, from which incomplete information is available.

3.1 Selection of breeding animals

Good selection is based on accurate and good assessment of the differences in performance of individual animals and on the possibility to pass those features to the offspring. Good characteristics can be seen by looking at the individual animal, its relatives and the whole family line. The farmer can only succeed in



Discussion on animal selection and breeding

With reference to a particular animal species, discuss with the farmers what characteristics they normally consider when selecting animals to breed. Do they allow mature bulls to move freely with mature females? How do they prevent inbreeding? Explain the disadvantages of inbreeding and suggest ways of avoiding it.



breeding, if he knows what characteristics he or she wants, focuses on them and keeps proper records to monitor the whole process. The appearance of an animal (phenotype) is influenced by the genetic potential of the animal (genotype) and the environmental factors such as health and nutrition, which contribute 60 to 80 % to the phenotype. Qualitative characteristics can be influenced through appropriate management like nutrition or housing. Good comparisons of animals can only be made when the animals are of the same age, sex and are managed in the same environment. Some characteristics (qualitative) can be passed on from the mother to the offspring. These characteristics, for example skin colour, will be present or absent in an individual animal, while other quantitative characteristics such as growth rate, body weight or level of production are inherited to an extent of 10 to 30 % and are largely influenced by management conditions.

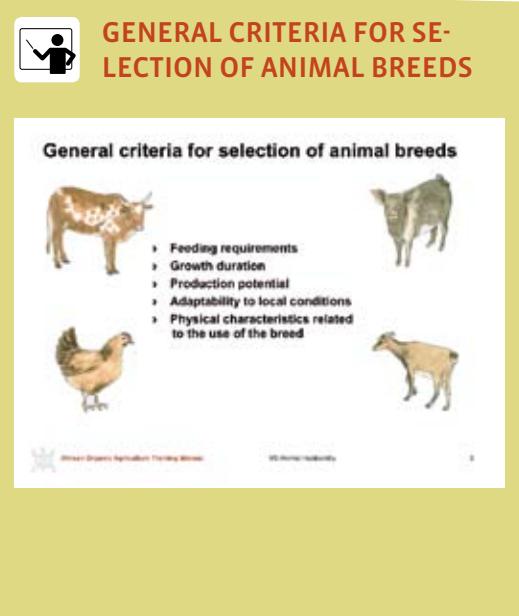
Organic breeding builds on four main principles:

1. **Species-specific breeding** - The breeding goals must be adequate for the species. They should promote the special features of the animal species.
2. **Site-related breeding** - Selection for production traits should fit well with the environment. For example, selection for high production is only possible in a very good environment with adequate, good feed.
3. **Disease resistance-related breeding** - The breeding goals should include health traits like easy births, proper legs, low somatic cell counts or little requirement for veterinary treatments.
4. **Flexibility-related breeding** - The breeding goals should also include flexibility traits, which show that animals can cope with unstable environments such as low supply of feed.

Recommendations to farmers regarding proper selection of animals for breeding:

- › Select livestock breeds that are easily adaptable to local conditions in terms of feeding, diseases and other infections. This will incur fewer expenses to manage them and result in fewer sudden deaths.
- › Put strong emphasis on functional traits such as longevity, ease of births, strong legs and on the quality of animal products such as somatic cell counts, fat and protein content in milk.
- › Allow animals to breed and reproduce under natural conditions as far as possible. Artificial insemination should only be used as an occasional, rather than a routine, practise.





- Cooperate with other farmers to exchange (male) animals from time to time to prevent inbreeding.
- To prevent inbreeding, castrate young male animals if they are not to be used as breeding animals.

4. Provision of appropriate and safe housing

Animal housing should aim to create an environment that offers protection from predators, heat, rain and theft, be easy to manage and have as much free movement as possible. For example, animals can spend the day freely feeding in an enclosed area and then be housed during the night. If livestock is partially kept in an animal house, this makes it easier for the farmer to monitor the amount of feed and water consumed by the animals, as well as to collect dung, droppings and urine. Part-housing also gives the opportunity to carry out health treatments such as de-worming and external parasite control and to closely observe the animals' behaviour.

Appropriate housing on organic farms aims at ensuring that animals have:

- Adequate space for the size and number of animals to allow for free movement, lying and resting. Animals need to express their natural behaviours, for example, pecking or digging in the ground, climbing or scratching.
- Sufficient fresh air and natural daylight, which helps prevent breathing problems and spread of infections.
- Protection against harsh weather conditions, for example, excessive sunlight, heat, rain and wind. Such unfavourable weather conditions facilitate the development and spread of infections and may stress the animals rendering them more susceptible to infections.
- Natural bedding material where animals are kept clean by avoiding direct contact with the wet ground or floor. The bedding will also absorb urine and faecal material, making it easy to collect.
- Permanent provision of clean water and routinely cleaned feeding troughs to provide clean feed.
- Security against predators without compromising the ventilation requirements and free-range housing.
- Protection from any spiky or dangerous elements to avoid injuries to the animals and the farmer.



Farm visit for discussion on animal housing

Take the farmers to a farm where animal species of specific interest are kept. Inquire from the participants what they think about the housing conditions of the animals on that farm. Share and discuss observations around the house with respect to the recommendations given below and suggest appropriate recommendations for improvement.



For easy management, housing should allow for easy removal of bedding material and excrement as well as easy access to cleaning the walls and floor. This requirement strongly depends on the nature of the floor and walls, the space and the number of exits and entrances provided.

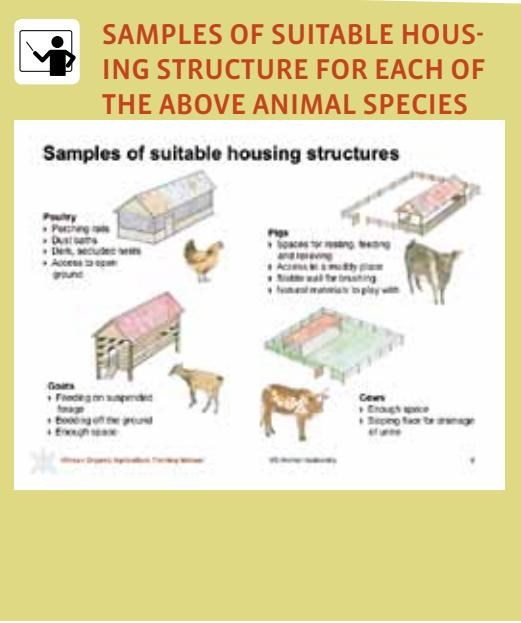
4.1 Construction of animal housing

Animal houses should be constructed in a simple way using locally available materials as much as possible to save on costs.

The following examples provide some valuable information for specific livestock housing designs based on the species' natural behaviours:

1. Poultry, especially chicken, enjoy perching at night and, therefore, perching rails should be provided for this purpose. Chickens enjoy playing in dust baths to clean their bodies. Dark, secluded nests should be provided for layers, as they prefer laying in such places. For flying exercises, the housing should have a provision to suspend green vegetables about 0.5 m off the ground. Poultry also like to scratch for ants and worms, as this is their natural way of looking for food. Thus they should be given access to open ground in proximity to the poultry house.
2. Pigs naturally prefer separate spaces for resting, feeding and for relieving themselves, thus their housing should provide such separate spaces. They also like to have access to a wet and muddy area for cooling their bodies, especially in hot environments. They furthermore enjoy brushing against the walls, so the wall should be stable and not too rough so as to cause bruising or other injuries. Pigs should be given natural materials to play with such as wood logs, twigs or straw.
3. Goats enjoy feeding on suspended forage, high enough so that they can attain an upright posture while feeding. They also like to climb, thus parts of their bedding can be raised off the ground so they can use different layers. The social structure of goats is quite strict; therefore, they need different individual places and corners where low and high ranking animals can feed separately.
4. Cows are big animals, sometimes with big horns and enjoy lying down while chewing cud (ruminating). They, therefore, need enough space to stand, turn, go past each other and lie down. If they get fed in the cow shed/kraal, every





animal needs to have enough space to feed without being disturbed. A gently sloping floor is necessary to allow easy drainage of large amounts of urine through a drainage channel to a paved drainage pit outside the cattle kraal.

5. Proper feeding of animals

Organic farmers aim to grow and produce most animal feed on their farms. They ensure that there is enough land for the animals to graze and enough space to grow extra feed, including feed for the dry season. Storing feed for the dry season reduces the cost of buying feed from other sources and ensures appropriate feeding during low seasons.

Different livestock species have different feeding requirements. The higher the expected productivity of the animals is, the higher the feeding requirements are. Commercial high yielding dairy animals for example require more high quality feed than non-dairy or low producing animals. Farmers should, therefore, select the species and breeds of animals that will do well in their farm without major purchase of feed.

In case of organic certification, purchased feed must be obtained from organic or proven natural sources. Growth promoters and hormones are not allowed as feeding supplements for organic animals.

5.1 Feeding requirements for animals

Like human beings, animals depend on different types of foods to grow and produce well. Different animal species need different feeds. The daily ration for any farm animal should contain an average composition of 7 parts carbohydrates, 2 and half parts proteins and half a part of vitamins, minerals and oils.

1. Carbohydrates provide animals with energy for their exercises, production, grazing and doing work for human beings. For example, a donkey needs energy to carry goods. Roughage feeders, like cattle, goats, sheep, camels and donkeys are able to obtain their basic carbohydrate requirements from pastures.

Non-roughage feeders such as pigs and poultry obtain their carbohydrates mainly from cereal grains such as maize, sorghum, and their industrial by-



Discussion on feeding of animals

Ask the farmers what animals they keep and how they feed them. Discuss difficulties in feeding the animals and exchange ideas for improvement.





NUTRITIONAL SOURCES FOR THE DIFFERENT FORMS OF LIVESTOCK

Nutritional sources for livestock species

Species	Carnbohydrates	Protein	Fats	Water	Minerals
Poultry 	Carbohydrates, protein and some fat and/or produce	Insects and worms, mealworms, beetles, larvae, fly pupae	Commercial nutrition or scratch seeds	Leafy greens, sprouts, vegetables, whole grains, berries	Ocean salt, potassium, lime meal
Pigs 	Live poultry	Lagomorphs, hoppers and grubs, Michaelmas daisies, tree root	Like country	Fruit peels and rinds, leafy greens, root vegetables	Minerals, shell flour
Goats & Sheep 	Forages, pasture, crop residues	Lagomorphs, hoppers, young grain	Not necessary to feed fat	Brown pastures, horns or crook branches	Mineral salts, dried kelp, lime, heritage whole
Cattle 	Live grass	Live grass	Like grass	Like grass	

products like maize bran. Tubers such as cassava and sweet potatoes are also used as a source of energy for those animals. Feeding of grains and tubers in ruminants should be restricted to high producing animals (for example, at the beginning of lactation) and to an average of 1 to 2 kg per day for big animals like cows and 100 to 200 grams for small ruminants like sheep and goats, to avoid excessive production of acids in their rumens during digestion. Such animals naturally do not depend on such feed. Grains should be reserved for human consumption as much as possible.

2. Protein is needed in the animal's body for growth and repair of tissues. Lack of protein in the diet leads to poor growth rates, reduced yield of animal products, loss of weight and late maturity for growing animals. Leguminous fodder is a good source of protein for most animals. Free-range chickens are able to obtain their proteins by picking ticks, insects and worms from the environment.

Earthworms for feeding chickens can be multiplied by mixing a small amount of the soil containing earthworms with fresh cow dung and dry leaves in half a drum, which is kept moist by covering with a sisal sack. The worms multiply quickly and after about two to three weeks they can be harvested and fed to the chickens. Pigs can be fed with human leftovers, which may contain protein from human diets.

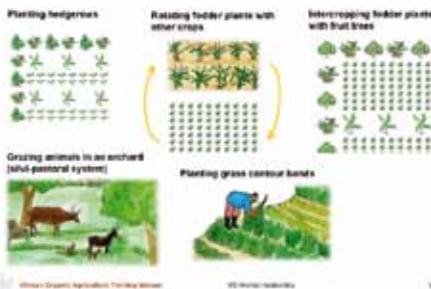
- Vitamins are only needed in small amounts in animals, mainly for boosting their immunity. They are plentiful in young green pasture or fodder, kales, young amaranth that have not yet seeded, and in fruit peels from the kitchen.
 - Minerals are essential in the animal body for different functions. For example calcium and phosphorus are necessary for eggshell formation, bone formation, muscle contractions, synthesis of hormones and enzymes. Their deficiency results in reduced growth, soft brittle bones that fracture easily, difficult births, low egg and milk production, retained afterbirth, etc. When animals lack some of these minerals, they develop the ‘Pica’ habit, which leads to eating strange things such as cloths, rags, bones, soap and metal sheets.

Minerals are available from some plants like amaranth (pigweed), stinging nettle (*Urtica dioica*), black night shade (*Solanum nigrum*) and pumpkin leaves (*Cucurbitae* spp.). Mixing equal parts of dry leaves from these plants and grinding them to a smooth powder will provide for most minerals in animals when placed in a mineral box and fed as often as possible. Salt (NaCl) should also be given to ruminants.



INTEGRATING FODDER PRODUCTION WITHIN THE FARMING SYSTEM

Integrating fodder crops into the farming system



5. Fats and oils provide a layer of insulation below the skin for protection against the cold. They also facilitate the absorption of vitamins in the body. Sunflower seeds provide a good source of fat for (cattle), pigs, poultry and rabbits. Cottonseed, sunflower, sesame or peanut cakes, after extraction of oil, are also good sources of fat. Ruminants can build fat from roughage.
6. While water may not be treated as a true nutrient, it is essential for providing a medium through which other nutrients are absorbed and assimilated in the body. It is also responsible for giving shape and turgidity to most tissues of the body. Clean water, which is free from contamination with chemicals and disease causing agents, should be provided to the animals all the time. Salty water with a lot of natural minerals is not suitable for livestock as it limits water intake.

5.2 Large animal feeding systems

a. Stall feeding

This is also sometimes called the ‘cut and carry’ system where animals are provided with feed either throughout their entire growing period, stage of growth or season of the year.

However, since animal welfare is given a high priority in organic agriculture, combined systems or free range systems are preferred so that the animals have the opportunity to move around and to socially interact. Animals should be provided with a wide variety of easily accessible feed—for ruminants, pasture is preferred—and water to encourage intake and to meet their nutrient needs. Supplementary feeding with feed rich in minerals, for example mineral leaks, and vitamins is often necessary to protect the animals from diseases and also to ensure proper functioning of bodily functions. But the intake of concentrates for ruminants should be limited to a very small amount, otherwise they can develop metabolic disorders like acidosis or maw displacement.

Integrating fodder production within the cropping system

Fodder production involves growing different types of grasses, trees and shrubs and cutting them when they attain a certain maturity to feed the animals. Fodder crops can be grown alone or intercropped or rotated with other crops. Fodder can be produced from planted or sown grass or from leguminous plants that



Discussion on stall feeding of animals

Invite a volunteer farmer, who practises stall feeding of cattle or smaller ruminants, either in a zero grazing or combined system and discuss with him advantages and challenges of stall feeding of the animals under local conditions.



are grown as cover crops within perennial crops or on soil erosion control bands, from planted hedges of suitable shrubs, shade and support trees along crop garden boundaries (fodder hedges). Crop residues are an additional source of fodder.

The best plants for fodder hedges are leguminous trees or shrubs such as calliandra (*Calliandra calothrysus*), leucaena (*Leucaena leucocephala*), sesbania (*Sesbania sesban*) or gliricidia (*Gliricidia sepium*). Hedges can be left to grow during the rainy season, without cutting them, to have maximum amount of leaves for feeding the animals during times of need such as the dry season. Grass plants can also be planted as fodder hedges. For example guinea grass (*Panicum maximum*), Rhodes grass (*Chloris gayana*), elephant (napier) grass (*Pennisetum purpureum*), Sudan grass (*Sorghum verticilliflorum*), Weeping Lovegrass (*Eragrostis curvula*), Congo signal grass (*Brachiaria rusiziensis*), Guatemala grass (*Tripsacum fasciculatum*), Kikuyu grass (*Pennisetum clandestinum*) and African brittle grass (*Setaria anceps*), maize and sorghum.

b. Pasture grazing

In pasture grazing, animals are allowed to graze directly on the growing pasture in a fenced paddock or communal grazing lands. Grazing of animals is especially recommended in the following situations:

- › Steep land that is very susceptible to erosion, thus unsuitable for annual soil cultivation, but can be maintained as permanent pasture.
- › Land that is covered with many stones.
- › Land that is seeded with pasture and used as grazing land within a crop rotation for a season or more. Growing pasture crops in a rotation, furthermore, interrupts the life cycles of annual weeds and crop pests.
- › Animals can also be brought into a crop field to graze on the crop residues and remains from the previous crop.

However, grazing must be controlled if the pasture is expected to regrow. Controlled and rotational grazing ensures that diverse, dense and useful pastures are maintained, which will also extend the grazing season. For some farm animals, such as cattle, proper pasture management also helps to reduce pressure with pasture-borne internal parasites.

In order to ensure controlled grazing, pastures are usually subdivided into paddocks. Animals are allowed to graze in one paddock for a short period of time.



When the plants are grazed, they are transferred to another paddock with grown grass. The animals do not return to a paddock until the plants have recovered and regrown to a desired height for grazing. As a result, the plants have time to recover and the animals always have high quality pasture. Overgrazing as well as under-grazing can lead to reduced pasture growth, reduced quality and quantity. Typically, grazing animals are moved quickly through paddocks during periods of rapid plant growth (rainy season) and moved slowly during the dry season. But even in the dry season, quite a rapid movement with a high density of grazing animals can make sense. Rapid movement also helps to prevent parasite invasions and illnesses. If managed well, controlled grazing produces enough pasture and the animals always have access to tender, high-quality plants over an extended period of time. The most efficient and ecological way to use dry pastures is to let different animal species graze together. Grass grazing species (like cattle) and species feeding on shrubs and bushes in addition to grass (like goats and sheep) use the pastures on different levels and complement each other in terms of their feeding behaviour.



Discussion grazing of animals

Inquire among the farmers how grazing of animals is done locally. Together, identify ways how it can be improved to get more and higher quality pastures. If possible, visit a farm with good pasture management and learn how the farmer manages his pastures.

Recommendations to farmers regarding good grazing practises:

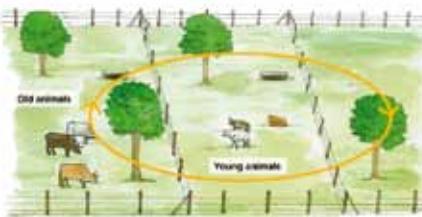
- The pasture should not be grazed before it has reached appropriate maturity (i.e. shortly before flowering).
- An appropriate number of animals should be allowed to graze in a given area, also called stocking rate, to avoid destroying the environment through overgrazing. Overgrazing weakens the pasture plants and will result in poor re-growth and sparse plant cover. This will result in soil erosion risks and growth of unwanted shrubs and weeds.
- The pasture should not be undergrazed either, since the fodder gets too old, leading to quality losses and bad growth of new grass shoots.
- The recovering/regeneration time given to pasture plants to regrow should not be too short or too long, such that the plants are always in the right stage to be fed. The regeneration time is also important concerning the control of parasites. Decisions about when to move animals from one paddock to another should be based on the seasonal availability of pasture, the number and size of paddocks in relation to the number and type of grazing animals. Pasture regeneration through burning should be avoided because it results in the loss of a wide variety of protein rich and medicinal plants that animals





ROTATIONAL GRAZING PATTERNS

Rotational grazing patterns



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REPLANTING GRAZING PASTURES

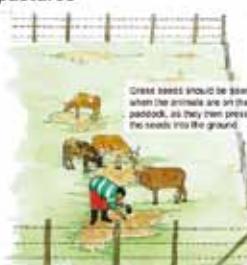
Improving grazing pastures

Replanting new pasture:

- + Offers the opportunity to use a diverse mixture of plants.
- + Involves high costs.

Resowing and changing management of existing pasture:

- + Involves lower costs.



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- require. It also destroys a lot of necessary organisms on and in the ground.
- > Good pasture plants that animals like should be encouraged in order to achieve better utilization of pasture. Sometimes replanting or resowing is necessary to maintain pasture quality.
- > Young animals should graze ahead of older animals in order to benefit from the fresh pastures and to minimise transfer of parasites from older to younger animals.
- > Rapid movement of big herds including different species is recommended.

How to improve grazing pastures

If grazing land no longer produces good pasture, it can either be replanted or improved by replacing old pasture plants. Replanting a new pasture offers the opportunity to use a diverse mixture of plants with differing maturities, which provide high-quality pasture and a longer grazing season. However, there is a high cost involved in terms of land preparation, planting/sowing and weed control, and normally, the farmer must keep the animals off the newly planted pasture land until the new plants have developed well. Therefore, improving an existing pasture is usually a preferable and more suitable option for small-scale farmers. This can be done by resowing and changing grazing management. Grass seeds should be sown when the animals are on the paddock, as they can then press the seeds into the ground using their hoofs.

Whether planting a new pasture or improving existing pastures, selection of appropriate plant species that are adapted to local climate and soil conditions is essential. Integrating legume plants in a pasture improves the overall pasture quality. It increases protein intake by the grazing animals and helps to extend the grazing season. Seeds should be broadcast out in the rainy season during the last few days of grazing on a paddock, so the animals will step on them and press them to the ground. Only open or sparsely covered spots should be resown.

Examples of grass plants (see section 5.2 above) and leguminous pasture plants include desmodium (*Desmodium* spp.), centro (*Centrosema pubescens*), siratro (*Macroptilium atropurpureum*), Clover (*Trifolium* spp.), lucerne (*Medicago sativa*), and Stylo (*Stylosanthes guianensis*).



Field visit to identify good pasture plants

Let the farmers go out to the field in groups and collect samples of local and valuable pasture plants. Then select the ones that are most preferred by the farmers, giving reasons for their choices. At the end of this exercise, a pasture album should be prepared with the different pasture plants (grasses and legumes) and their characteristics.





Discussion on preservation of fodder

Inquire among the farmers about preservation of fodder by asking the following questions:

- › Do you normally experience pasture shortages for feeding your animals? During which times of the year and for how long?
- › How do you feed the animals during this time?
- Do you preserve fodder for the animals, and how do you preserve it?

Preservation of fodder

The dry season can be very tough on all kinds of animals, but especially on the larger ruminants such as cattle, sheep and goats. Animals may lose weight and have reduced growth rates because they do not get enough balanced feed. This implies that they will take much longer to attain fertility or market size, hence the farmer loses both time and money. With better planning and adoption of the following measures, these problems can be minimised.

Harvesting and storing excess fodder available during periods of surplus ensures that animals have sufficient fodder throughout the year. Preserved fodder with high fibre content like crop residues and by-products are only suitable for feeding to ruminants, and limited amounts for pigs, though not to poultry. Leguminous fodder plants should be harvested at the flowering stage or when flower buds start to grow, while grasses should be harvested before flowering when the plants have maximum nutrients and green matter. The rate of digestion of the preserved fibrous fodder can be increased by supplying a protein supplement. Locally available protein sources, include legume residues, pods, green fodder and oilseed residues (e.g. from oil extraction).

How to produce hay?

Fodder preserved by drying in the sun is called hay. It is leafy dry fodder and greenish in colour. Hay making is the oldest and most important way of preserving fodder. It is, however, not a common practise among animal keepers in the tropics, probably because of the very poor quality of mature tropical grass.

Hay can be made manually or with simple equipment and from different plants, especially those with thin stems and more leaves are better suited because they dry fast. More leaves than stems are cut and laid out well in the field in thin layers and turned regularly for quick drying. The fodder should be harvested when it is less moist during sunny days to prevent development of moulds, which are extremely harmful to animals, as well as to human beings. The grass should not be over-dried, but rather cured. For example, it should not be left to turn brown in colour. If labour is available, then the dried grass should be chopped and then tied up tightly in bundles.

Storage of hay can be done using a simple granary-like structure built with four supporting poles. The floor is raised above the ground and made of slatted frames to provide air circulation and prevents the hay from becoming wet from below. The cured hay bundles are then stacked inside this structure. The outer





HAY MAKING PROCESS

Hay making process



SILAGE MAKING PROCESS (ENSILING)

Silage making process



surface is then 'thatched' or covered with a plastic sheet to keep the rain off.

Box-baling is another method that can be used especially for small amounts. The hay is hand chopped, put in wooden boxes for better compressing and then tied up in bales, which are fitted in wooden boxes.

Suitable plants for making hay

Crops and grasses which are appropriate for hay include guinea grass, Rhodes grass, elephant (Napier) grass, sorghum, maize and leguminous fodder crops such as cowpea and lablab. Crop residues and fallen leaves can be included in the hay to increase the quantity and quality of hay feed available.

A tuber crop like cassava can also be grown easily to produce foliage, even in slightly drier seasons, producing enough forage after about three months. Cassava crops can be harvested about 6 inches above the ground and sun-dried for 3 to 5 days before being collected in bundles or made into bales prior to feeding or storage. A drying period of 4 to 6 days is necessary for drying the stem and branches, which have a higher moisture content. The drying process is not only to reduce moisture, but also to decrease hydrocyanic acid to a safe level for ruminants.

Legume leaf meal (hay), which consists of dried leaves from a range of tree legumes, can also be used. The leaf material is harvested, dried in the shade and tightly packed in bags for later use. This material can also be fed to laying hens for yellow-coloured egg yolks.

How to make silage?

Silage is the product of controlled green fodder fermentation retaining a high moisture content. The fresh fodder material is harvested, chopped and filled in pits (silos) under anaerobic conditions while still fresh. The anaerobic environment is created by lining the pit with a plastic sheet on the sides and bottom. After filling and trampling over the material to press out most of the air, the top is then also lined with plastic and covered with soil. The material is again trampled over to make sure the covering is soil, air and water proof. The material will remain preserved as long as it remains air-tight. The quality of the ensiled product will depend on the quality of the material ensiled and on the fermentation process.



6. Proper management of animal health

A healthy animal is in a much better position to cope with disease and parasite infections and will grow and produce at a normal rate. However, the health and well-being of animals is also strongly affected by housing conditions, feeding, handling by human beings and direct exposure to parasites and disease pathogens.

6.1 Causes of poor health in animals

There are different possible causes for poor health in animals:

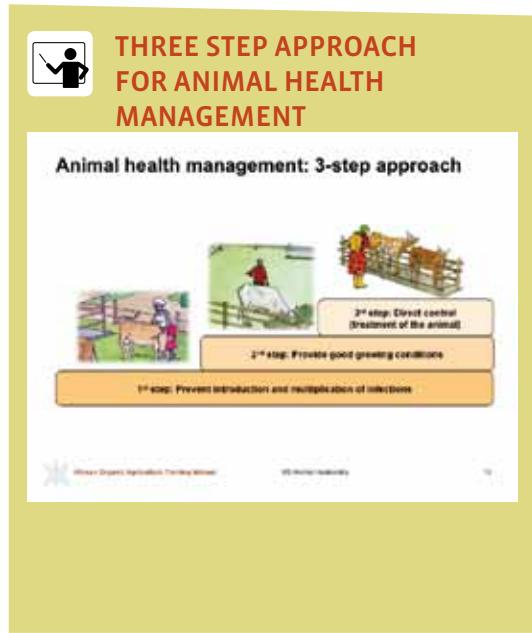
- › Poor feeding, both in terms of quality and quantity, affects animal health and performance as well as the ability to resist disease infections. It further causes metabolic disorders like acidosis, milk fever, acetonaemia and pasture bloat in cattle caused by nutritional imbalances of minerals, vitamins, protein and energy supply from feed.
- › Poor hygienic conditions of the animal housing provide good breeding grounds for a number of parasites and other disease causing organisms. Feeding troughs contaminated with animal faecal material is a very common source of infections.
- › Endo-parasites like nematodes and other worms, and ecto-parasites such as lice, ticks and mites cause infections, which reduce feed intake, and the rate at which the food is broken down inside the body for its different functions. This again affects body weight gain, production and reproductive performance of the animals.
- › Injury to the animal due to poor handling or exposure to dangerous physical materials such as glass and metal can result in infections that weaken the animals.
- › Disease causing organisms (pathogens) and parasites that are transmitted when infected animals, human beings and equipment or materials are moved from one flock or farm to another.



Field visit for discussion of animal health management

Take the farmers to a nearby animal farm and let them identify all possible causes of infections that can affect the health of the animals. Discuss possible measures for prevention and treatment.





6.2 The three-step approach

Organic animal health management can be seen as a three-step approach with multiple tools:

- › **1st step measures:** The first step consists of preventing the introduction and multiplication of infections.
- › **2nd step measures:** The second step involves providing good growing conditions for animals to enhance their natural immunity and resistance to infections.
- › **3rd step measures:** The third step involves application of direct control measures (treatments) to kill the parasites and disease causing organisms.

Each step of the three-step approach builds the foundation for the next one. The aim is to optimize the steps 1 and 2 that minimise introduction and spread of infections, and promote natural immunity and strong healthy animals. This will minimise the direct control measures/treatments in step 3. With proper and efficient application of steps 1 and 2, direct intervention is usually minimised. This approach saves on costs and prevents negative impacts of some direct control measures on the animals and nature.

6.2.1 Preventive measures in animal health management (1st step tools)

Organic management of animals primarily focuses on precautionary and preventive measures, which include:

a. Proper selection of suitable animal breeds

The breed of the animal is the starting point in successful organic animal health management. Only breeds adapted to local conditions in terms of feed requirements, weather, common parasites and disease tolerance should be chosen. This will minimise the cost of management as well as the risk of losses due to deaths.

b. Quarantine measures

Any new animals introduced in the farm should first be well treated and isolated for a while to allow for closer monitoring of their health status. Movement of any materials including manure, and equipment should be restricted from areas and farms unless the healthy status of such farms is ascertained to be safe. Visitors to the farm should also sanitise their feet before moving into the animal houses or grazing areas to minimise transfer of infections.





c. Regular monitoring of animals

Close observation of animals is important to identify and treat infections before they worsen or infect other animals. Thus organic farmers keep daily or frequent records to assist in assessing possible signs and causes of the diseases or injuries. Signs of illness may include reduced appetite resulting in reduced feed and water intake, reduced productivity or, for example, a drop in milk or egg production, apathy observable as a lack of vitality, head down or abnormal movement, abnormal discharge from bodily orifices, difficulty in breathing observable as fast, laboured, coughing, and gasping, inflammation of mucus membranes in the mouth, conjunctiva, and vulva lips, where the membrane may be pale or dry in cattle, rise or drop in body temperature, excreta material may become different from normal, either too hard, too watery or may be covered with mucus or blood. Heavily infested animals can be separated from others or, as a final measure be slaughtered so that they do not infect others. The meat should only be eaten if the animal's body temperature is normal and there is no abnormality in the meat, otherwise it should be buried away.

d. Vaccination

Vaccination is recommended especially for diseases that are difficult or impossible to cure and which cause great losses by causing high mortality rates. Examples of such diseases include foot and mouth disease, anthrax, pneumonia, African swine fever and avian influenza.

For certification, organic standards classify the use of vaccines as restricted. This means that their routine use is discouraged and is only permitted when it can be demonstrated by the organic farmer that a specific disease is endemic in the region or on the organic farm, or where their use is required by law or if a veterinarian recommends it. Organic certifiers will, therefore, require written verification from a veterinarian to confirm the presence or threat of disease infection. In addition, the vaccines must not contain genetically modified ingredients or by-products. The use of vaccines under these circumstances will not prejudice certification and does not require quarantine procedures, but full records of treatments must be kept.



6.2.2 Provision of favourable growing conditions (2nd step tools)

Organic management of animals also focuses on providing appropriate and favourable growing conditions to enhance the animal's natural immunity and resistance to infections. These include provision of balanced animal feed, appropriate housing and animal-friendly handling practises.

Although animals have varying degrees of natural ability to resist or withstand infections, farmers can enhance this ability. Young animals derive this ability by suckling of colostrum, especially within the first 6 hours of birth as it contains antibodies. Routine and preventive application of antibiotics is not recommended for organic animals as it interferes with the animal's ability to develop natural resistance to infections. The disease pathogens, in the long run, tend to develop resistance to these drugs.

a. Proper nutrition

The feeding of animals should ensure balanced diets and right proportions, high quality and fresh forage, low levels of concentrates for ruminants and mineral supplementation to avoid deficiencies. Potentially poisonous feeds like thorn apple weed (*Datura stramonium*), mouldy feed or use of poultry droppings, dung or other manures as feed, should be avoided. Grazing pastures should also be managed well with adequate rotations to avoid build up of pasture borne internal parasites such as gastrointestinal nematodes.

b. Ensuring proper housing and sanitation

Regular cleaning of the animal housing units, feeding and watering troughs and the surrounding environment helps reduce health risks. All animal manure should be regularly composted while all the non-compostable material has to be properly collected and incinerated or disposed of to avoid creating potential sources of injury to the animals.

c. Avoiding stressful conditions

Organic farmers aim to minimise physical and psychological stress in animals in order to promote well-being and normal growth. Stressful conditions weaken the bodies of animals rendering them susceptible to infections. They also sometimes inflict direct injury to their organs. Stress can also be caused by weather conditions such as excessive heat, sunlight, rain, wind or confinement such that the animals cannot meet their behavioural needs like walking, running, flying or resting. Harsh handling of animals includes physical beating, inflexible tethering and deprivation of sufficient access to food and water are other conditions that can cause stress. Gentle handling leads to tame, calm and healthy animals.



PROVISION OF GOOD GROWING CONDITIONS

Good growing conditions (2nd step)

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DIRECT CONTROL (TREATMENT OF INFECTIONS)

Direct treatment (3rd step)

- > In case preventive measures are insufficient
- > Treatment with chemical drugs and antibiotics only in case of infection
- > Stick to the required waiting period before selling products as organic

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6.2.3 Direct control and treatment of infections (3rd step tools)

While organic animal management emphasizes good care and preventive practices as the preferred method of maintaining livestock health, it also recognizes that sometimes these measures may be insufficient to protect against disease and illness. In such cases, treatment with chemical drugs and antibiotics may be applied. However, when such treatments are administered, appropriate withdrawal measures should be followed, especially for certified organic animal husbandry. The use of such treatments does not result in the loss of certification status, but does require the treated animals to be withheld from sale or killing for a period two times the legal withholding period for the substance in question. Also products of such treated animals may not be sold as organic for a certain time.

On the other hand, there are natural herbal remedies and traditional treatments used in animal treatments. These remedies are easily available and cheap. They include:

- > Dietary additives like vitamins and minerals.
- > Botanical dewormers such as garlic, pumpkin seed and worm wood (*Artemisia spp.*) that can be added in animal feed to manage gastrointestinal nematodes, and lung and liver parasites.
- > Neem seed oil, tephrosia or pyrethrum to control ticks.

However, farmers need to consider that when the organic treatment is not effective, conventional treatment must be applied to ensure the welfare of the animal.

6.3 Management of ticks and other external parasites

Besides lice and mites, ticks are very important external parasites in the tropics, attacking nearly all types of animals including poultry. They suck blood from animals causing discomfort and in extreme cases causing anaemia thus affecting growth. They also can transmit diseases and damage animal skin.

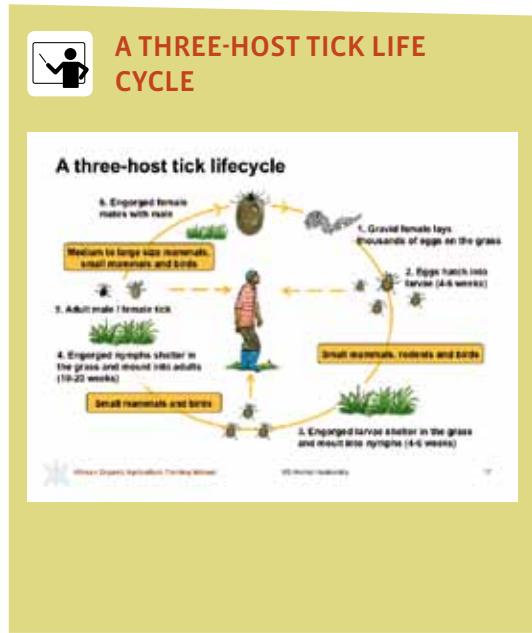
There are mainly two major types of ticks: soft and hard ticks. Soft ticks, the argasids, are distinguished by their soft bodies and by having mouthparts that are on the underside of the tick body. They are fast feeders and blow up like a balloon when engorged with blood. Hard ticks, the ixodids, have a hard plate on the upper surface and have terminal mouthparts, which they use to pierce and



Discussion on veterinary treatment of infections

Ask the farmers about the symptoms of common infections in the area that are normally treated with veterinary drugs. Where are the drugs obtained from and who administers them?





attach themselves to the host. They are slow feeders and take several days to finish their meal.

Other external parasites like fleas cause a lot of discomfort to animals and can transmit diseases from one stock to another.

Understanding the life cycle of ticks

Ticks can be one-, two-, or three-host feeders. In one-host species, all stages live and moult on the same host, then eggs are laid on the ground. In two-host species, larvae and nymphs share the same host, but the adult stage reproduces on a separate host. In three-host species, all three stages target different hosts; eggs are laid on the ground. The majority of ticks are 3-host feeders and the hosts may or may not be of the same species. The sheep tick (*Ixodes ricinus*) usually feeds once per stage, on different hosts from a wide range of species during its life cycle. This makes it one of the most common ticks to infect livestock, domestic pets and human beings. Other host species include: mice, rats, squirrels, reptiles, cattle, horses, sheep, pigs, dogs, cats and humans.

The life cycle of ticks involves 4 stages; egg, larva, nymph and adult. When the eggs hatch, the larva seeks a host, feeds and then drops off to moult to the nymphal stage. The nymph then seeks another host, feeds, drops off and moults to the adult stage. The adults (male and female) seek another host, feed, drop, mate and then lay eggs on the ground. Ticks are different depending on how long this cycle takes and the number of hosts involved in the cycle.

Recommendations to farmers regarding proper management of ticks and other ecto-parasites:

Ticks and other external parasites can be sustainably managed applying a range of practises.

- a. Selection of animals with reduced susceptibility to ticks, for example, locally adapted breeds.
- b. Close observation and monitoring of animals to ensure that infections are identified at an early stage for quick intervention.
- c. Trapping of the parasites using strategically placed traps around the grazing paddocks or the animal resting areas.
- d. Applying biological control measures, for example, by keeping and allowing local chicken to forage around the animal enclosures picking and eating ticks.



- e. Applying organic treatments exist mainly as repellants. Examples are lime sulphur, neem and eucalyptus oil (*E. globulus*) and the use of natural pyrethrum.

Natural botanicals such as *Tephrosia*, *Lantana camara*, *Tagetes minuta* and *Azadirachta indica* preparations can be used to control ticks. Eucalyptus leaves mixed in the animal beddings also repel ticks and other parasites. There are many local medicinal plants used for treating animals, on which experiences can be shared with other animal farmers and local extension agents.

General guidelines for preparation of botanicals:

1. Boil 1 kg of leaves in 10 litres of water for 30 minutes.
2. Allow the preparation to cool down.
3. Apply it on the animals with a broom or a brush at a rate of about 5 litres per animal. Alternatively spray it with a knapsack after filtering it well. Some soap powder may be added to the solution to make it stick to the animal body.

There may be specific recommendations for specific botanical preparations.

- f. Double fencing, particularly from neighbouring farms, can help to prevent spread of ticks and lice from neighbouring infested animals.
- g. Proper pasture and grazing management with appropriate withdraw periods exceeding 3 months for old animals to 6 months for young animals for infested pastures will break the lifecycles of most external parasites and reduce pest pressure. Changing paddocks frequently, even between different species, also helps to further reduce parasite pressure.

6.4 Management of internal parasites

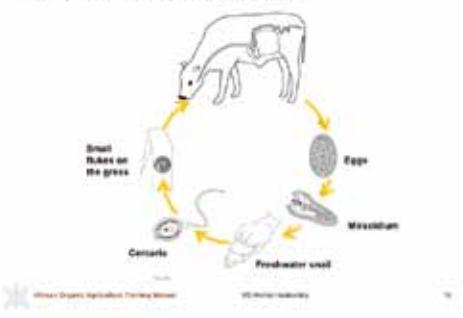
Internal parasites, commonly called worms, affect most animals and can seriously influence production and health of grazing animals. Especially young animals with weak immune system are at higher risk. Most worm parasites are pasture-borne, meaning that animals get infected while grazing. Once established, worm





LIFE CYCLE OF THE GIANT LIVERFLUKE

Life cycle of the giant liverfluke



parasites produce eggs which are passed with animal faeces. Eggs develop into infectious parasite larvae which are taken up by the animal while grazing. High stocking rates and insufficient pasture rest periods contribute to high incidence of infestations.

Most farmers have always relied heavily on anti-parasitic drugs (dewormers), called 'anthelmintics' to control internal parasites in their animals. But the long-term use and in some cases misuse of these drugs has resulted in parasites that have become increasingly resistant. Therefore, organic farmers should not routinely use dewormers, but only on a need basis, depending on the severity of the infestation and if the permitted substances or practises are not sufficient to treat the animals.

Examples of common internal parasites of cattle are hairworms (stomach/intestinal worms), lung worms, liver flukes and coccidia. In sheep and goats gastrointestinal worms (round worms, nematodes, stomach worms), tape worms, liver flukes and coccidian are common. In pigs, large round worms (ascarids), nodular worms, whipworms, lung worms, stomach worms, thread worms and kidney worms are frequent. In this manual only two major internal parasites, the giant liverfluke and the gastrointestinal nematodes can be discussed.

Giant liver fluke (*Fasciola hepatica* or *Fasciola gigantica*): Giant liver flukes are flat, earl-shaped parasites of many mammalian species, including humans. In the farm setting they predominately parasitize ruminants such as goat, sheep and cattle. The life cycle of liver flukes apart of the main host includes an intermediate host, a fresh water snail.

Adult flukes colonize the liver of the main host and produce eggs, which are passed via the bile duct to the environment with the faeces. Within the eggs, an intermediate parasitic stage, the miracidium develops, which after hatching infests fresh water snails. After approximately 24 hours Cercaria, another intermediate parasitic stage, leave the body of the snail and after further development and migration to nearby pasture are taken up by the main host. Within the main host, the Cercaria develop to small flukes which migrate to the liver and become adult.

The most effective preventive measure to avoid liver fluke infestation of farm animals is to avoid grazing animals near fresh water, as the life cycle of liver flukes is linked to fresh water where the intermediate host, the snails, live.



Gastro Intestinal Nematodes (GIN): These are worm parasites of the small intestine and the abomasum of ruminants. They have a life cycle without an intermediate host. Worm eggs are excreted with the faeces of the hosts. Within the faeces, a first larvae (L1) hatches from the eggs and develops to the infectious third larvae stage (L3), which leaves the faeces and migrates to the pasture. Infection takes place when animals take up L3 larvae while feeding.

Recommendations for prevention: L3 Larvae of GIN are dependent on wet grass or at least dew to migrate on the grass that is eaten by animals. Therefore, one possibility to avoid infection is to graze animals only on dry pastures.

General recommendations to farmers regarding proper management of internal parasites:

Generally, organic control of internal parasites relies on maintaining good management practises and reducing the risk of infection by ensuring good nutrition and minimum stress. Application of the following specific practises proves helpful:

- a. Good pasture management practises to disrupt the life cycles of the parasites. Animals should be moved to a clean pasture especially after the rains, when these parasites are actively multiplying. The old pastures can then be dug/ploughed to expose the eggs and larvae to sunlight and heat, and used for crop production or for other animal species.
- b. Good feeding of animals helps to keep animals strong and tolerant to internal parasites.
- c. Proper grazing planning is very important in managing parasites, for example through rotational grazing paddock system. Older, less susceptible animals should graze behind the younger animals in the rotation. Fewer numbers of animals on a given grazing area combined with good rotations also reduces parasite populations to a great extent.
- d. Some fodder plants like for example Sericea lespedeza have shown very good anthelmintic properties. Feeding sericea to sheep or goat substantially reduced internal parasites like gastrointestinal nematodes. Deworming with fodder plants is very advantageous because the animals are properly fed and treated at the same time.
- e. Organic treatments like drenches made from natural products such as garlic, molasses, vegetable oil, Aloe vera products and many other natural botanicals have been used by some farmers. Copper sulphate ($CuSO_4$) in very dilute



doses is also allowed for use by organic farmers. However, there are other substances listed as permissible according to different organic standards.

6.5 Other husbandry practises in animal production

Pain inflicted by mutilation practises such as castrating, marking, dehorning, debeaking, de-tailing must be kept to a minimum. In some organic standards de-horning, debeaking and de-tailing are prohibited.

A good relationship between animals and humans is important: Frequent, gentle handling and talking to the animals leads to tame and calm animals which can be treated, driven and handled without stress, noise and injuries.

All tools and technical equipment used for animal management such as racks, fences, wells and tools for mutilations have to be kept in proper and clean condition or else animals can be hurt by nonfunctioning tools.

7. Proper handling of animal products

With the appearance of diseases like mad cow disease, avian flu and health problems caused by bacteria like *Salmonella* and *E. coli*, there is increasing public awareness of animal health and human safety. Animal products are highly perishable and provide a good medium for the development of many disease pathogens. If not well managed, they can be a serious source of infection to the consumers of these animal products.

Slaughtering and preparation of animal products

The obligation in the conversion of animals into edible products and useful by-products is to slaughter the animal in a humane manner and to process the carcass in a hygienic and efficient way. At the time of slaughter, animals have to be healthy and physiologically normal. In preparation for slaughter, animals should be adequately rested, particularly if they have travelled over long distances. However, pigs and poultry are usually slaughtered on arrival as time and distances travelled are relatively short and holding them in stalls is stressful for them. Animals should be given water during holding and can be fed, if required. The holding period allows for injured and sick animals to be identified.



There are many methods of slaughtering animals but whatever method is used, should ensure minimum pain and stress to the animals by managing them calmly and without a lot of noise and by leaving the ones that know each other together. The carcass has to be prevented from contamination and waste materials have to be collected and disposed safely.

General recommendations to farmers for proper handling of animal products:

- Slaughter only healthy animals for human consumption.
- Observe the withdraw periods for conventionally treated animals before slaughtering the animals and selling their products as organic.
- Appropriate sanitary procedures have to be applied to maintain personal and food hygiene and minimise contamination of the environment.
- The carcass has to be cooled down during the first day after slaughter.
- Specific organic market standards should be observed in the whole process of slaughtering to ensure that the products are fit for the organic markets.
- Adequate preservation either by cooking, boiling, drying, salting or freezing/cooling is necessary.
- Minimising the environmental pollution through proper and safe waste water and solid waste disposal after slaughtering.

8. Organic certification and marketing of animal products

Animal products are commonly targeted for the local market in the producing countries whereby local demand normally surpasses the supply. In such situations, there is still room to increase production to meet the ever increasing demand. However, in some cases, consumers even within domestic markets are demanding sustainably produced animal products such as eggs, milk and meat. There is, therefore, an opportunity for marketing sustainably produced or organic products which can fetch premium prices. But the decision to certify animal production should be based on the availability of the market or the willingness of retailers to promote sustainably produced or organic animal products.



Discussion on markets for animal products

Assess the local situation regarding market opportunities for animal products by asking the following question:

- Which markets ask for animal products?
- Is there demand for products originating from animal friendly or organic production?
- Are there farmers in the area who are certified organic to produce and market organic animal products? How do they estimate demand and prices?



Local organic standards exist in some countries, which may have specific requirements for animal production. The following general requirements are, however, common to all:

- › Proper choice of breeds
- › Animals that were bred using cloning techniques or embryonic transfer are not allowed
- › Use of feed only from natural or organically certified sources
- › Limited use of concentrate feeds fed to ruminants
- › Chemical treatments and therapies not allowed, except for therapies described by a veterinarian
- › Permanent tethering of animals is not allowed

