



# CATTLE: HOUSING AND FEEDING MANAGEMENT

Keeping cattle is one of the most satisfying activities for many farmers. Owning cattle signifies successful farming, business, and well-being. It also means being able to maintain big creatures which require a lot of knowledge to keep and handle. If this knowledge or the means for proper care are missing, this will be obvious from the look of the animals - and the business will suffer, too.

## How many animals can I feed?

This is the first question you have to ask yourself. The main limitation is usually the amount of fodder you can provide on a regular basis. In organic production, animals are regarded as manure -producing units, and the number of farm animals depends on how much manure the farm can absorb. For cattle, this number would be one large dairy cow per acre, or two cows of a small breed.

Cattle need a lot of feed. One good dairy cow (pure Guernsey or Jersey) needs at least 5 tons of dry matter from fresh or dried grass per year. This is 25'000 kg of fresh Napier grass, or about the amount you can grow on around one acre of land. Provided you practise a very good fodder grass management or interplant the grass with legume fodder plants like desmodium, you will still need at least 0.75 acres to feed this cow well.

Dairy cows generally need much more forage than breeds for meat production, and they are high-yielding only when fodder quality is excellent. In Table 1 below you can find the fodder and land requirements for some common breeds.



## Handling cattle

Good cattle farmers are calm and gentle in their behaviour towards their animals. If an animal is sick or does not fulfil the expectations, they try to find out what could be wrong and never blame the animal. They do not shout and do not beat, but they observe their animals well and try to understand them.

Good handling is especially important with young animals. And it is rewarding: animals which never learnt to mistrust and fear humans are much easier to handle. It is less likely that they attack people, because they do not see them as enemies against whom they have to defend themselves.

Hand feeding a young animal will often create a lasting bond between the animal and the feeding person. On the other hand, once an animal has learnt that humans can not be trusted, there is no way you will ever get this out of its mind again.

### Only well-fed animals can earn you a profit

There is one very important reason why you should never keep more animals than you can feed well and keep healthy.

An animal which is not fed and kept properly also has a very low milk or meat production, if any. The feed you produce or buy just to keep it alive does not bring you any benefit. Such an animal tends to be infertile or sick and may need to be treated, or even be culled prematurely.

In other words, an underfed and suffering animal costs you more than it can earn you. Think well whether you are not better off without this animal, and if you could not use the land and the financial resources you are spending on it in a more beneficial way.

**Table 1: Cattle breeds, milk production, forage and land requirements for one cow (rough values)**

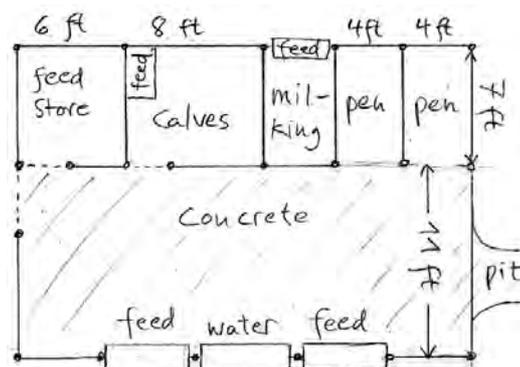
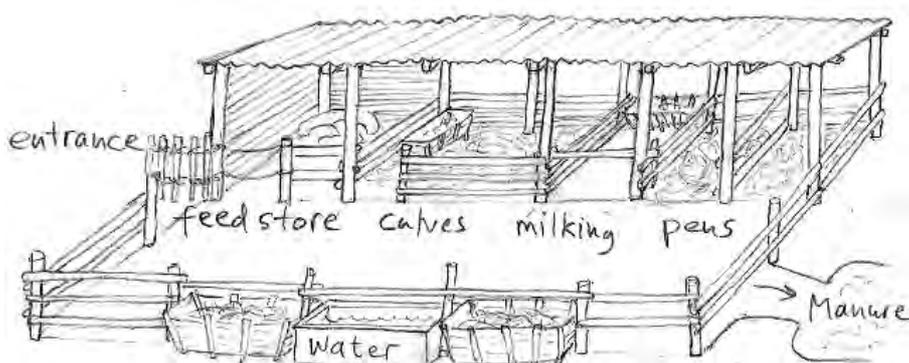
Breed	Live weight (kg)	Milk production per year (kg)	Average forage intake per day (kg fresh matter)	Total forage intake per year (t dry matter)	Area needed to produce forage for one cow (acres)
Pure Friesian	650	7500	100	6 - 7	1 - 1.5
Pure Guernsey Pure Jersey	400-450 kg	5000 - 6000	65 - 75	5 - 5.5	1
Crossbreed	350 - 500 kg	2000 - 4000	40 - 60	3 - 5	0.5 - 1
Indigenous breed (Boran, Sahiwal)	350- 400 kg	up to 2000	35 - 45	3	0.5

## The cattle unit

- Cattle are a social animal species. They should always be kept in groups of at least two animals.
- Cattle should never be tied up, except during feeding to avoid the stronger animals getting all the feed.
- Cattle must be able to move freely, especially in Zero grazing units, otherwise health problems will arise and milk production will drop. If your animals have no access to a grazing area, then the place where they are kept permanently must be considerably more spacious than a shed where animals are just taken for the night.

### Requirements of a zero grazing unit for diary cows with calves

<b>Space</b>	Each adult cow needs at least 8 square meters apart from her resting pen. The easiest way is to confine this area in front of the stall. The larger the space, the better!	<b>Troughs</b>	Provide troughs for feeds and for water.
<b>Roof</b>	<p>All animals must be able to stand in the shade and shelter under the roof.</p> <ul style="list-style-type: none"> <li>• The roof must be high enough for a person to stand up and work under it.</li> <li>• It must slope away from the pen so rainwater doesn't flow into it.</li> <li>• Covered areas:               <ul style="list-style-type: none"> <li>resting boxes</li> <li>calves' pen</li> <li>milking place</li> <li>fodder store</li> <li>mineral salt box</li> </ul> </li> <li>• If your region is very hot or very wet, you should roof feed troughs and the walking area or part of it to provide more shelter.</li> </ul>	<b>Water</b>	The shed should be close to a reliable source of clean water. One dairy cow needs between 50 and 180 litres of water every day (5 to 18 buckets).
<b>Floor</b>	<ul style="list-style-type: none"> <li>• should be made of concrete or hard-packed soil. Concrete is easiest to clean.</li> <li>• should not be too smooth; otherwise the cattle will slip on it. A rough floor also keeps the hooves short.</li> <li>• The ground must slope gently towards a channel leading to a manure pit outside the pen.</li> </ul>	<b>Milking area</b>	<ul style="list-style-type: none"> <li>• Provide a separate area for milking.</li> <li>• Provide a trough there, so the cow can feed during milking.</li> </ul>
<b>Resting pens</b>	<ul style="list-style-type: none"> <li>• Each cow must have her own resting box or cubicle where she can lie down, chew cud, and sleep.</li> <li>• They should measure 4 feet x 7 feet.</li> <li>• The floor should be dry and made of soil. Cattle should never lie on concrete, as this wounds their joints.</li> </ul>	<b>Calves</b>	<p>Reserve an area especially for calves. If there are several calves, the area has to be large enough for all of them.</p> <ul style="list-style-type: none"> <li>• Provide at least 2 square meters for each calf.</li> <li>• Provide an opening to the calf area which is too narrow for cows to enter, but easy for calves to pass, when they are allowed to join their mothers.</li> <li>• Fix a small feeding trough inside the calves' pen. Provide water as well.</li> <li>• The calves' pen needs to be kept especially clean and dry.</li> </ul>
<b>Bedding</b>	The area where the animals lie and rest and the calves' pen should have beddings. Use a layer of any dry vegetative material to absorb urine and manure.	<b>Manure pit</b>	<p>Dig a large manure pit and a channel leading from the walking area to the pit.</p> <ul style="list-style-type: none"> <li>• A concrete pit is best.</li> <li>• You can also make a paste of red soil, cow dung and ash, and smear this paste on the sides and bottom of the pit; then allow it to dry. Repeat this five times to build up a relatively leak-proof pit.</li> <li>• Manure must be protected from heavy rain and from the sun. Build some kind of roof or use at least a good big plastic sheet as a cover. Manure is the best fertilizer for all your crops, but it loses its value very fast if it is washed out or dries up.</li> </ul>



**Sketch and map:** This unit is designed to house two cows and their calves. The big box is for the calves, but it can also be used in case one animal is sick and needs to be kept apart, or for a cow to give birth.

## Maintenance of the cattle unit

- Dung and urine have to be swept into the manure pit at least once every day. Keep the pit covered.
- The bedding material must be changed as soon as it is soaked and dirty. This is necessary to keep the animals clean and dry and will prevent serious diseases like diarrhoea, foot rot and mastitis.
- Clean the feeding troughs every time before you put fresh fodder into them.
- The water trough needs to be cleaned and brushed out from time to time.

## Feeding cattle

The basic requirements of cattle are simple: they need grass, and they need water. But feeding them adequately can be challenging if you do not have large grazing areas where the animals can feed themselves.

Cattle for meat production are not very demanding concerning fodder quality. But if you want a cow which produces milk, it is never enough to just give her what you have. Feeding dairy cows is demanding and a real science. A dairy cow requires your whole attention!



## Fodder amount

A small animal will obviously feed less than a large animal. But the amount an animal feeds depends also on the quality of the feed: from good feeds, it will consume higher amounts.

Dairy cows naturally produce most milk during the first three months after calving. Then production drops slowly and stops before the next calf is born. There is no way to prevent this and even the largest amounts of the most expensive quality feeds will not change this.

A cow requires a certain feed quantity just to keep her body weight; this is called maintenance. A 450 kg-cow needs 20 to 30 kg of fresh fodder per day, depending on feed quality.

For milk production, she needs additional forage: about 3 kg of fresh grass for each litre of milk. As her milk production increases, so does her forage intake. But from a certain point, because her stomach can not extend forever, she needs better and more concentrated feeds to produce still more milk.

## Water

Water is required for all body functions and must be provided at all times. All creatures will die from lack of water quicker than from lack of any other nutrient.

A cow needs:

- 40 to 50 litres of water per day for her own body
- 1.5 litres of water for every litre of milk produced

To produce 10 litres of milk, a medium cow needs 40 + 15 litres = 55 litres of water per day (6 buckets).

For 15 litres of milk: 40 l + 15 x 1.5 litres = 62.5 litres.

For 20 litres of milk: 40 l + 30 l = 70 litres and so on.

If is very hot, cattle need even more water. When hay or concentrates are fed, more water will be needed for proper digestion.

Calves also need increasing amounts of clean water while they are growing. Fix at least a bucket in the calves' pen and refill it several times per day.

## Fodder quality and milk production

Good and nutritious fodder is green, young and fresh. Young plant growth contains more proteins which are necessary for milk production, but also for growth of young animals. Old, dried up fodder plants or crop residues have lost most of the nutrients required for animal productivity. You can offer mountains of dry maize stalks to a cow, but you will still not see more milk.

Like all creatures, a cow has exact requirements. A dairy cow can probably produce more milk than any other animal, but if she is not given the nutrients she needs, it is just impossible for her to do it.

From Napier grass of good quality alone, a dairy cow can produce around 10 - 15 litres of milk per day, if she eats up to 70 kg (seven good head loads) every day. This is the point where the nutrient composition of Napier and most other grasses restricts the production of a higher amount of milk. The problem is the protein content which is insufficient.

Missing proteins can be provided with other fodder sources. Green plants high in proteins, usually legumes, can be mixed with the Napier grass (see Table 2 beneath).

Legumes should not be used in higher shares than 30% of the total ration, because most of them contain substances which affect digestion. But in this way, you can raise milk production up to around 12 to 18 litres per day.

**Table 2: Rough protein content of some common forage plants.**

Low protein content	Medium protein content	High protein content
<b>Crop residues</b>	<b>Grasses</b>	<b>Legumes and others</b>
Maize and Sorghum stover Banana stems Wheat, rice and barley straw	Napier, Guatemala, Rhodes, Sudan (Kow kandy), Kikuyu, Guinea, Makarikari, Congo signal grass, Giant setaria	Lablab, Lucerne, Desmodium, Centro, Calliandra, Leucaena, Sesbania, Mulberry Sweet potato vines Young maize leaves

If a cow still has a higher milk production potential, which is usually the case with exotic breeds and upgraded cows during the first months of lactation, you have to provide high quality fodder grass which has been cut at a young age (Napier: not higher than 3 feet). In addition, concentrates provide missing nutrients in a more concentrated form. For more detailed information on concentrate feeding refer to the TOF-leaflet No 11 "Fodder production and concentrates".

## Concentrates

They contain protein and / or energy sources. You have to buy them from reputable companies and stockists to ensure that they have the required quality and are worth their money. One kg dairy meal should provide 2 additional litres of milk.

- If concentrates are used in large quantities to make up for otherwise poor feeds, this can have serious consequences for the cow. A ruminant's stomach is made specifically to digest roughage, material from green plants, which must never be replaced by other feed. Please read the box beneath to see why!
- Concentrates are usually added to the feed per litre of milk production above a certain level. If you provide roughage and legumes of high quality, then this level is at around 15 litres of milk.
- Concentrates should always be given in small portions of not more than 2 kg at once, mixed with roughages.
- Increase of concentrates before and during lactation should not be higher than 2 kg per week.
- It is not advisable to feed more than 6 kg concentrate per day to a medium sized cow (450 kg).

### Too much concentrates can be dangerous

Concentrates in high quantities, and this also includes all grains, disturb the natural and very complicated balance in the digestive system of cattle. When this happens, the cow will eat less, because she feels sick.

Milk production will not increase, but drop instead. The changes in the system can seriously affect the health of the cow, leading to changes in the blood, cramps, protein deficiency, vitamin deficiency and loss of weight, reduced growth of the unborn calf, fertility problems and strain on the liver.

For cows with high milk production it is therefore essential to provide high quality roughage. This is achieved with young fodder grasses and legumes. Napier grass for example should be well fertilized and harvested when it is not higher than 3 feet to have the required forage quality. For the dry season, hay and silage should be prepared.

## Minerals

Dairy cows, but also beef breeds need appropriate levels of Ca, P, Mg and other trace elements which are usually not provided from the fodder. These minerals are very important and have to be given in the right proportions.

Pregnant cows especially require adequate amounts of minerals for the development of their calf. In addition, traditional dry season feeds are generally very low in minerals and should be supplemented generously.

- Salt licks in blocks should be available for the animals at all times.
- In addition, around 100 grams of minerals in granules may be mixed into the concentrate every day and for each cow.
- Never give cows the ordinary table salt as it does not contain any of the required minerals!
- The mineral feed box needs to be protected from rain.
- Be careful when purchasing locally produced licks. Numerous products are on the market, and it is difficult to say which one has the right composition and quality. Forages from different regions also have different mineral composition.
- To make the right choice, it is therefore advisable to seek advice from the local livestock extension office for the recommended mineral.

## How are the feeds offered?

- For cattle, the natural way to feed is by being busy with grazing for a total of 10 hours a day, and another 7 hours with chewing cud. If you want to be sure that a dairy cow produces the maximum amount of milk she can, the best way is to offer as much feed as she will eat.
- Ideally, roughage is provided during the whole day and the trough should never be completely empty. Provide the feed at least in the morning and in the evening. You will need big troughs which can hold the required 25 to 40 kg of Napier grass for each animal. Chop it to avoid waste by the cows spilling long grass all over the place.
- It is natural that the stronger cows eat from the ration of weaker animals. If you have several animals and observe that not all of them get enough fodder, you should tie them up or separate them for feeding. If you only feed them twice a day, you should tie them up for at least two or three hours each time. Cows are slow eaters.
- Calves should also be offered roughages from the start. At the beginning, they will just nibble a bit, but they will get used to it soon. Their stomach will develop faster this way, they can be weaned earlier, and their overall development will be healthier.
- After feeding, all cattle will want to drink a sufficient amount of clean water.

