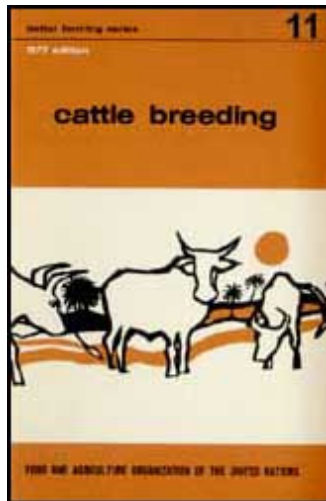


























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 The reproductive systems

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 How to know your herd

 What cattle produce

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 Milk production

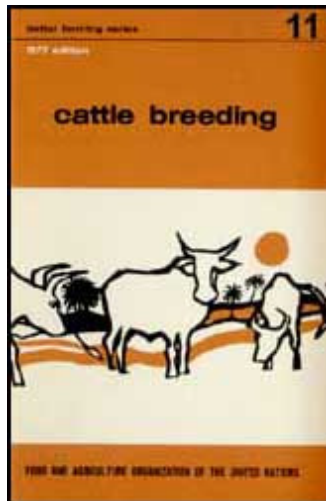
 Organizing sales


 (*introduction...*)





 Farmers' groups



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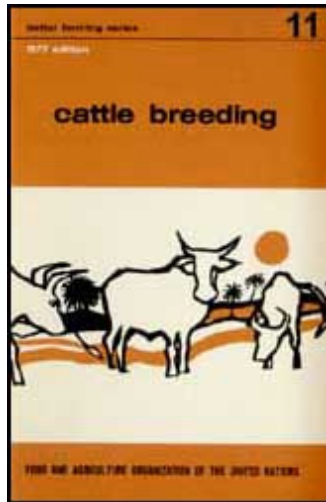
 Better Farming Series 11- Cattle Breeding  
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 *(introduction...)*

  Preface

 Cattle breeding means wealth

 A few words to understand the course



- Feeding cattle
- Looking after cattle
- How cattle reproduce
- What cattle produce
- Organizing sales

## Preface

This manual is a translation and adaptation of "L'elevage des bovine," published by the Agri- Service- Afrique of the Institut africain pour le developpement economique et social (INADES), and forms part of a series. Grateful acknowledgement is made to the publishers for making available this text, which it is hoped will find widespread use at the intermediate level of agricultural education

and training in English- speaking countries.

The original texts were prepared for an African environment and this is naturally reflected in the English version. However, it is expected that many of the manuals of the series - a list of which will be found on the inside front cover - will also be of value for training in many other parts of the world. Adaptations can be made to the text where necessary owing to different climatic and ecological conditions.

Applications for permission to issue this manual in other languages are welcomed. Such applications should be addressed to: Director, Publications Division, Food and Agriculture Organization of the United Nations, Via delle Terme di Caracalla, 00100 Rome, Italy.

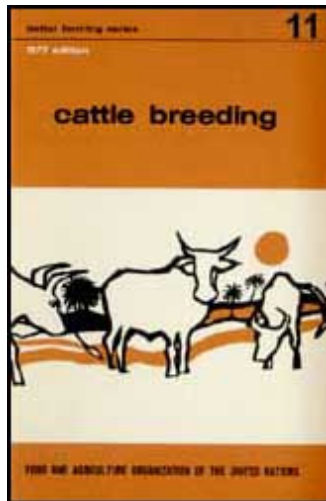
The author of this English version is Mr. A.J. Henderson, former Chief of the FAO Editorial Branch.











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## □ Organizing sales

### **Cattle breeding means wealth**

In traditional breeding not much trouble is taken with the herd.

The herd is not a means of earning a living, but a sign of wealth and power.

The owner wants to have a lot of animals, but many of them are small, ill, or very old and thin.

In traditional breeding the herd is wealth that produces little.

To make the herd produce more, a different way of working is needed.

A modern farmer should learn to

- feed his animals well;

- house his herd well;
- take good care of ill animals;
- make a good choice of breeding animals;
- sell at a good price.

Cattle breeding is wealth; it is capital that can produce a lot.



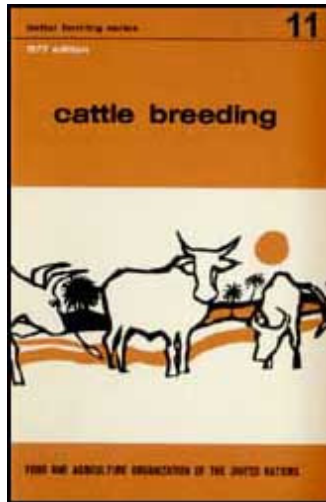
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*(introduction...)*



- 📄 Preface
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- ☐ Feeding cattle
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- ☐ What cattle produce
- ☐ Organizing sales

## **A few words to understand the course**

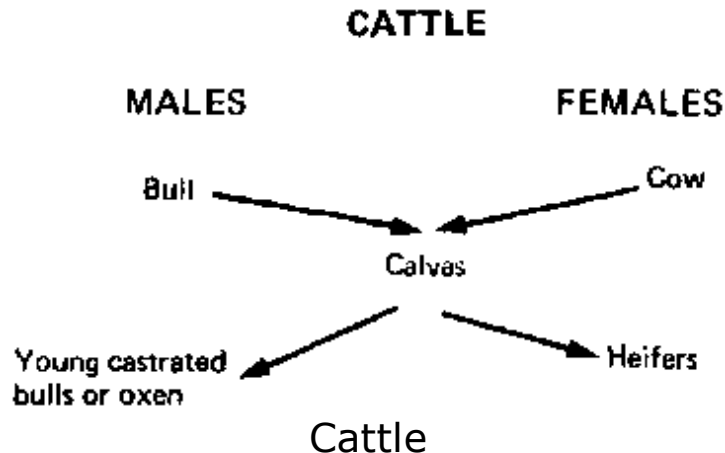
Mamadou is happy to show us his animals. He has a fine herd of cattle.

His herd of cattle consists of:

- 1 male: the male is called the bull.
- 8 females which have already had young ones: the mother

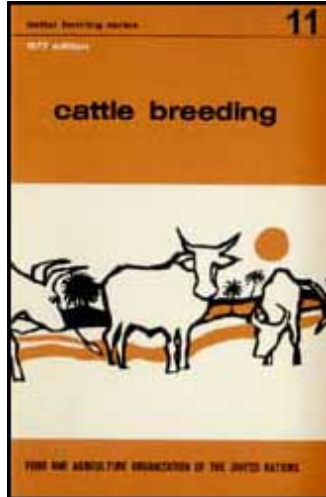
females are called cows.


- 6 young ones of less than 6 months: they are called calves.
- 4 young females which have not yet had calves: they are called heifers.
- A pair of oxen for ploughing. These animals have been castrated; they cannot make young ones any more.



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 Better Farming Series 11- Cattle Breeding (FAO - INADES, 1977, 63 p.)

➔  Feeding cattle

 *(introduction...)*

 How cattle feed

How to feed cattle

 *(introduction...)*

 Improving pasture

 Storing grass

 Mineral supplements

 Daily requirements of cattle in feed

units and protein



Watering cattle



How to feed calves

## **Better Farming Series 11- Cattle Breeding (FAO - INADES, 1977, 63 p.)**

### **Feeding cattle**

It is very important to feed cattle well.

An animal that is badly fed grows badly; does not produce much meat; does not produce good calves; is often ill.

A modern farmer pays attention to his animals' feeding.

He knows the needs (see Booklet No. 8, page 20) of all the animals in his herd.

He gives the cattle food to meet their needs and gives it regularly

(see Booklet No. 8, page 23).

He knows too that all the animals in the herd do not use their food in the same way.

For example:

He knows that one ox in his herd gains weight faster than the others. He knows that this ox makes better use of the food given to it.

A cow which is expecting a calf gets more food. It has a pregnancy requirement (see Booklet No. 8, page 21).

A working ox also needs more food. It has a production requirement (see Booklet No. 8, page 20).

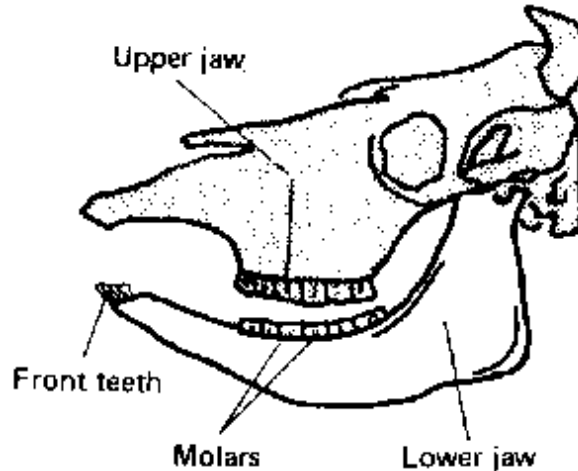
## **How cattle feed**

Cattle eat chiefly grass. We shall see how the grass is used, how it is digested.



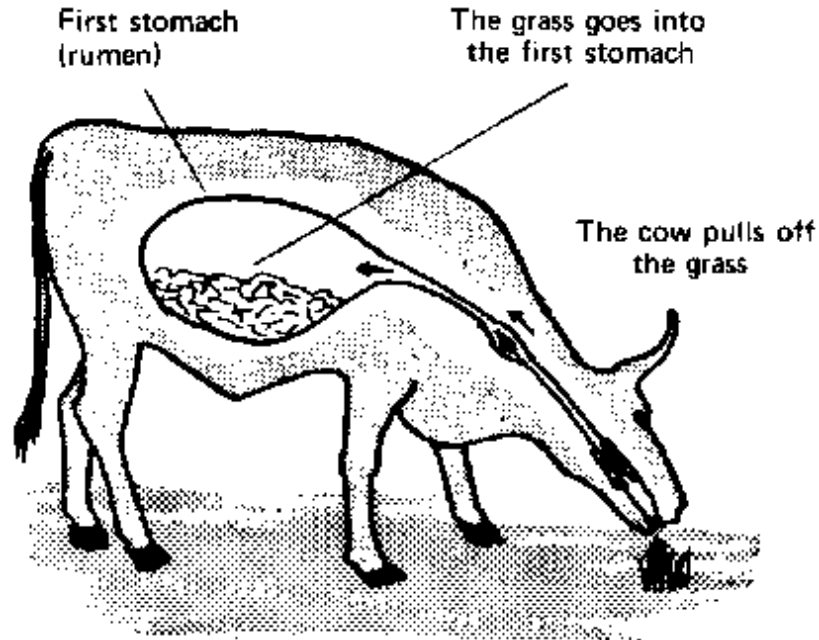
- Let us watch a cow feeding. When a cow feeds, it takes a little grass with its tongue. It grips the grass between the upper jaw and the teeth of the lower jaw. It jerks its head to pull off the grass.
- Let us look at a cow's mouth. There are two jaws and a tongue. The upper jaw has no front teeth. The lower jaw has eight front teeth. The older the animal is, the more the teeth are worn. You can tell the age of a cow by looking at its front teeth.

Toward the back of the mouth you can see large teeth. With these the cow chews the grass. They are called molars.



Bones of a cow's head

When the cow has bitten off the grass, it does not chew the grass at once with its teeth; it swallows it. The grass goes into the first stomach (or rumen).



A cow feeding

A cow can eat a lot of grass; there is room for up to 15 kilogrammes of grass in its first stomach, depending on the size of the breed.

But a cow needs a lot of time to feed, to fill up its first stomach. So

you must give a cow, and especially working oxen, at least 8 hours a day to feed off pasture.

Cattle ruminate.

When a cow has finished filling its first stomach, it often lies down.

But it goes on moving its jaws. It is ruminating.

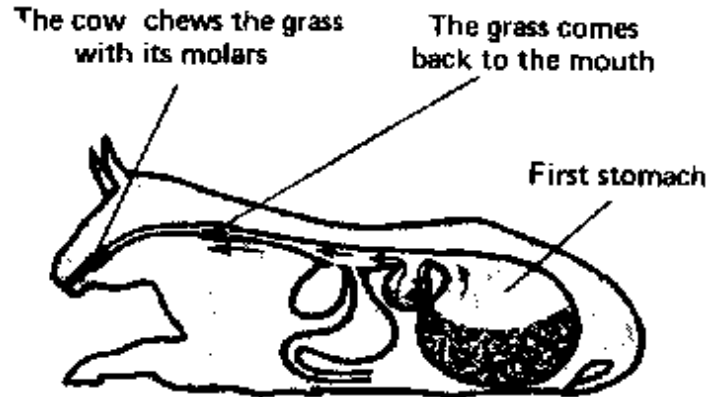
The cow brings up a little grass from its first stomach into its mouth.

It chews this grass for a long time with its molars.

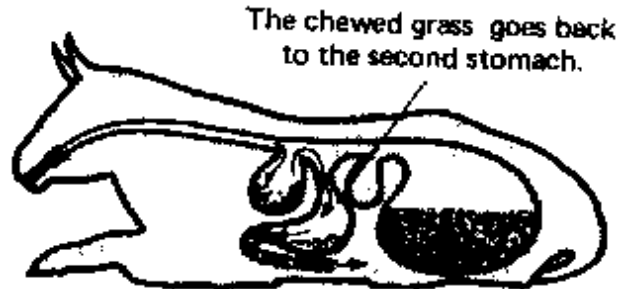
When the grass is well chewed and broken down, the cow swallows it again.

But this time the grass does not go into the first stomach, but into the second one.

A cow needs several hours to ruminate.



A ruminating cow: the grass comes back to the mouth



A ruminating cow: the grass goes to the second stomach where it is digested

- A cow can ruminate well when it is quiet, and above all when it is lying down.

If you make a shelter, the cow will be protected from rain, wind and sun; it will be quiet; it will rest; it can ruminate well.

- The cow ruminates because its digestive system is made to digest and transform grass. The digestive system consists of the mouth which takes in the grass, of the first stomach which stores it, of the molars which chew it, and of the other parts of the stomach and intestine which digest it. This intestine is very long, more than 20 metres.

- Animals that ruminate are called ruminants.

Goats, cows, sheep and camels are ruminants.

Young calves do not ruminate, because their first stomach is not yet developed. So they must be given different food.

## **How to feed cattle**

Cattle must be given enough food, and rich food, all the year round.

- Enough food

If an animal cannot find enough food, it cannot gain weight.

All the food is needed for its maintenance (see Booklet No. 8, page 20).

- Rich food

Cattle eat grass.

They find in grass what they need to build their bodies and become strong.

But it is often necessary to give them a feed supplement (see Booklet No. 8, page 14).

Cattle that are raised for meat must grow quickly.

Then you can sell them faster and make money faster.

So give them a feed supplement.

An ox that is bred for working must be strong, have big muscles and bones. It will be strong if it is well fed.

So give it a feed supplement.

A cow that is producing calves needs good feeding. It has to feed the calf in its womb. And then it has to give the calf milk.

So give the cow a feed supplement.

- All the year round
- In the rainy season there is plenty of grass, it grows quicker. It is easy to feed cattle then.



- In the dry season it is very difficult to feed animals well. Grass becomes hard and scarce. The stems are tall, the leaves dry. Animals don't want to eat this grass. They get thin and sometimes die.

So there are months in the year when cattle are well fed.

There are other months in the year when cattle are badly fed. They get thin, lose the weight they have gained during the rainy season.

That is why you have to wait several years, often 5 or even 7 years, to get cattle for selling.

If the cattle were better fed, especially in the dry season, they would take fewer years to reach the same weight.

They could be sold when they were younger.

A modern cattle breeder who hasn't got enough food for his animals during the dry season should sell some of the animals at the end of

the rainy season.

Then his animals will have enough food during the dry season, they will not get thin, they will stay in good health.

- How are cattle fed in traditional animal husbandry?

To give the animals enough food all the year round, people used to move the herd from place to place.

When there is no more water and grass in one region, the herd is taken to another region where there is still water and grass. This is called transhumance.

During the dry season, grasses are very hard and very tall. They prevent the cattle from walking and they are not good to eat. So they are burned. After the fire the grasses grow again and are better for the animals to eat.

But brush fires damage the soil (see Booklet No, 5, page 21 ) and

they destroy useful plants which cannot stand burning as well as grass.

- The modern way of feeding cattle

In order to give animals enough good food all the year, farmers

- improve their pastures
- make new pastures and grow fodder crops
- store green fodder as silage and hay
- give their animals feed supplements
- give their animals enough water

## **Improving pasture**

A pasture is the field where cattle find grass to eat.

In order to have tender, young grass, divide the pasture into four parts.

Each week put the cattle in one part, and let the grass grow in the

other parts.

At the end of four weeks go back to the first part



First week



Second week



Third week



Fourth week

## The four weeks

After the herd has been through the pasture, cut the weeds before they seed, so that they won't multiply.

### **Storing grass**

During the rainy season, grass grows a lot. The cattle do not eat all of it. Grass can be stored in the form of silage or hay.

- Silage

Dig a pit 1.50 to 2 metres deep and 1.50 to 2 metres wide.

This pit is called a silo.

It has to be made rather long, so that all the cut grass can be put into it.

At the bottom of the silo put some large stones.

On these stones put the grass to be stored.

Tread the grass well down by trampling on it.

On top of the full silo, on the pressed- down grass, put earth and

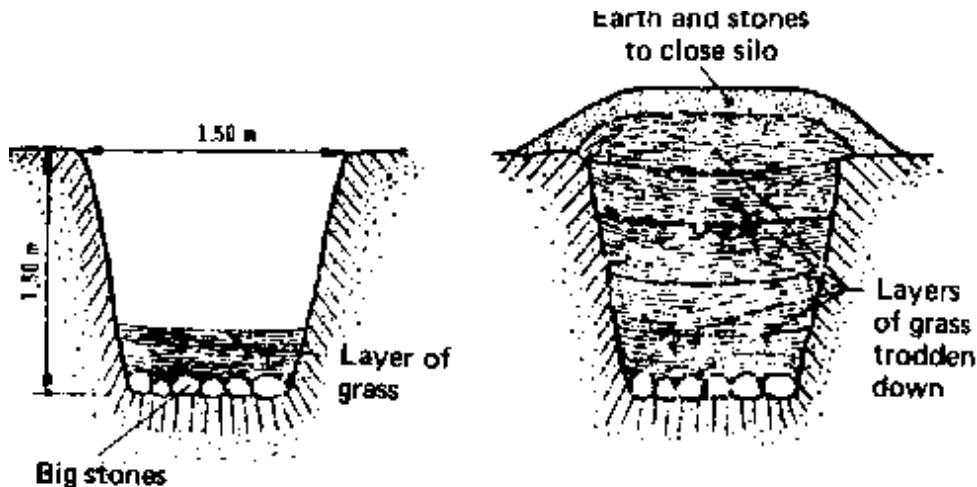
stones.

The silo must be well closed, so that air and rain cannot get in, and the grass will not rot.

Grass so kept stays good for a long time, for several months.

Animals eat it readily.

So that the grass stays good, you must not take more than 2 days to fill, tread down and close the silo.



A silo  
A silo

- Hay

You can also dry grass. Cut the grass when it is green and let it dry. The dried grass is called hay. Many farmers keep the dried stalks and leaves of groundnuts in order to feed them to animals. This is groundnut hay. Hay is nearly as good a food as green grass.

For hay to be good food, you must cut the grass vein it is still green, before it starts going to seed, and before it becomes too hard. Cut the grass when it is young, and you'll get good hay. If you wait too long before cutting the grass, you will get not hay, but straw. Animals do eat straw, but it is not easy to digest. Straw is used for making manure.

### How to make hay

You can cut grass with a machete. But you will get the work done more quickly if you cut the grass with a scythe.



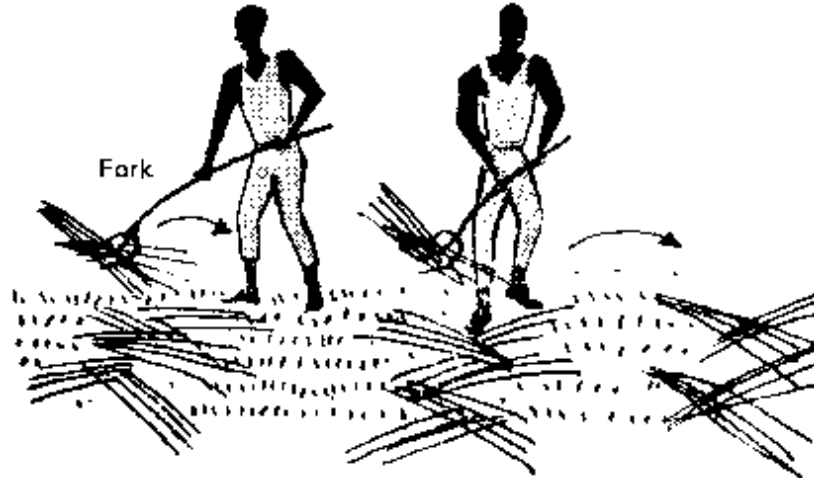
### Cutting grass with a scythe

When the grass is cut, let it dry in the sun. Then turn it over and leave in the sun the parts that are not yet dry. This work is done with a fork. When all the grass is quite dry, make it into a big heap



next to the animal shed.

Then you can give the animals food during the dry season.



When the grass is dry on one side, turn it over to dry on the other side

Sun is needed to dry grass.

So you must wait for the end of the rainy season before you make

hay.

## Feed supplements

When there is not enough fodder, when the grass is very hard, give the cattle a feed supplement.

When oxen are working, when cows are about to calve, when cows are giving milk, they must be given a feed supplement.

You can give them oil cake made from groundnuts, copra or cottonseed.

You can also buy cattle meal.

Some manufacturers make a feed in which every 100 kilogrammes contain: 50 kg maize meal 10 kg copra oil cake 38 kg groundnut oil cake

2 kg mineral salts (dicalcium phosphate and salt).

For example, a cow weighing 300 kg which gives 3 litres of milk can

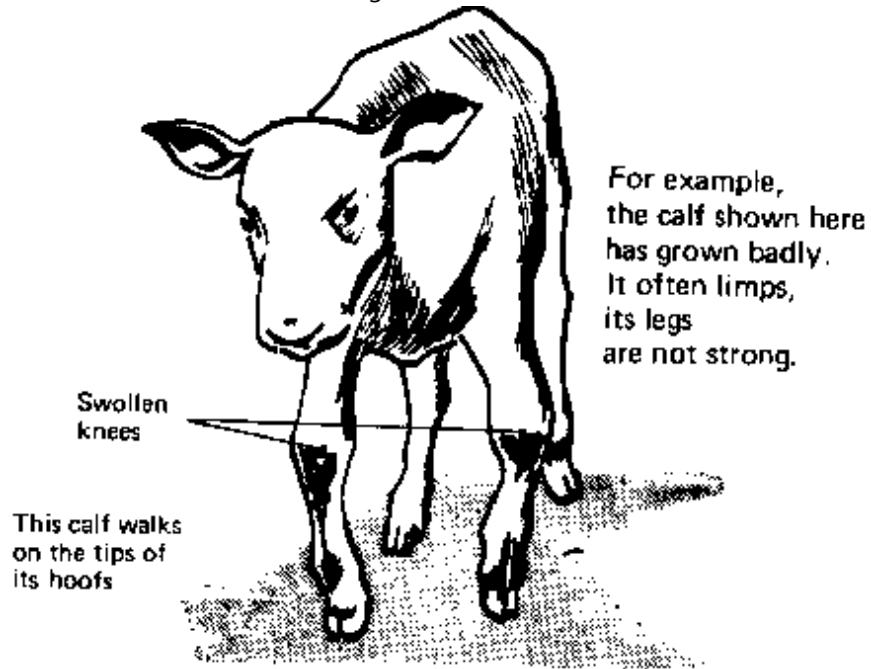
be given every day:

15 kg of pasture grass

1 kg of palm kernel or copra oil cake.

## **Mineral supplements**

A mineral supplement supplies mineral salts. Animals too need mineral salts. If animals do not get enough mineral salts, their bones will not grow well.



This calf has not had enough mineral salts

You can also give mineral salts by putting salt in the water or in the hay, by giving native soda or a mineral lick (licking stone). A licking stone weighing 1 kg contains: salt (400 g), calcium (150 g), phosphorus (80 g) and other mineral salts.

## Supplementary note (see Booklet No. 8, pages 20-21)

### Daily requirements of cattle in feed units and protein

- Maintenance requirement

<b>Weight (kg)</b>	<b>Feed units</b>	<b>Protein (g)</b>
50	0.7	25
100	1.1	50
150	1.5	75
200	1.9	100
250	2.3	125
300	2.6	150
each additional 50	0.3	25

- Growth requirement

**Aae**                      **Feed units Protein (a)**

Up to 1 Year	1.4	300
1 to 1 1/2 years	2.7	200
1 1/2 to 2 years	3.0	200
2 to 3 years	3.2	200

- Fattening requirement

### **Feed Units Protein (g)**

3.0                  150

### Pregnancy requirement

#### **Feed units Protein (g)**

Fifth month	0.3	During the last 2 months double the maintenance requirement
Sixth month	0.6	
Additional per month	0.3	

### Lactation requirement

## **Feed units Protein (g)**

Per litre of milk 0.3                      60

- Work requirement

### **Feed units Protein (g)**

Normal work 0.2                      200

Heavy work 0.3                      240

## **Watering cattle**

Animals need water.

Animals lose weight in the dry season because they are not well fed, but also because they do not drink enough.

An ox can drink 30 to 40 litres of water a day, or even more in the dry season, if it is very hot and the grass is very dry. Oxen do not need to drink as much if it is not very hot and if the food contains

plenty of water, such as green grass or silage.

Animals drink

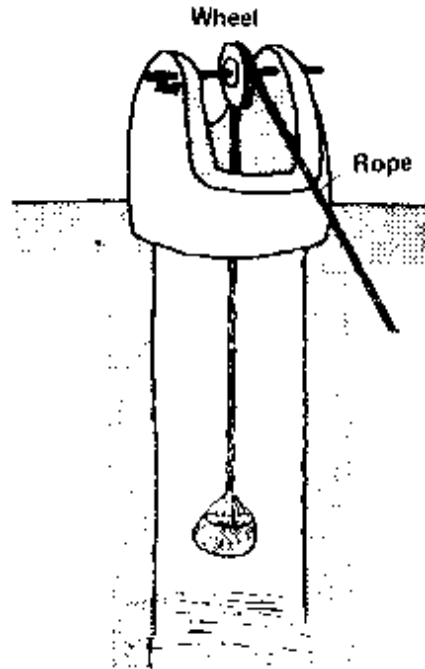
- at the cattle shed, from a hollowed- out tree trunk, or from a barrel cut in half, or from a concrete basin, all of which must always be kept very clean.
- from a river or stream. But you must be careful, because the water is often dirty and may give the animals some disease. Their water must always be clean. You can build a little dam (see Booklet No. 6, page 16) to store up water.
- at a well.

Wells are sometimes very deep and it takes a lot of work to draw water from them.

It is quicker with a hand pump or a motor pump, or with a rope and wheel.



You can use an ox or a donkey to pull the rope.



Drawing water from a well

So, remember, it is important:

- to give every animal every day all the water it needs, even in the dry season. It is best to let the animals drink two or three times a day.
- to give them water that is as clean as possible. Many diseases come from dirty water.
- not to let the animals stand in the water after they have drunk. They make the water dirty.

It is good to add a little salt to the water. We have seen that mineral salts are good for animals.

## **How to feed calves**

- At the beginning, with mother's milk

The first stomach of a young calf is not fully developed. It cannot ruminate. If it is fed grass, it cannot digest it (see page 8).

But milk is digested without ruminating. So the best food for a

young calf is the mother's milk.

But too often the cows do not have much milk and the calves cannot drink enough.

Never feed two calves with the milk of only one cow.

The cow gives too little milk to feed two calves.

A two- month- old calf fed with its mother's milk needs 4 to 6 litres of milk a day.

During the first 2 months leave all the mother's milk for the young calf. During this period do not milk the cow. Keep all her milk for the calf.

It pays better to do that.

If you sell milk during these first 2 months, you earn a little money.

But the calf will not be well fed, it will not put on weight.

It may die.

In that case you will lose a lot of money.

- Later, with grass

For 2 months the calf drinks its mother's milk.

At the age of 3 weeks, it can be given a little green grass. Its stomach develops and it begins to ruminate. At 3 months it can digest grass. The calf, we say, is then weaned. It no longer needs all its mother's milk. The cow can then be milked.

After weaning, the calf no longer drinks its mother's milk and feeds on grass.

Weaning is often the time when calves die. It is difficult for calves to change from one food to another.

To help a calf at weaning, give it a feed supplement as well as grass. If you mix this feed supplement with water, the calf will digest it better.

Do not forget to give calves a mineral supplement (see page 17).

If a calf lacks mineral salts its bones will be badly formed.

## FEED SUPPLEMENTS AT WEANING

You may give the calf any of the following:

- Cereals

Millet, sorghum, maize, rice are good feed for calves.

Crush these cereals so that they are well digested.

1 kg of crushed millet feeds a calf as well as 2 kg of whole millet grain.

These feeds are costly.

They are food for people, but you can give animals grain that is broken or damaged by insects, and the part that people do not eat, that is, the bran of rice, maize or millet.

- Oil cake

This is the name for what remains when the oil has been taken from groundnuts, copra, oil palm kernels or cottonseed.

Oil cake is good food, rich in protein.

Meal for calves Dealers sometimes sell meal for animals. This meal is a mixture of crushed grain and oil cake.

For instance, to make 100 kg of meal, the following mixture is used:

62 kg of crushed sorghum  
35 kg of groundnut oil cake  
3 kg of mineral supplement.

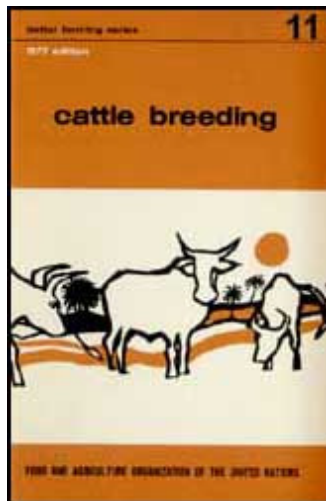
The 3 kg of mineral supplement contain:


0.6 kg lime  
0.3 kg salt  
2.5 kg bone ash.











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 Better Farming Series 11- Cattle Breeding (FAO - INADES, 1977, 63 p.)

- ➔  Looking after cattle
  -  Animals must be watched
  -  How to watch over animals
  -  Housing animals
  -  The health of the herd
    -  (*introduction...*)
    -  Diseases
    -  Cattle must be vaccinated



How to take care of wounds



What to do about parasites

## **Better Farming Series 11- Cattle Breeding (FAO - INADES, 1977, 63 p.)**

### **Looking after cattle**

#### **Animals must be watched**

A farmer who leaves his animals to roam freely, who does not watch them, has not much work to do.

But his cattle:

- do not make good use of the grass. They eat the good grasses first and leave the poor ones. The good grasses are always eaten before they make seeds, and so they cannot multiply. On the other hand, the poor grasses which are not eaten grow well and make many seeds. So they multiply and the pasture becomes poor.

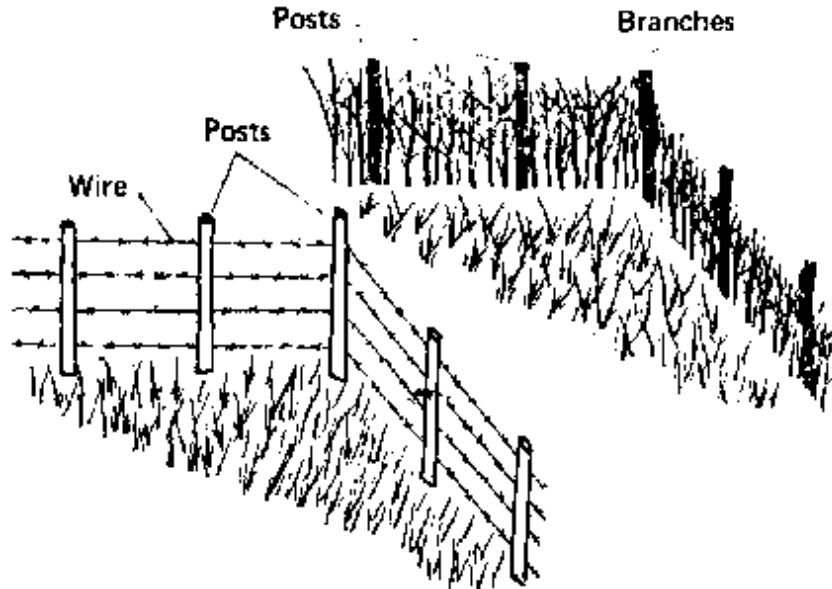


- may have accidents and get diseases. They may go near streams where they are bitten by tsetse flies and catch sleeping sickness. If an animal is bitten by a snake or has some accident, nobody knows about it, and nobody looks after the animal. The oxen can also be stolen more easily.
- damage crops. To prevent animals from damaging crops, fields must be surrounded by fences, or else fields a long way from the village must be farmed. Then the farmer loses a lot of time going to his fields.

## **How to watch over animals**

- In a paddock

To make a paddock, put a fence around the pasture so that the animals cannot get out. The fence is made with wire and posts. But wire is costly.



Two kinds of fence

There are cheaper ways of making a fence. You can plant a row of small trees very close to one another, or two rows of sisal or thorns. You can also use millet stalks. It takes a lot of time and work to make fences and keep them in good repair.

In the paddock it is easier to keep the animals under watch.

They can't get out and damage the crops, and they make better use of all the grass of the pasture.

Making fences requires money and work. It is useless to spend money unless at the same time you improve the animals' food, and house them better and look after them better.

- With a herdsman

It is best for the farmer himself to watch over his animals. He can also get some member of the family to do it. Or several farmers who know one another well can put their cattle together, and pay a herdsman. In any event, the farmer must keep an eye on the herdsman to make sure he is doing his job well.

To do his job well, a herdsman must know about animals, look after them well, and lead them to good pastures. A good herdsman does not cheat the farmers; for example, he does not sell the milk which the calves are supposed to drink.

To help the herdsman, a dog can be trained to lead the animals, to prevent them from leaving the herd and to bring them back when they do. A well-trained dog is very useful to the herdsman.

## **Housing animals**

Why shelter is needed

To protect the animals from wild beasts, from wind, sun and rain, and from diseases.

- In a traditional enclosure there are often too many animals.

The cattle stand on a mixture of earth, excrement, urine and water. They can't lie down. They can't ruminate well, and do not make good use of their food.

They are very dirty. When animals are dirty they get more diseases, their wounds do not heal well, especially those of the feet.

The calves are in danger.

Parasites and diseases attack them more easily.

Many calves die.

Each time a calf dies you lose a lot of money.

Good manure cannot be made.

Instead you have only a mixture of earth and excrement. This mixture is not as good for the fields as real manure.

The traditional enclosure must be improved by making a shed and a manure heap.

How to make a cow shed and manure heap

Animals must not be left to stand on a mixture of earth, excrement and water.

Choose a dry place.

If you put up the shed in a hollow, the rainwater will collect there and will not run off.

You can greatly improve the animals' housing without spending too much money, by using wood, earth and straw which you can find on the spot.

Animals must be protected from wind.

Build a wall on the side from which the wind usually blows.

Animals must be protected from sun and rain. Put up a straw roof.

When the shed is built, spread straw on the ground. This straw, mixed with excrement and urine, rots and makes manure. When the straw is rotted, put clean, dry straw on top of it, so that the animals are always on clean straw.

When there is a lot of manure, take it away. You can either take it straight to the field and mix it at once with the soil by ploughing it in, or else you can make a manure heap near the shed. Then you can take the manure to the fields when you are ready to plough.

- The animals must not be too crowded in the shed.

If they are too crowded, they have no room to lie down, and may hurt themselves.

A cow needs 5 to 6 square metres space (3 metres by 2).

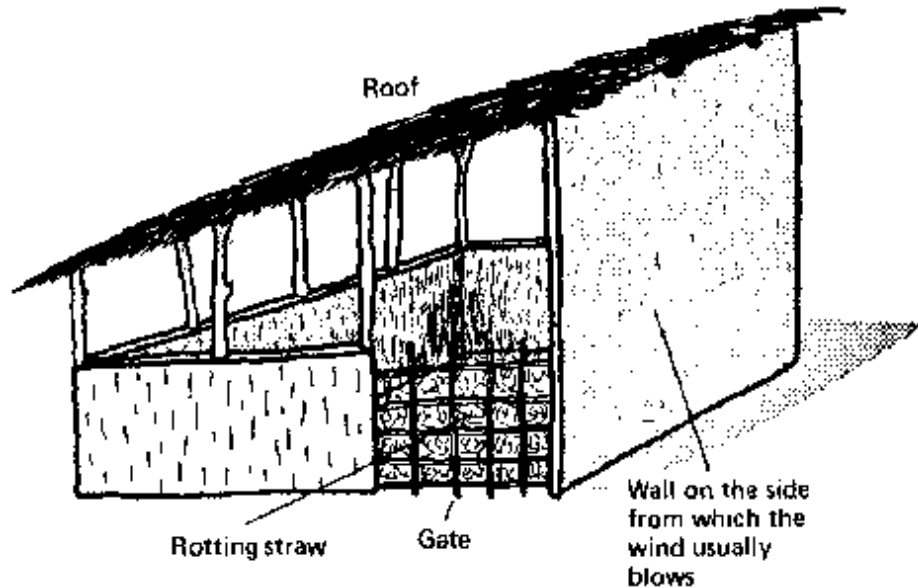
For example:

there is room for 6 cows

in a cow shed 5 metres wide and 7 metres long.

- The shed should be disinfected. once a month to kill disease germs.

Put the shed so that the wind will carry the smell away from the house.



Side view of cow shed

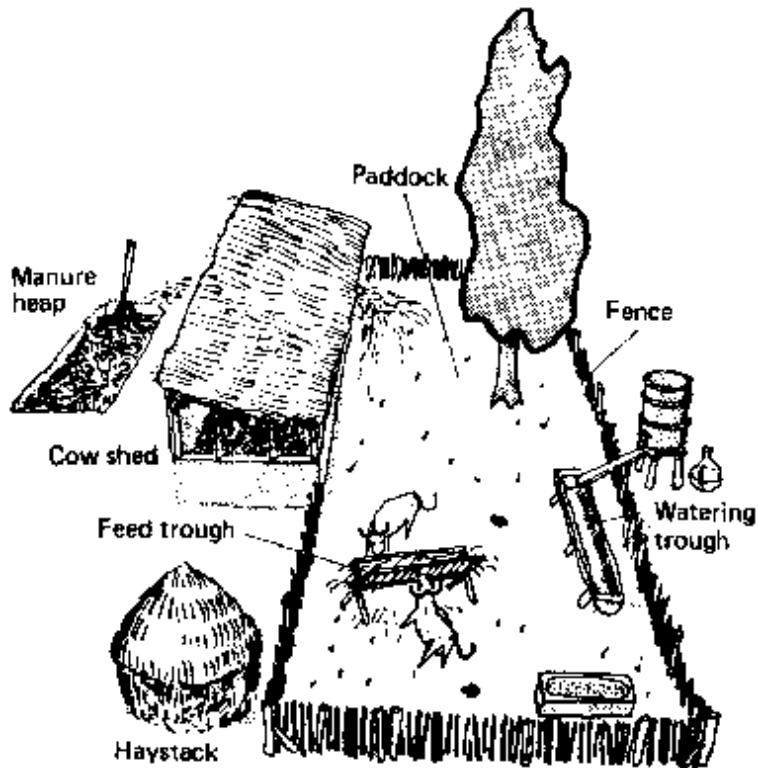
- Next to the shed, make a paddock where the animals can walk about.

Surround it with a strong fence made out of posts, branches or thorns. Leave a few trees to give shade.



Inside the paddock, put feed troughs where you can give the animals their feed supplement, and watering troughs where the animals can drink. The feed troughs and the watering troughs can be made with hollowed tree trunks or barrels cut in half.

The gates of the shed and paddock must be big enough for a cart to enter.



The paddock

## The health of the herd

An animal can be in bad health. An animal in bad health loses weight, and may even die. A good breeder looks after the health of his herd.

An animal can be in bad health because of

- diseases
- injuries
- parasites.

## **Diseases**

There are many diseases which prevent animals from growing and may even kill them.

The animal husbandry services have done a lot of work on diseases. Nowadays rinderpest and other serious diseases are much less common.

All the same, there are still many diseases to treat.

These diseases can make a farmer lose a great deal of money.

A good way of controlling diseases is vaccination (see Booklet No. 9, page 10). So too is feeding the herd well and housing it well.

A good breeder looks after the health of his herd.

- When an animal is ill, you must go and see the veterinary surgeon.

He will tell you what medicine to give the animal.

- You must keep the animal alone, by itself. Why? Because of the danger of infecting other animals.

There are two kinds of diseases:

- contagious diseases:

These are diseases which can pass from one animal to another. If one animal in a herd is ill, it can give this disease to all the other

animals. For example, rinderpest (see page 34) and anthrax (see page 35) are contagious diseases.

- noncontagious diseases:

These are diseases which do not pass from one animal to another. If one animal is ill with such a disease, this disease is no danger to the other animals.

- When an animal has a contagious disease, it must be kept by itself.

Do not leave the animal with the rest of the herd. In this way you avoid contagion for the rest of the herd.

Do not eat the meat of animals that have died from certain contagious diseases such as tuberculosis. This disease can be passed on from animals to people.

Do not mix your herd with herds passing through, especially if they

come from far away. Passing herds may bring diseases with them.

Do not mix with your herd an animal you have bought or which comes from somewhere else unless you are sure it has been vaccinated.

To make a country's animal husbandry modern, a veterinary service is necessary, and all farmers should follow the advice of this service.

If an animal dies of a contagious disease, burn the body, or bury it 2 metres deep with quicklime to kill the germs.

## THE CHIEF DISEASES OF CATTLE

### Rinderpest

The disease begins with a high fever. The animal is tired; its breathing gets faster; it shows lesions on the mucous membranes, first on the genitals, later on the lips, the nose, and around the

eyes; pus oozes from the lesions; the animal slobbers.

During the first few days of the disease, the animal is very constipated. Later, it has severe diarrhoea in which blood can be seen and which stinks very badly. After a few more days, the animal dies.

This disease is highly contagious. It can cause the whole herd to die within a few weeks. Contagion comes through drinking water being dirtied by pus or the excrement of sick animals.

There is a vaccine for this disease.

## Pleuropneumonia

At the beginning, this disease is hard to recognize. The sick animals cough in the morning; They have a slight fever and eat less. The disease may go on like that for several months. Later, the cough becomes more severe; the animal can even be made to cough by tapping its chest; breathing becomes faster and faster; the animal

stops eating and dies. Its lungs are ravaged by the disease.

Pleuropneumonia is not highly contagious; it passes from one animal to another only by means of prolonged contact.

Vaccination against this disease is recommended, and often even obligatory.

## Anthrax

This disease often takes a very rapid course. It begins with a high fever, followed by diarrhoea with blood. The animal dies within two days. The blood of the dead animal is thick and black.

Animals that die of this disease must be burned. If a man eats the meat of animals dead of anthrax, he can catch the disease. If the dead animals are buried, the disease stays in the soil, and other animals which graze grass at that spot catch the disease.

There is a vaccine against this disease.



## Black- quarter

Animals which have this disease limp; they have swellings on their muscles; they die quickly. Their meat is full of black swellings which have a very bad smell.

Animals dying of this disease must be burned. This will! avoid infecting the pastures.

There is a serum for treating this disease, and a vaccine for protecting healthy animals.

## Trypanosomiasis (sleeping sickness)

Trypanosomiasis is a disease that greatly weakens animals, because it attacks their blood. Some animals may die of the disease. The disease is transmitted by a fly which lives in hot and humid regions, especially where there are woods. This fly is called the glossina or tsetse fly.

Some animals are fairly resistant to this disease, others such as zebu cattle, asses and horses are not. Oxen are resistant, zebras are not; animals obtained from crossing the two are more resistant than pure zebras. Some goats are resistant, others are not.

All animals are more resistant when they are well fed and well looked after.

In certain regions, the tsetse fly occurs only in the neighbourhood of stagnant water and during certain months of the year. Local herdsmen should know where to take their herds, to places without flies.

There are remedies for treating this disease.

### Other diseases

Many other diseases may attack cattle, such as piroplasmiasis (Texas fever), which is transmitted by ticks, tuberculosis, which can be passed on to people, enteritis, contagious abortion, and others.

Only the most important diseases have been mentioned here.

## **Cattle must be vaccinated**

Children are vaccinated before they are ill in order to prevent them from becoming ill.

Animals should be vaccinated before they are ill in order to prevent them from becoming ill.

All animals must be taken for vaccination.

Usually vaccination is compulsory and free of charge.

If all farmers do not take their animals for vaccination, the animals which have not been vaccinated may catch the disease, and it stays in the region.

Even if there has been no contagious disease in a region for a long time, vaccination is still necessary. The germs of diseases still exist.

But with the vaccine the germs are not dangerous. If you do not vaccinate, the disease comes back.

Vaccination tires animals a little, but it is not dangerous if the animals are well housed and well fed.

## **How to take care of wounds**

The wounds of animals need to be attended to carefully.

If you see an ox or a cow that has difficulty in walking (that limps), that bleeds after a fight with another animal, or that has hurt itself, lose no time in looking after it.

If you wait, the wound may get worse. It may get infected.

An infected wound does not heal quickly. It may prevent the animal from walking, from going to the pasture, from working and from giving milk. A cow in pain gives less milk.

Find out how the animal got hurt.

Has it a thorn in its foot?

Has a piece of wood or iron torn the skin?

Has the rope, the collar or the yoke rubbed too much, or has it been too tight?

Is there a vicious animal in the herd?

Once you have discovered how the animal got hurt, remove whatever has caused the wound. Do not work the animal; it is better to lose a few days' work than to lose the animal.

Take care of the wound.

Clean the wound with hot water.

Add to the water some disinfectant that will prevent the wound from becoming more infected.

A wound that is always kept clean heals quickly.

So wash the wound often.

## **What to do about parasites**

Parasites are little animals that live on the skin or in the bodies of other animals.

- Parasites that live on the skin

Chief among the parasites that live on the skin of cattle are the ticks.

Ticks stick to the skin of the animals and suck blood.

If an animal has many ticks, it can lose up to half a litre of blood a day. After a time it may become very weak.

Ticks wound animals.

Often you can see an animal's ears damaged by ticks.

Often you can see animals walking with difficulty or with wounds on the udder. In that case the cows are difficult to milk, and they will not let their calves suck.

Ticks may also bring serious diseases.

They spread fevers, typhus, brucellosis and piroplasmiasis.

Ticks can be killed with a pesticide such as toxophene.

Ticks can also be killed with paraffin oil. - Soak a piece of cloth in paraffin oil and rub the places on the body where there are ticks.

The veterinary services can tell you what pesticides to use, and can help you to apply the treatment.

This must be done over and over again.

- Parasites that live in the body

Generally parasites live in the digestive tract. Many are worms:

tapeworms, roundworms, pinworms. Sometimes they live in the muscles or the lungs, as for instance strongyles.

They injure the digestive tract and the animals cannot digest properly. Animals that have worms lose weight and sometimes die.

To kill these parasites, the animals are given medicine such as phenothiazine. There are traditional medicines that can also be used.

A good way to control parasites is to let pastures rest.

Why?

The eggs of the parasites fall on the pasture with the animals' excrement. They grow in the grass, and then they can attach themselves to the skin of the animals, or the animals may eat them together with grass (ticks, worms).

If you let the pasture rest long enough, the parasites cannot feed



on the skin or in the bodies of the animals. So they die.

To control parasites, rest your pasture. Do not put the animals always on the same pasture.



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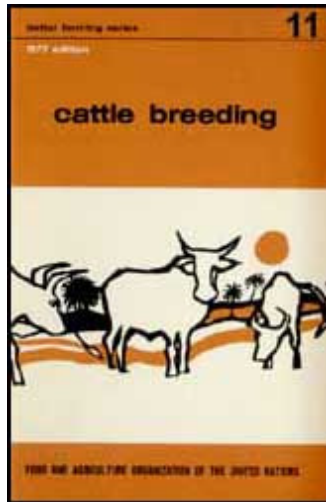
Better Farming Series 11- Cattle Breeding  
(FAO - INADES, 1977, 63 p.)









How cattle reproduce



*(introduction...)*



-  The reproductive systems
-  Pregnancy and birth
-  Age of breeding animals
-  Castrating bulls
-  Choosing breeding animals
-  How to know your herd

## **Better Farming Series 11- Cattle Breeding (FAO - INADES, 1977, 63 p.)**

### **How cattle reproduce**

- We shall now study how cattle reproduce.

It is very important to study this, in order to improve cattle breeding.

When you have a good knowledge of how cattle reproduce, you can make a good choice of breeding animals, and of the right time for breeding. Then you will get bigger animals, animals that grow faster and are stronger, that produce more milk, meat and work.

- To understand how animals reproduce, the reproductive organs of the females and males must be studied.

We have already studied the digestive system, in order to understand digestion and to know how to feed animals.

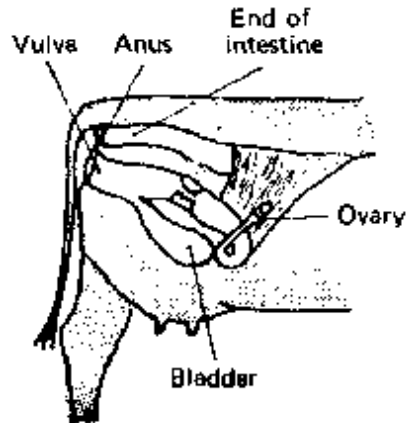
We shall now study the reproductive system of the cow and bull, in order to understand reproduction and to know how to improve the herd.

## **The reproductive systems**

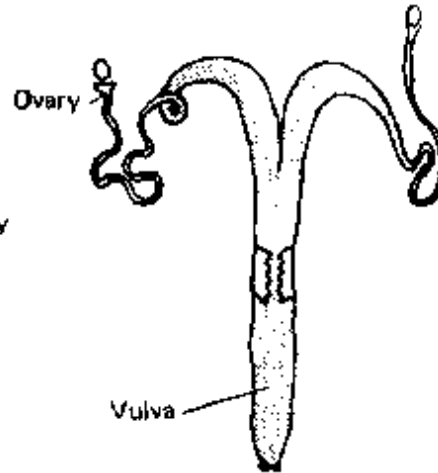
- The reproductive system of the cow

The reproductive organs of the cow are all inside the animal.

You can see only the entry to the system which is called the vulva.



**Genital organs of the cow**



**Genital organs  
removed from cow**

Genital organs of the cow; genital organs removed from the cow

Flowers have ovaries which contain ovules (see Booklet No. 3, pages 7 and 11).

When the ovules are fertilized by pollen, the ovules become seeds.

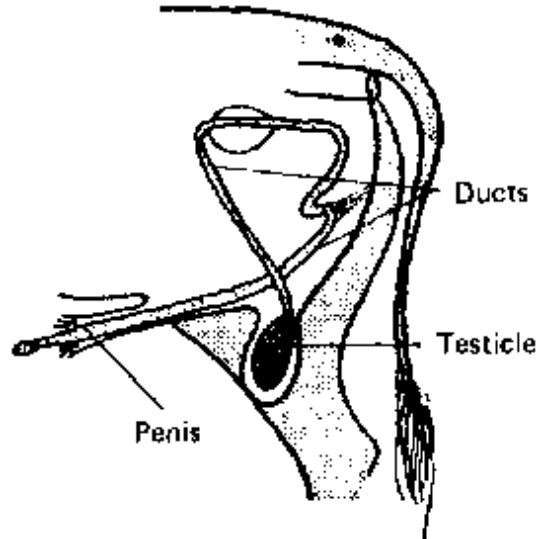
The cow has two ovaries. Every three weeks the ovaries produce an ovum. {In animals, the female reproductive cell is called ovum, plural ova).

If the cow is served by the bull at this time, the ovum is fertilized. It develops and becomes a calf.

- The reproductive system of the bull

This system consists of:

- two testicles which hang between the hind legs;
- the penis;
- two ducts which connect the testicles with the penis.



Reproductive organs of the bull

Stamens give the pollen that fertilizes the ovule in a flower (see Booklet No. 3, page 10).

Testicles give the semen that fertilizes the ovum.

The fertilized ovum becomes a calf.

## **Pregnancy and birth**

- When a cow carries a calf in its womb, we say she is pregnant. Pregnancy begins with fertilization and ends with the birth of the calf. It lasts about 9 months.

When a cow gives birth to a calf, it is called calving.

- If the cow has already had a calf, she must not feed this calf more than 5 or 6 months after the new fertilization. The calf she is carrying needs more food. The cow cannot feed the calf in the womb and give milk at the same time.
- Some days before the birth, the cow's udder swells.

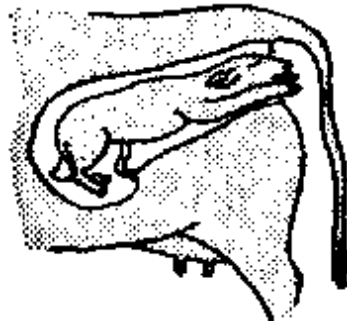
At the time of birth, part of the membranes which cover the calf in the womb comes out. These membranes contain water. Next you see the legs of the calf come out, either the two forelegs or the two hind legs.

Sometimes it is necessary to pull downward a little on the calf's legs, to help the birth.

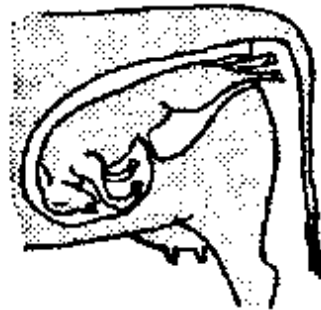
After the calf has come out, if the umbilical cord still joins the calf to the cow, cut it and clean it well. You can use a little iodized alcohol.

After the birth, the rest of the membranes come out. All the membranes must come out. Otherwise they may rot inside the cow and cause her to die.

The calf comes out  
forelegs first



The calf comes out  
hind legs first





## At birth the calf may come out in two ways

When the calf is born, the cow rubs it with her tongue. She licks it. Let the cow lick her calf.

At this time the cow is often thirsty. Give her water to drink. During the first few days after the birth, the mother's milk is thick and yellow. The calf must drink this milk which will clean its digestive tract.

Take great care of calves. They are delicate. They easily catch parasites. To protect them, give them a medicine to get rid of internal worms at the age of 3 weeks and of 10 weeks. They easily catch diseases. To protect them, have them vaccinated.

At 3 weeks, the calf begins to eat grass with a little cooked cassava.

Look after young calves well. Feed them well, give them good housing. If you do not, they may die and you will lose a lot of money.

## **Age of breeding animals**

### Heifers

The ovaries begin to produce ova (see page 42) when a heifer is 9 or 10 months old. From that time, heifers can be fertilized.

But do not have a heifer served by a bull when she is too young. The heifer cannot go on growing herself and feed the calf she is carrying. In fact you may have accidents when the calf is born, at calving.

So wait until the heifer is big and strong enough, until she is about 2 years (24 months) old, before having her served.

### The bull

The testicles of young bulls begin to produce semen when the bulls are about 8 months old.

But do not have cows served by too young a bull. The bull will get

tired, will not grow well, will not eat well and will become a poor breeding animal. Do not have the bull serve cows before it is 18 months old.

To make sure that heifers are not fertilized too young, and that bulls do not serve cows before the age of 18 months, do not put heifers that are too young together with bulls, or bulls that are too young with cows.

## **Castrating bulls**

A herd of 25 cows needs only one good bull, a good breeding animal. The other males in the herd must be castrated.

A castrated male is called an ox or bullock.

- How to castrate a bull

Either remove the testicles (see page 43) or crush the ducts which connect the testicles to the penis. The animal husbandry service

and the livestock assistants have instruments for castrating bulls.

- Why castrate bulls?

After castration bulls are quieter, they are not vicious, and it is easier to harness them. They put on weight more quickly, the meat is better. They cannot fertilize the cows; in this way you prevent poor breeding animals from reproducing, and can leave them in the herd.

- At what age should bulls be castrated?

At about 10 months if you want to sell them to the butcher.

At about 18 months if you want to make working oxen.

If you wait until 18 months, the ox is stronger for work, but in that case it must be kept away from the herd, so that it cannot cover the COWS.

## **Choosing breeding animals**

Bulls and cows must be carefully chosen because the calves take after their parents.

- Cows that give a lot of milk usually produce females that will also give a lot of milk. This quality is passed on from mother to daughter.

Cows that grow and put on weight quickly usually produce males and females that will grow and gain weight quickly. This good quality is passed on from the mother to her calves.

- Bulls that grow and gain weight quickly, that have well developed bones and muscles, that are not vicious, usually produce calves that grow and gain weight quickly, that have well developed bones and muscles, and are not vicious. Calves often have the good qualities of the bulls.

Bulls born from a cow that gave a lot of milk often produce females that will also have a lot of milk. The good qualities of the bull's mother are often passed on to the bull's daughter.

## Choose breeding animals

- that are well formed.

Sell all poorly developed animals.

Keep animals with plenty of muscle, especially of the back and rump, because they give the best meat. This quality will be passed on to the calf.

- that gain weight quickly.
- that are resistant to disease.

If a cow has little resistance to sleeping sickness (see page 36) her calf will also have little resistance.

- that give plenty of milk.

Such cows can easily feed their calves.

You can also milk the cow and drink the milk or sell it.

The good qualities of the bull and the cow are often passed on to their calves.

The bad qualities of the bull and the cow are also passed on to their calves. So it is very important to make a good choice of bull and cows.

It is easier to improve the herd by a good choice of bull. A cow passes on her good qualities to only one calf each year. A bull passes on his qualities to all the calves of the herd,

## **How to know your herd**

We have seen how important it is to make a good choice of breeding animals.

In modern animal husbandry we look for breeding animals of good quality.

But we also look for animals from parents and grandparents that

were of good quality.

The family qualities are passed on to the young. This is what we mean by selection.

Modern farmers keep a herd book.

Give a number to each animal in the herd.

This number is the animal's name.

Mark the number on the animal's rump, for instance, by branding.

Use a double page of the book for each animal.

Write in the book everything you need to know about your animals (see Booklet No. 9, pages 22- 24).

## RECORD OF A FEMALE

No. of animal Year of birth



No. of sire No. of dam

### SERVICE

1<sup>st</sup>

No. of sire .....

Date of service .....

No. of offspring .....

No. of deaths before weaning .....

2<sup>nd</sup>

No. of sire .....

Date of service .....

3<sup>rd</sup>

4<sup>th</sup>

5<sup>th</sup>

Feed

Production (milk, weight)

Vaccinations and disease

Remarks

Two pages of the herd book which records each female in the herd.

### RECORD OF A MALE

No. of animal Year of birth

No. of sire No. of dam

### SERVICE

No. of female Date

1st .....

2nd .....

3rd .....

4th .....

5th .....

6th .....

7th .....

First of two pages of herd book in which each male is recorded. The second page is the same as for females (see preceding page).



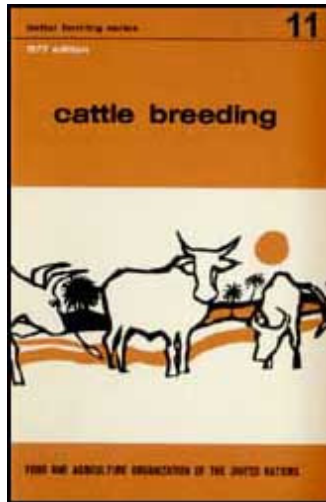
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 Better Farming Series 11- Cattle Breeding  
(FAO - INADES, 1977, 63 p.)

➔  What cattle produce

 Meat production



## Milk production

### **Better Farming Series 11- Cattle Breeding (FAO - INADES, 1977, 63 p.)**

#### **What cattle produce**

#### **Meat production**

A farmer can sell animals every year, especially young bulls, oxen and old cows. These animals are sold for slaughter.

A farmer should sell fat animals. Then he will earn a lot of money. Young bulls, oxen and old cows that you want to sell should be well fed and looked after.

You will sell many fat animals if the herd has a good yield (see Booklet No. 9, page 29).

That is to say:

- If the animals are of a good breed.

The animal husbandry service is finding out which breeds produce most and thrive best in each region.

- If all the animals grow quickly.

On the same pasture, all the animals do not gain weight as quickly as each other.

You should keep only the calves of bulls and cows that have grown quickly.

- If there are many cows which calve each year.

You must sell the old cows: they do not produce calves, they do not gain weight any more and they eat a lot.

You must also sell the surplus bulls: they eat but are of no use.

You must keep the most fertile cows and make them breed. A fertile cow calves each year.

## THE MEAT YIELD OF CATTLE

All cattle do not yield the same amount of meat.

For example:

Two cows each weigh 250 kilogrammes.

They are slaughtered.

The blood, skin, hoofs, head and everything in the belly are

removed.

What remains is called the carcass, that is, the meat with the bones.

Now let us weigh the carcass of each cow. One weighs 115 kg; the other weighs 134 kg.

So the carcass of one cow weighs 19 kg more than the other: the yield in meat of the two cows is different. All cows do not give the same amount of meat.

The meat yield of cattle is the relation of the carcass weight to the weight of the live animal. If a cow weighs 250 kg and if the carcass weighs 115 kg, the yield is:  $115 \times 100/250 = 46\%$

If a cow weighs 250 kg and if the carcass weighs 134 kg, the yield is:  $134 \times 100/250 = 54\%$

If an ox weighs 350 kg and if the carcass weighs 180 kg, the yield is:  $180 \times 100/350 = 51\%$

The meat yield of cattle is about 50 %, that is, the weight of the carcass is about half the weight of the live animal.

All cattle do not give the same quality of meat.

The meat of an old thin cow does not fetch such a high price as the meat of a young, fat bullock, because it is not of such good quality. The meat of a young fat bullock is of very good quality.

So all cattle are not worth the same price.

The price changes with the amount of meat and with the quality of meat.

For example, in some places a thin cow is worth about 7 500 francs, but a fat cow of the same age is worth about 15 000 francs.

It is better to make 30 000 francs with two cows of 15 000 francs each, than 22 500 francs with three cows of 7 500 francs each.

You can earn more by selling fewer animals, if each animal is sold



at a very high price.

## **Milk production**

Milk is formed in the cow's udder.

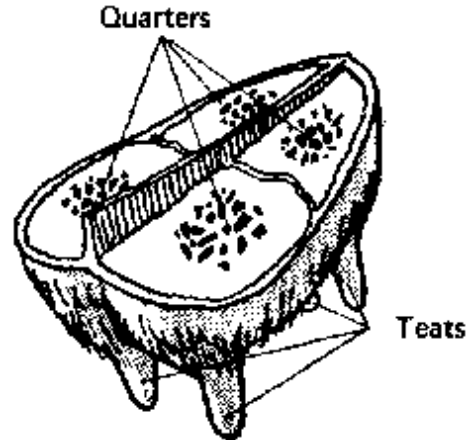
The milk comes out through the teats.

Squeezing the teat makes the milk come out.

The milk is produced by the blood that circulates in each quarter of the udder.

If plenty of blood circulates in the udder, plenty of milk is produced.

Emptying the cow's udder of milk may take 5 to 10 minutes.



The cow's udder

For good milking, the cow must be calm; if you strike her or she is frightened, she will not let herself be milked easily.

Make sure you always empty the udder. If all the milk is taken away the udder can develop. A well developed udder can give more milk. Often a cow gives more milk after her third calving than after the first.

Milking must be done every day at the same time, for example, in

the morning, before going to the pasture. The cow gets into the habit of giving her milk at the same time every day.

A cow with large blood vessels can have a lot of milk.

Milk production changes greatly according to:

- breed

Some breeds yield more milk than others.

- health

Cows that are ill give little milk.

- age

At the first calving, cows have little milk; afterwards they produce more. When they are old, production is less.

- time of calving

If the cow calves in the rainy season, when there is plenty of good grass, she gives a lot of milk.

- feeding A well fed cow gives more milk than a badly fed cow. A cow in milk needs a feed supplement and plenty of water.

Use of milk

- Milk is food for calves.

To grow, a calf needs to drink a lot of milk.

If you milk the cow there is not enough for the calf, and the calf cannot gain weight; it will be less resistant to diseases. Many calves die because they lack milk.

When the calf has finished drinking you can milk the cow if there is any milk left in the udder. You can also milk the cow after some months, when the calf has begun to eat grass and feed supplements.


- Milk is food for people.

Cow's milk is very good for both children and adults.



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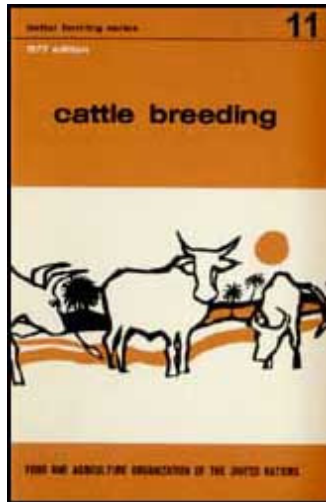
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 Better Farming Series 11- Cattle Breeding  
(FAO - INADES, 1977, 63 p.)

➔  Organizing sales

 (*introduction...*)

 Farmers' groups



## **Better Farming Series 11- Cattle Breeding (FAO - INADES, 1977, 63 p.)**

### **Organizing sales**

To earn more money, it is not enough to work well, you must also sell well.

A farmer should think carefully to decide:

- When to sell an animal
- You should sell sterile cows which do not produce calves. You should feed them well for several months and sell them when they are really fat.
- You should sell a cow before it is too old. If you wait too long before selling, maybe you will get one more calf, but the cow will be too old to fetch a good price. By keeping a cow that is too old, you lose more money than you can earn from the calf she may produce.
- You should sell oxen as soon as they no longer gain weight. It is useless to keep them for 5 or 6 years. Sell oxen at 4 years. If you keep them longer, the ox eats food that would have enabled you to raise another animal.
- Sell some animals at the end of the rainy season. Then you will be able to feed the herd well in the dry season (see page 101).

- You know when meat is bought at a high price, for example, at festivals and at the end of the dry season. Organize your breeding so as to have animals for sale at that time.
- Where to sell animals and milk

Should animals be sold in the village, at the market, in the town?

Where will you earn most?

A modern farmer should know how to work out what is the cost of taking the animals from the village to the town if he wants to know where to sell his animals.

- How to sell animals

A farmer can sell

- for slaughter, for meat, when his animals are really fat.
- for breeding



If he has fine young bulls of a good breed, of a good family, well selected, they can be sold at a higher price.

- for fattening

If he has too many young calves and not enough grass to feed his animals he can sell some calves to another farmer who will fatten them.

A farmer should think before selling.

## **Farmers' groups**

It is to the advantage of farmers to form groups (see Booklet No. 9, page 31 ) to buy a bull together; to pay a herdsman together; to sell their milk together; to sell their animals together.

Farmers in a group can organize their work better, organize their sales better.

For a group to succeed, it must

- decide the aims of the group in advance;
- settle who is in charge of the group;
- not be too big;
- have members who trust each other.

Suggested question paper

### FILL IN THE MISSING WORDS

A modern animal breeder has a fine. . .

He gives his animals enough .....and  
.....especially in the dry season.

For this he makes and ..... with pasture grass at the  
end of the rainy season.

He gives pregnant cows a feed.....He also gives oil  
cake to cows which give.....

So that his cattle will have well formed bones he also gives them

a.....

The animal breeder builds a.....

His herd is protected from sun and rain, and the animals make .....for the fields.

To keep his animals in good health, he protects them against diseases by.....He has only one.....in his herd, but a very fine bull because he wants to have.....calves.

For each animal he keeps a record in a.....

A cattle breeder should.....before selling.

With his friends he forms a.....

### ANSWER THE FOLLOWING QUESTIONS

At what age can a bull serve cows?

What is a mineral supplement?

How much water does an ox need?

Why must a cow which has a calf be well fed?

What is weaning?

How many bulls should you keep in a herd?

Why must cattle be vaccinated?

How is hay made?

What do you do when an animal is injured?

Where you live, how do you make a shed for cattle?

What must you do when an animal is ill?

## EXERCISE

A cow weighs 300 kg.

Its maintenance requirement in feed units is . .....

This cows gives 4 litres of milk a day /to produce 1 litre of milk 0.3 feed unit is required). The cow's production requirement in feed units is:

4 x ... = ... feed units.

The cow's total requirements in feed units are: maintenance requirement plus production requirement,

... feed units plus ... feed units = ... feed units.

The farmer has some groundnut hay which gives 0.4 feed unit per kg.

How many kilogrammes of groundnut hay must the farmer give the cow?

....  
= ... kg of groundnut hay.  
....

When should animals be sold?

.....

Why?

.....

How will you choose bulls and cows for breeding?

.....

# Why?

.....

