better farming series 8

1976 edition

animal husbandry

feeding and care of animals

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

BETTER FARMING SERIES

Twenty-six titles have been published in this series, designed as handbooks for a two-year intermediate level agricultural education and training course. They may be purchased as a set or as individual documents.

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1. The plant: the living plant; the root
2. The plant: the stem; the buds; the leaves
3. The plant: the flower
4. The soil: how the soil is made up
5. The soil: how to conserve the soil
6. The soil: how to improve the soil
7. Crop farming
8. Animal husbandry: feeding and care of animals
9. Animal husbandry: animal diseases; how animals reproduce

SECOND YEAR

10. The farm business survey
11. Cattle breeding
12. Sheep and goat breeding
13. Keeping chickens
14. Farming with animal power
15. Cereals
16. Roots and tubers
17. Groundnuts
18. Bananas
19. Market gardening
20. Upland rice
21. Wet paddy or swamp rice
22. Cocoa
23. Coffee
24. The oil palm
25. The rubber tree
26. The modern farm business

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Animal husbandry

Feeding and care of animals

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PREFACE

This manual is a translation and adaptation of "L'élevage – la nourriture et le soin des animaux," published by the Agri-Service-Afrique of the Institut africain pour le développement économique et social (INADES), and forms part of a series of 26 booklets. 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.

OUTLINE OF COURSE

PLAN OF WORK

FIRST WEEK

Why learn about animal husbandry?

Read pages 4 to 9.

Have you understood
that a herd is wealth
and that it can earn a lot?

Take a look round your village to see what animals are used for.

SECOND WEEK

Feeding animals.

Read pages 10 to 23.

This is a difficult lesson.

You have to understand
the needs of animals
and the value of foods.

Don't hurry.

Reread the lesson several times.

THIRD WEEK

Pasture.

Read pages 24 to 30.

Reread pages 10 to 23.

How can you make better use of pasture?

Do you make hay or silage?

Where do your animals drink?

FOURTH WEEK

Looking after animals.

Read pages 31 to 36.

Reread carefully the whole course.
It is very long,
but it is very important.

Making a shelter for the animals
does not cost much.
It is made with things you can get in the village.

Don't answer the question paper
until you understand the course.

Don't hurry.

WHY LEARN ABOUT ANIMAL HUSBANDRY?

- **Farmers may have many animals.**

  They usually keep chickens and goats
  around the house.

  They often have sheep and cattle
  which roam about freely
  or are in the care of a keeper.

  In dry regions
  there are donkeys, horses and camels.

  All these animals
  are raised and used as they always have been.
  This is called **traditional animal husbandry.**

- **But animals can be raised in other ways,
  and then the farmer can earn more money.**

  Go in for **modern animal husbandry.**
  You will have more animals
  and fatter ones.
  You will get more money for them
  if you sell them.
  You will make a bigger profit.

  **Replace traditional animal husbandry
  by modern animal husbandry.**

Why farmers go in for traditional animal husbandry

- **To have food to eat**

Every now and then
the farmer kills a chicken, a duck,
a goat, a sheep or a pig,
in order to eat it.
If he has no animals,
he buys meat on the market.

Some people drink a lot of milk.

Meat, milk and eggs
are very good food,
rich food
which contains a lot of **proteins.**

Proteins are a food that people need.
To eat enough proteins
means good health.
People who don't eat enough proteins
are often ill or don't grow big.
Proteins help to build up a man's body
and give it strength.

Proteins from animals
are a food that people need
in order to grow,
become strong
and stay in good health.

- **To have animals for sacrifices and feasts**

At a birth,
a marriage,
a funeral
or traditional feasts,
or when strangers come as guests,
people often kill some animals:
chickens,
goats,
sheep,
cattle.

So the farmer often needs animals.
He has to raise them himself.

- **To have a store of wealth**

Animals are often a store of wealth.

For example, in Mali
when the stores of millet are about to go bad,
a farmer sells his millet
and buys some animals.

When the farmer needs money,
either to pay his taxes
or for a dowry or some feast,
or to buy something,
he sells one or more of his animals.

Animals are wealth
that you can either show or hide.

If you want to show your wealth,
you can keep them near the village.
If you want to hide your wealth,
you can get someone to keep them for you
far from the village.

But this wealth produces little

• **The farmer has wealth,**
but does not look after it.
It does not require much work,
but it does not bring in much money.

Often, animals are not milked.
If they are milked, it may be the herdsman
who drinks the milk or sells it.
Many animals die
because they are badly fed,
or because disease kills them.

Unless they are well watched,
flocks and herds stray into the fields
and ruin the crops.

• A man who owns a cart,
but goes on carrying his produce on his head,
owns a working tool, a means of wealth,
but he does not use it.

A man who owns some bank notes
and keeps them in a jar
does not make his money produce anything;
he lets his wealth lie idle.

A man who owns animals
and does not look after them
lets his wealth lie idle.

The cart,
the bank notes,
the animals
are wealth,
they are **capital.**

It is no good letting capital lie idle.
Animals are a capital
that should produce as much as possible.

Animals can earn much more

Traditional animal husbandry is useful,
but it produces little and earns little.

Modern animal husbandry
can produce more and earn much more.

- Well-fed animals grow more quickly,
  they become bigger,
  yield more **meat.**
  They can be sold at a better price.

- Well-fed animals give more **milk.**
  The young animals are in better health.
  The milk can also be sold or drunk.

- Well-trained animals can be **harnessed**
  and help you to farm bigger fields.
  They help to carry wood, water, harvests.
  You have more time for farming,
  your fields will be bigger and better worked.

- Animals produce **manure.**
  Your soil will become richer and better.
  Your harvests will be better.
  You will make more money.

- Animals that are well fed and looked after
  are healthy.
  They have more young ones
  and your herd will be better and bigger.
  You can sell animals and earn more money.

Animal husbandry
is a capital
that can produce a lot.

HOW TO IMPROVE ANIMAL HUSBANDRY

If animal husbandry is to produce more,
the animals must be raised in a different way.

- **A farmer who wants to earn more money must look after his animals himself.**

  He must both grow crops
  and look after his animals.

  In the old days there were people who grew crops
  and people who raised animals.
  Those who grew crops
  did not go in for animal husbandry,
  and those who raised animals grew no crops.

  Today the same man
  must both grow crops and raise animals.

- **The farmer must learn to look after animals.**

  He must:

  - **feed them better:**

    especially the young animals;
    he must lay in reserves for the dry season,
    give the animals enough to drink.

  - **look after them better:**

    build a shelter for them,
    protect the animals against parasites and diseases,
    look after them if they are hurt.

  - **use them better:**

    make manure,
    train oxen,
    choose the best animals
    for meat, milk and work.

WHY ANIMALS MUST BE WELL FED

A child that does not eat well
does not grow well;
it is often ill.
A man who does not eat well
cannot do much work;
he is not strong,
he is often ill.

It is the same with animals.

A badly fed calf
does not grow well;
it is often ill
and often it dies.
A badly fed cow
does not produce big calves;
she cannot feed them well.

A farmer who feeds his animals well
makes more money.

Animals change
cheap food that is difficult to carry
into other more costly foods that are easy to carry.

For example:
grass, over-ripe yams,
grain that is broken or eaten by insects,
the remains of the family's food,
are changed into
milk, meat, work and young ones.

HOW FOOD IS USED IN THE ANIMAL'S BODY

Food is digested.

When the animal eats,
the food goes into the **digestive tract.**
In the tract the food is changed and **digested.**
The digested part of the food
enters the blood to feed the body.
The rest is rejected as **excrement.**

When the greater part of the food
enters the blood,
the food is said to be rich.

When the greater part of the food
is rejected,
the food is said to be poor.

There are rich foods
and poor foods.

Examples:

- Millet is rich food for certain animals.
  They can make good use of it.
  The greater part of it enters the blood.
  One kilogramme of crushed millet
  can give an animal's body as much strength
  as six kilogrammes of grass.

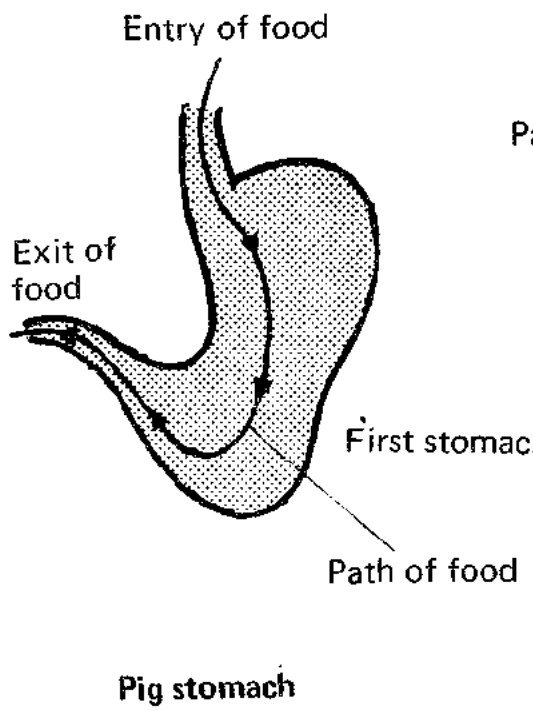
- Hard, stringy grasses in the dry season
  are a poor food for animals.
  The greater part of the dry grass
  does not enter the blood;
  it is rejected.

NOT ALL ANIMALS DIGEST FOOD IN THE SAME WAY

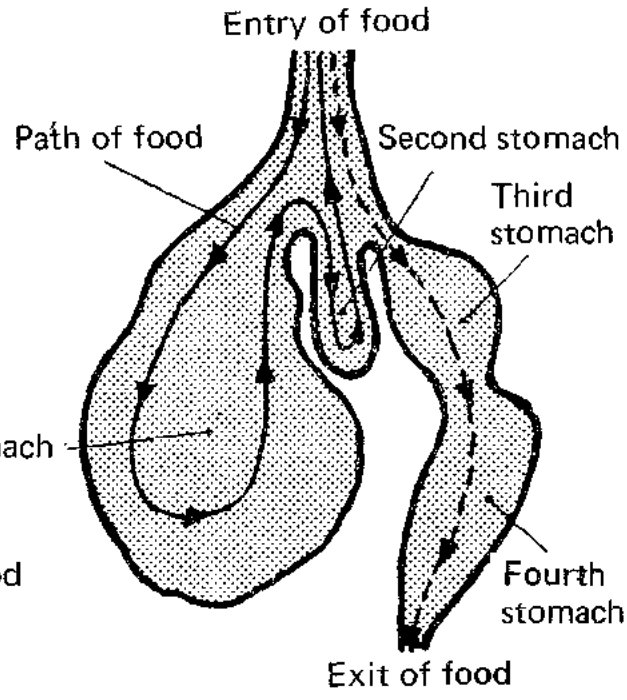
For example:

Chickens, cows, pigs
do not eat the same food.
These animals have different stomachs;
they do not digest in the same way.
That is why they do not eat the same things.

Sheep, goats and cows
eat the same food.
These animals have the same stomachs.
Chickens and ducks
eat the same food.



Pig stomach



Cow and goat stomach

In one and the same herd of cattle
there are often animals that eat the same food
but do not grow in the same way.
They eat the same food
and have the same digestive tract,
but some use their food better than others.

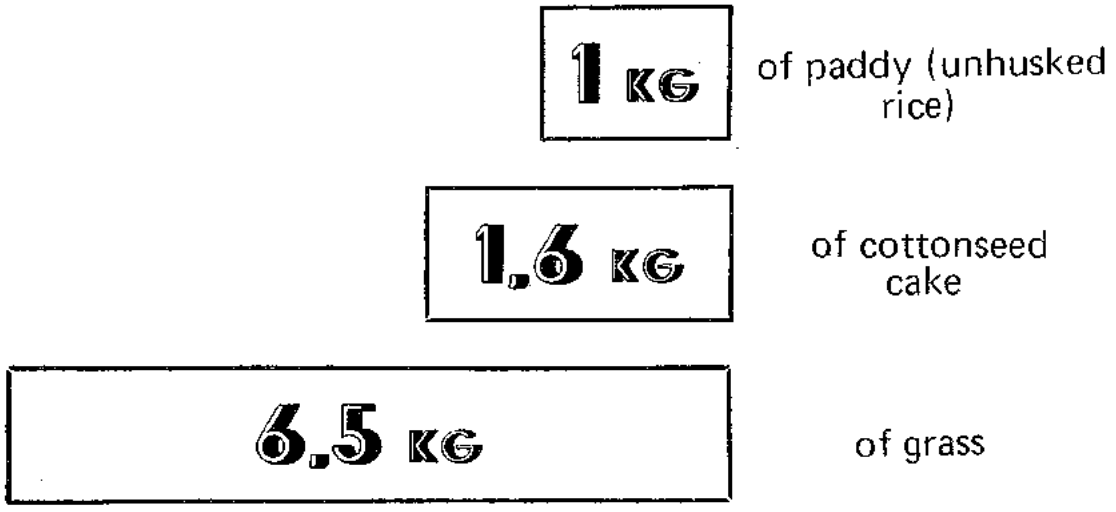
HOW TO CHOOSE ANIMALS' FOOD

You must choose foods
that give strength and energy.

- Many experiments have shown
  that a cow which eats 1 kilogramme of paddy
  (unhusked rice)
  can give as much milk
  as a cow which eats 6.5 kilogrammes of grass.
- Other experiments have been made
  for every kind of food for animals.
  These experiments have shown
  the amount of each food
  which has the same value as 1 kilogramme of paddy

1 kg of paddy is used to measure
the value of foods.

1 kg of paddy is called a fodder unit or feed unit.



1 kg of paddy,
1.6 kg of cottonseed cake,
6.5 kg of grass
have the same food value.
They give 1 fodder unit.

FOODS THAT GIVE NITROGEN MUST BE CHOSEN

To live, plants take out of the soil mineral salts
(see Booklet No. 6, page 10)
which contain nitrogen, phosphorus, potassium.

Different plants have different needs
(see Booklet No. 6, page 14).

All plants do not have the same need
of the same amount of mineral salts.

Animals too have different needs.

- They need food
  that gives them strength and energy;
  these are called **energy foods.**

  For example: maize, cassava.

- They need food
  to make their muscles and their meat.
  These are **nitrogenous foods,**
  foods that contain nitrogen.

  For example: oil cake.

Modern farmers put fertilizers on their fields.
Fertilizers complete the plants' food.

Modern farmers who raise animals
also complete the food of their animals
by giving them, as well as energy foods,
foods that contain nitrogen.
These foods are called **feed supplements.**

With nitrogenous foods an animal
grows better and produces plenty of meat.

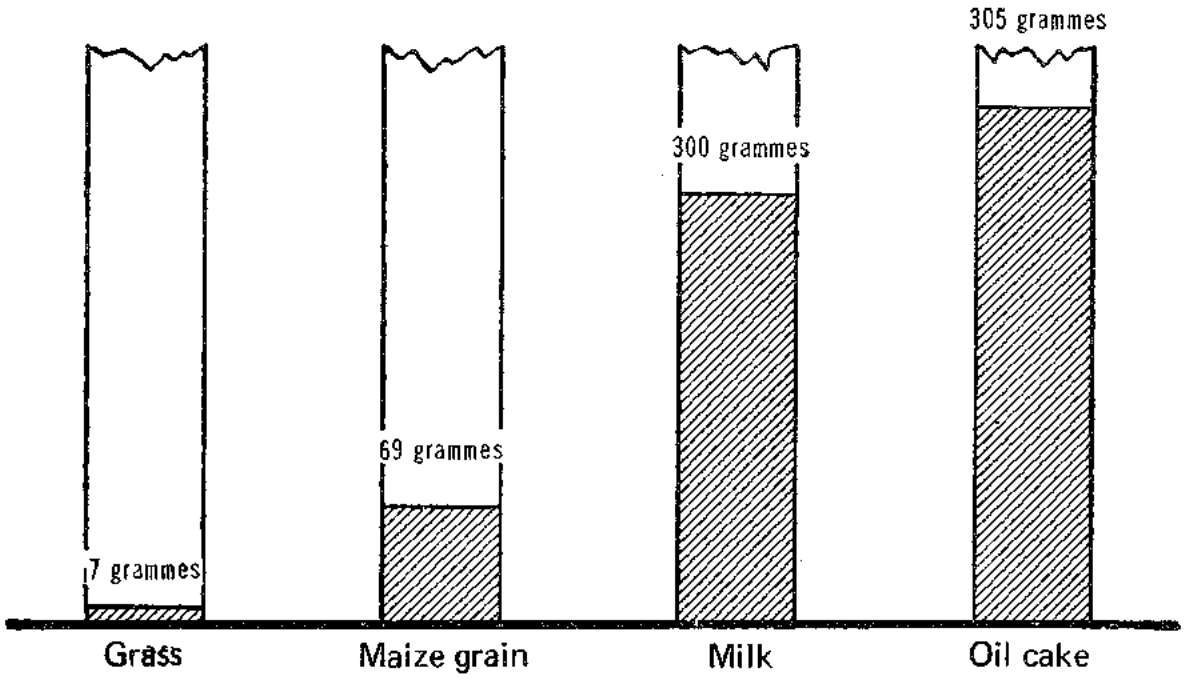
Food rich in nitrogen
is called a **protein-rich food.**

Feed supplements, like fertilizers (see Booklet No. 6, page 14), are costly.

A farmer must choose the right feed supplement.

Many experiments have made it possible to work out
the amount of **digestible proteins** (nitrogen)
which each food contains.

The foods which are richest in nitrogen
are oil cake, meat meal and fish meal,
and milk.



The amount of digestible protein (nitrogen) in 1 kg of food

In the same way as for fodder or feed units,
tables have been made which show
the amount of digestible protein
in each food.

Other tables have been made which show
the protein needs
of each kind of animal.

Animals make good use
of energy foods and body-building foods
if they are given mineral salts
and clean water at the same time.

VALUES OF CERTAIN FOODS

- Grass and silage (see page 28) have a value
  of 0.1 to 0.2 fodder unit.
  Five to ten kilogrammes of grass or silage are needed
  to give the value of 1 fodder unit.
  One kilogramme of grass or silage
  contains between 10 and 40 grammes of protein.

- Hay has a value
  of 0.3 to 0.5 fodder unit.
  Two to three kilogrammes of hay are needed
  to give the value of 1 fodder unit.
  One kilogramme of hay
  contains between 25 and 70 grammes of protein.

- Oil cake has a value
  of 0.5 to 1 fodder unit.
  1.5 kilogrammes of oil cake are needed
  to give the value of 1 fodder unit.
  One kilogramme of oil cake
  contains between 150 and 400 grammes of protein.

- Grains have a value
  of about 1 fodder unit.
  One kilogramme of grain is needed
  to give the value of 1 fodder unit.
  One kilogramme of grain
  contains about 50 grammes of protein.

- Tubers have a value
  of 0.3 or 0.2 fodder unit.
  Three to five kilogrammes of tubers are needed
  to give the value of 1 fodder unit.
  One kilogramme of tubers
  contains between 7 and 9 grammes of protein
  (see the table on page 37).

WHAT IS A MINERAL SUPPLEMENT?

A mineral supplement
gives **mineral salts.**
Animals as well as plants
need mineral salts.
If an animal lacks mineral salts,
its bones do not grow well.

You can give mineral salts
by putting **salt** in the drinking water or in the hay,
or by giving **native soda** or a **salt lick (licking stone).**

In a 1-kg licking stone there are:
400 grammes of salt,
150 grammes of calcium,
80 grammes of phosphorus,
and other salts.

VITAMINS

Animals need vitamins.

Vitamins help in the development of muscles.
Only very small amounts of vitamins are needed.
Vitamins are found chiefly
in grass and fruits.

It is good for all animals,
even pigs and chickens,
to eat a little grass.

GIVING THE ANIMALS WATER TO DRINK

- **Animals need water**

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

A sheep can drink 2 to 6 litres of water a day.
An ox can drink 30 to 40 litres of water a day,
or even more in the dry season,
when 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:**

  - **in 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.**

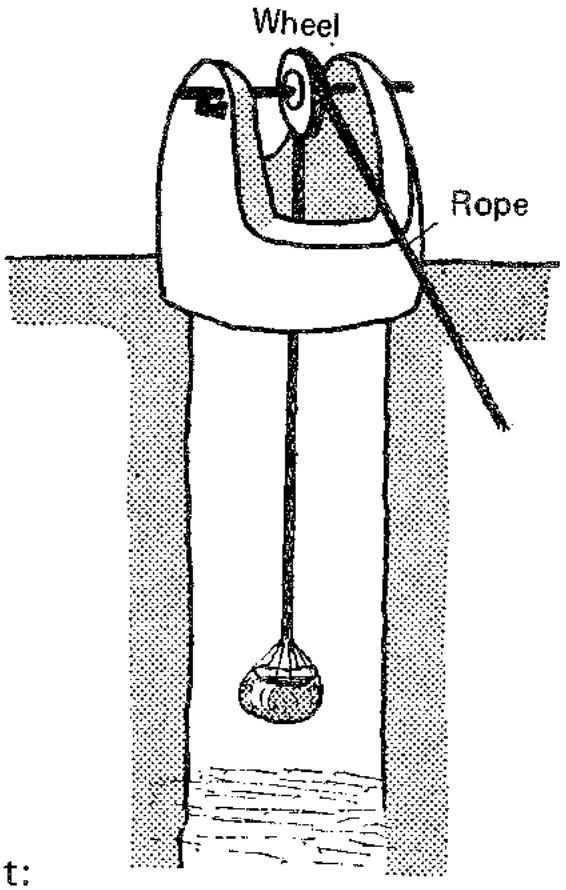
    But you must be careful,
    because the water is often dirty
    and may give the animals some disease.
    Their water must always be clean.

    You can build a little dam (see Booklet No. 6, page 16) to store up water.

- **at a well.**

Wells are sometimes very deep.

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 animal to pull
the rope.

- 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 make 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.

FOOD NEEDS OF ANIMALS

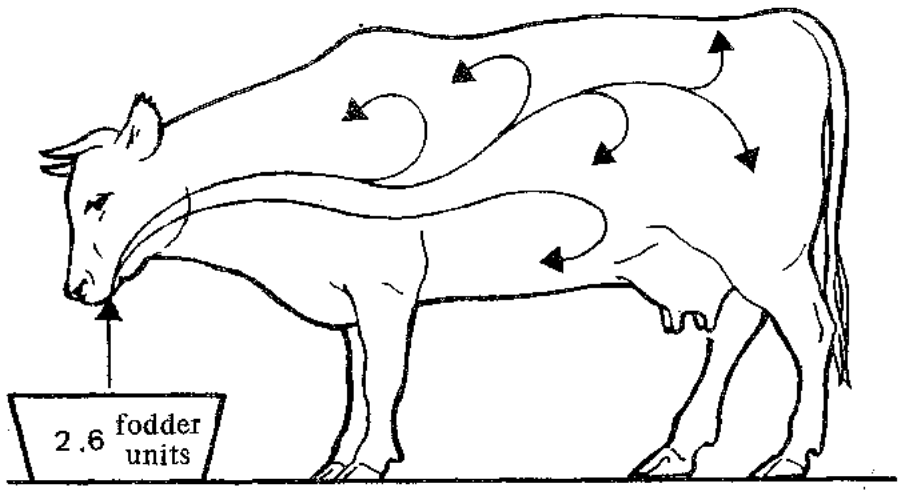
- An animal must feed to live.

  Many experiments have been made to find out what amounts of food an animal needs to live.

  These are its **maintenance requirement.**

  These needs are different for each kind of animal and change according to the animal's weight.

Maintenance requirement of a 300-kg cow

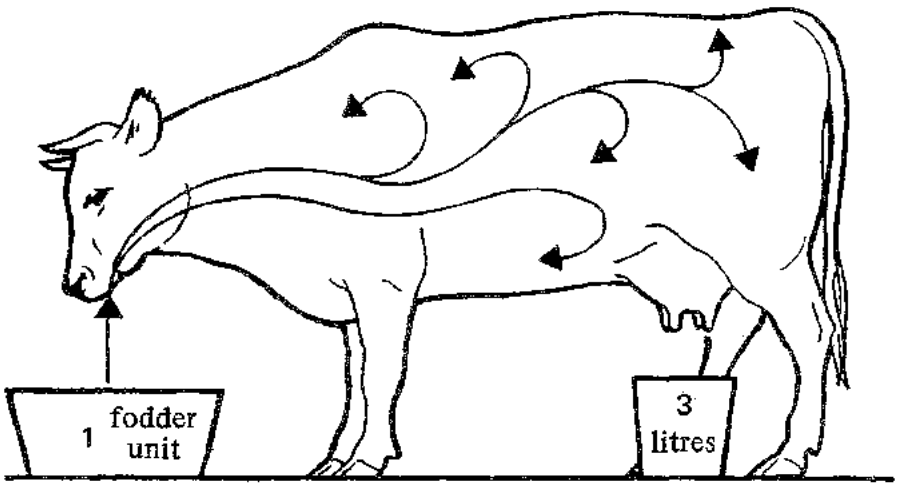


- Many experiments have been made to find out what amounts of food an animal needs to **produce** milk, meat, work.

  These are its **production requirement.**

  This requirement changes for each kind of production and according to the amount of production.

Production requirement to give 3 litres of milk



Many experiments have been made
for each kind of animal to find out:

- the **pregnancy requirement**
  when it is expecting young;
- the **production requirement**
  when the mother is giving milk;
- the **requirement for growth**
  when the young animal is growing.

Tables have been made which show for each animal the

maintenance requirement . . . . . according to weight
production requirement . . . . . according to production
pregnancy requirement . . . . . when it is expecting young
growth requirement . . . . . when it is growing.

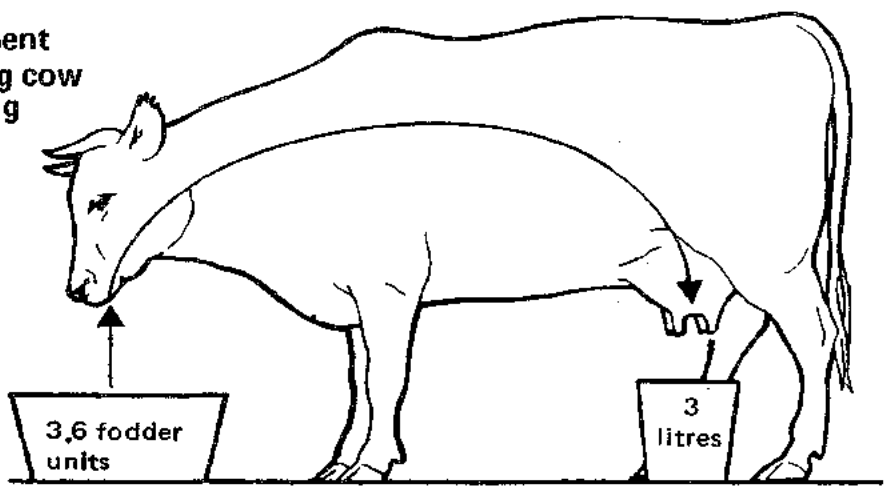
To find out what an animal needs,
add up all these requirements.

For example:

A cow weighing 300 kg
which produces 3 litres of milk
needs:

maintenance requirement	2.6 kg
production requirement	1
Total	3.6 kg

Total requirement of 300-kg cow producing 3 litres of milk



HOW TO FEED ANIMALS

Animals must be given
enough food,
rich food,
prepared food.

- **Enough food.**

An animal that doesn't eat enough won't put on weight.
What it eats all goes on maintenance (see page 20).
Instead of having five animals that do not gain weight,
a farmer prefers to have four
that he can feed well.
He sells them at a good price.
He earns more money.

- **Rich food.**

An animal that is raised for meat
must grow and fatten quickly.
Then you can sell it more quickly.
You can raise another animal,
and make a lot of money.
To make animals grow quickly
a farmer must give them rich food,
he must give them feed supplements (see page 14).
Rich food is costly,
and a farmer doesn't want to waste it.
Know the animals' needs (see page 20)
and reckon what the food costs
and what it earns in the way of meat, eggs, etc.

- **Prepared food.**

To help animals digest this rich food,
the farmer prepares it for them, that is:
grains are crushed,
roots and tubers are cooked.

Animals must be fed:

- **at the same time every day.**

  The feed supplement must be given
  every day at the same time,
  so that the animal can digest it.

- **all the year round.**

  During the rainy season
  it is easy to feed animals well.
  There is plenty of grass, it grows quickly,
  it is young and nourishing.

  During the dry season
  it is difficult to feed animals well.
  There is little grass, it is dry and hard,
  and not very nourishing.

So there are some months in the year
when cattle are well fed,
and grow fat and are in good health.
There are other months
when animals are badly fed
and lose weight.

This is why a modern farmer
stores food for the dry season.
If he cannot feed all his animals well
because he has too many,
he sells some of them
at the end of the rainy season.

Then the rest of his herd
will not suffer during the dry season.
At the end of the dry season,
when animals cost more,
he has some fine animals to sell
and earns more money.

PASTURE

Many animals feed on grass.
A farmer must grow good grass.

IMPROVING PASTURE

A pasture is the field
where animals find grass to eat.
A pasture can be improved
by encouraging the good grasses to grow and multiply,
that is, grasses which are richest in fodder units.

To do that:

- **Animals must not be allowed on the whole of the pasture.**

  In the rainy season, grass grows fast.
  The animals eat
  only a part of the pasture.
  The other part of the pasture is left to rest.
  There the grasses grow well, they multiply
  and this part of the pasture
  will be better the following year.

- **Weeds left by the animals must be cut.**

  The animals stayed on one part of the pasture,
  but they left uneaten certain weeds.
  These weeds must be cut down
  before they make seeds.
  Then they will not multiply.

- **Good use must be made of the pasture.**

  Some farmers
  put too many animals on a pasture.
  Some farmers
  do not put enough animals on a pasture.
  You must put on a pasture the number of animals
  that will use it without spoiling it,
  but at the same time will be well fed.

Pasture that is not used is wasted wealth.

MAKING NEW PASTURE

To make new pasture,
sow or plant grass.

Wait till the grass has grown and become fairly tall
before putting animals on it.
When the animals have eaten the grass,
take them to another pasture.
The grass will grow again on the first pasture.
Wait till it has fully grown
before putting the animals back on the first pasture.
Sown or planted pastures
can yield plenty of grass.

To make a new pasture,
sow Pueraria,
Centrosema,
Stylosanthes,
Crotalaria,
Melinis,
Napier grass (elephant grass).
Ask the extension worker what plants to use
and where to buy them.

Many of these plants continue to grow
during the dry season.
So you have a reserve of pasture grass,
and the animals are well fed all the year.

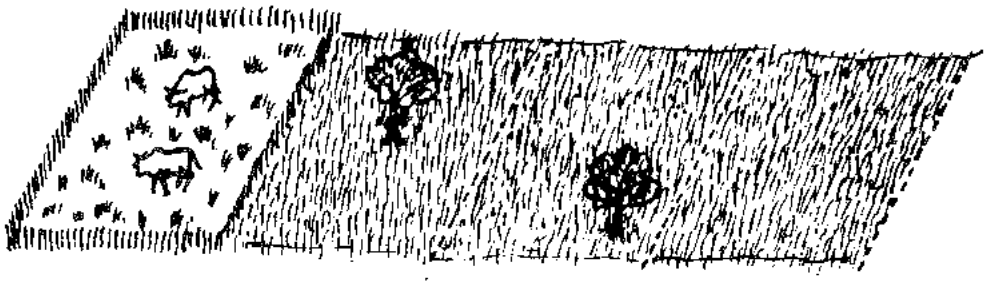
These plants protect the soil
and make it richer.
When you plough up this pasture,
the crops that you grow afterwards
will yield good harvests.
The pasture is part of the land allocation
(see Booklet No. 5, page 27).
The pasture acts as a fallow.

USING NEW PASTURE

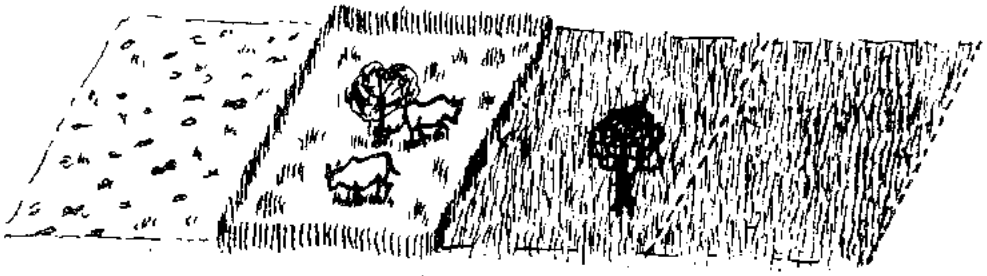
Divide the field into four parts.

Each week put the herd on one part.
The grass grows meanwhile in the other parts.

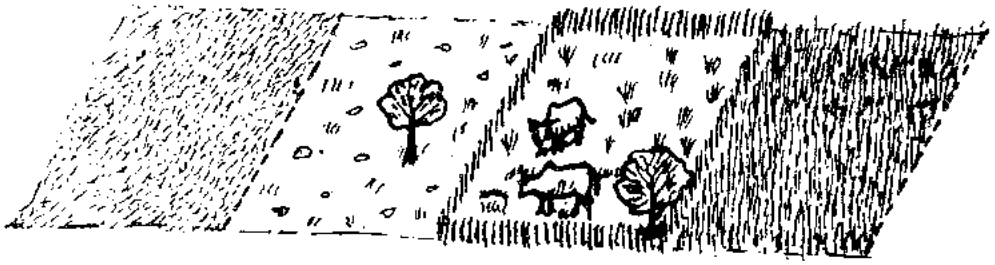
At the end of four weeks,
start again on the first part.



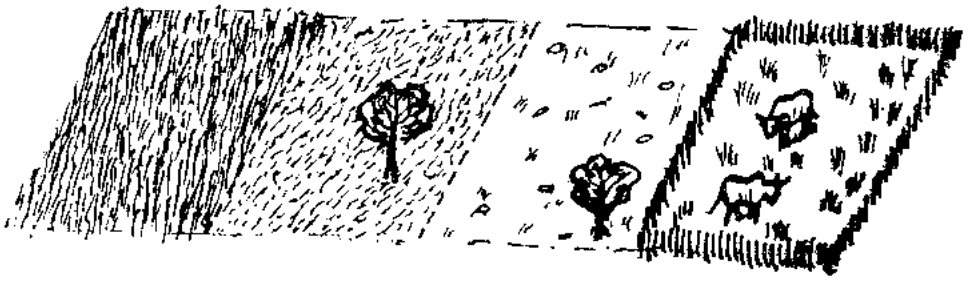
First week



Second week



Third week



Fourth week

GROWING FODDER CROPS

You can sow millet, maize,
or selected grasses (see Booklet No. 3, page 22),
such as Guatemala grass or Digitaria,
as fodder crops for animals.

Do not wait until the seeds form.
Cut the plants when they are still green
and give them to the animals to eat.
Do not let the animals
go among these crops.

You must cut the plants at the right moment.
If you cut them too soon,
they will not have grown enough
and will give less food.
If you cut them too late,
the plants will be hard,
and not easy to digest (see page 11).

Many farmers
are not used to growing millet or maize
to give to animals.
But if they feed their herd well,
they earn more money.
Just a few kilogrammes of this food
will enable the animals
to do better in the dry season.

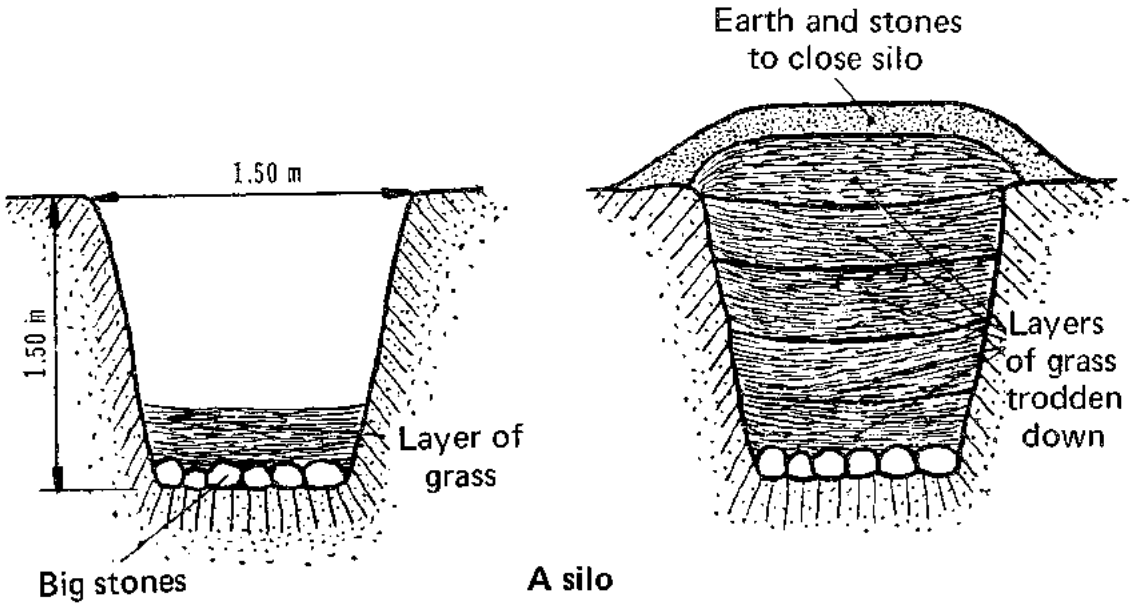
Do not sow this millet or maize
to eat the grain or to sell it,
but to give the green plants
to the animals to eat.
The animals change this millet and maize
into milk, into work and into meat,
for the use of people.

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 down well 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 two days
to fill, tread down and close the silo.



A silo

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 when 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.

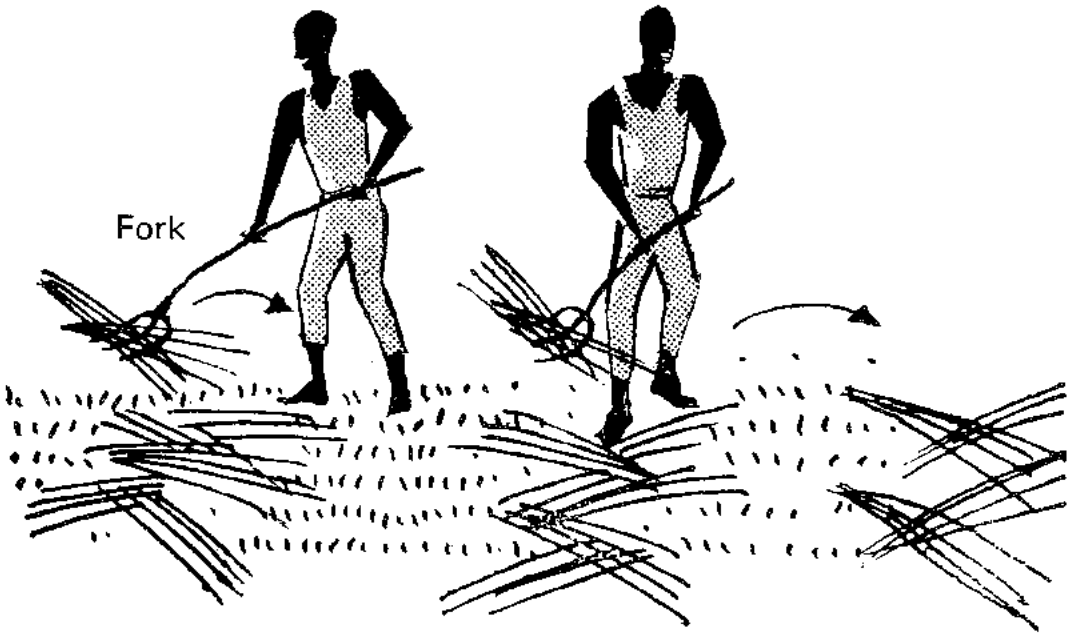
Animals do eat straw, but it is not easy to digest.
Straw is used for making manure.

- **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.

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.

In addition to grass and hay,
give a feed supplement (see page 14).

For example:
Give oil cake to oxen when they are working,
to cows when they are pregnant
and are feeding the calves with their milk.

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 animals:

- **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.**

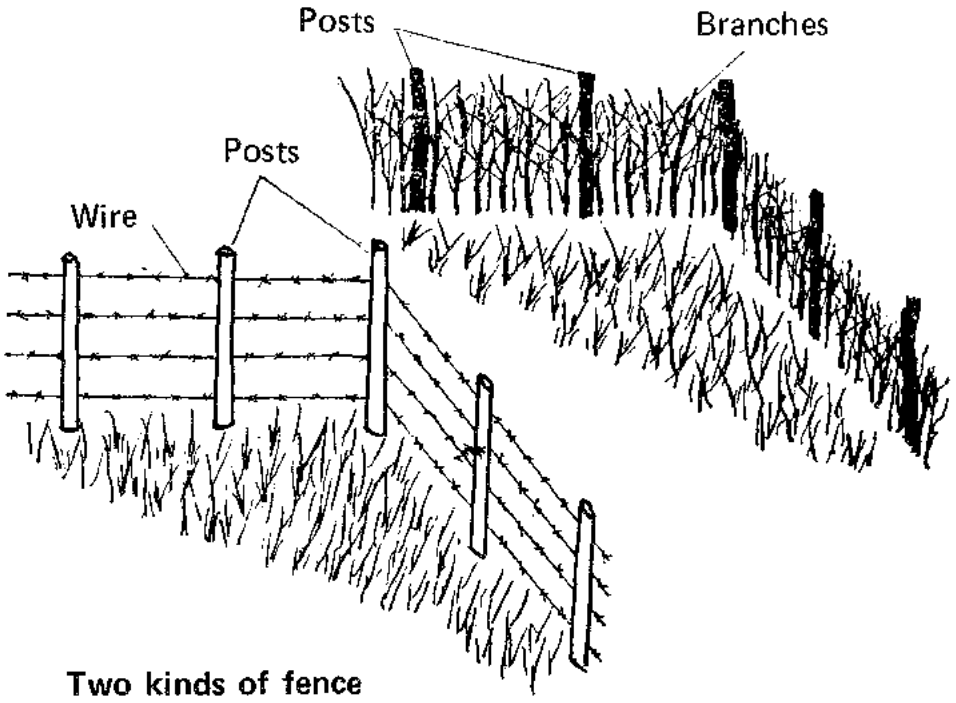
They may go near streams
and catch many diseases.
If an animal is bitten by a snake
or has some accident,
nobody knows about it,
and nobody looks after the animal.
Animals can also be stolen more easily.

- **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.

● 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 animals together,
have them vaccinated,
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 young animals are supposed to drink.

To help the herdsman,
a dog can be trained
to lead the animals,
to prevent them 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.

Where to build the shelter.

- Near the farmer's house,
  so that he can watch the animals better.
- On dry ground, on a mound.
  Wet soil causes diseases.
  Do not build in a low-lying place
  where the rain water collects.

How to build a shelter.

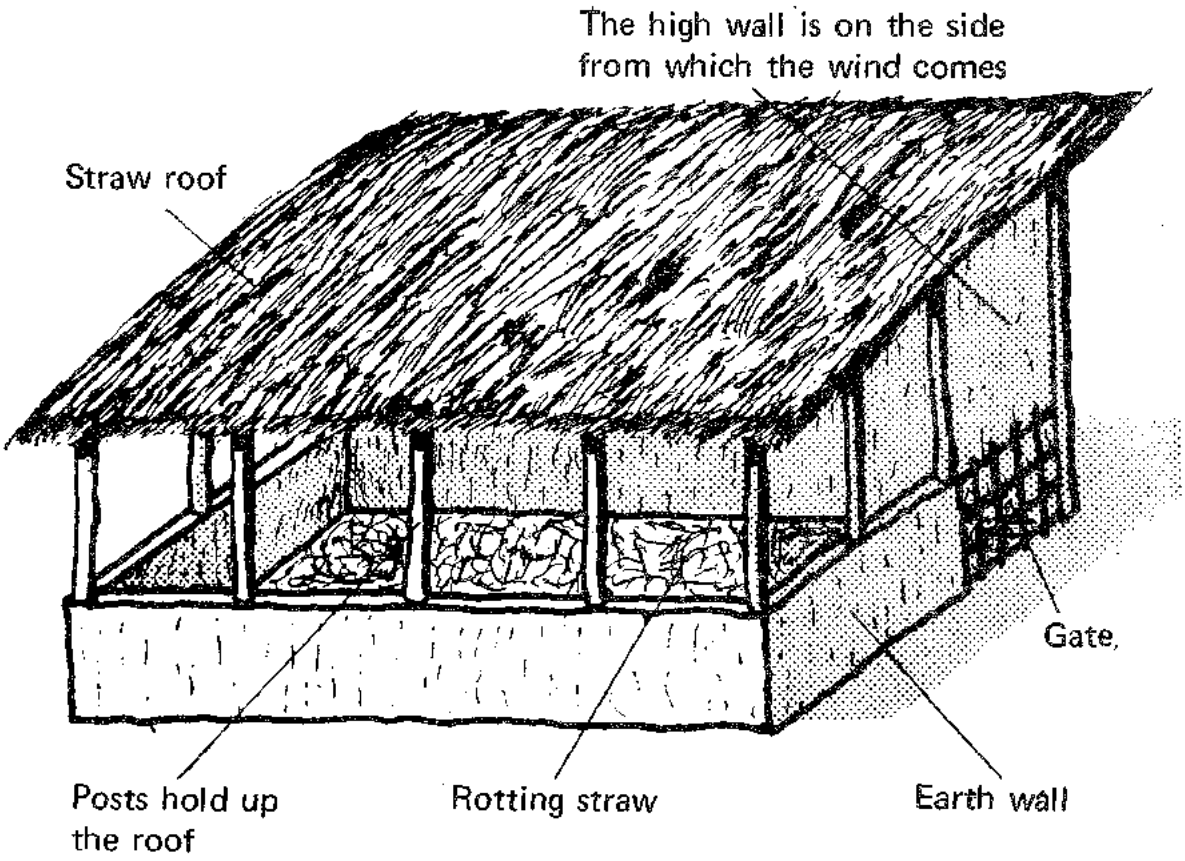
- You can build a shelter
  without spending a lot of money.
  Use wood, earth, straw.

- The animals must be protected from the wind.
  Build a fairly high wall of earth
  on the side from which the wind usually blows.
  Build small walls on the other sides.

- The animals must be protected
  from sun and rain.
  Make a straw roof.

- There must be a door
  big enough for you to get the dung out easily.

- The shelter must not be too small.
  The animals must not be crowded.
  A sheep needs 1 square metre
  and a cow needs 5 to 6 square metres.



Front view of shelter

- Along the lower edge of the roof
  fix a bamboo that you have cut in half lengthwise.
  You must also take out the little divisions inside the bamboo.
  Slope the bamboo slightly, and under the lower end
  place a drinking trough.
  The rain that falls on the roof
  will run into the bamboo
  and from the bamboo into the drinking trough.
  The bamboo will act as a gutter.

- You must build the shelter in such a way
  that the wind carries the smell
  away from the house.

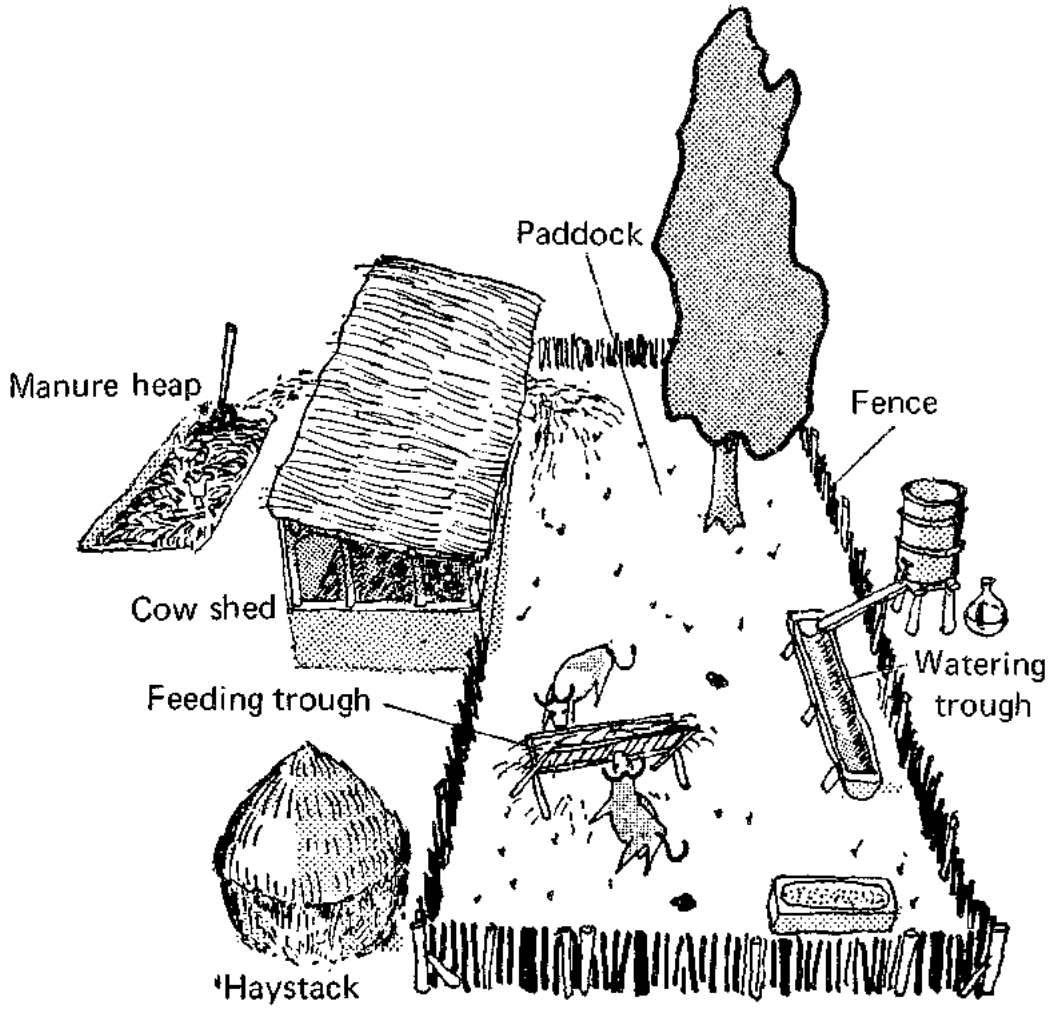
Beside the shelter make a paddock
where the animals can walk about.

Put a strong fence round it,
made of stakes, branches or thorns.
Leave a few trees to give shade.

In the paddock put
Feeding troughs where you give the animals
their feed supplement
and **watering troughs** where the animals can drink.

The feeding troughs and the watering troughs
can be made with hollowed-out tree trunks
or barrels cut in half.

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



VALUES OF SOME ANIMAL FEEDS

Feed	Number of feed units per kg of feed	Kilogrammes of feed to equal 1 feed unit	Grammes of digestible protein per kg of feed
Green fodder			
Pasture grass	0.15	6.5	16
Maize stems and leaves	0.2	4	6
Pueraria (grass)	0.3	3.5	41
Green sorghum	0.15	6.5	12
Green millet	0.1	10	7
Cassava leaves	0.2	5	63
Hay			
Very good prairie hay	0.6	1.5	60
Average prairie hay	0.35	3	23
Groundnut leaves without shells	0.4	2.5	35
Pueraria (hay)	0.5	2	87
Silage			
Pasture grass	0.15	6.5	14
Maize	0.15	6.5	8
Sorghum	0.15	6.5	18
Oil cake			
Groundnuts	1.2	0.8	400
Copra	1	1	167
Cottonseed	0.6	1.5	181
Palm kernel	1	1	145
Grains			
Maize	1	1	68
Paddy	1	1	40
Roots and tubers			
Cassava	0.3	3.5	7
Yams	0.25	4	9

SUGGESTED QUESTION PAPER

FILL IN THE MISSING WORDS

A farmer can earn money with his .....

This requires him to .....

A farmer should ..... of his herd.

An animal that is badly fed is often .....
and it does not .....

In the dry season animals do not have enough .....

A farmer grows ..... crops.

Animals also need clean .....and.....,
for example, a licking stone.

Animals should not be left ....., but put in a paddock.

You can have the herd watched by a .....,
who is helped by a well-trained .....

Animals are protected from wind and rain by a .....

It is built on a ..... . It is big enough
for the animals not to be .....

Beside the shelter, make a ..... where the animals can walk about.

ANSWER THE FOLLOWING QUESTIONS

What is a feed supplement?
What is a mineral supplement?
What mineral supplements do you know?
Why must an animal with young be well fed?
What is meant by "maintenance requirement"?
Why do animals need water? And why clean water?
How do you make hay?
How can pasture be improved?
Explain to a friend why you do not leave the animals to roam freely.

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