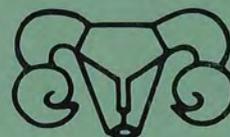


A COLLECTION OF TRAINING MATERIALS FOR
**ON-FARM RESEARCH ON SMALL
RUMINANTS**

Second Edition



Balai Penelitian Ternak/Small Ruminant-Collaborative Research Support Program
Pusat Penelitian dan Pengembangan Peternakan
Badan Penelitian dan Pengembangan Pertanian
Departemen Pertanian

October 1989

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Editor : Patrick J. Ludgate
Illustrators : Ruli Lubis
 : Muchji Martawidjaja
Translator : Hardi Prasetyo



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October 1989

ORIGINAL BOOK
KUMPULAN PERAGAAN DALAM RANGKA
**PENELITIAN TERNAK
KAMBING DAN DOMBA
DI PEDESAAN**

Cetakan Kedua

Penyunting : Patrick J. Ludgate
Penata Gambar : Ruli Lubis
Muchji Martawidjaja



Balai Penelitian Ternak/Small Ruminant-Collaborative Research Support Program
Pusat Penelitian dan Pengembangan Peternakan
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Departemen Pertanian

Oktober 1989

This technical information is derived partially from research results obtained by the staff of the Small Ruminants Program of the Research Institute for Animal Production, Ciawi, West Java, INDONESIA.

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PREFACE

On-farm research activities are an effort to increase animal productivity and production especially in the villages. This effort requires the support from all parties especially from the farmers directly involved with this program. The Outreach Pilot Project (OPP) is one of the projects resulting from the collaboration between the Research Institute for animal Production (RIAP) with the Small Ruminant-Colaborative Research Support Program (SR-CRSP), in support of the on-farm research activities relating to sheep and goat production in the villages. This is a multi-disciplinary program which involves : breeding and reproduction, nutrition, management, health, economics, marketing and sociology.

In order to improve the ability of the research staff in the development and testing of technologies with farmers, various training materials have been developed and used to improve animal husbandry skills and to stimulate discussions. This book contains a collection of training materials from each discipline with explanations which can be used by farmer when needed. Moreover, it is hoped that this book can be used by all parties concerned with increasing sheep and goat productivity and production in the villages.

Bogor, October 1989

DIRECTOR
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ACKNOWLEDGEMENTS

A collaborative research program between the Central Research Institute for Animal Science (CRIAS), the Research Institute for Animal Production (RIAP) and the Small Ruminant-Collaborative Research Support Program (SR-CRSP), was started in 1980. This program is built around cooperatively funded research activities in which several U.S. research institutions and USAID, collaborate with Indonesian research institutes to investigate the constraints and areas for development related to increased sheep and goat production in Indonesia. This program is focussed on increasing the smallholder farmers productivity of sheep and goats. In so doing, it has anticipated that the family welfare of these smallholder families will improve.

The materials presented in this book are part of our methodological strategy that provides a basis for the researchers and farmers to work together toward developing and testing new animal production and marketing techniques to be used under village conditions. We hope this collection of training materials will be useful to the small ruminant farmers as it reflects a framework for continued on-farm research in small ruminant production.

Special thanks and appreciation is extended to Dr. Soetatwo Hadiwigeno, Head of the Agency for Agricultural Research and Development; Drh. Jan Nari, Head of CRIAS; Drh. M. Rangkuti MSc., CRIAS; Dr. Benny Gunawan, Head of RIAP; Dr. Purnomo Ronohardjo, Head of the Research Institute for Veterinary Science; Dr. Tjeppy D. Soedjana, Coordinator of the Small Ruminants Program, RIAP; Dr. Ir. Ade Djuhara, Head of BPLP/BLPP; Ir. H. Asep Djuarsa, Head of the Livestock Extension Services in the Bogor district; Ms. Joyce Turk and Mr. Wilbur Scarborough, United States Agency for International Development; Dr. Luis Iniguez, Project Liaison Officer for the SR-CRSP in Indonesia and the Principal Investigators of the SR-CRSP for their assistance and support.

Bogor, October, 1989

Patrick J. Ludgate
SR-CRSP

INTRODUCTION

The Small Ruminant-Collaborative Research Support Program (SR- CRSP), was started in 1980, as a collaborative research program with the Research Institute for Animal Production (RIAP) Ciawi, West Java focussed on increasing the production of sheep and goats in Indonesia and thereby increase the food supply and income of the smallholder farmers engaged in small ruminant production. Small ruminants are a particularly important component in the diverse agricultural systems of the smallholder farmers in Indonesia. For instance, in West Java, the most populated island, it is estimated that 35 per cent of the farming families raise sheep and goats as an important source of their family income. These small ruminants also provide a, means of savings, source of manure, contribution to religious functions and social status.

Trough a multidisciplinary research methodology and the participation of scientists from Breeding, Nutrition, Management, Sociology, Economics and Health, the RIAP/SR-CRSP scientists have identified the main constraints faced by farmers in improving small ruminant productivity and have developed a number of production technologies that optimize animal production under on-station conditions. These technologies are now being tested under village conditions, trough the Outreach Pilot Project (OPP). The OPP is an on-farm research program with the direct participation of farmers, scientists and local livestock and extention service personel. This on-farm research follows a farming system research methodology. Our on-farm research has emphasized the need for sustainable technologies that are technically feasible, socially acceptable and economically profitable in meeting the family welfare objectives of the smallholder farmers.

This book presents a collection of training materials that are used in the on-farm research and testing of technologies in the Outreach Pilot Project. The materials presented in this book are part of our methodological strategy that provides a basis for the researchers and farmers to work together to develop and test new animal production techniques to be used under village conditions. We hope this collection of training materials will be useful to the small ruminant farmers as it reflects a framework for continued on-farm interdisciplinary research in small ruminant production. We also hope that it will be helpful to the efforts of associated communication and extension services that are involved in promoting the research recommendations toward improved farm family welfare.

Throughout this year, each discipline developed and tested a variety of sheep and goat management and marketing technologies focussed on increasing the productivity of the small ruminant farmers. In the following sections each discipline presents basic animal management procedures and portions of technology packages designed to improve the productivity of sheep and goat farmers thereby providing them with the means to earn additional income through the sale of small ruminant animal products.

Finally, it is hoped that this valuable booklet will provide technical assistance and information to the smallholder farmers and the livestock extension services engaged in sheep and goat production and training in Indonesia, as well as provide encouragement for further research activities in the area of small ruminants.

Bogor, October, 1989

Patrick J. Ludgate

SR-CRSP

BREEDING

by

Bambang Setiadi and Muryanto

BREEDS OF SHEEP AND GOATS IN INDONESIA

Knowledge of breeds of sheep and goats in Indonesia would help in achieving success in raising these animals. Each breed has certain characteristics which can be used for their identification and selection for a particular production objectives.

The breeds are :

SHEEP

1. *Sheep indigeneous to Indonesia*

Characteristics :

- body relatively small,
- color and characteristics not homogeneous.

2. *Fat-tailed Sheep*

Largely found in Madura, Sulawesi, East Java and Lombok.

Characteristics :

- body slightly larger than indigeneous sheep,
- males with small horns, polled females
- long and wide tail which can accumulate deposits of fat
- the tip of the tail is small.

3. *Priangan Sheep (Garut Sheep)*

Belived to be a crossbreed between indigenous sheep, merino and fat-tailed sheep from South Africa.

Characteristics :

- males with large horns, curving backward, shaped like spirals, base of left and right horns almost joined,
- ears can be long, medium, or short, behind the horns,
- short tail with a rather large base
- adult body weight for male ranges 60-80 kg and for female 30 - 40 kg.

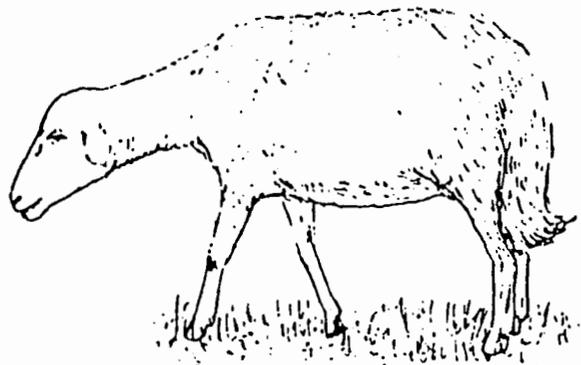
BREEDS OF SHEEP AND GOATS IN INDONESIA

SHEEP

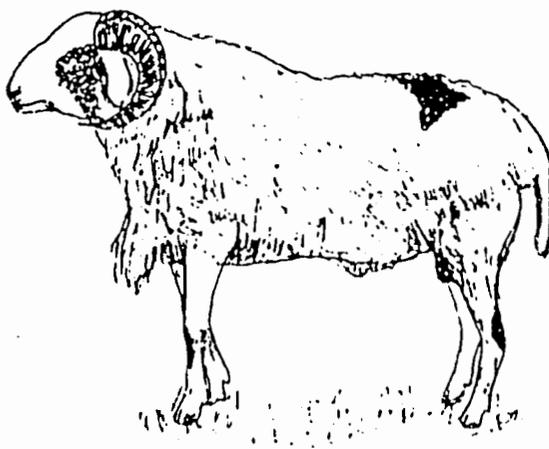
1. Indonesian Indigenous Sheep



2. Fat-tailed Sheep



3. Priangan (Garut) Sheep



4. *Merino Sheep*

Originated from Spain.

Characteristics :

- medium body size
- males with large and twisted horns,
- females are polled

5. *Suffolk Sheep*

Originated from England.

Characteristics :

- in the country of origin, the adult body weight for males ranges 60-90 kg and for females 45-68 kg,
- carcass percentage 50-65 % of body weight,
- males and females polled, with black heads

6. *Dorset Sheep*

Originated from England

Characteristics :

- in the country of origin, the adult body weight for males ranges 45-57 kg and for females 32-41kg,
- carcass percentage 50-65 % of body weight.

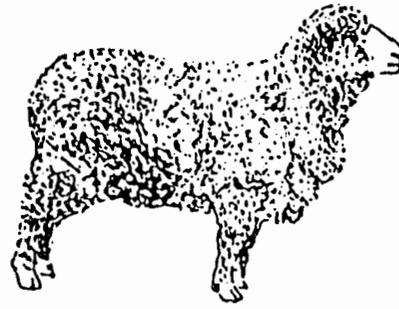
7. *Blackbelly Barbados Sheep*

Originated from Barbados Island (Caribbean Sea)

Characteristics :

- medium prolificacy
- brown with black belly

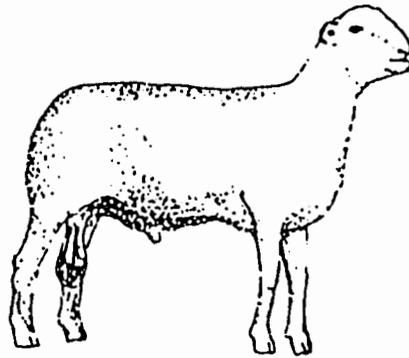
4. Merino Sheep



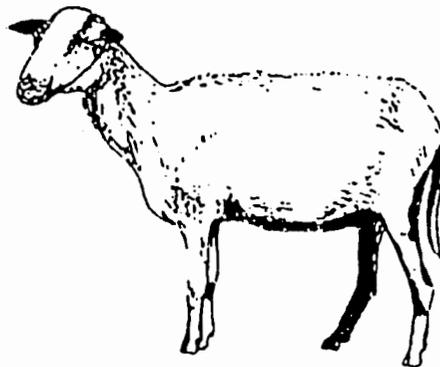
5. Suffolk Sheep



6. Dorset Sheep



7. Barbados Blackbelly Sheep



GOATS

1. *Kacang goat*

Indigenous to Indonesia, origin not clear.

Characteristics :

- body small and short,
- ears small and erect,
- short neck, elevated back,
males and females are horned
- average height for adult males ranges 60-65 cm and females 56 cm,
- adult body weight for males \pm 25 kg, for females 20 kg.

2. *Etawah goat (Jamnapari)*

Originated from Jamnapari area, India.

Characteristics :

- curved nose,
- males and females are horned,
- long ears (30 cm), drooping,
- long legs with long hair on the back legs,
- spotted colored coat with black, white or red, or brown and white,
- good milk producer (\pm 3 l/day/animal),
- large and long teats, (like bottles)
- adult body height for males ranges 90-127 cm, for females 76-92 cm,
- adult body weight for males ranges 68-91 kg, for females 26-63 kg.

3. *Etawah crossbreds*

Crossbreds between Kacang and Etawah goats from many years ago. This breed has been well adapted to Indonesian conditions. The shape of the body is between Etawah and Kacang goats.

- ear length ranging between 18-30 cm,
- adult body weight \pm 40 kg for males and \pm 35 kg for females,
- shoulder height between 76-100 cm,
- for the males, the fur around the neck and shoulders is thicker and slightly longer; for the females, long fur only on thigh areas
- coat color varies from light brown to black.

4. *Saanen goat*

Originated from Saanen Valley, Switzerland.

Characteristics :

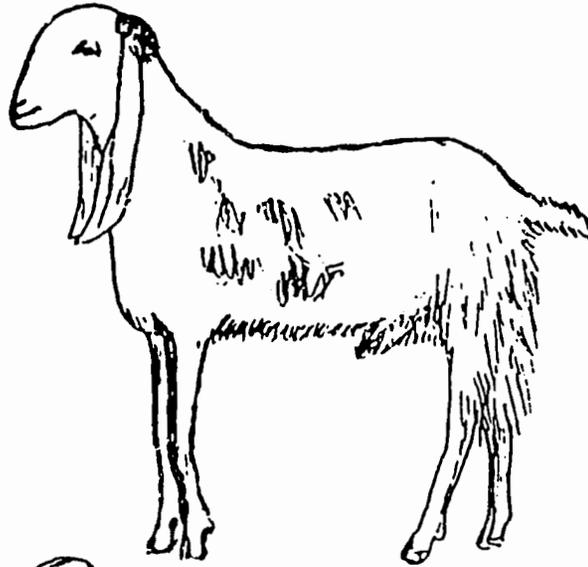
- males and females are hornless
- coat color white or light cream, with black spots on the nose, ears and teats,
- wide forehead, medium and erect ears
- dairy type

GOATS

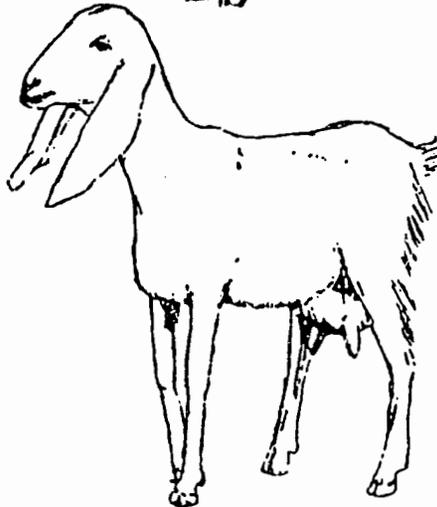
1. Kacang Goat



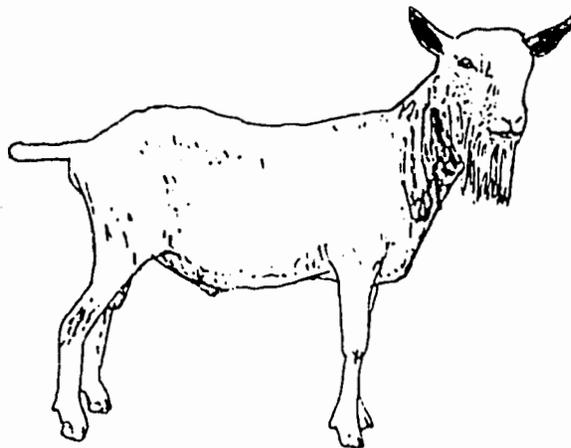
2. Etawah Goat



3. Etawah Crossbred Goat



4. Saanen Goat



5. *Marica goat*

Largely found in Sulawesi

Characteristics :

- body smaller than kacang goat,
- possibly related to kacang goat.

6. *Gembrong goat*

Largely found in Bali

Characteristics :

- larger body than kacang goat
- rather long hair, especially on males.

7. *Alpine goat*

Characteristics :

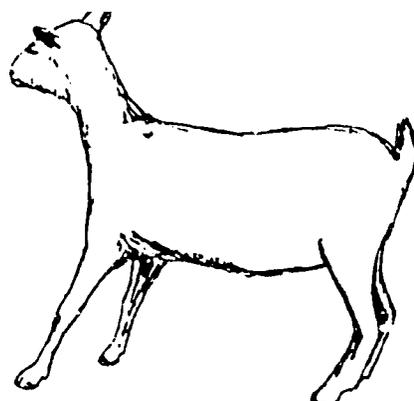
- some with horns and some without,
- the same size and height as saanen goat,
- coat color varies from white to black,
- white line above the nose,
- dairy type.

8. *(Anglo)-Nubian goat*

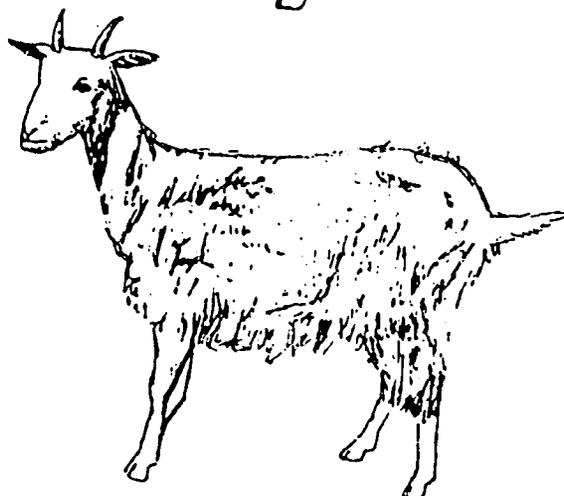
Characteristics :

- short hair,
- long legged and well adapted to hot weather,
- prolific animals,
- some with horns and some without.

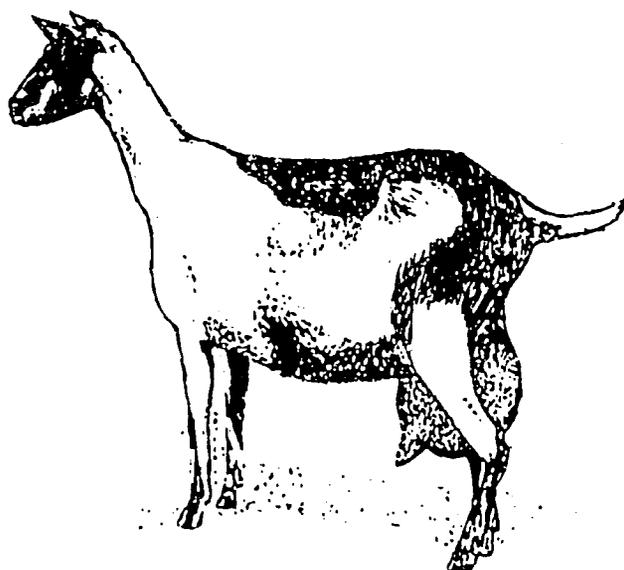
5. Marica Goat



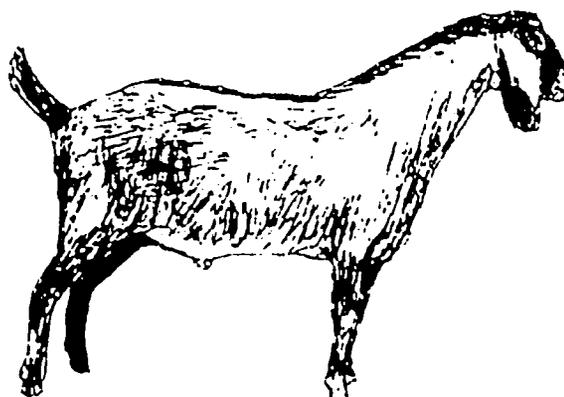
6. Gembrong Goat



7. Alpine Goat



8. (Anglo) Nubian Goat



SHEEP - GOAT BREEDING STOCK

Characteristics for male breeding stock

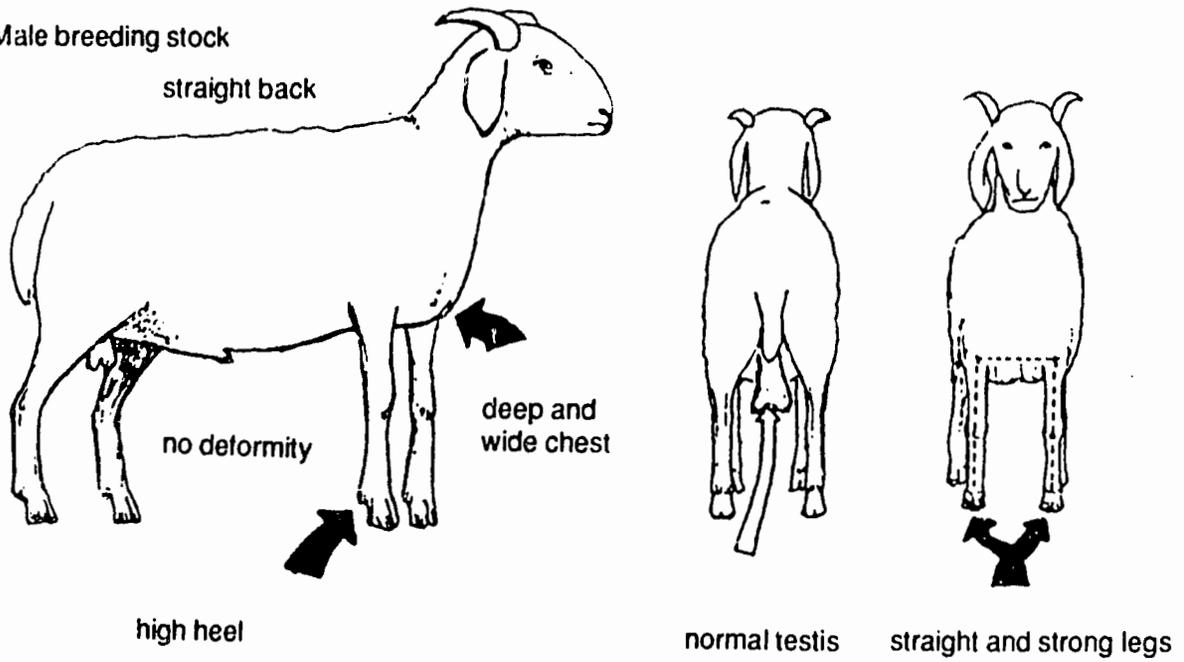
- healthy, large body, relatively long and no deformities,
- deep and wide chest,
- straight and strong legs,
- high heels,
- good appearance,
- active and with high libido,
- normal testicles (two of equal size, firm),
- penis firm and can produce an erection,
- preferably coming from twins,
- clean and shiny coat.

Characteristics for female breeding stock

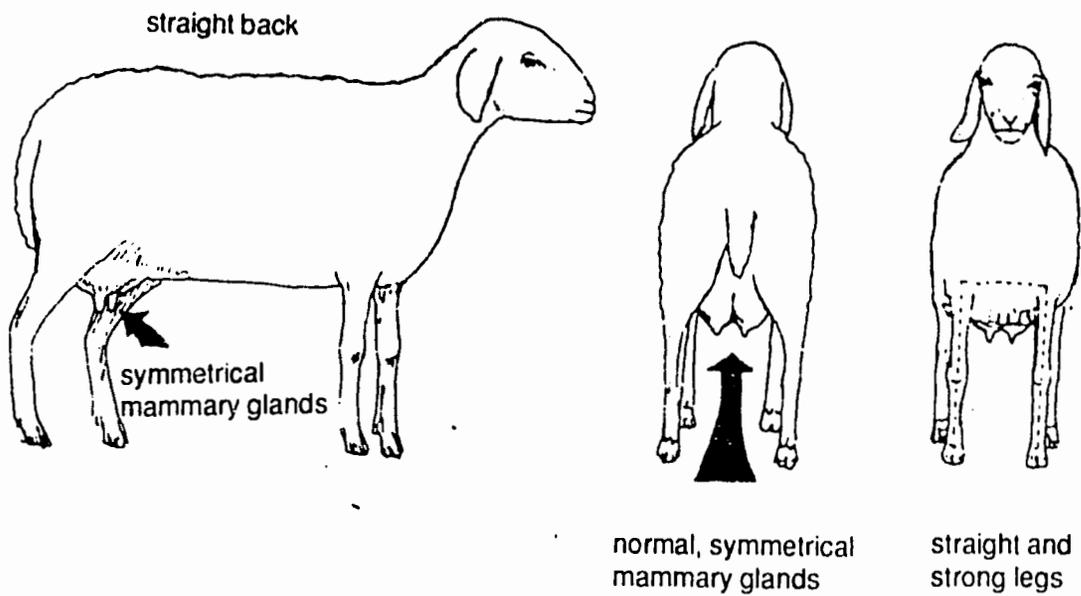
- healthy, not too fat and no deformities,
- straight and strong legs,
- normal genitals,
- good mothering ability,
- normal teats (smooth, firm, no infection or swelling),
- preferably from twins,
- clean and shiny coat.

SHEEP/GOAT BREEDING STOCK

1. Male breeding stock



2. Female breeding stock



breeding

Balitnak / S.R. - C.R.S.F

BODY DEFORMITIES

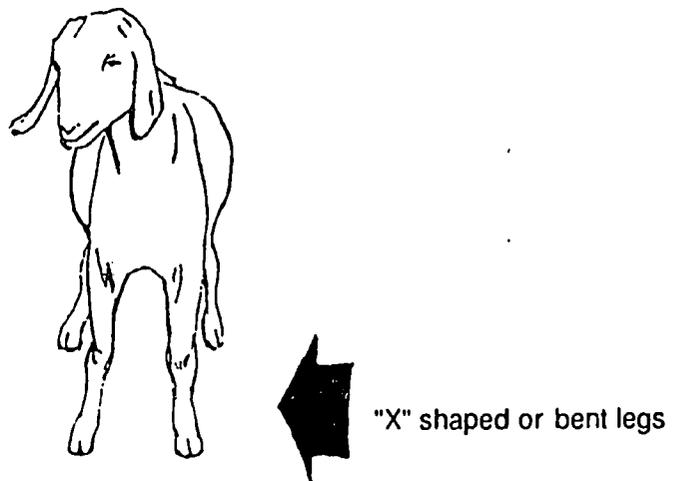
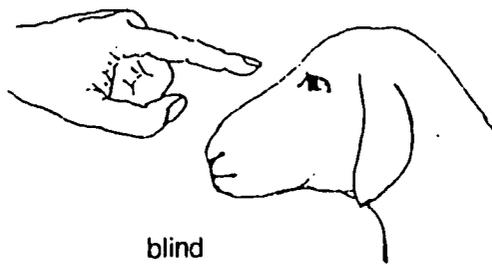
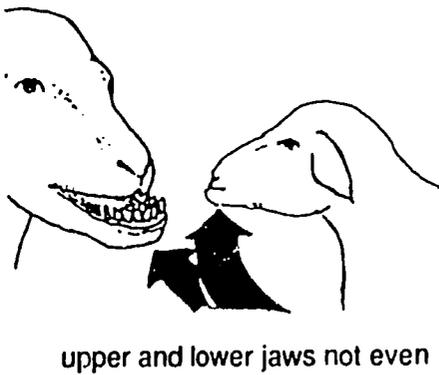
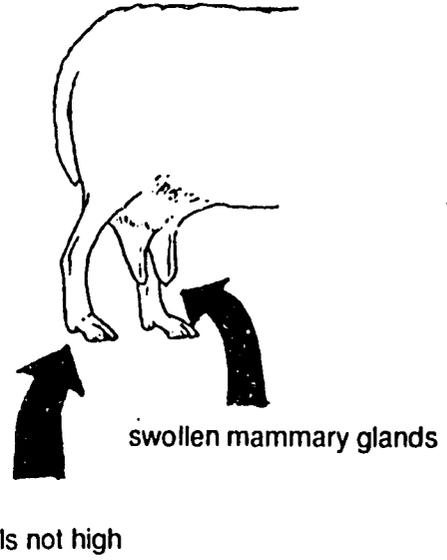
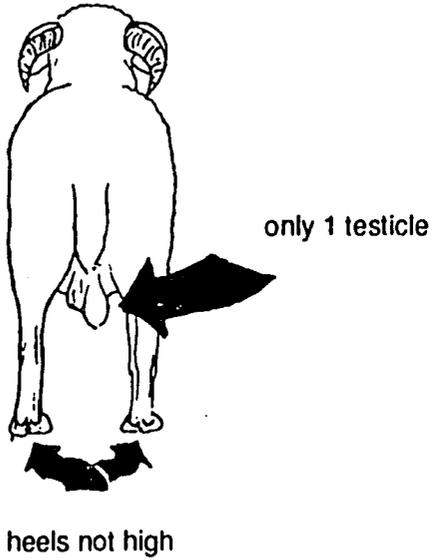
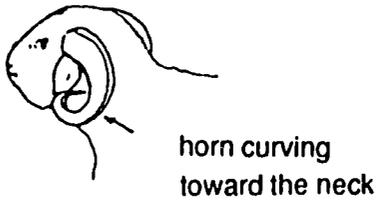
When you choose sheep/goats, avoid the ones with body deformities such as :

- upper and lower jaws not even,
- horns curving toward the neck,
- only one testicle, or two but of unequal sizes,
- sign of infections, swelling in teats,
- legs shaped like an X,
- blind, (trough checking by pointing an index finger in front of the eyes, if there is no response (blinking) then the animal is blind),
- sterile.

BODY DEFORMITIES

1. Male

2. Female



breeding

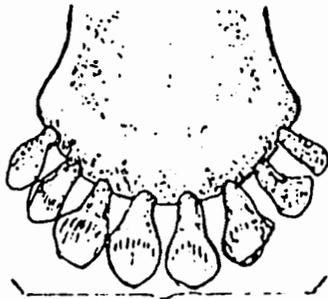
Balitnak / S.R. - C.R.S.P

PREDICTING THE AGE OF SHEEP-GOATS

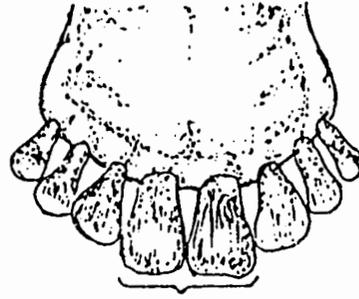
Predicting the age is based on the number of permanent incisors.

Permanent Incisors	Age
1. None (only temporary teeth)	less than 1 year
2. A pair of incisors (2 teeth)	1-2 years
3. Two pairs of incisors (4 teeth)	2-3 years
4. Three pairs of incisors (6 teeth)	3-4 years
5. Four pairs of incisors (8 teeth)	4-5 years
6. Permanent incisors starting to wear out or to fall out	5 years or more

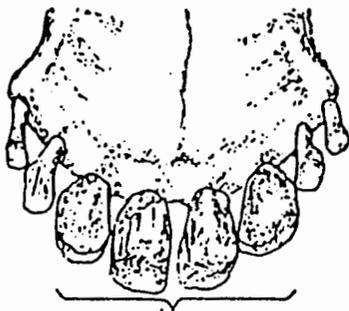
**ESTIMATION OF AGE BASED ON THE NUMBER OF
PERMANENT INCISORS IN THE LOWER JAW**



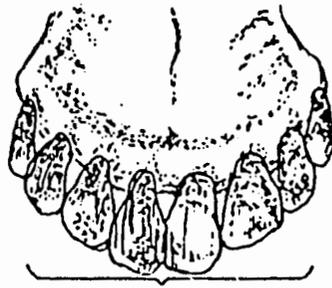
temporary incisors
less than 1 year



1 permanent pair
1 - 2 years



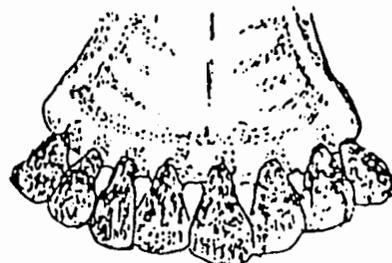
2 pairs of permanent incisors
2 - 3 years



3 pairs of permanent incisors
3 - 4 years



4 pairs of permanent incisors
4 - 5 years



permanent incisors starting to wear away
5 years or
more

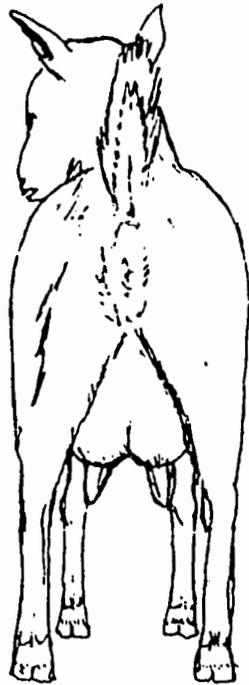
breeding

Balitnak / S.R. - C.R.S.P

PUBERTY - HEAT

- Puberty is the physiological stage in life when the female animal begins its estrus cycles. In this condition a female has the potential to produce offspring.
- Sheep/goats reach puberty at about the age of 6-8 months,
- Age of first mating is usually between 10-12 months (for females), and for males preferably more than 1 year old,
- Mating can only be successful if the female is in heat.
- The signs of heat are :
 1. The outer part of the genitals is swollen, wet, red and warm,
 2. Wagging of the tail,
 3. Remains quiet when mounted by a male or other animals,
 4. Restless (noisy) and reduced appetite .
- A female will be in heat approximately every 17 - 19 days (if not mated or if unsuccessfully mated),

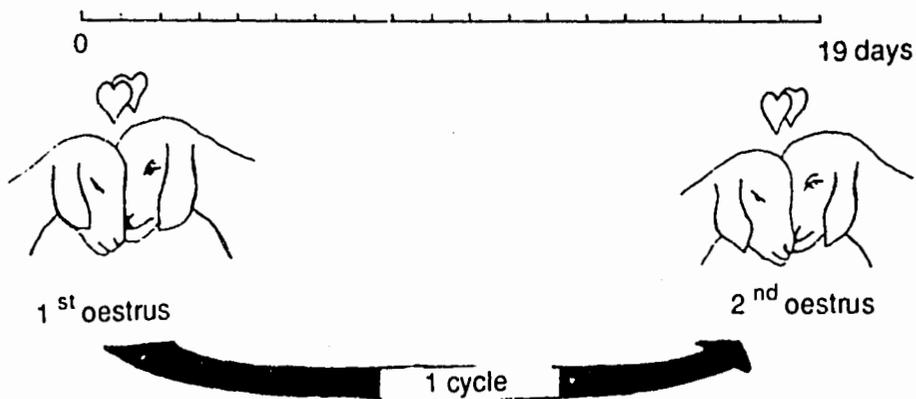
PUBERTY



Signs of oestrus

- sex organ swelling, reddish and damp
- restless and noisy
- wagging tail
- mounting another animal stationary when mounted

OESTRUS CYCLE

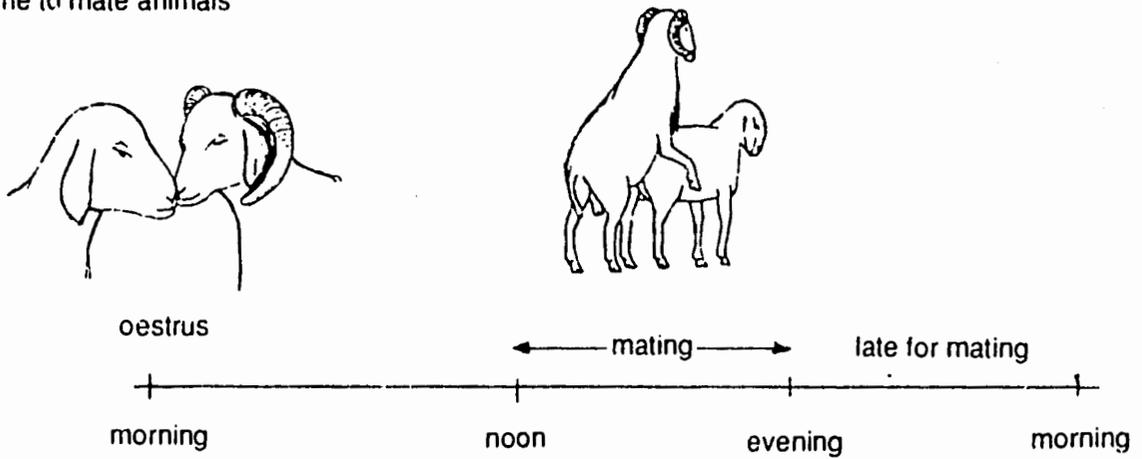


MATING

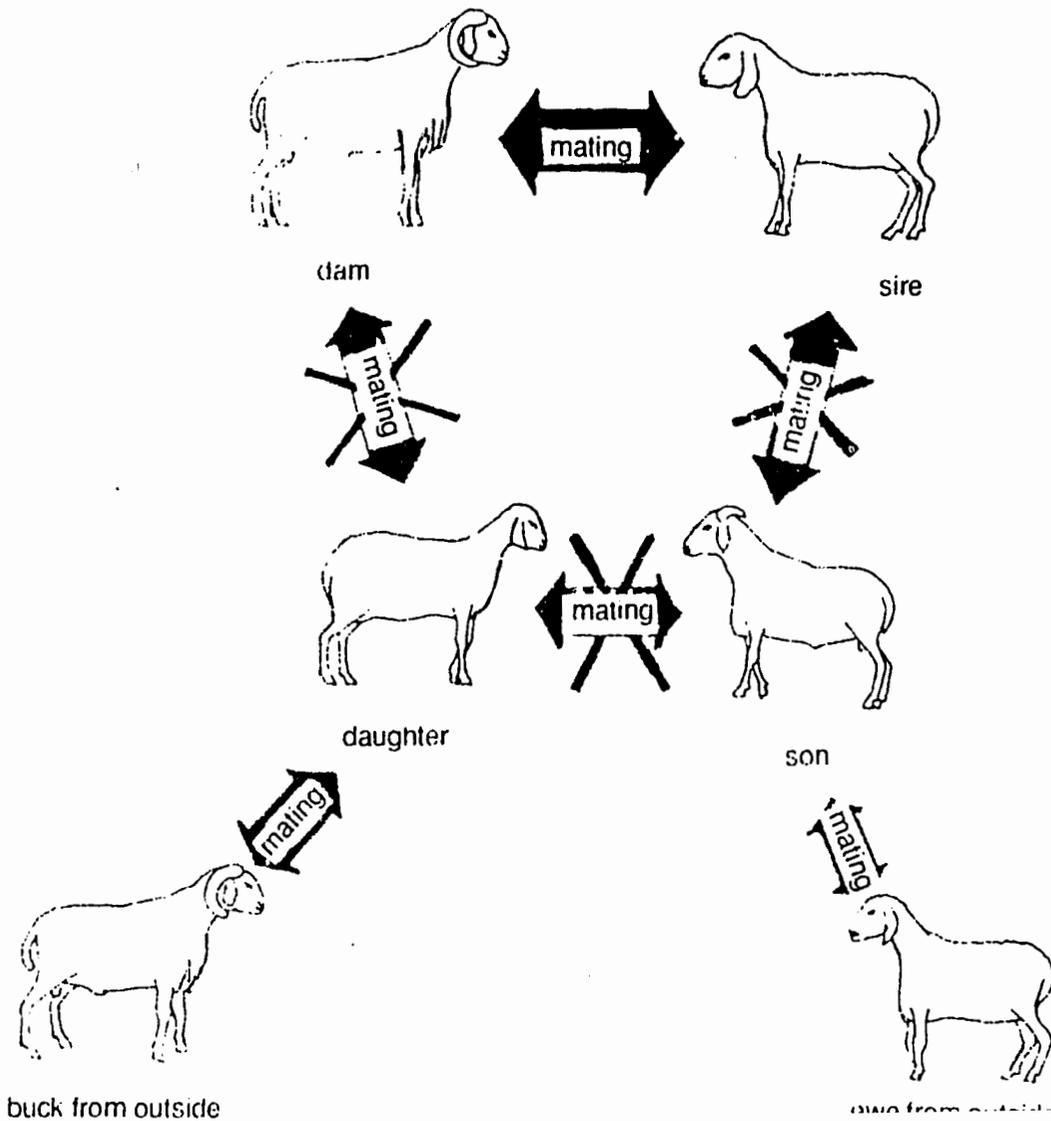
- The best time for mating sheep/goats is 12-18 hours after the first appearance of the signs of heat,
- To avoid unsuccessful mating, the animals (male and female) should be put in a small pen together.
- If mating is unsuccessful (no pregnancy), shown by the female returning to estrus (after 17-19 days), it must be remated.
- Do not mate animals which are closely related (father and daughter, mother and son, brothers and sisters), because it may result in lambs/kids with birth defects (small, unhealthy and deformed).
- Therefore, rotate the male breeders or borrow an unrelated male from one of the other farmers.

MATING

time to mate animals



- avoid mating animals closely related



breeding

Balitnak / S.R. - C.R.S.P

PREGNANCY

Pregnancy is shown by :

1. No signs of heat there is no other cycle
2. Swelling of the stomach on the right hand side,
3. Teats are lower,
4. Frequent scratching of the body on the wall,
5. The animal appears calmer

Prepare separate pens for pregnant ewes/does by using partitions so that :

1. They are not disturbed by the males or other animals,
2. Their feed is not disturbed by other animals,
3. They are calmer

To maintain the health of the ewe/doe and to promote its pregnancy, it is necessary :

1. To keep the barn clean including, the floor and the area under the barn
2. To maintain the pen in good order, so that the animals may not get caught in between broken floor slats.
3. To shear the wool/hair (during early pregnancy).

Offer good quality feed, especially between 2 months prior to and 3 months after lambing, the feed should consist of :

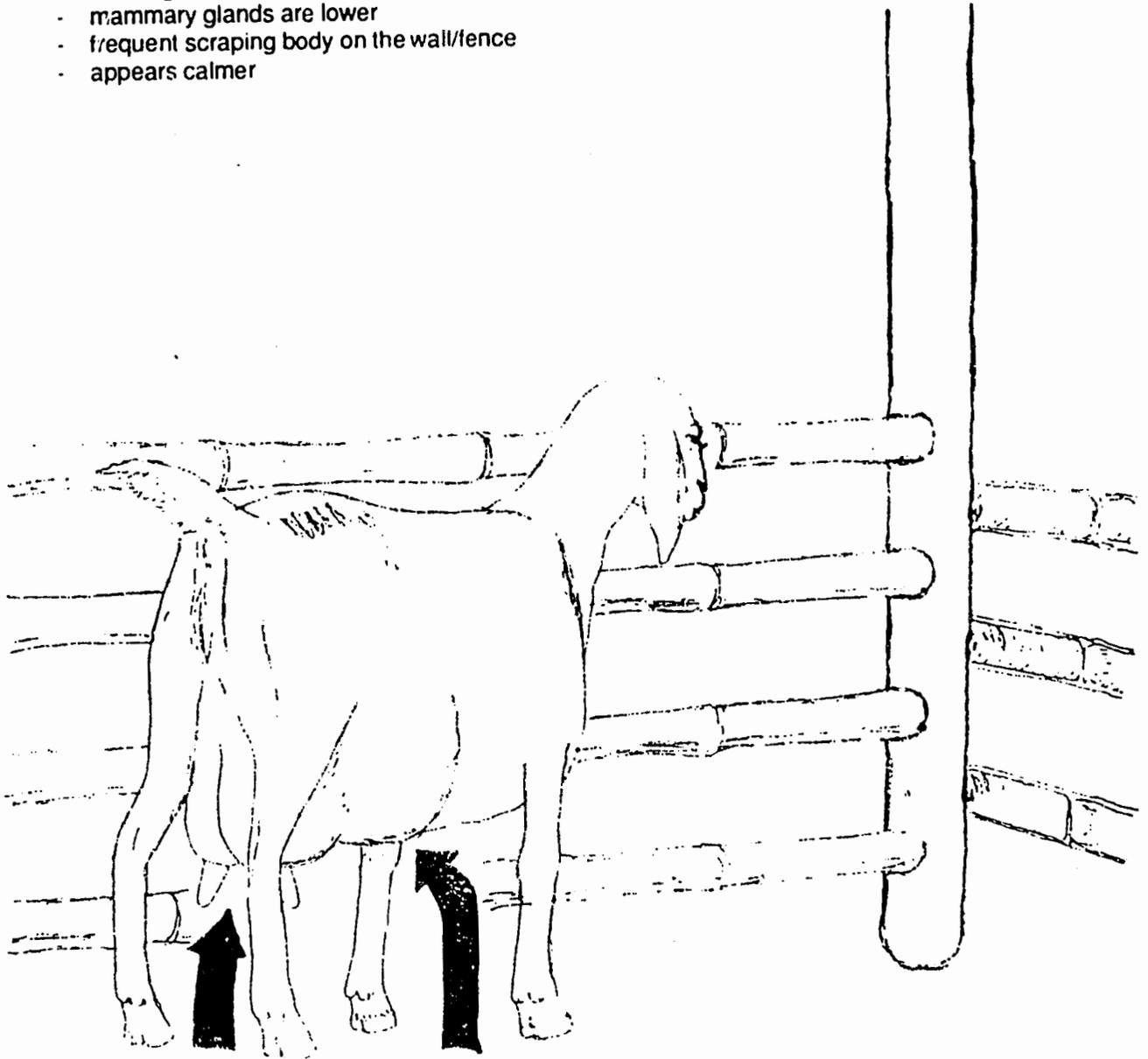
1. Grasses,
2. Legume forages (gliricidia, sesbania, calliandra, or other legume leaves),
3. Extra feed, rice bran or soybean waste products.
4. Plenty of clean water

Gestation period (time to birth) is \pm 150 days (5 months).

PREGNANCY

Pregnancy can be detected by :

- no sign of oestrus on the next cycle
- swelling of the right side of stomach
- mammary glands are lower
- frequent scraping body on the wall/fence
- appears calmer



lower mammary
glands

swelling on the right side
of stomach

breeding

Baltnak / S.R - C.R.S.P

PREPARATION FOR LAMBING

The signs prior to lambing :

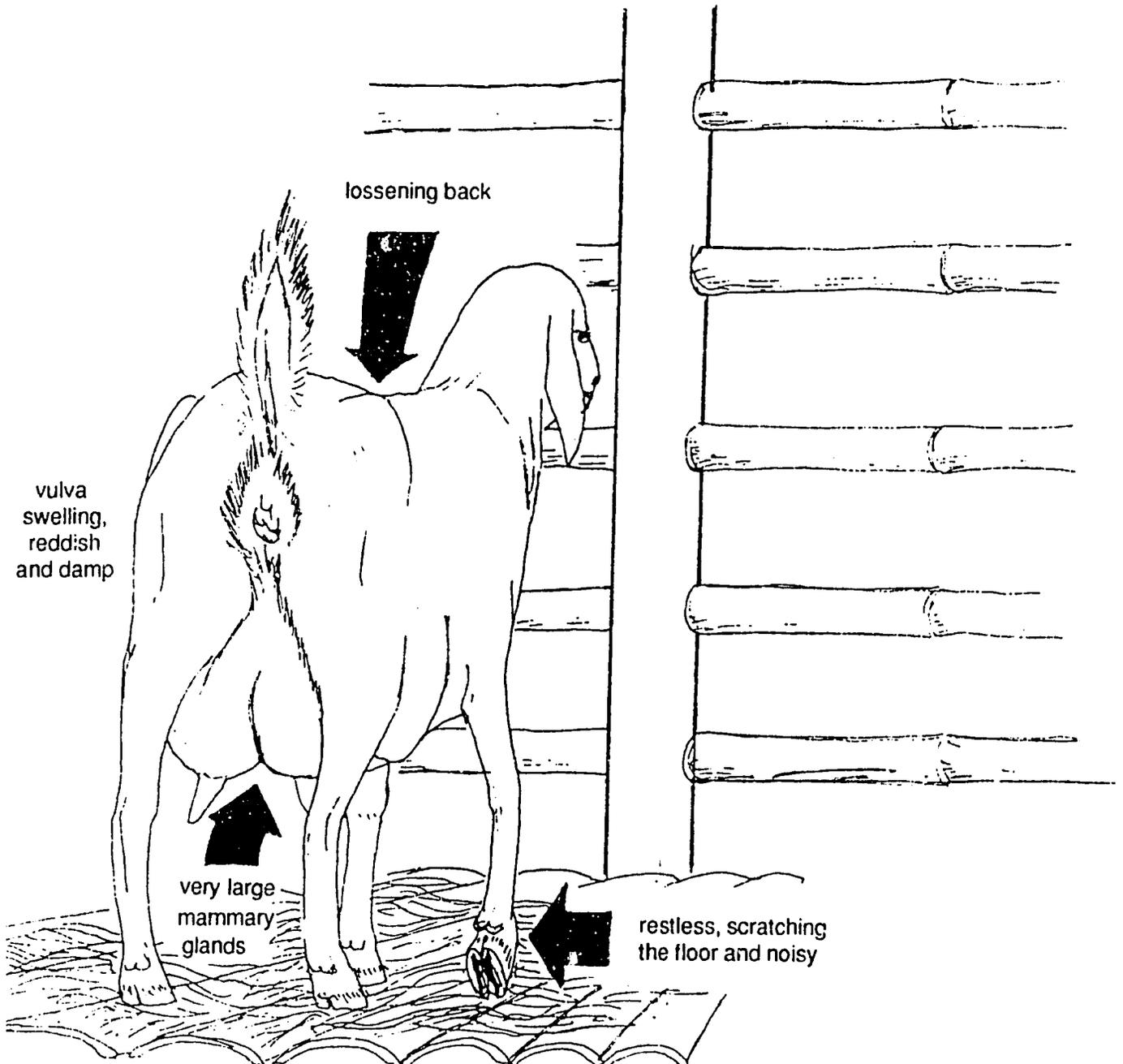
1. Relaxing of the hip muscles,
2. Mammary glands are very large and teats are firm,
3. The vulva is swollen, reddish and wet,
4. Restlessness, scratching the floor and making noise.
5. Declining appetite.

Preparation for lambing :

1. Clean the pens,
2. Prepare dry and clean bedding to absorb any liquid coming out during the birth process (dry straw or jute bag),
3. Prepare a 7% iodine solution for dressing the umbilical cord.

PREPARING FOR LAMBING

Signs prior to lambing :



BIRTH POSITIONS OF LAMBING

Normal lambing :

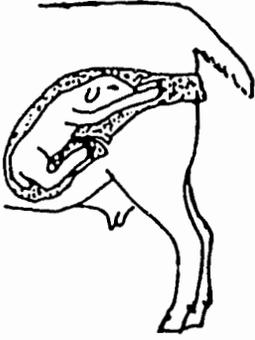
1. Anterior position
2. Posterior position
3. Normal twin lambing

Abnormal lambing :

4. One of the front legs is backward
 5. The head is twisted backward
 6. Curling
 7. Upside-down position
 8. Abnormal twin lambing,
- The position of the lamb (especially the abnormal ones) may cause difficulties in lambing. Therefore, it is necessary to keep guard when a ewe is showing the early signs of preparing to lamb (watching from a distance).
 - When the ewe shows any sign of difficulties, immediately provide any help following the proper procedures.

POSITIONS OF LAMBING

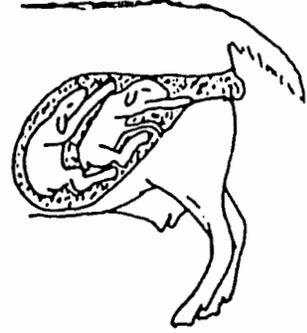
Normal position



1. anterior position

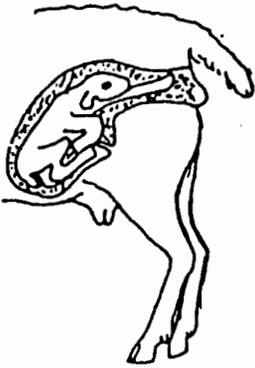


2. posterior position



3. normal twins

Abnormal position



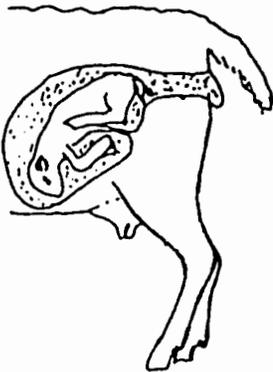
4. one of forelegs backward



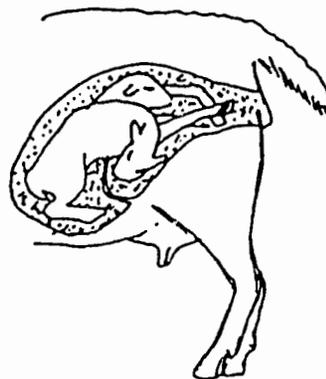
5. head twisted backward



6. curling



7. abnormal posterior position

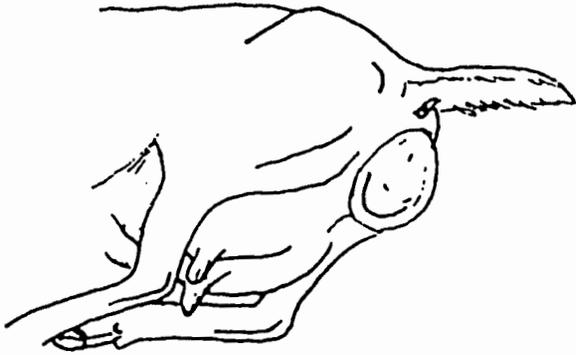


8. abnormal twins

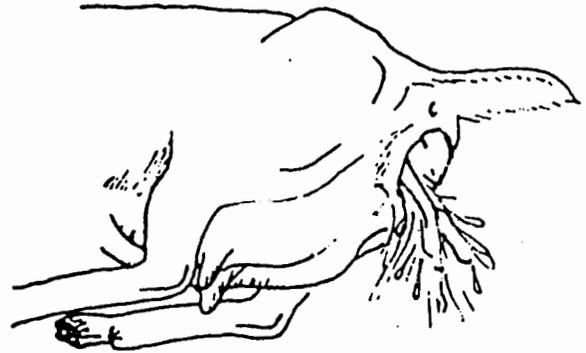
LAMBING PROCESS

- Amniotic sac (water sac) is broken
- When the lamb begins to come out, the ewe will start to push with its abdominal muscles. The lamb is usually delivered within 1 to 1.5 hours, if not, then the animal needs help with the birthing process.
- The placenta mixed with mucus and blood will usually come out within 12-24 hours after the animal is born.
- Cut the placenta and dip the umbilical cord in a 7% iodine solution.
- Let the ewe lick the lamb until dry, if the ewe does not want to lick, it is necessary to clean any fluid from the lamb's body by using a dry and clean cloth.
- Clean the nose and mouth of the newborn lamb to make it easier to breath.

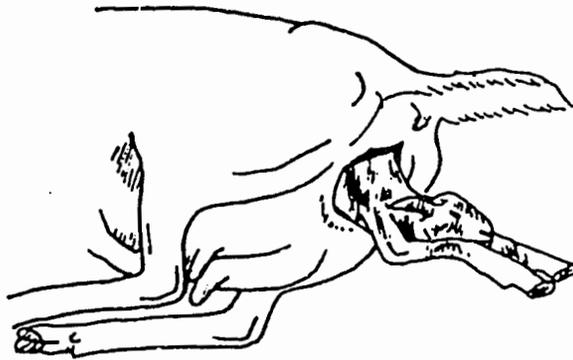
LAMBING PROCESS



amniotic sac is coming out

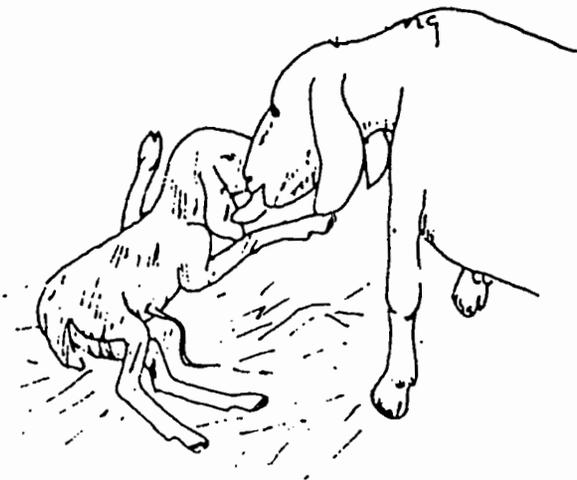


amniotic sac is broken

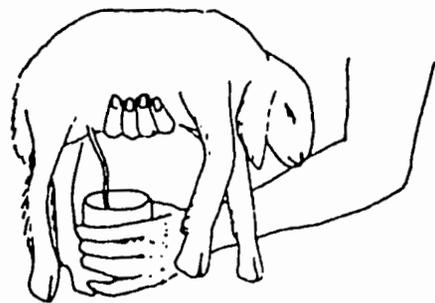


the lamb is coming out

let the ewe lick the lamb dry



dip the cut from placenta into iodine solution

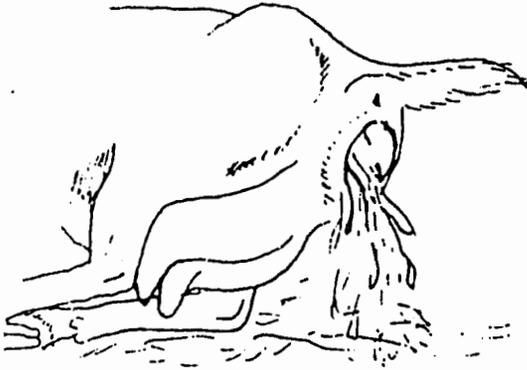
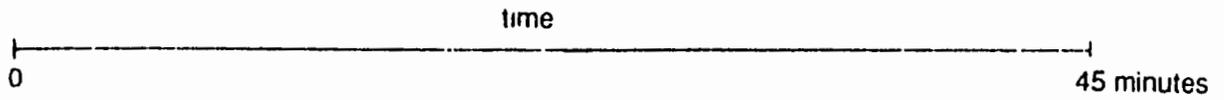


DIFFICULTIES IN LAMBING

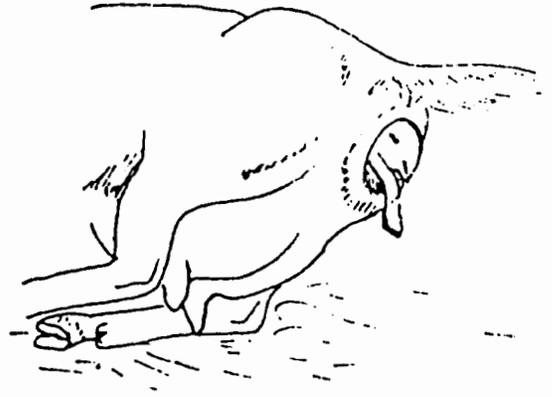
Difficulties may occur when :

1. The lamb is not in a normal position
 2. The ewe has narrow hips
 3. The lamb is too big
 4. The lamb/kid has died inside the pregnant animal (stillborn lamb)
 5. The ewe is in a weak or unhealthy condition
- Difficulties in lambing can be anticipated when the lamb is not out after 45 minutes or an hour after the amniotic sac was broken.
 - Therefore, better care is required, especially for animals lambing for the first time, such as providing them with enough feed, water, exercise and peaceful surroundings.

DIFFICULTY IN LAMBING

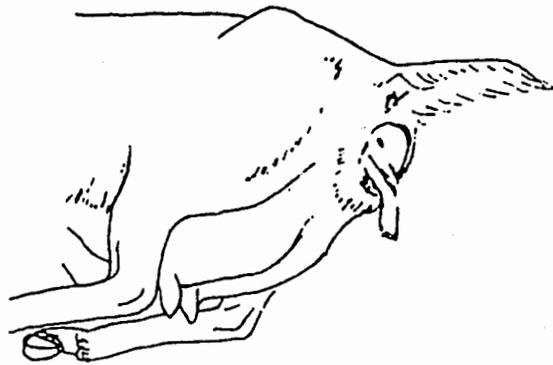


amniotic sac is broken



after 45 minutes
the lamb is still not out

after 1 hour



the lamb is still not out

breeding

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AIDS FOR LAMBING DIFFICULTIES

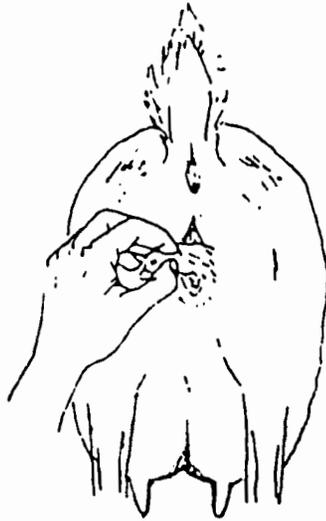
Procedures in helping the lambing process:

- Clean the vulva and the surrounding area with soap.
- Wash your hands and lubricate them with soft soap.
- Insert your hand slowly into the vulva in a partially closed position.
- Feel and locate each part of the lamb's body such as the legs, and head and determine whether it is a single or twins.
- For the anterior position (front feet first) you should feel the head and the forelegs. If one of the legs is missing, insert your hand further to find it. Then, slowly pull the leg into the correct position and pull both legs gently to retrieve the lamb.
- For the posterior position (back feet first) both hind legs must be parallel. To make sure that they are hind legs, the hooves should point downward and the back should point upward. If the hooves point upward then the legs must be forelegs.
- If a part of the body is not in normal position, try to correct it slowly and pull gently to retrieve the lamb.
- To help the newborn's breathing, clean the mucus from the nose by using a piece of straw inside the nostril or grab the hind legs and swing the body carefully.
- Let the ewe lick the lamb until dry.

ASSISTING IN DIFFICULT LAMBINGS



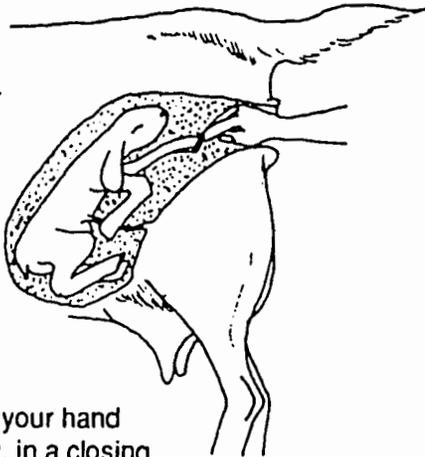
trim your nails



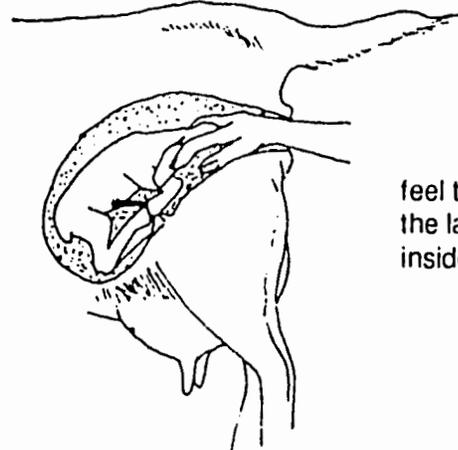
wash hands and the vulva
with soap



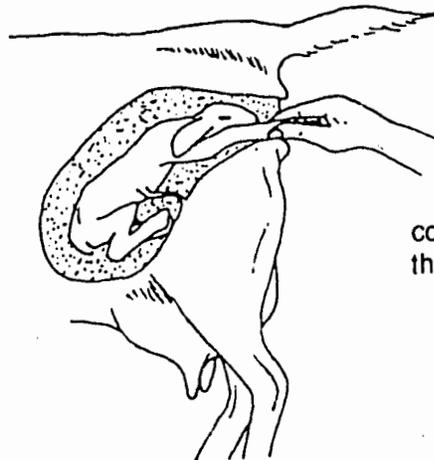
lather with soap as
lubricant



insert your hand
slowly, in a closing
position



feel the part of
the lamb's body
inside



correct any wrong position carefully,
then pull the lamb slowly

CARE FOR NEWBORN LAMB/KID

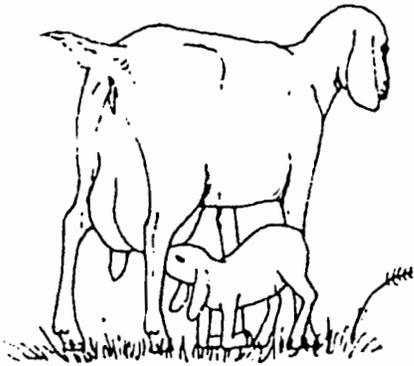
- Soon after birth, the lamb should start suckling (within the first few hours). When there is a problem, the lamb should be helped to suckle.
- A newborn lamb which does not suckle within 12 hours because of the death of its' mother, should be given colostrum from another source (perhaps another sheep or goat is lambing/kidding at the same time, or from a neighbor's animal) as soon as possible and for at least during the first few days to replace the mother's colostrum,

Preparing Milk replacement :

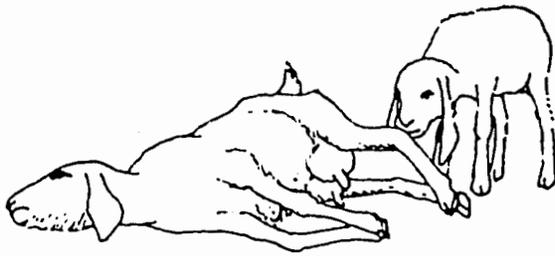
Mix homogeneously- 0.25-0.5 liters of cow's milk or powdered milk with 1 teaspoon of fish oil, 1 chicken egg and 1/2 tablespoon of sugar. Forcefeed the lamb 3-4 times a day. If after 2 days the lamb has not defaecated, give 1 teaspoon of mineral oil.

- A lamb without a mother can also be fostered to another suckling ewe. This procedure will present difficulties because the intended new mother will not want to accept a new lamb.

CARE FOR NEWBORN LAMBS



soon after birth, the lamb should suckle the ewe



a lamb which does not suckle within 12 hours, due to ewe's death, should be given milk replacement from day 1

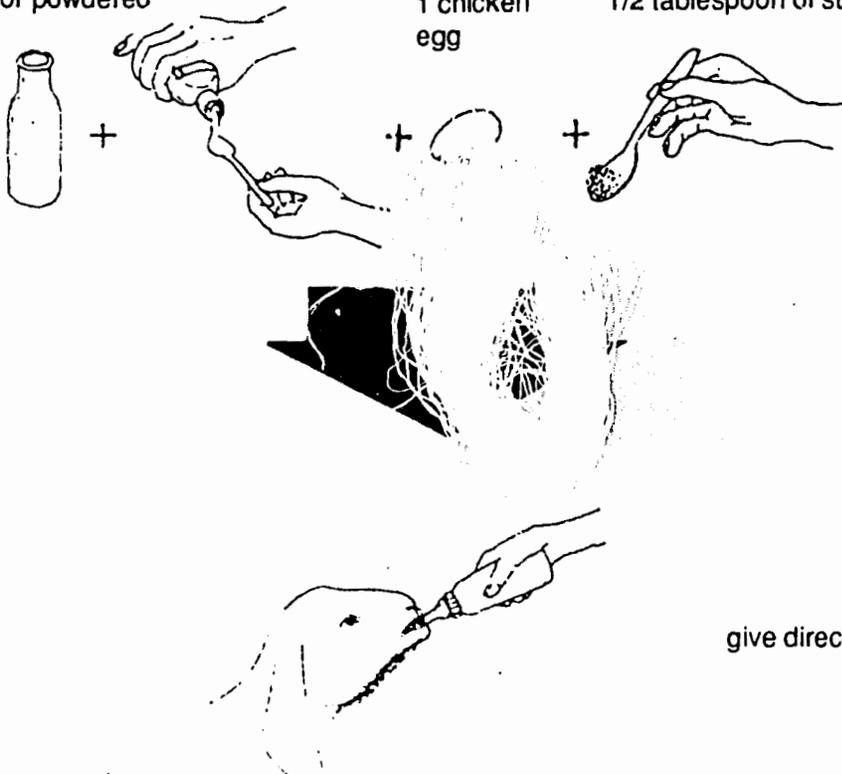
preparing milk replacement

1/2 liter of cows, does or powdered milk

1 teaspoon of fish oil

1 chicken egg

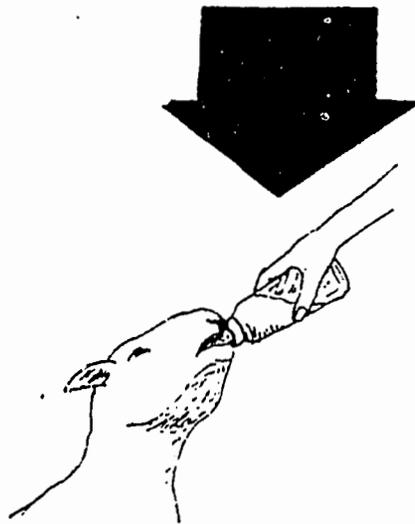
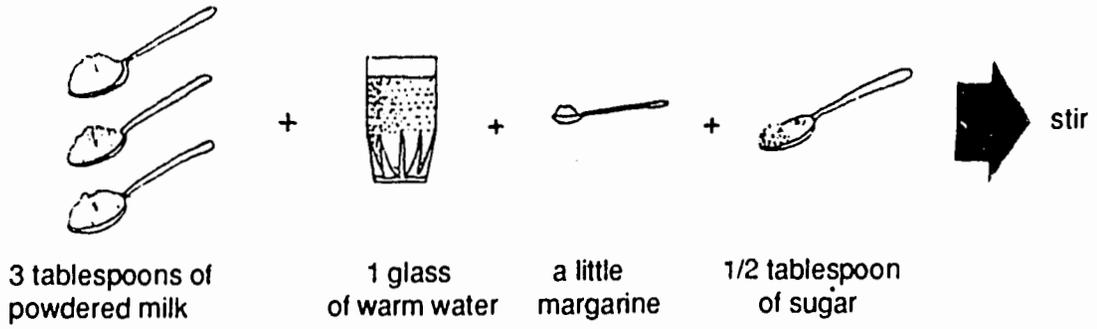
1/2 tablespoon of sugar



give directly (forcefeeding)

PREPARING MILK REPLACEMENT

Give the milk twice daily and every week
add 1 tablespoon of powdered milk for
each feeding

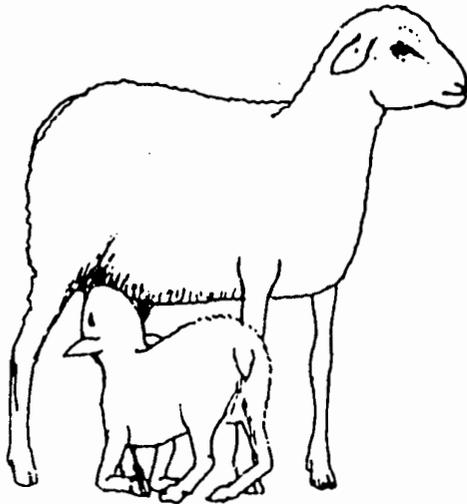


Milk replacement feeding is given until 3 months of age.
If powdered milk is not affordable, rice milk can
be used instead. Starting from a month old, rice
bran can be offered gradually.

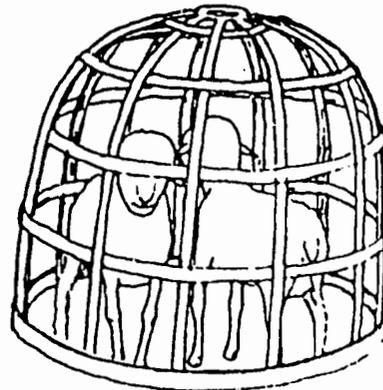
PREWEANING CARE FOR LAMBS

- Suckling competition occurs in ewes with 3 or more lambs. The weaker lambs should be helped with milk replacement, and for orphaned lambs.
- Make a simple partition, to avoid trampling by the ewe
- Offer good young grass to train the lambs to eat forages
- Give extra feed such as rice bran or soybean waste product for 2- 3 months.

When a ewe has 3 or more lambs



rotate them for suckling



When the ewe has only a little milk, the lambs can be given :

- rice milk-water from boiled rice
- milk replacements

breeding

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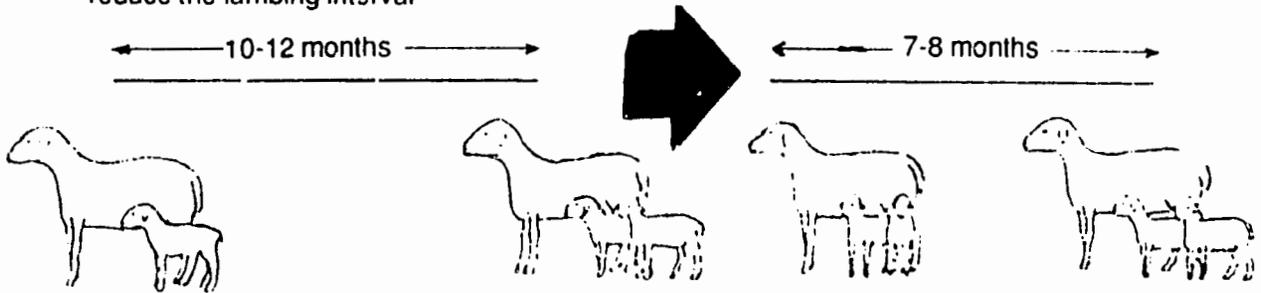
TO INCREASE THE NUMBER OF LAMBS BORN PER YEAR

$$\text{Number of lambs born/ewe/year} = \text{average litter size (animal)} \times \frac{\text{less than 365 (days)}}{\text{lambing interval (days)}}$$

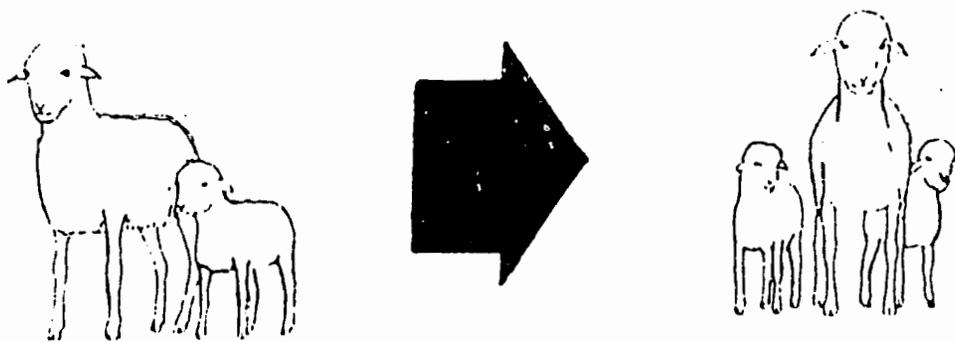
- Lambing interval is the time between each lambing of a ewe.
- Litter size is the number of lambs born per ewe per lambing
- The number of lambs born/ewe/year will increase when :
 1. Lambing interval is shortened (\pm 8 months)
 2. Average litter size per ewe is 2 or more

TO INCREASE THE NUMBER OF LAMBS BORN PER YEAR

- reduce the lambing interval

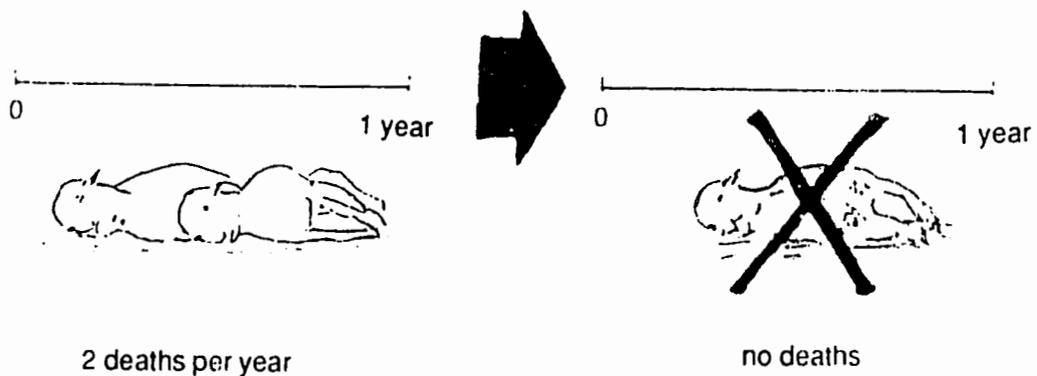


- increase the litter size



- through :
- select a ewe from twins and mate to a buck also from twins
 - give good quality feed 7 days prior to oestrus

- reducing lamb mortality rate



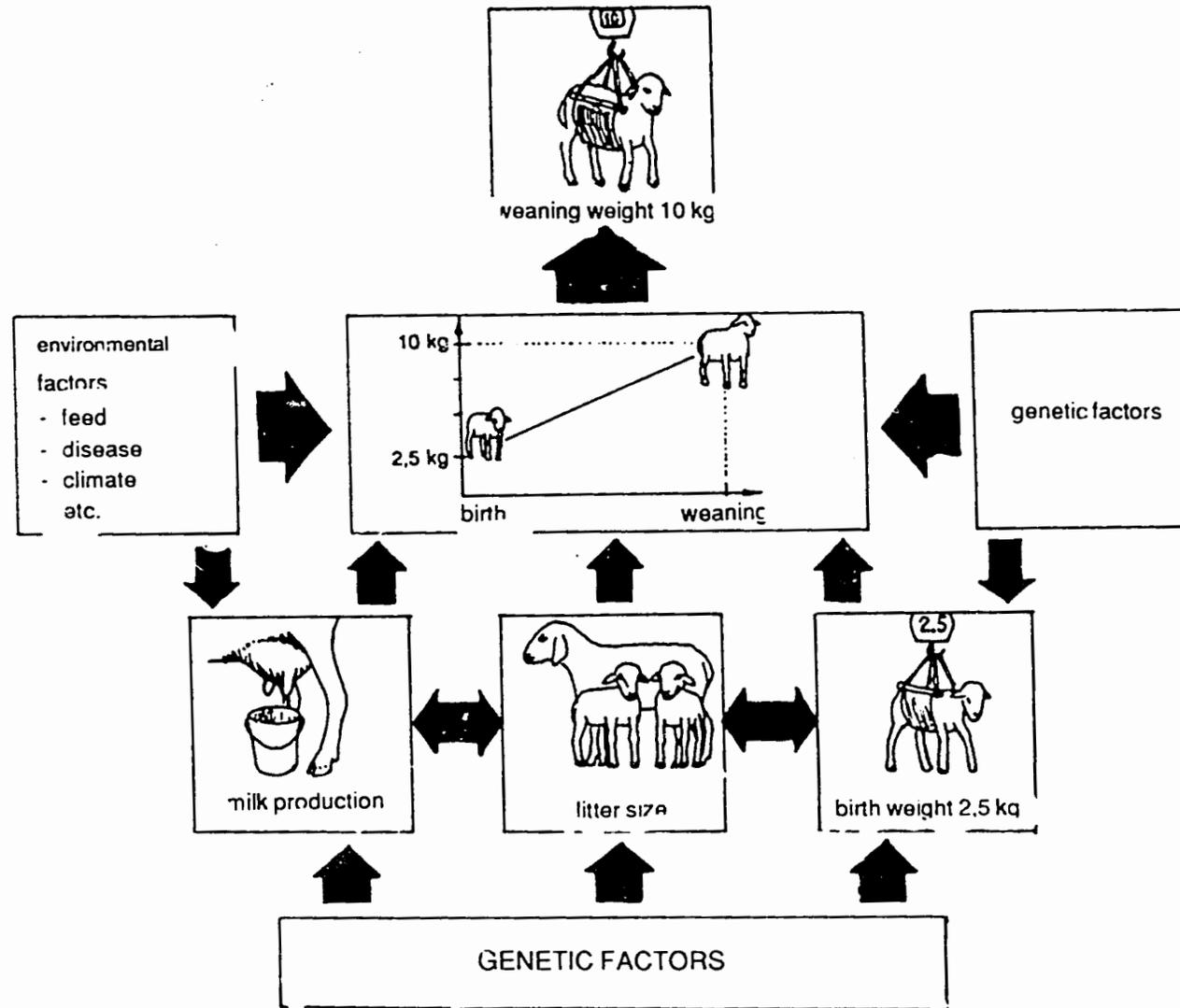
breeding

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INCREASING THE PRODUCTIVITY OF SHEEP AND GOATS

- Production (measured in, body weight, growth, milk production) and reproduction (measured in, number of lambs born, lamb mortality, etc) characteristics of sheep and goats are influenced by several interrelated factors.
- These factors are genetic and environmental (feed, breed, diseases, management, climate, etc).
- As an example, weaning weight is influenced by birth weight, breed, litter size, ewe milk production and preweaning growth. Therefore, weaning weight is influenced by genetic and environmental factors.
- In order to increase animal productivity do not concentrate only on one factor, either genetic or environmental, the farmer must concentrate on both.

INCREASING PRODUCTIVITY OF SHEEP/GOATS



PRODUCTION RECORD CARDS

The success in supplying sheep and goat breeding stock is determined by the accuracy and consistency in recording the production data such as body weight, date of mating, date of lambing, type of lambing (single or multiple births), etc. This record keeping can be simplified in the form of a production record card.

This card is useful not only in selecting animals but also in planning when the next mating or lambing period is for each ewe because the information is always recorded. This card can help in shortening the lambing interval and in management procedures.

By following the weight of an animal, we can estimate the price if the animal is to be sold.

By following the production records, we can correctly select which animal is to be slaughtered or sold, so as to avoid selecting the wrong animals for slaughter or sale.

Notes :

● Types of ears

There are three types :

1. Short = when ear length is less than 3 cm
2. Medium = when ear length is between 3-8 cm
3. Long = when ear length is between 9-12 cm or more

● Types of lambing :

Type of lambing is the number of lambs born in a litter. There are singles, twins, triplets or quadruplets.

● Body weight

The column for body weight is filled-in according to the date when the animal is weighed with its weight

PRODUCTION RECORD CARD

Balai Penelitian ternak /SR-CRSP Outreach Pilot Project (O.P.P.)			
19			
Production record card for sheep/goats			
Ident. No. :	color pattern :		
Sex :			
Birth date :			
Ewe no. :			
Buck no. :			
Ears : short / medium / long			
Birth type : single / twins / triplets			
Month	Body weight Date Kg	Mating Date Buck no.	Remarks
Jan			
Feb			
Mar			
Apr			
May			
Jun			
Jul			
Ags			
Sep			
Oct			
Nov			
Dec			

On the day the ewe lambs, record:
the date, body weight and sex of the lambs.

Do not forget to record the date and weaning weight, when the animal is weaned (usually three months after birth)

From the record cards, select an animal with the best record compared to the others. The good animals can be used as breeding stock.

When something happens to the animal, deliberate or not, it should be recorded, such as :

- selling an animal, when and to whom
- if an animal dies, record the symptoms and what happened to the body
- when an animal is sick, record the disease, when it is unknown record the symptoms and whether the animal was treated or not and the type of treatment or medication given.

breeding

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PRODUCTION RECORD CARD

Lambing						
Birth				Weaning		
date	sex	number of lambs	weight	date	number of lambs	weight
Notes						
date	remarks (death / sale / slaughter)					

Accurate and consistent recording of the production data such as body weight, date of mating, date of lambing, type of lambing, etc. is important

* Types of ears = ear length measured from the base to the tip of the ear

There are 3 type of ears :

1. Short = ear length is less than 3 cm
2. Medium = ear length is between 3-8 cm
3. Long = ear length is between 9-12 cm or more

Type of lambing = the number of lambs born in a litter, single twins, or triplets.

Body weight = the column for body weight is supplied with body weight on the day (date and month) the animal is weighed.

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PRODUCTION CALENDAR FOR SHEEP/GOATS

One of the technical aids in planning a breeding program is to use a "production calendar" containing information on :

- mating date
- approximate lambing date
- approximate weaning date
- approximate date for remating a ewe after lambing
- approximate estrus cycle length
- approximate first estrus for a young female
- approximate first mating for a young female,
- approximate time for selling young males

By setting the date and month of mating in the calendar, a Breeding Table and a Breeding Wheel can be used to obtain approximate dates for lambing, weaning, rebreeding and the dates for mating and selling the offspring.

For example, if mating is on the 1st of January 1989, turn the inner circle until the mating arrow points to 1st January, if the mating is successful, the ewe is expected to lamb between May 22 and June 1, 1989. We can also determine the range for weaning and rebreeding for the ewe from the Breeding Wheel.

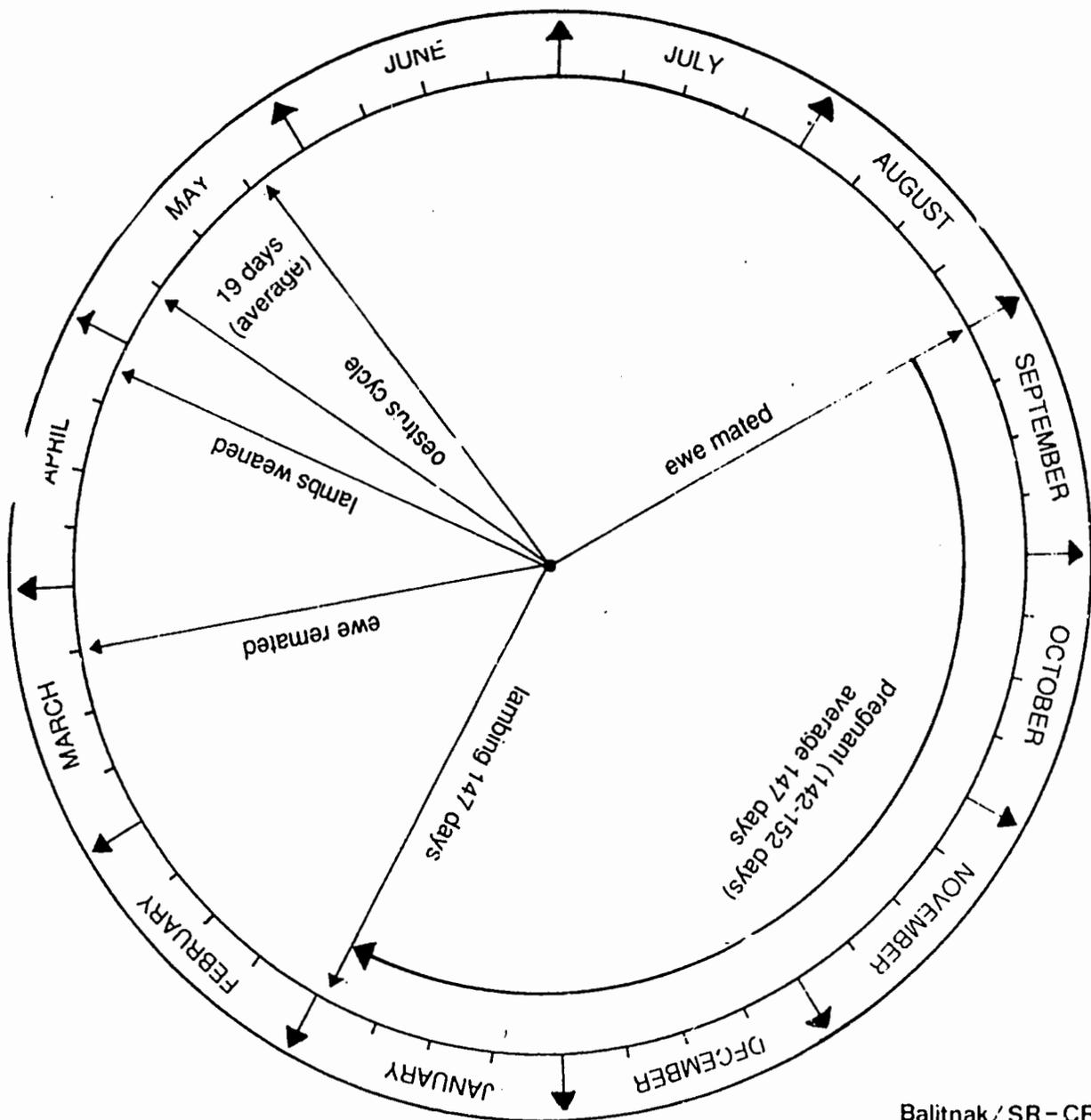
Pregnancy and Lambing					
Date of mating	Date of lambing	Date of mating	Date of lambing	Date of lambing	Date of mating
Jan. 1	May 30	May 1	Sep. 27	Sep. 3	Jan. 30
6	Jun 4	6	Oct. 2	8	Feb. 4
11	9	11	7	13	9
16	14	16	12	18	14
21	19	21	17	23	19
26	24	26	22	28	24
31	29	31	27	Oct. 3	Mar. 1
Feb. 5	Jul. 4	Jun. 5	Nov. 1	8	6
10	9	10	6	13	11
15	14	15	11	18	16
20	19	20	16	23	21
25	24	25	21	28	26
Mar. 2	29	30	26	Nov. 2	31
7	Agu. 3	Jul. 5	Dec. 1	7	Apr. 5
12	8	10	6	12	10
17	13	15	11	17	15
22	18	20	16	22	20
27	23	25	21	27	25
Apr. 1	28	30	26	Dec. 2	30
6	Sep. 2	Agu. 4	31	7	May 5
11	7	9	Jan. 5	12	10
16	12	14	10	17	15
21	17	19	15	22	20
26	22	24	20	27	25
		29	25	31	29

PRODUCTION CALENDAR FOR SHEEP/GOATS

To **determine** when a ewe will lamb, if mated on September 4, 1989

Bring the arrow for "ewe mating" (by turning the inner circle) to the number 4 in the month of September, then the ewe is expected to lamb- (the arm for "lambing") on January 29, 1990 (January 24 to February 3 or approximately five months).

With this production calendar, we can **plan** the production of sheep/goats according to local conditions.



Balitnak / SR - CRSP
Breeding. Sept. 1989

IDENTIFICATION OF ANIMALS

Providing some means of identifying the animals can make it easier for the owner to identify and control them. The identification number should be recorded on the production record card.

Methods of identification :

1. Giving names to the animals based on body markings

Examples :

- an animal with spotted colors may be called the Spot
- a male with a large body may be called the Stud, etc

This method can be adopted only if the number of animals is small (less than 10 animals). When the number is larger, the proper method is by assigning numbers to each animal.

2. Assigning numbers to animals

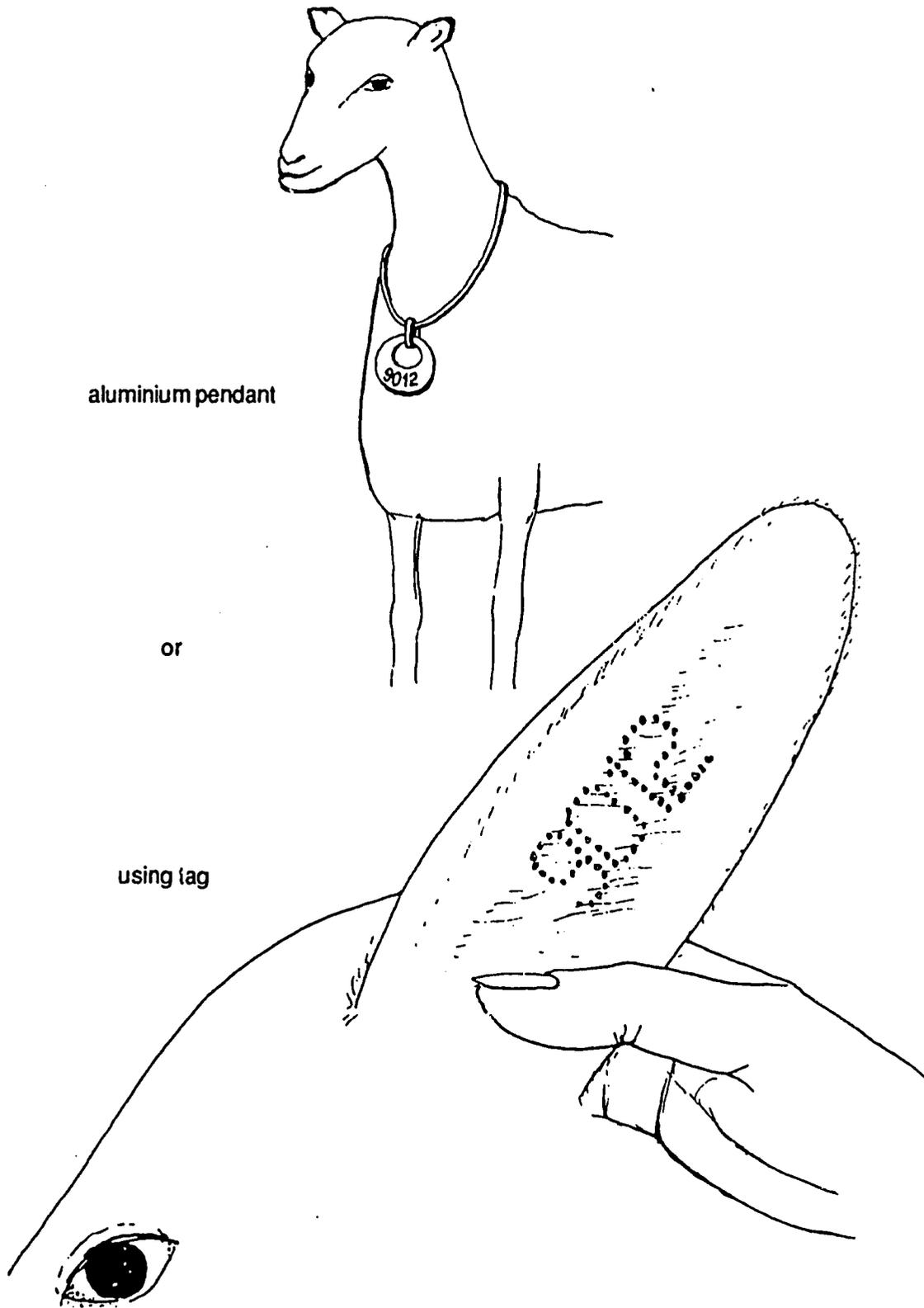
A number can be branded or tattooed on the ear, or by writing it on a piece of wood or an aluminium tag hung around the neck.

The number consists of 4 digits. The first shows the year the animal was born, and the next three digits show the order of when the animal was born in that year.

Examples :

- No.9012 --- 9 means that the animal is born in 1989, 012 means that the animal is the twelfth animal born in 1989.
- No.0007 --- represents the seventh animal born in 1990

ANIMAL IDENTIFICATION



MANAGEMENT OF FEEDING SYSTEMS FOR SHEEP AND GOATS

by

I W. Mathius, Dwi Yulistiani and Agustinus Wilson

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FEEDS AND FEEDING

- Sheep and goats require feed daily
- The feed is utilised for
 - maintenance
 - production (growing, milk production)
 - reproduction (mating, pregnancy and giving birth)
- The amount of feed required daily for each animal varies depending on the physiological status of the animal.
- However, as a rule of thumb the daily roughage requirement for sheep or goats is $\pm 5 - 20 \%$ of its body weight.
- A sheep, for example, an animal of 25 kg requires 3.75 kg forage every day,
 $(15 \%) \quad \text{or} \quad 0,15 \times 25 \text{ kg} = 3.75 \text{ kg}$
- Considering some amount of feed that will not be eaten, more than 3.75 Kg forage should be provided.
- The forage refused, usually old leaves and grass, could reach about 50 %
Therefore, the amount of forage offered should be doubled $2 \times 3.75 \text{ kg} = 7.5 \text{ kg/animal/day}$

PROCESSING OF FORAGES BEFORE FEEDING

- Fresh forage is usually preferable.
- However, some forages and leaves can not be consumed in the fresh form as they may contain toxic compounds which can cause death.
- Forages and leaves such as cassava or gliricidia should first be processed to eliminate or reduce the toxic compounds.
- There are some low-cost and simple methods that can be used by farmers, namely:
 - let the leaves wilt overnight.
 - let the leaves dry under the sun for 2 or 3 days.
- These processes will remove the toxins and the characteristic smell of the leaves.
- After these processes, these forages are usually palatable and can be given freely.
- *Ad libitum feeding (all they want) will result in better growth if they are good quality forages.*

FEED INGREDIENTS

Sheep and goat diets require protein and energy from the feed in order for the animals to grow. Thus, the feed ingredients can be divided into 2 groups; namely carbohydrate and protein sources.

Those as carbohydrate sources :

- grains : sorghum and corn
- milling by-products : rice bran, corn and sorghum
- tubers : cassava, sweet potato, "onggok" (tapioca waste)
- forages : grasses

Those as protein sources

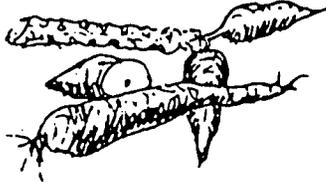
- forages : gliricidia, sesbania, leucaena, centrocema, pigeon pea leaves
- agricultural by-products: cassava leaves, groundnut leaves-oil seed meal: soybean meal, cotton seed meal, bean curd waste, soysauce waste

FEED INGREDIENTS

Carbohydrate sources :



tapioca, waste



cassava leaves



sweet potato peels



rice bran

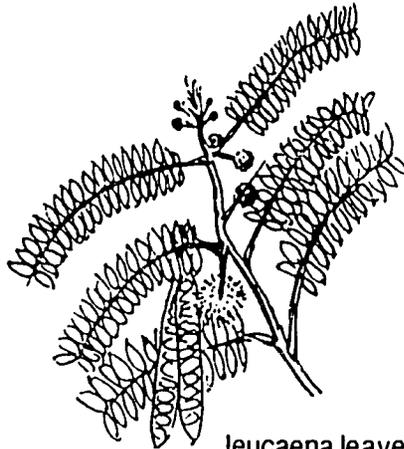


sweet potato peels

Protein sources :



legume leaves



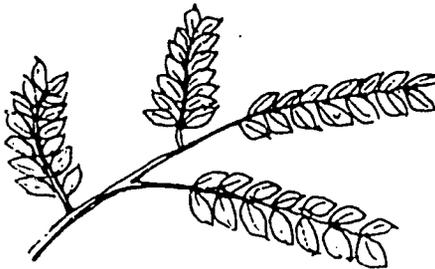
leucaena leaves



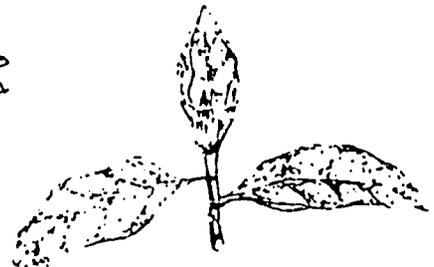
cassava leaves



peanut leaves



gliricidia leaves



jack fruit leaves

FEEDING SYSTEMS

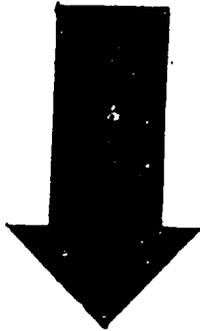
Feeding with only grasses does not fulfill the nutritional requirements for sheep and goats since the quality of the grasses is usually low. Therefore, the feed has to be a mixture of grasses, legume leaves, agricultural by-products, milling by-products and oil seed meal. Cooking salt is added which can also increase the feed intake. Drinking water should be clean and provided daily. Grasses are cut when they are mature prior to bloom and are given when the morning moisture has evaporated.

FEEDING SYSTEM

a. Not sufficient

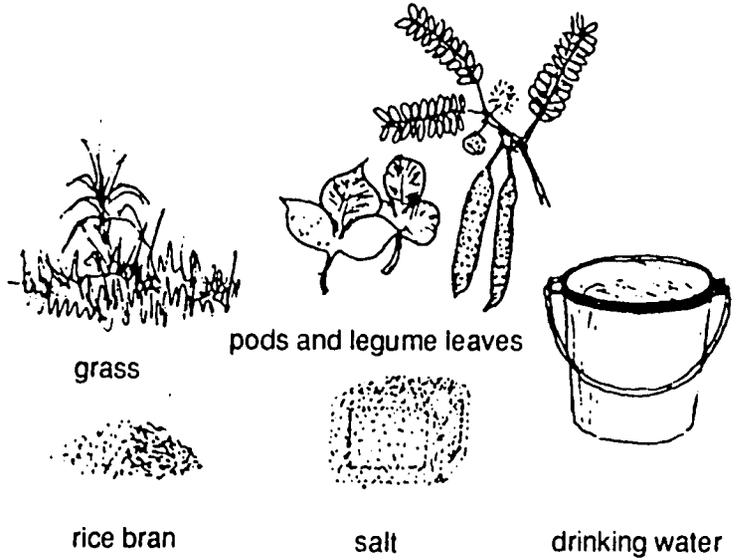


only grasses



thin, small
and weak

b. Correct feeding



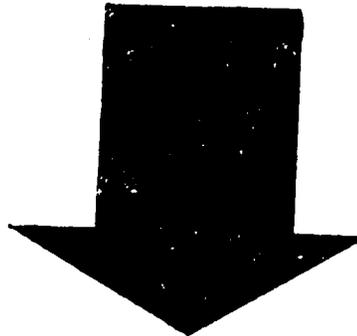
grass

Pods and legume leaves

rice bran

salt

drinking water



fat, big
and healthy

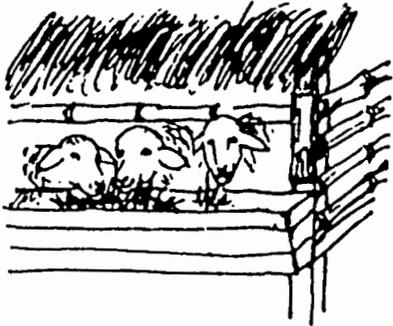
HOUSING THE ANIMALS

Feed requirements for sheep and goats are different from one animal to another depending on the physiological state of the animals. To simplify the feeding system, according to these requirements, animals must be placed in separate pens. Partitioning of the barn is also useful for health care control and management.

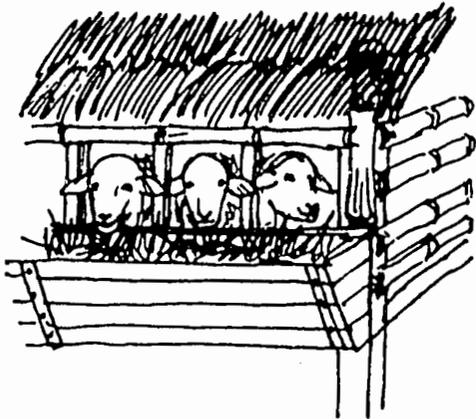
Partitioning should be according to sex, age and physiological status, for instance:

- pregnant ewes/does
- mature ewes/does
- adult males
- ewes with suckling kids/lambs
- post-weaning lambs/kids

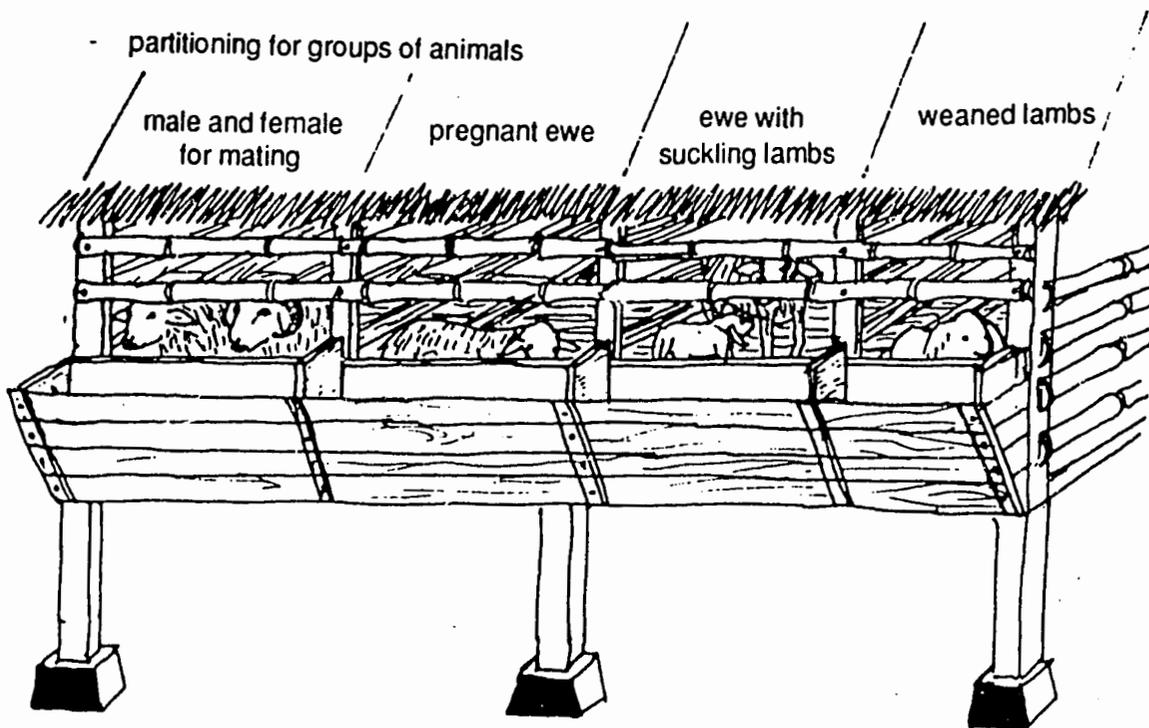
HOUSING THE ANIMALS



- incorrect housing system, animals competing for feed



correct housing



ANIMAL PHYSIOLOGICAL STATUS AND THEIR FEED REQUIREMENTS

1. ADULT SHEEP and GOATS

Adult sheep and goats demand considerable amounts of good quality feed to survive. They should be fed with grasses as energy sources and other forages as protein sources, leaves such as cassava, sweet potato or legumes like gliricidia and leucaena are given as much as 1 - 1.5/ kg/ animal/ day.

2. EWES TO BE MATED

Three weeks before mating, the females condition should be improved through upgrading the quality of the feed. Usually, the feed consists of forages, agricultural by-products and supplementation such as 2-3 glasses of rice bran or 1 - 1.5 kg of legumes/animal/day.

3. PREGNANT EWES

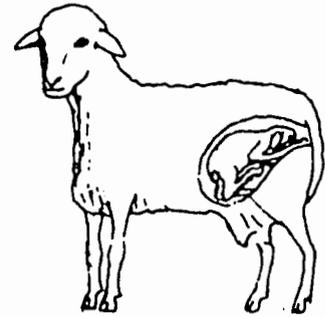
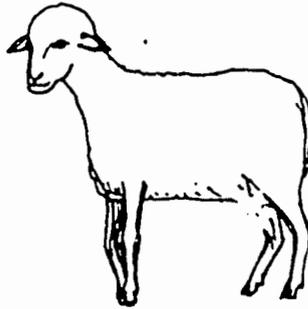
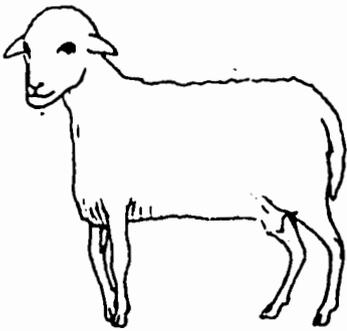
Six weeks prior to lambing/kidding, the ewes/does body weight should be increased. Grasses, as the only feed, will not be adequate, therefore oil seed meal or 2 - 3 glasses of rice bran or 1 - 1.5 kg of legumes/animal/day should be added in their ration.

ANIMALS PHYSIOLOGICAL STATUS AND THEIR FEED REQUIREMENTS

1. adult

2. ewe/doe to be mated

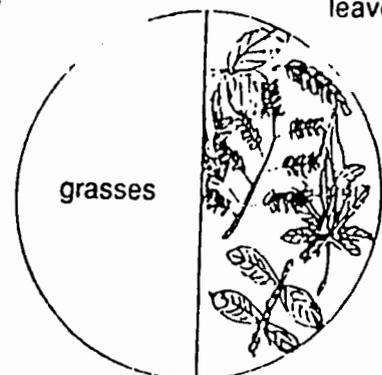
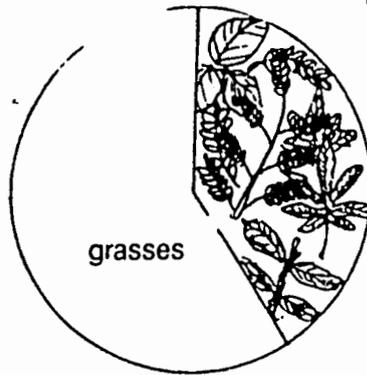
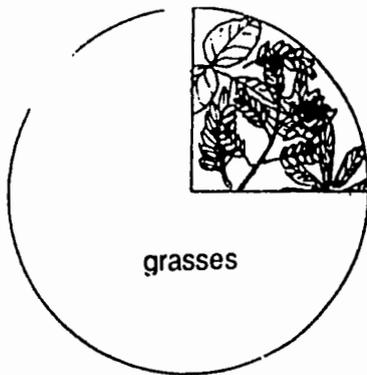
3. pregnant ewe / doe



leaves

leaves

leaves



or



1 part
of leaves

2 parts
of leaves

3 parts
of leaves



3 parts
of leaves

3 parts
of grasses

3 parts
of grasses

4. LACTATING EWES/DOES

Does/Ewes with twin kids/lambs have 20 - 40 % higher milk production than does/ewes with only single/does lambs, consequently, the demand for nutrients is also higher.

For both types however, they are fed with grasses and green forages as protein sources. Instead of 2-3 glasses of bran as feed supplement for ewes with twin lambs, ewes with single lambs only receive 1 glass of rice bran.

Alternatively, rice bran can be replaced by fresh legume leaves as much as 1 - 1.5 kg/ animal/ day.

5. PRE-WEANING LAMBS

When the lambs or kids are 2 - 3 week old, they are able to consume green forages which should be of good quality and easy to digest along with a sufficient amount of concentrate. Separate feeding (creep feeding) should be practised for the lambs or kids. In this procedure the lambs or kids are placed in a pen where their mother can not enter but the kids can easily enter their mother's pen.

The purpose of separate feeding is to optimize growth before weaning.

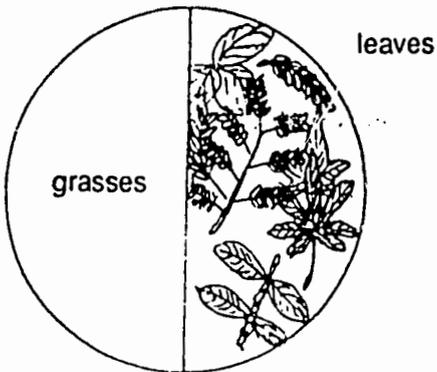
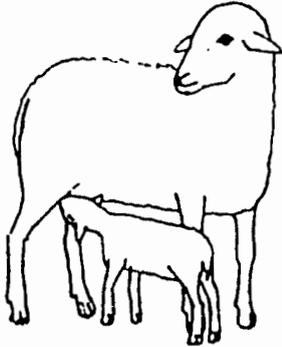
6. POST-WEANING LAMBS

After 6 months, the young animals can be fully separated from their mothers. They have to be fed with good quality feed not only to reduce mortality but to improve growth. Along with providing them with easily digested grasses, fresh forages and leaves they are also given as much as 0.5 - 1.0 kg/animal/day of legume leaves.

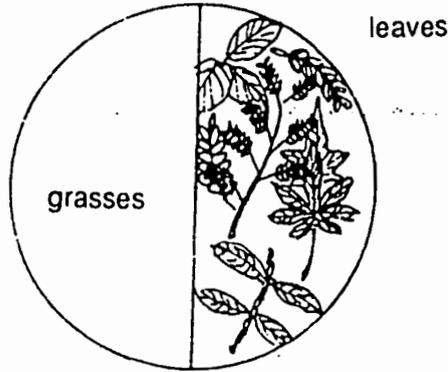
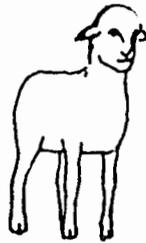
Supplementation with 0.5 - 1 glass of rice bran/animal/day results in a faster growth rate.

ANIMAL PHYSIOLOGICAL STATUS AND THEIR FEED REQUIREMENTS

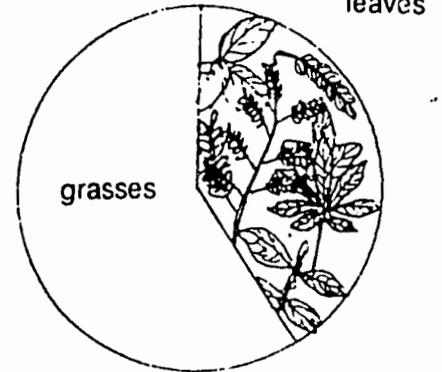
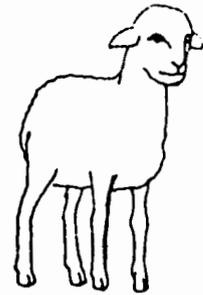
4. lactating ewes/does



5. preweaning lambs/kids



6. post weaning lambs/kids



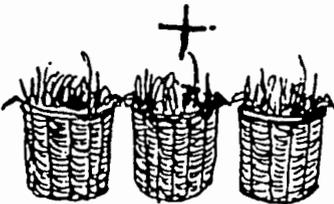
3 parts of leaves



1 part of leaves



1 part of leaves



3 parts of grasses



1 part of grasses



1 1/2 parts of grasses



• drinking water is also very important

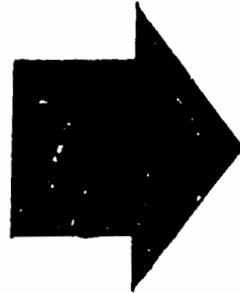
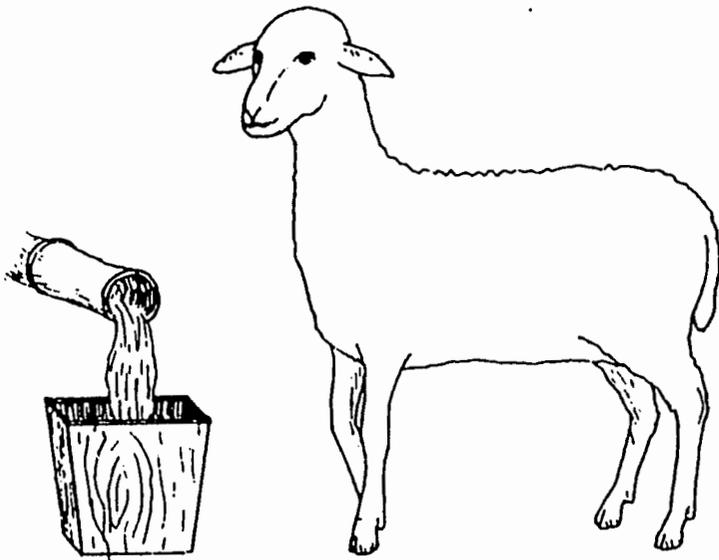
nutrition

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WATER REQUIREMENT

- The animal's body contains about 70 % water.
- If the animal loses 20% of its body's water, it will cause death. Water is also necessary to aid the digestion process.
- Therefore, it is important to have water available at all times.
- Water requirement for each animal varies depending upon :
 - Physiological state, young animals comparatively require more water than adults, per unit of body weight the lactating ewes require more water than the non-lactating ones
 - Animals fed on old or mature forages require more water than those fed on young forages
- Water requirements for sheep and goats are about 1.5 - 2.5 liters/day
- Drinking water has to be clean and the water container has to be cleaned every two days.

WATER REQUIREMENT



animal's body contains 70% water



full of clean water

supply enough water for all age groups of animals, especially young, pregnant and lactating animals



empty



on a hot day, animals need more water in 24 hours



Notes :
pregnant and lactating ewes require more water



old/mature forages

animals receiving mature forages need more water



young forages

nutrition

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WATER CONTAINERS

- Water containers can be bought or made according to the farmer's preference. Several types of water containers are available:

A. Plastic bucket

- place it beside the feed
- place it inside the feed trough and make sure it is not spilled out or dirty.

B. Thick - board container

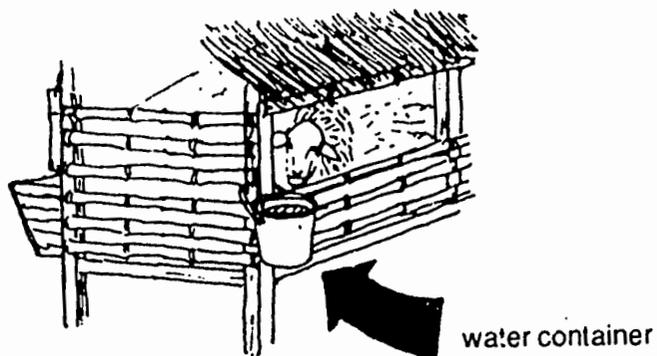
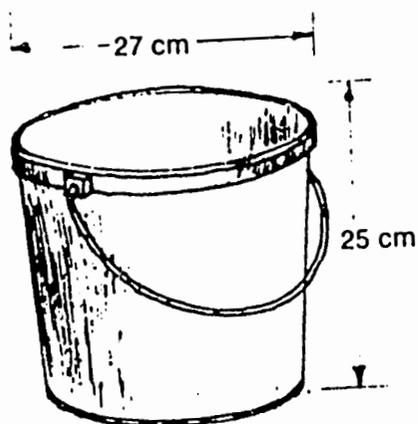
- the size is adjustable
- according to the requirements see the size as in the picture
- the joints have to be nailed and covered with asphalt and the container should be painted black so that it can last longer
- place it beside the feed trough

C. Plastic pipe or Bamboo stems

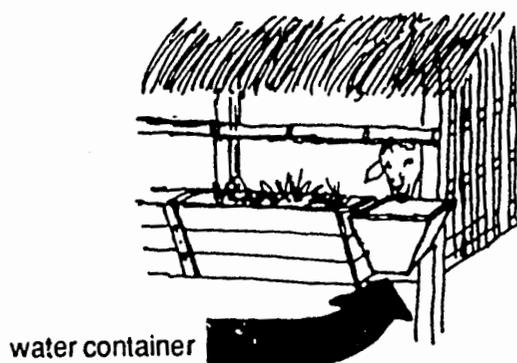
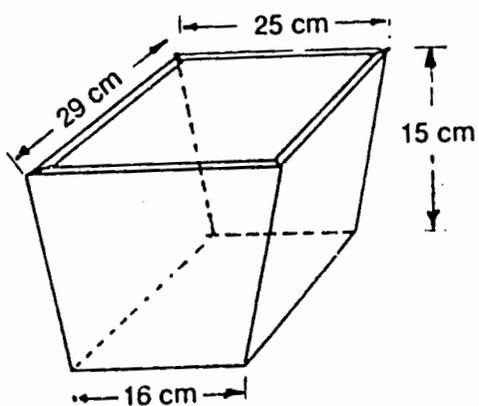
- use large sizes
- the right and left ends of the plastic are blocked with asphalt as a sealer
- place it along the back of the pen.

WATER CONTAINERS

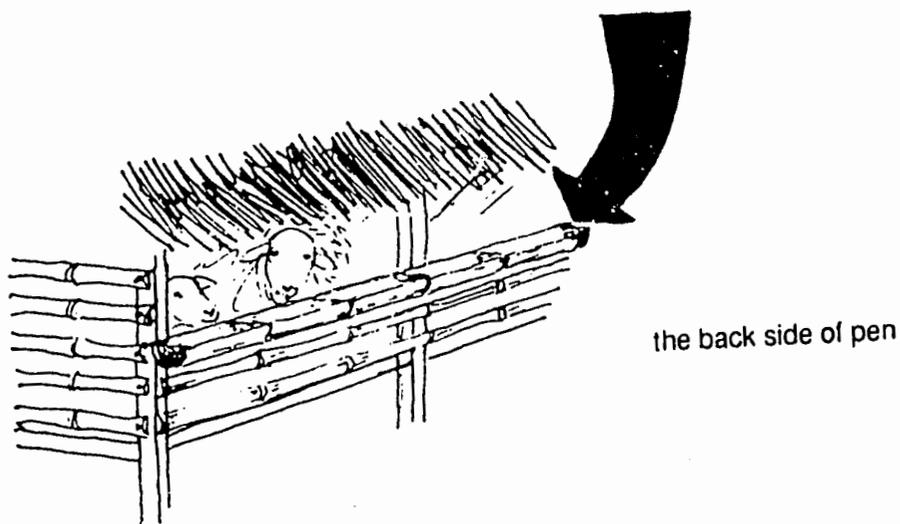
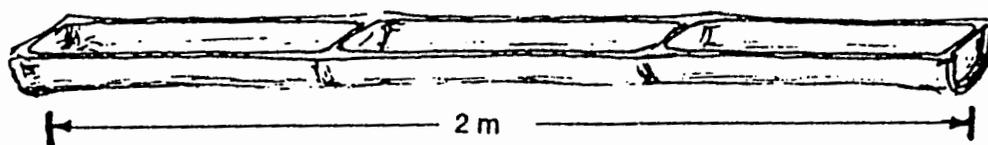
A. Plastic bucket



B. Box made of thick board (13 mm)



C. Large bamboo halves



PROVIDING SALT

- Sheep and goats require minerals and substances to increase appetite and feed intake.
- Providing ordinary salt or a commercial mineral mixture can fulfill this requirement.

SEVERAL WAYS OF PROVIDING SALT

A. Place the salt inside a bamboo lick.

In this way, the salt will not be wasted and the animal can lick the bamboo as it needs the salt.

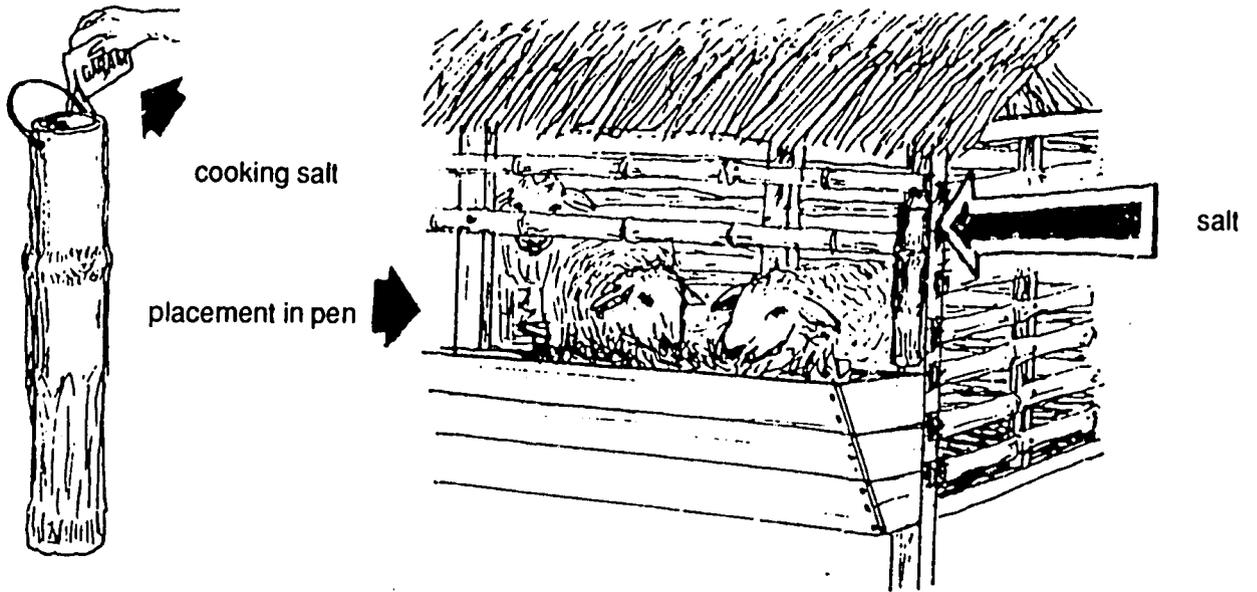
Method to make the bamboo container :

- use a large mature bamboo tube (6-9 cm dia.)
- cut into a 1.5 segment length (see drawing)
- peel off the outside layer of the bamboo
- open the top and keep the bottom closed
- attach a string or piece of wire to the top of the bamboo in order to hang it in the barn
- pour the salt + mineral mixture and little water into the bamboo (water is only added at the beginning)
- hang the bamboo in a corner, 75 - 100 cm above the floor

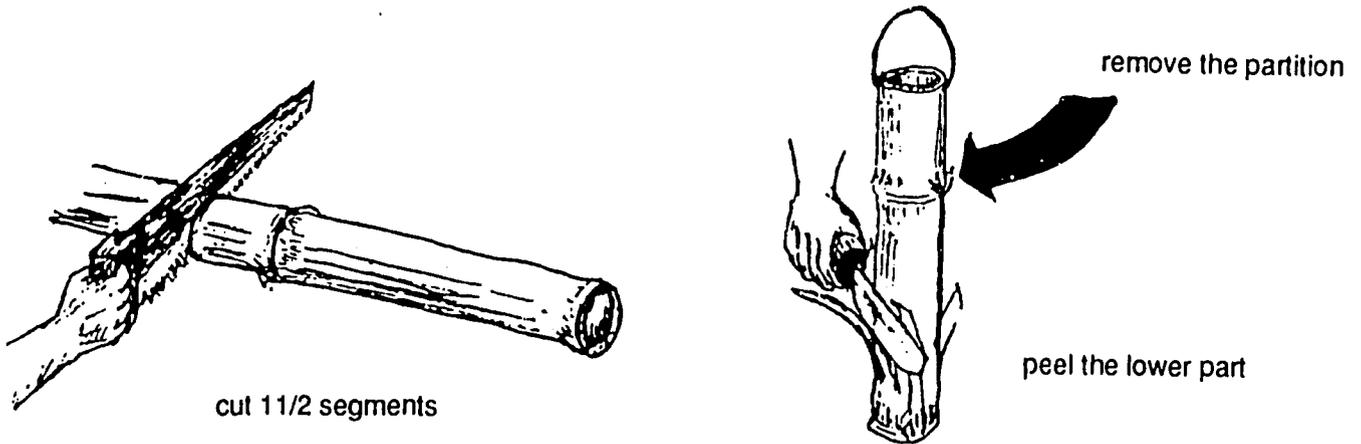
B. Place the salt in a small bucket and tie it to the inside wall of the pen.

PROVIDING SALT

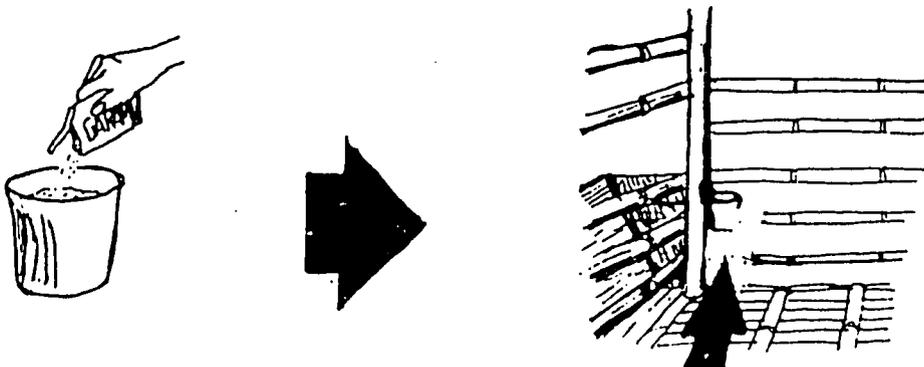
A.



preparing salt container made of bamboo



B.



put salt in a small bucket and fix it on the wall

FORAGE SUPPLY FOR SHEEP and GOATS

- There are many ways to provide forages continually.
- For instance : by cultivating various types of forages.
- Forages can be planted on the under-utilized areas such as along the paddy banks, roadsides, fences, etc.
- The choice of forages to be planted depends on the farmer's resources and the availability of land.
- For example : A farmer who lives in or near a rubber plantation area may be able to grow legumes since native grasses in this area are available throughout the year.
- Legumes such as gliricidia, leucaena and sesbania are good quality forages that the farmer may be able to grow.
- Starting from a certain age and with a good management system, these legumes can be expected to provide forages for feed supplements everyday.

NUTRITIONAL REQUIREMENTS

- The nutrients are : protein, energy, minerals, crude fibre and vitamins.
- The required amounts of nutrients depends on the physiological status of the animals.
- For instance : a young and growing lamb demands more nutritions feed than pregnant ewe.
- To meet the standard requirements, the feed rations must be adjusted to the right proportions.
- These rations are a mixture of grasses and leaves (legumes, sweet potato leaves etc.)

For example :

Physiological status	Grasses	Leaves
Adult	75%	25%
Pregnant	60%	40%
Lactating	50%	50%
Post-weaning kids and lambs	60%	40%

- Feed supplements such as rice bran, corn flour, coconut meal, soybean meal, etc. can be given when available and inexpensive.
- It is suggested that the farmers use what is available in their fields such as sweet potato leaves, gliricida, sesbania or leucaena leaves.

VARIOUS TYPES OF FORAGES

A large variety of forages can be utilized by sheep and goats.

A. Grasses

1. Native grasses (available throughout the year)
2. Elephant grass
3. Setaria
4. Panicum maximum
5. King grass, etc.

B. Legumes

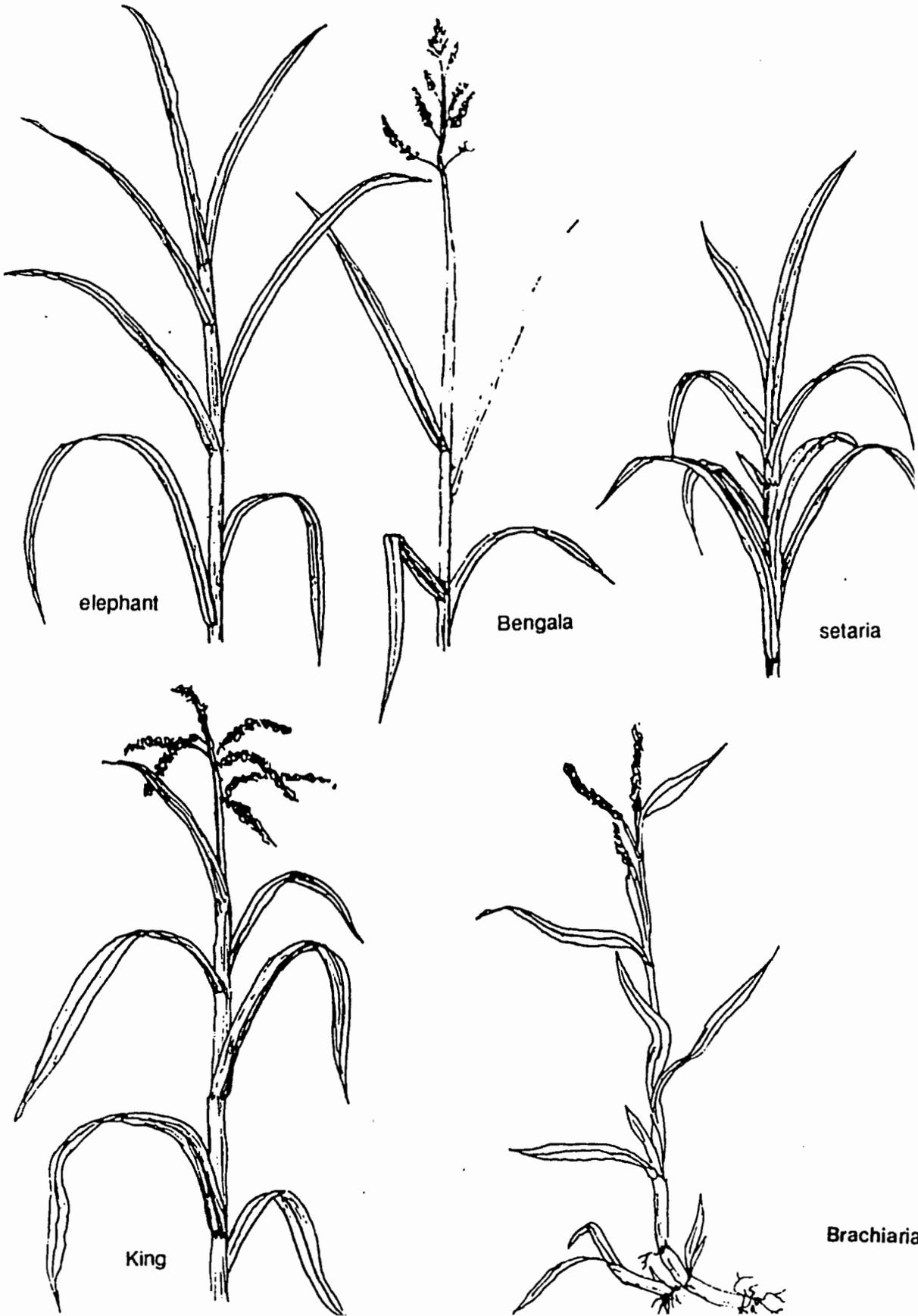
1. Leucaena leaves
2. Sesbania leaves
3. Gliricidia leaves
4. Calliandra leaves
5. Albizzia leaves

C. Agricultural by-products

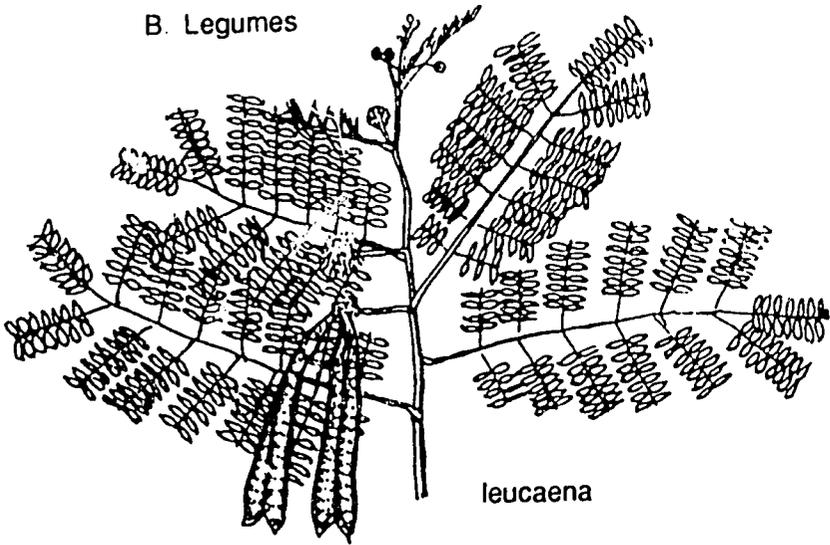
1. Cassava leaves
2. Sweet potato leaves
3. Jack fruit leaves
4. Peanut straw
5. Soy bean straw
6. Banana leaves, etc.

VARIOUS TYPES OF FORAGES FOR SHEEP/GOATS

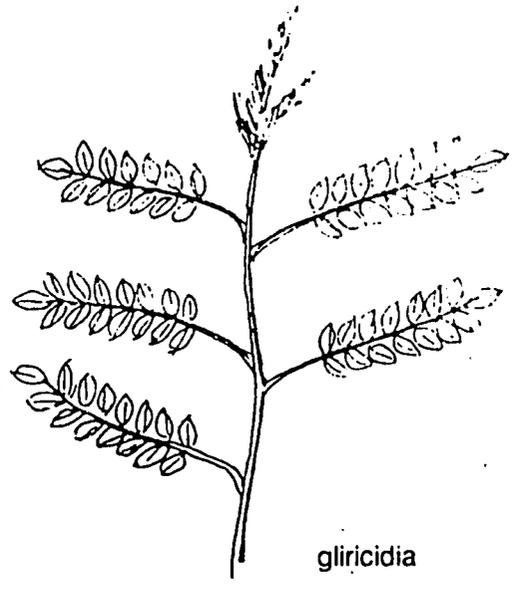
A. Types of grasses



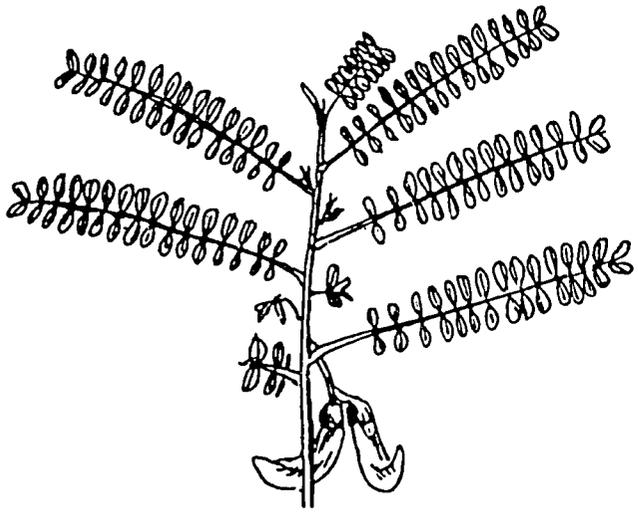
B. Legumes



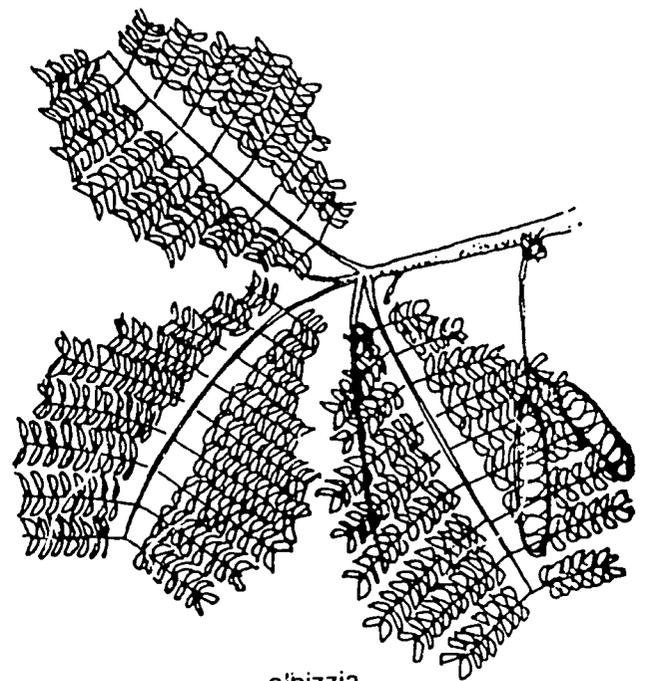
leucaena



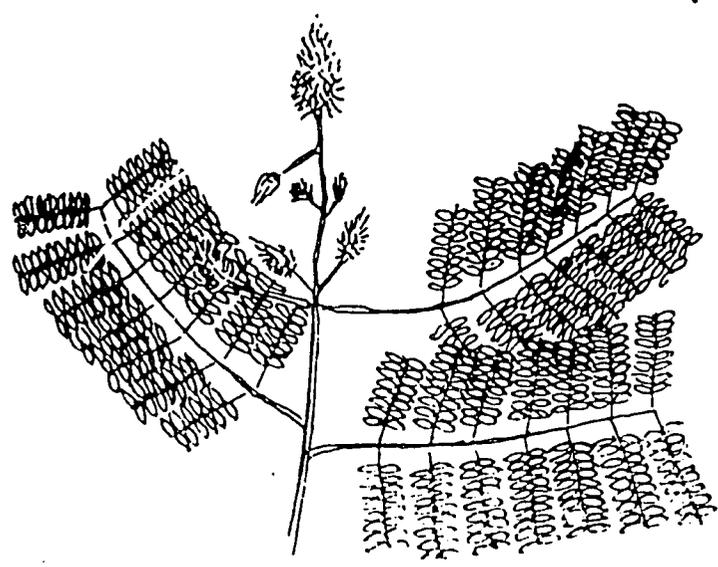
gliricidia



sesbania

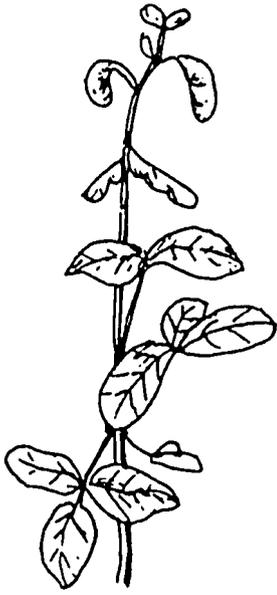


albizzia



calliandra

C. Beans and Nuts



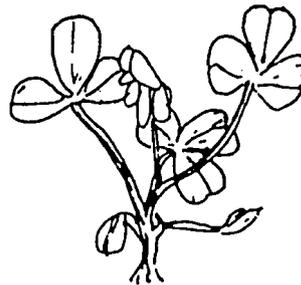
siratro



beans



nuts



peanuts

TECHNICAL GUIDE FOR PLANTING LEGUME TREE SEEDS (LEUCAENA, SESBANIA, CALLINADRA)

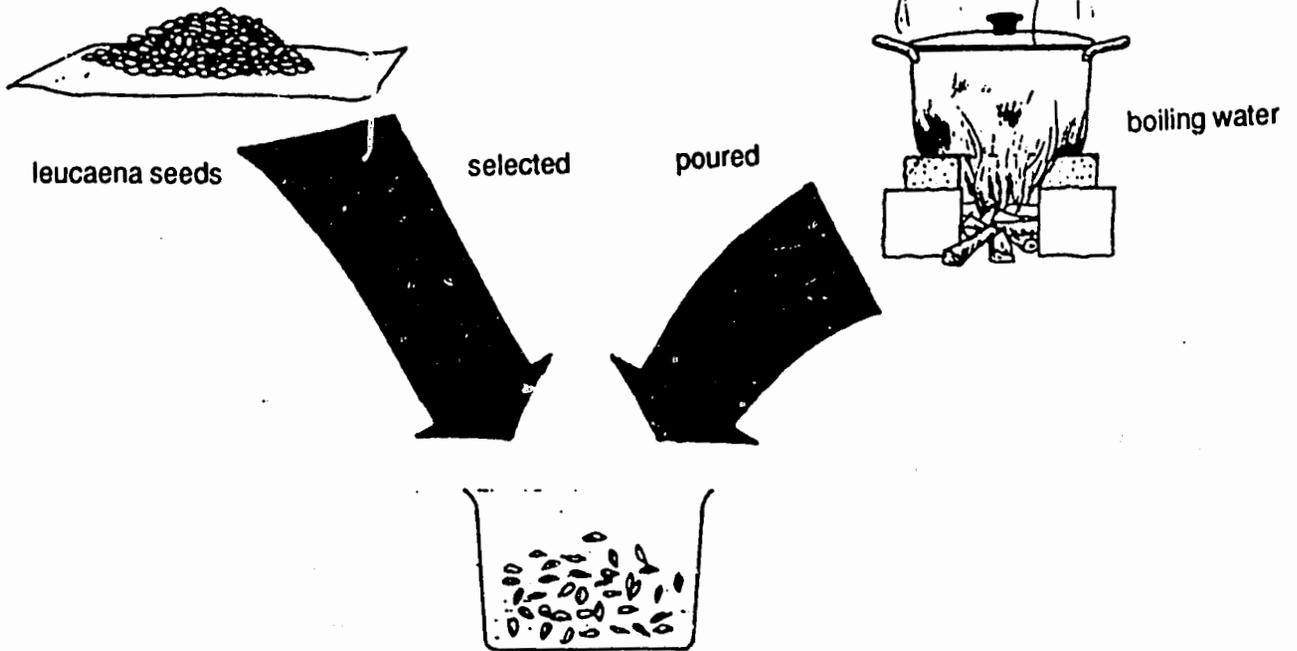
PREPARATION

- Choose good quality, mature and full seeds.
- Boil 2 liters of water.
- Pour the boiling water over the seeds and soak them for 24 hours. The amount of water should be 2 - 3 times the volume of the seeds.
- Prepare the germinating box, using a sand media in a small box, pot or a plastic container. To prevent the growth of fungi, the sand media should be treated with Diathene M. 45 (mix it with the sand or sprinkle it over the top).

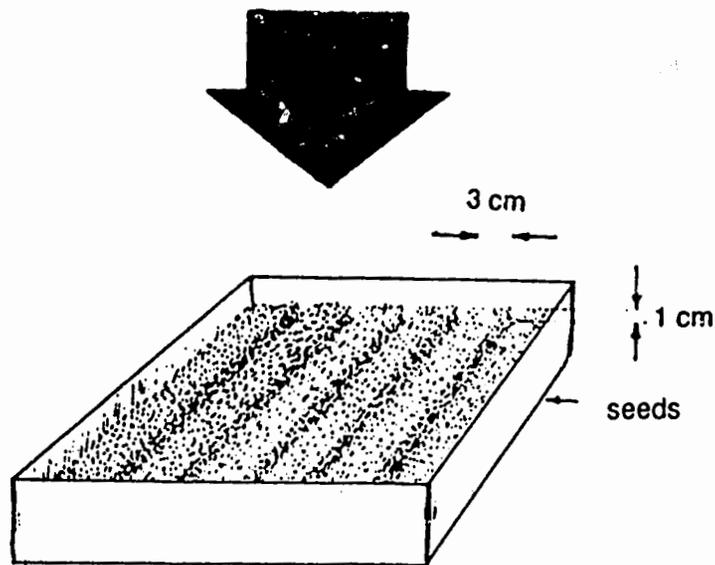
GERMINATING METHOD

- Make a series of ditches 1 cm deep in the sand media which are 3 apart between each ditch.
- Pour the seeds into the ditch and cover it with sand.
- Water them once a day.
- After 8 - 10 days, the first primary leaf should start to come out and the seeds are ready to be planted in the nursery.

GERMINATION



water
2 - 3 times the seed volume,
soak for 20 hours



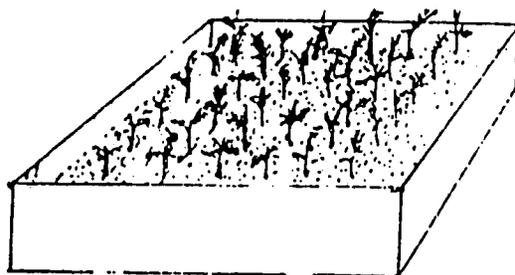
germination container

- distance between ditches 3 cm, 1 cm deep
- sand medium + diathene M. 45

PLANT NURSERY

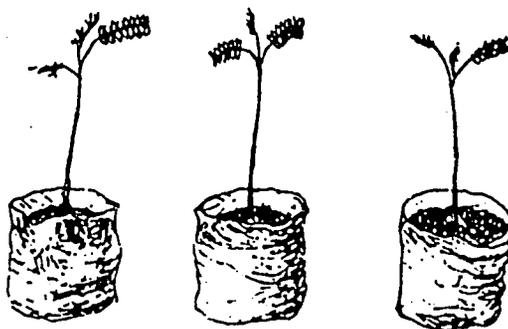
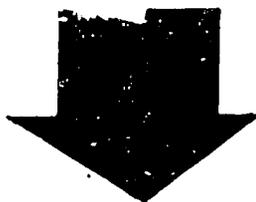
- Prepare a mixture consisting of soil, manure and sand in a nursery bed or plastic bags with holes.
- The germinated seeds are moved to this nursery bed or put in the plastic bags.
- Water the seeds everyday and let the plants grow for 2 - 3 months in the nursery.
- In the nursery, the plants should be given some compost.

NURSERY



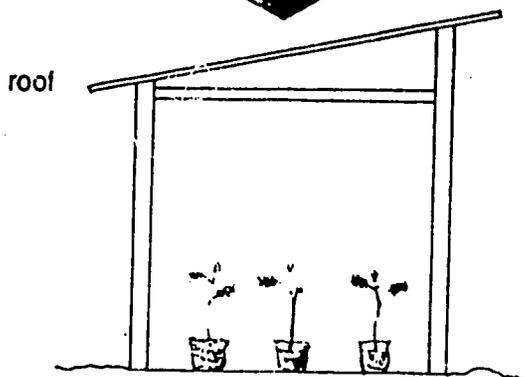
seedlings

days



plastic bag + growth medium

- water once a day
- compost and soil



roof

nursery beds

IN THE FIELD

- The plants that grow well in the nursery may be ready to be transferred to the field.
- About 1 g/ plant of fertilizer (NPK fertilizer or organic fertilizer) is necessary for the first month. If the plants do not grow well, fertilization has to be continued during the second month.

PREVENTING INSECT ATTACKS

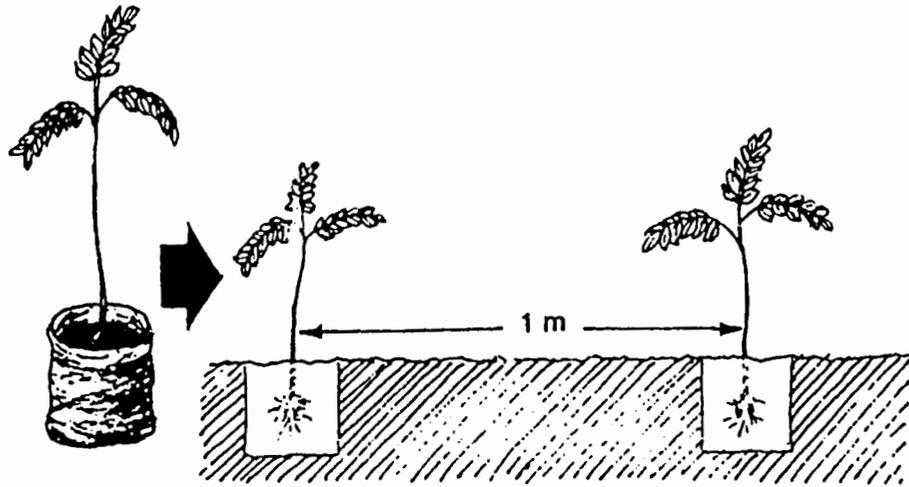
- To prevent aphid attacks, spray the plants with insecticide.
- The insecticide to use is 0.2 % Novacron or 0.2 % Gusadrin.
- The spraying is done once a week or until the aphids are gone.

NOTE :

The insecticide spraying should not be continued 10 days before the forage is harvested for animal feed.

NURSERY, IN THE FIELD, PROTECTION

In the nursery 2-3 months

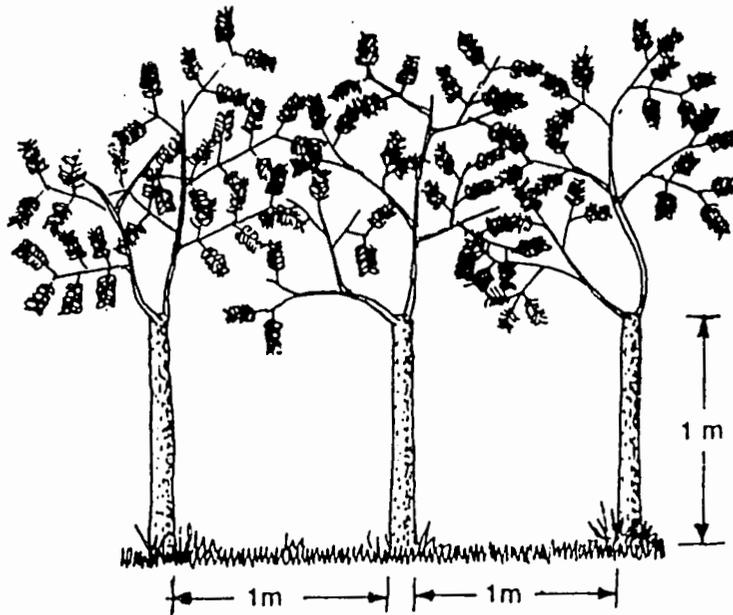


mix soil with compost

insecticides
against
aphyds



0,2% Novacron or 0,2 % Gusadrin



until the aphyds disappear
or 10 days prior to harvest

nutrition

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CULTIVATING LEGUMES AS A SOURCE OF FORAGES

To maximize the function of under-utilized areas, these areas can be planted with forages for animal feed, for instance, gliricidia trees.

Some guidelines for cultivating gliricidia trees are presented here.

Planting can be carried out with seeds or stems however, using stems is better as they grow faster and can be harvested earlier.

Methods of planting using stems :

- the stems should be old enough
- use the bottom part of each branch
- the stem length is ± 1 m
- the diameter is ± 3.5 cm
- distance between trees is ± 0.5 m
- the planting depth is ± 30 cm.

Based on the above guidelines, the number of trees that can be planted can be calculated. For example : along a fence 150 m long, 300 legume trees can be planted (see table).

The first harvesting should be at 1 year of age in order to let root system grow strong and deep. The subsequent harvesting can be done every 90 days. If we have 300 trees and they are harvested every 90 days, with the rotation system, we can harvest 3 gliricidia trees daily producing ± 4.5 kg fresh leaves.

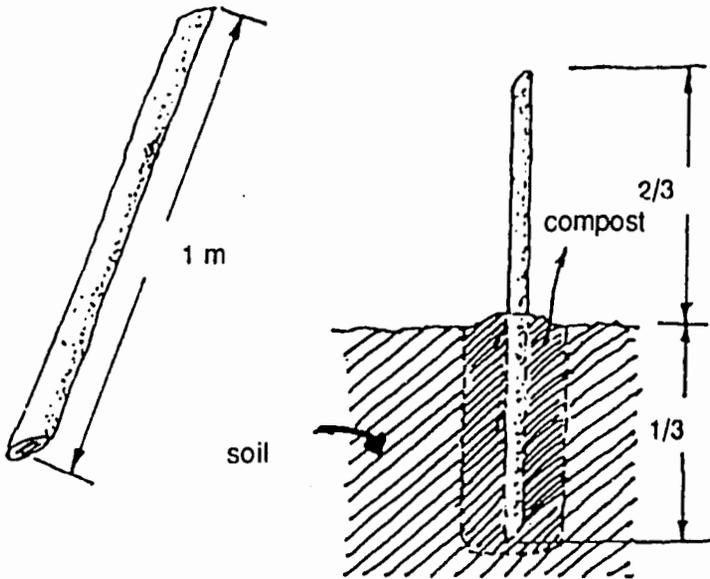
Tabel 1. Production from Gliricidia Legumes (Kgs).

Area planted	25 x 25 (625 m ²)	25 x 50 (1250 m ²)	25 x 75 (1875 m ²)	50 x 75 (3750 m ²)
Number of Plants	220	300	400	500
Production/harvest/tree	2.5	3.3	4.5	5.5
Legume production (kg)	4	6	7	9
Production				
Number of Animals				
4	1	1.5	1.7	2.2
6	0.7	1.0	1.2	1.5
8	0.5	0.75	0.9	1.1
10	0.4	0.6	0.7	0.9

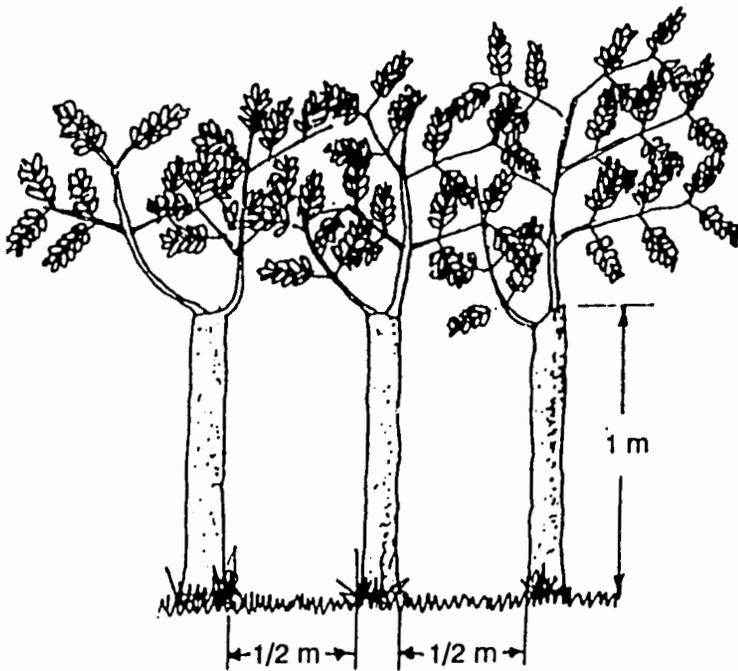
Harvest interval 3 months

(Source : W. Mathius, 1988)

METHOD OF PLANTING GLIRICIDIA USING STEMS



- select a stem which is not too young or too old, cut 1 meter
- prepare the soil mixed with compost
- bury 1/3 of the stem in the ground



location	:	along fences
spacing	:	1/2 meter
age at first cutting	:	+ 1 year
age at next cuttings	:	3 months
production per tree	:	1 1/2 kg

nutrition

Baltak / SR / G. 7.

CULTIVATION OF FORAGES FOR RUMINANTS

Location :

1. Sloping areas
2. Paddy bank areas
3. Fence areas

Types of forages :

All types of forages can be consumed by sheep and goats.

There are 2 groups :

- grasses
- legumes
- combination of grasses and legumes

Benefits :

1. Sources of animal feed
2. Erosion control
3. Fertilizer (green fertilizer, especially legumes)
4. As shading for main crops
5. Conservation of environment

SLOPING AREAS / MOUNTAIN SIDES

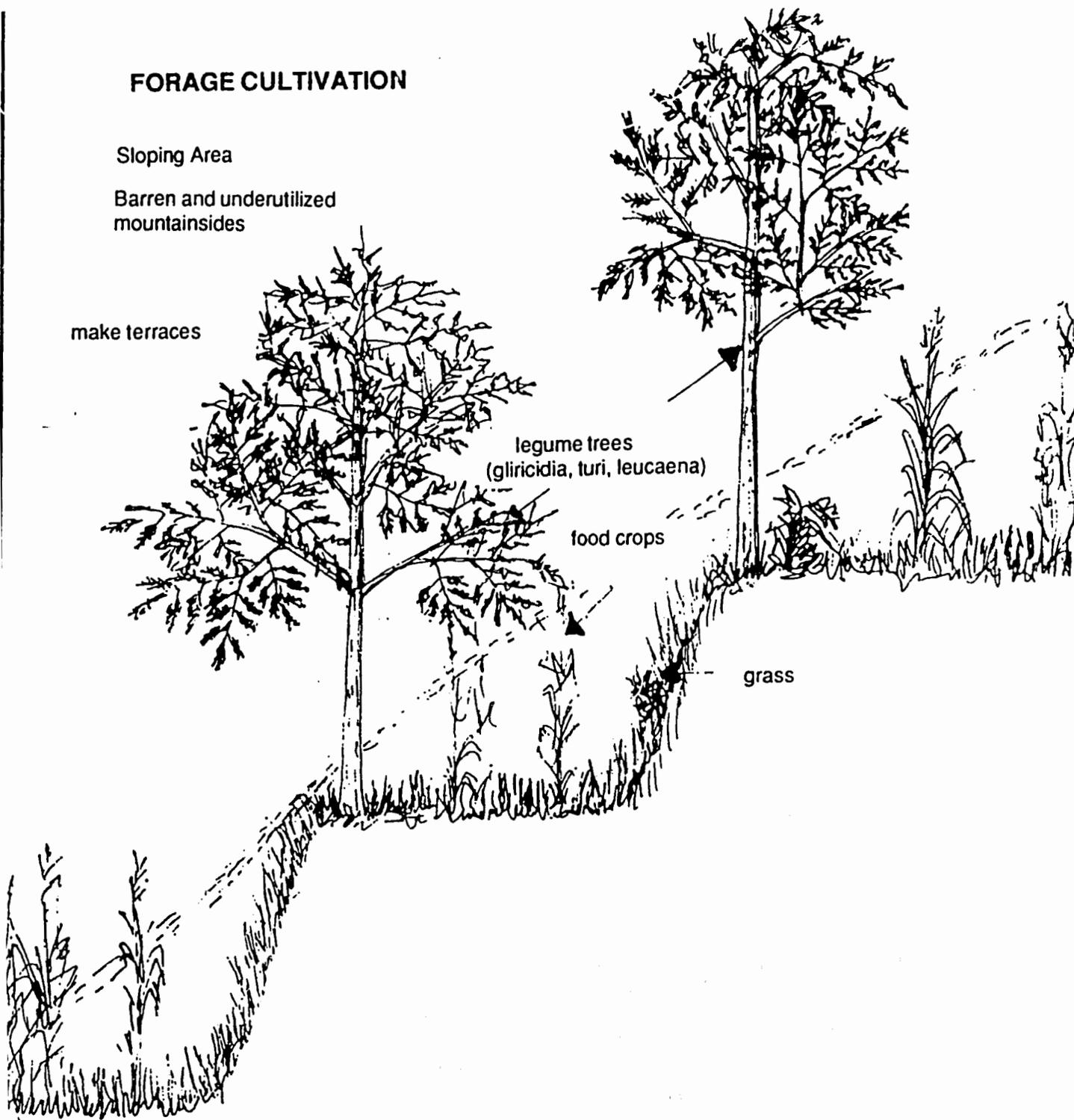
- Areas with 20 - 50% slopes, barren areas and those that have not been well cultivated can be utilized for cultivation of food crops and forages.
- Make terraces like stairs (see picture)
- On the flat areas, the soil is ploughed and fertilized with manure.
- At the end of each terrace, legume trees such as gliricidia, sesbania or calliandra are planted (see picture). They function as forage sources, erosion control and fertilizing agents.
- On the sloping areas, grasses such as elephant, brachiaria or setaria grass are cultivated as forage sources and erosion control.
- On the flat areas, food crops such as corn or upland rice are cultivated.

FORAGE CULTIVATION

Sloping Area

Barren and underutilized mountainsides

make terraces



- Grass as a source of forages and erosion control
- legume trees as a source of forages and fertilizing agent

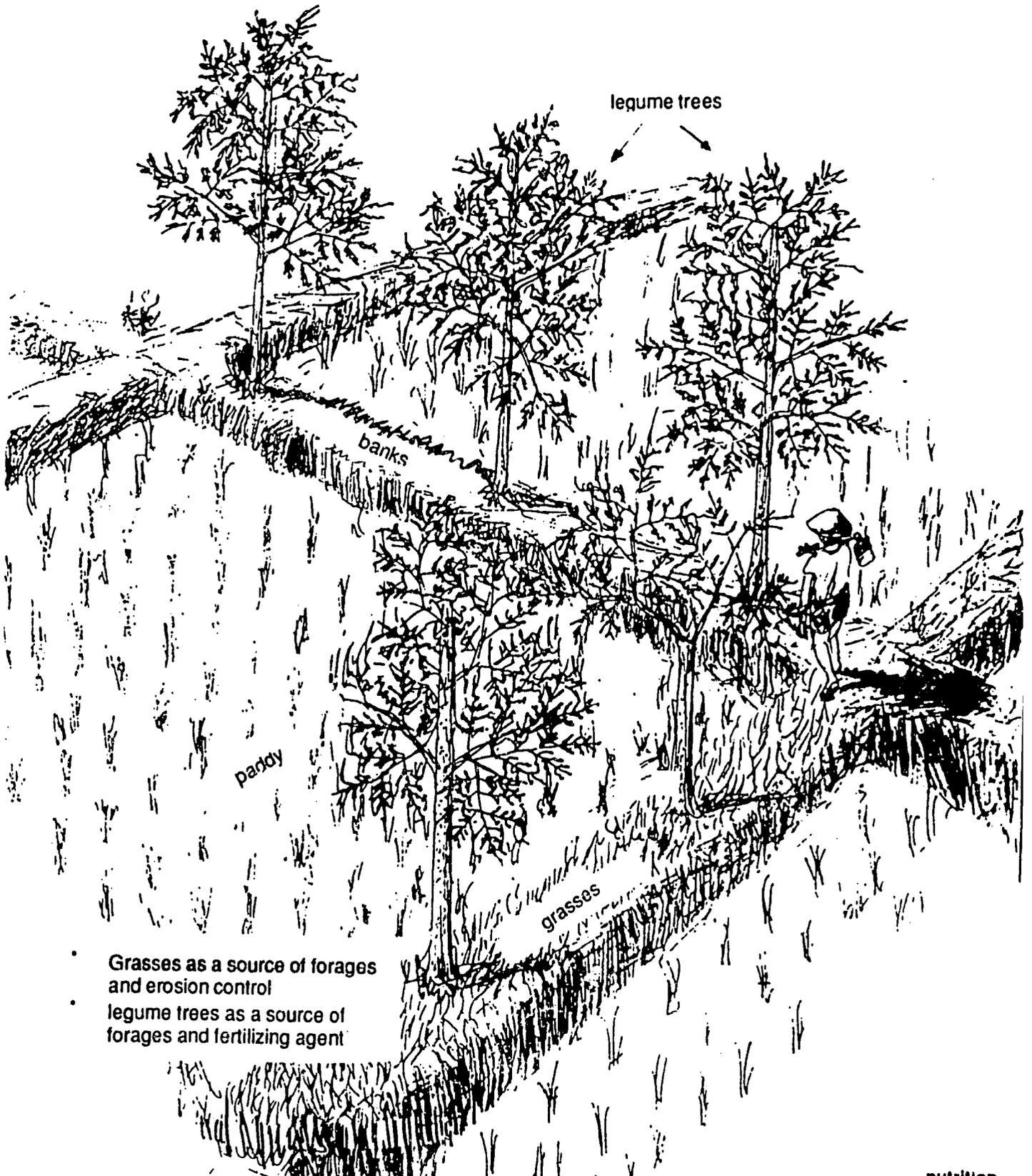
nutrition

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PADDY BANK AREAS

- Paddy banks are usually underutilized areas.
- These areas can be used maximally as areas for forages.
- Cultivate this area with grasses that will not disturb the main crops. Choose appropriate grasses such as setaria or brachiaria and if necessary, ask the field officer from the Animal Extension Service. These grasses can be used as animal feed as well as erosion control.
- Legume trees such as gliricidia or leucaena can also be planted (see picture) as good quality feed and green fertilizer.
- Pruning of these legumes has to be careful as not to disturb the food crops such as rice.

PADDY BANK AREAS



LIVING FENCES

- Their main functions are primarily to protect the main crops and for home security.
- The living fences can also be utilized as a source of forages.
- The main support for the fence should be legume trees such as gliricidia, leucaena or sesbania, which provide good quality feed. The distance between the trees is $\pm 1 - 2$ metres.
- In between the legume trees, elephant or king grasses can be planted. Allow the grasses to grow the height of 1 m so that they can serve as a fence. To make the grass stems stand upright, they can be tied up with bamboo or sticks (see drawing).

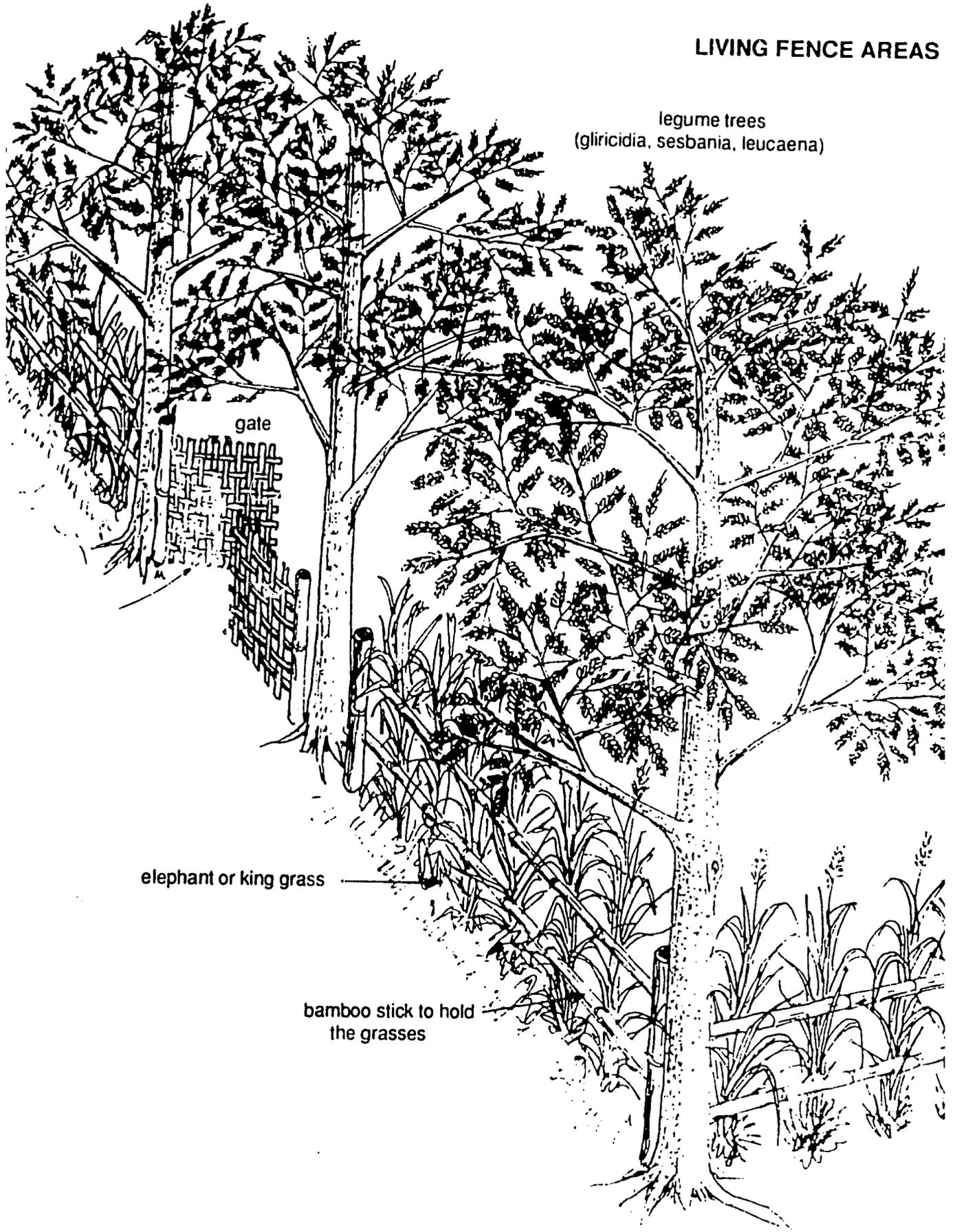
LIVING FENCE AREAS

legume trees
(gliricidia, sesbania, leucaena)

gate

elephant or king grass

bamboo stick to hold
the grasses



nutrition

Balifnak / SR - CRSP

MANAGEMENT OF SHEEP and GOAT PRODUCTION

By

M. Martawijaya

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ANIMAL SHELTERS

Raising sheep or goats intensively demands adequate animal housing.

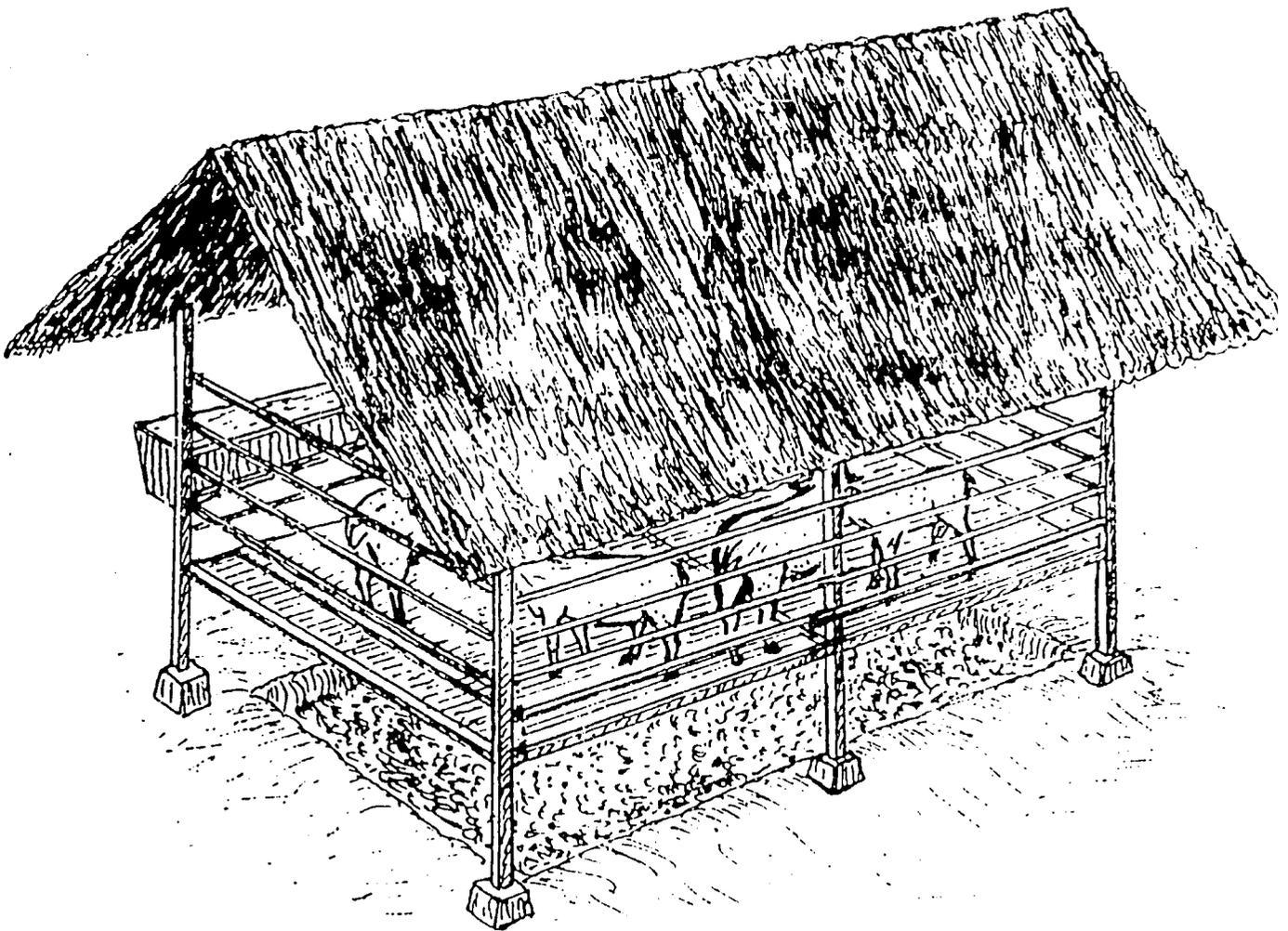
The animal barn has several functions :

- protects the animals from predators
- prevents the animals from damaging trees and crops
- provides a place to sleep and rest
- provides a place for mating and giving birth
- provides a single location for collecting manure
- provides a place to take care of sick animals
- makes management and control of the animals easier

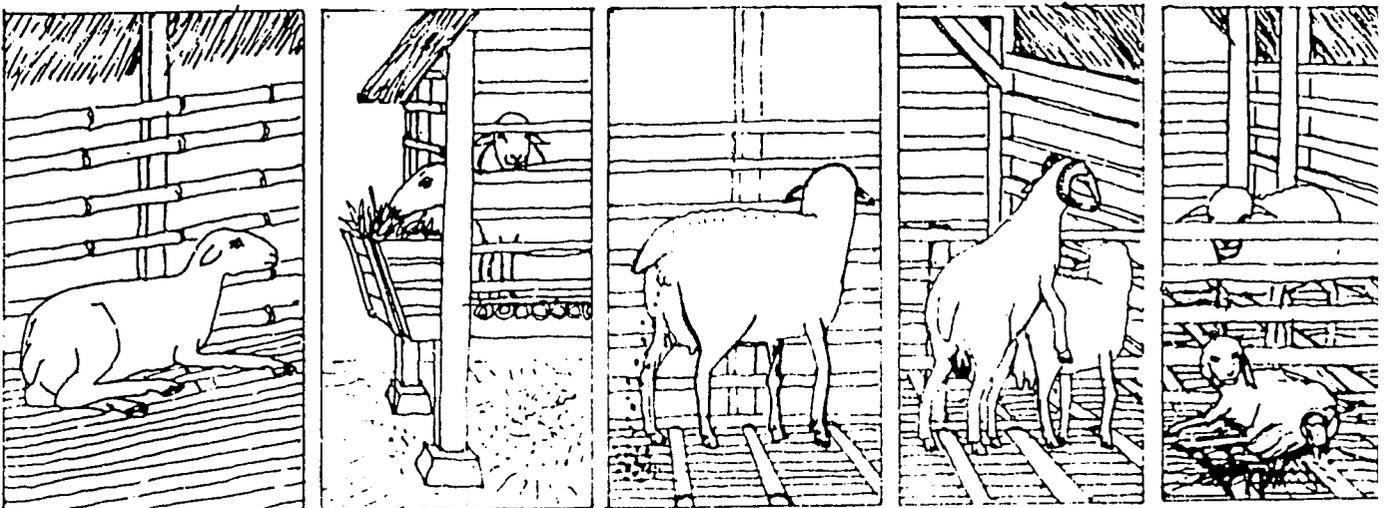
When considering these functions, there are several things to be noted :

- the animal barn should be strong to last a long time
- the barn has to be maintained regularly
- the animal barn has to be cleaned routinely to help keep the animals in a healthy condition
- repairs should be made immediately so that the damage will not spread.
- the size of the barn should be according to the number of animals being raised.

ANIMAL BARN AS A SHELTER



ANIMALS BARN AS A PLACE FOR ANIMAL ACTIVITIES



resting

eating

excreting

mating

lambing

management

Balitnak / SR · CRSP

BUILDING AN ANIMAL BARN

Considerations when building an animal barn :

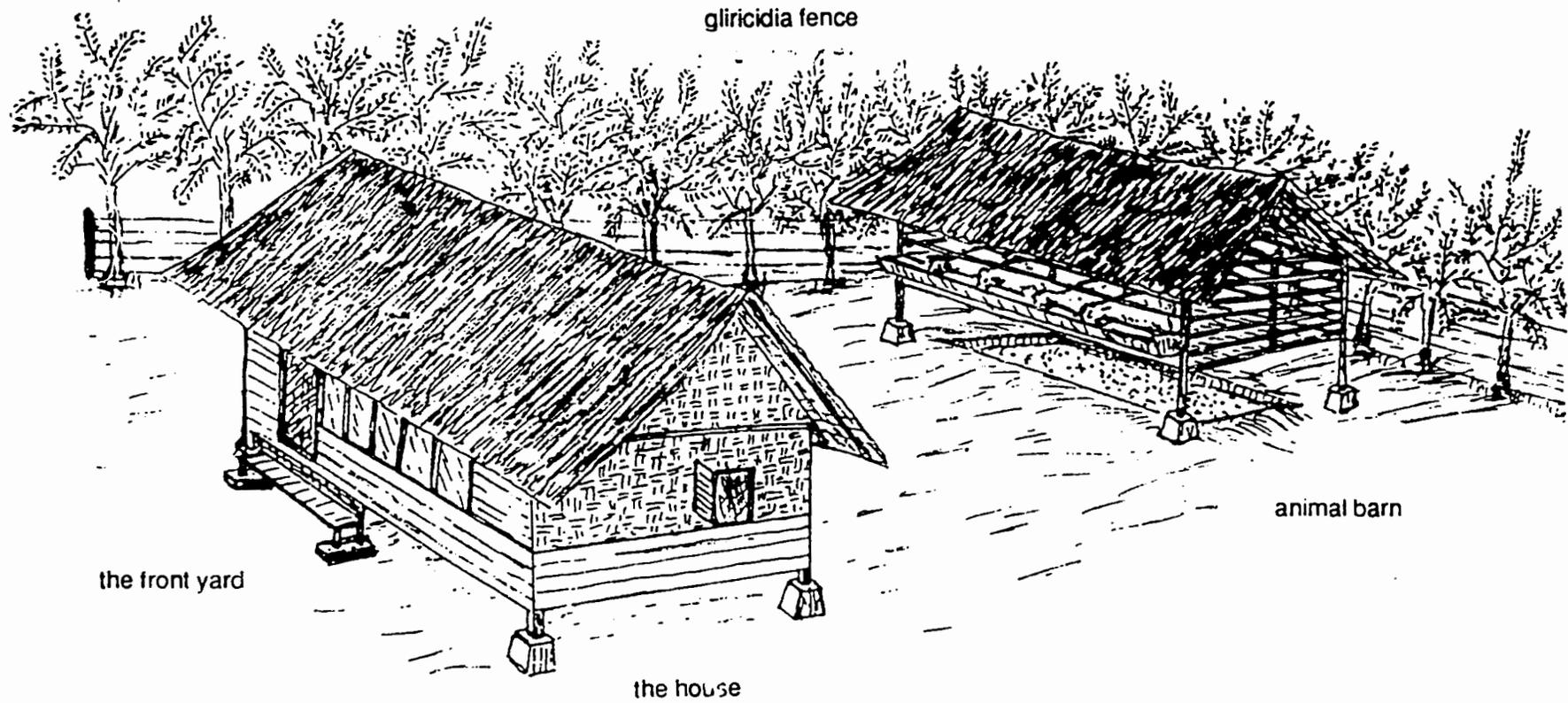
- choose a dry area that is not likely to be flooded with water
- the distance between the animal barn to the farmer's house or the well should be quite far (a least 10 meters)
- the animal barn should receive the morning sunshine evenly and be well ventilated
- it should be protected from direct wind especially at night.

Materials for building an animal barn :

- should be available in the local area
- should be inexpensive but strong enough to last a long time
- should be able to resist rot and insects

BUILDING AN ANIMAL BARN

1. Located behind the house
2. The distance from the house should be about 10 meters



ANIMAL BARN DESIGN

Housing design :

1. Raised barn
2. Ground level barn

RAISED BARN

Advantages :

- relatively cleaner because faeces, urine and rubbish fall from the floor to the ground.
- cleanliness is easier to guarantee
- barn floor is not wet
- the growth of pathogenic bacteria, parasites or fungi on the floor can be reduced.

Disadvantages :

- the costs are relatively higher.
- the risk of animals falling out is higher,
- the barn may become overloaded with too many animals in it.

GROUND LEVEL BARN

Advantages :

- the cost is lower
- the construction is simpler
- accidents caused by animals slipping off or falling in a hole in the floor can be eliminated

Disadvantages :

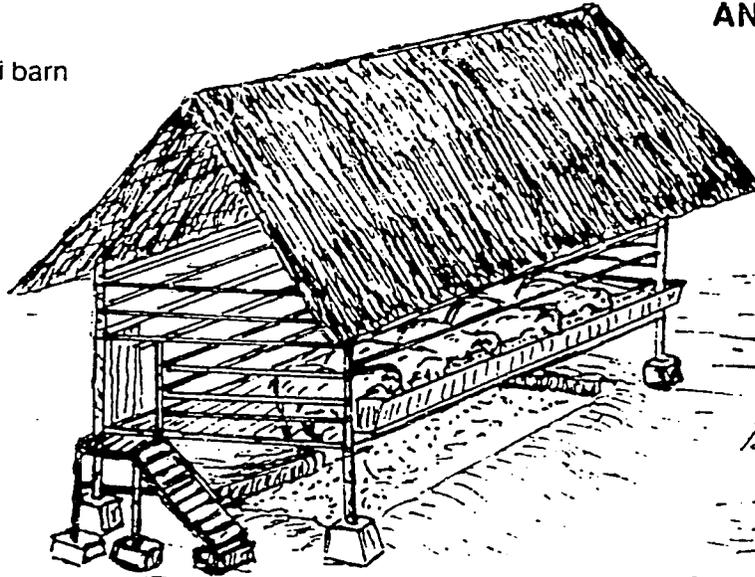
- the pens are not easy to clean because manure, urine and feed residues are mixed on the floor.
- the animals are not easily kept clean
- the floor is often wet and muddy
- the pathogenic bacteria, parasites and fungi grow well on the floor.
- the health of the animals is often poor.

NOTE :

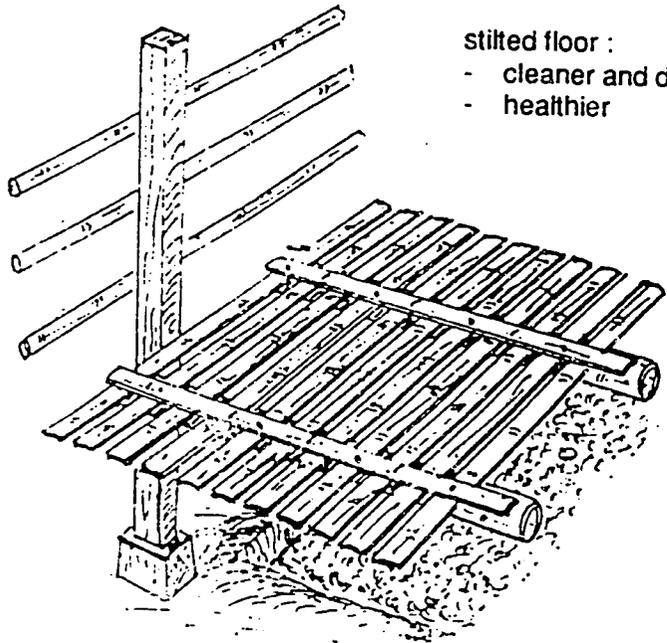
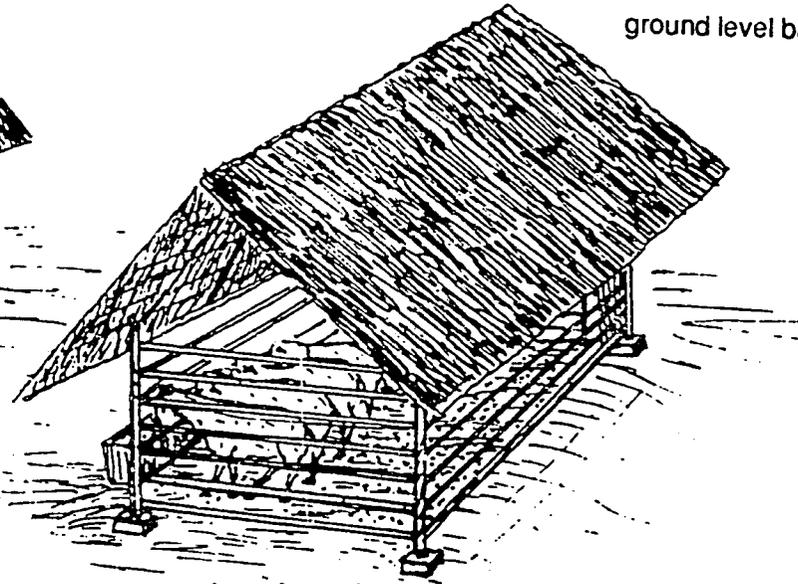
A ground level house is not advisable as it does not meet the basic health requirements for humid tropic environments.

ANIMAL BARN DESIGNS

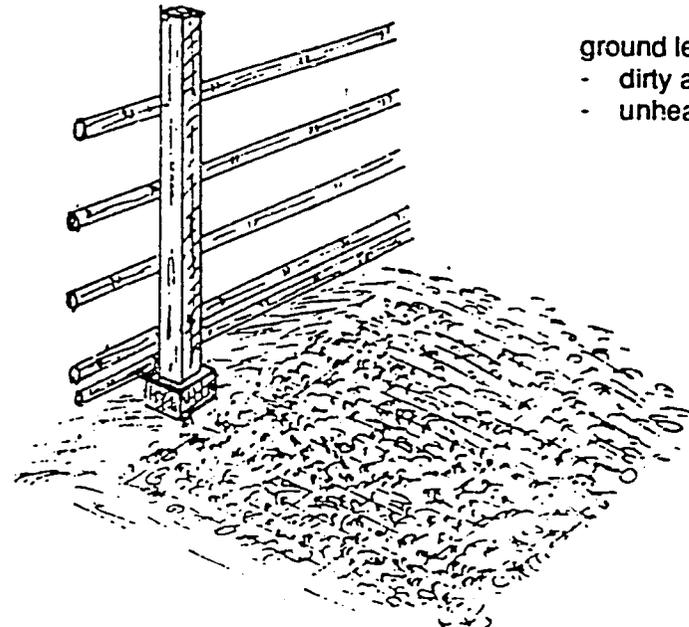
stilted barn



ground level barn



stilted floor :
- cleaner and dry
- healthier



ground level floor
- dirty and wet
- unhealthy

ELEVATED BARN AND ITS PARTS

1. Roof :

- a. provides a shelter to protect the animals from rain and heat.
- b. materials that can be used:
 - palm leaves/ palm fronds
 - grasses
 - roof tiles
 - zinc sheeting and others

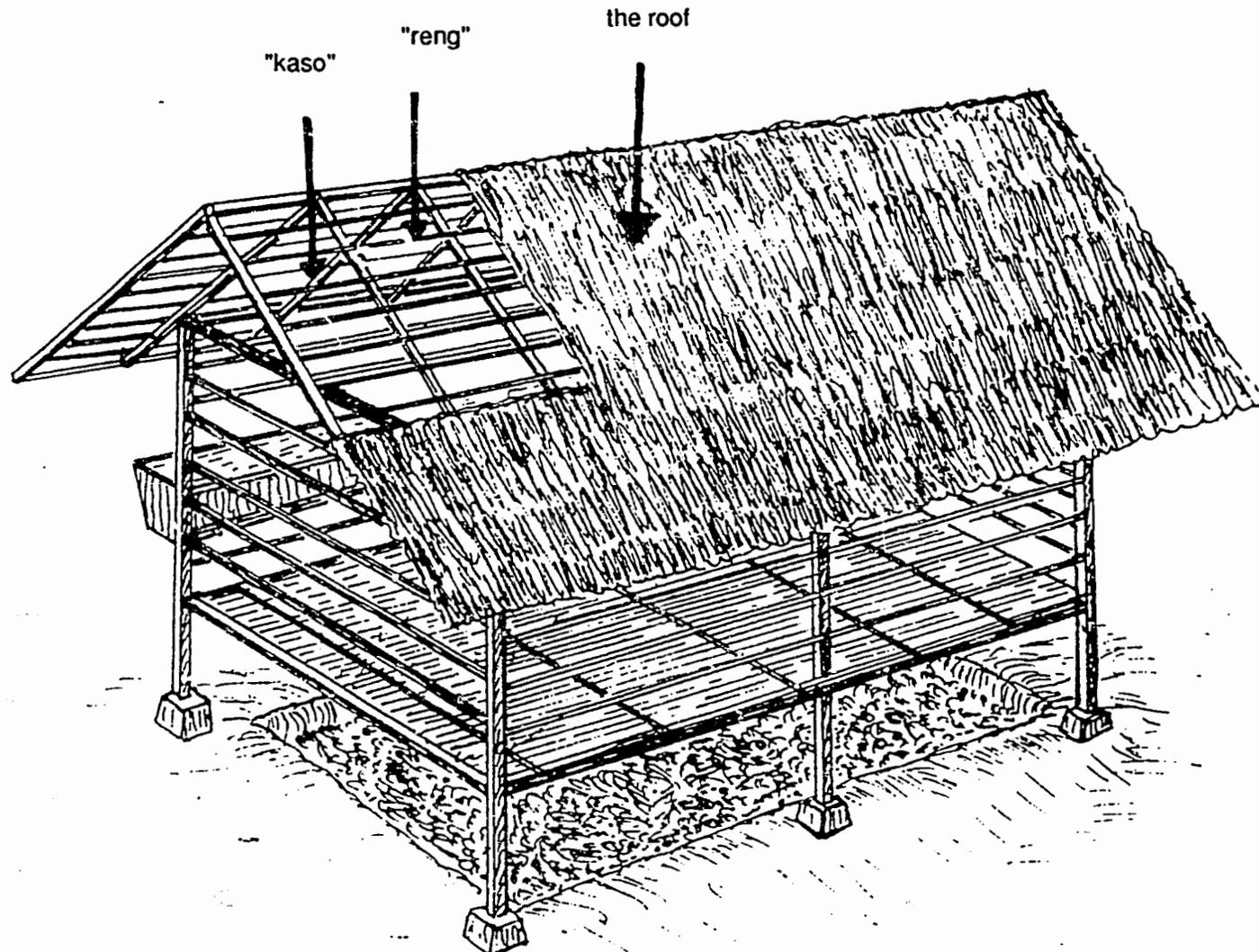
2. Roof Trusses :

- a. provides support for the tile supports and roof materials
- b. materials :
 - bamboo (diameter \pm 5 cm)
 - sago palm timber
 - coconut palm

3. Roof Tile Supports :

- a. provides support for roof materials
- b. materials :
 - split bamboo (width 2 - 3 cm)
 - a roof made from palm leaves or grasses does not require roof tile supports and these are tied directly to the roof trusses.

THE ROOF AND ITS FRAMES



BARN FRAME CONSTRUCTION

A. Function : provides support for the entire barn

B. Parts of the frame construction :

1. Main column/ frame :

a. supports the whole pen and animal load

b. materials :

- timber $\pm 12 \times 12$ cm
- split coconut trees
- large trunks, thick bamboo (diameter ± 14 cm)

2. Horizontal frames :

a. supports the slotted floor and animal load

b. materials :

- timber $\pm 12 \times 12$ cm
- split coconut trunks $\pm 12 \times 12$ cm
- large, thick bamboo

3. Purlins :

a. supports the roof supports and roofing materials

b. materials :

- wood $\pm 12 \times 6$ cm
- bamboo (diameter ± 10 cm)

4. Vertical frames :

a. supports purlins

b. materials :

- wood $\pm 12 \times 6$ cm
- bamboo (diameter ± 10 cm)

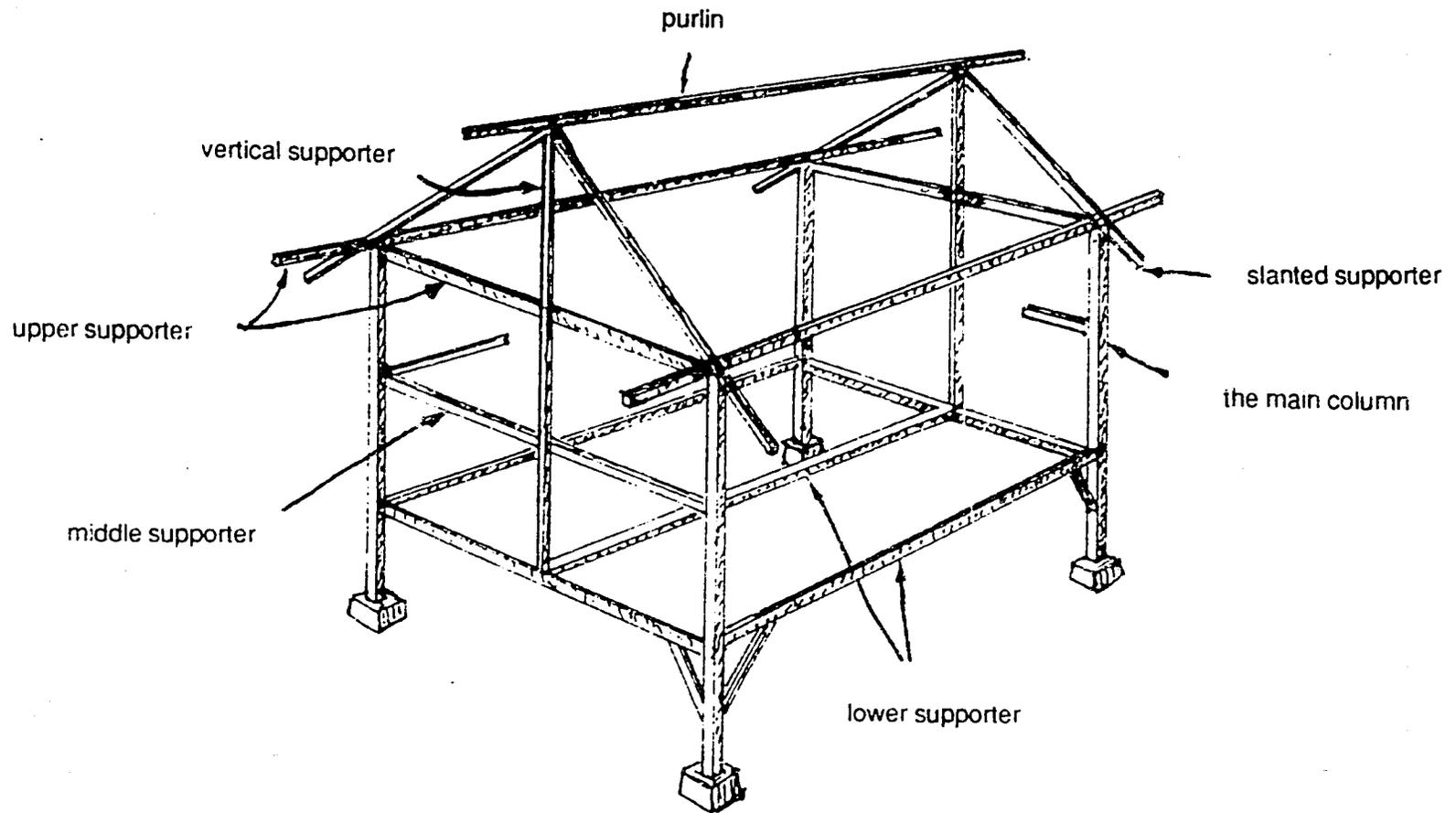
5. Middle frames :

a. strengthens the entire barn and to holds up the walls

b. materials .

- wood $\pm 12 \times 6$ cm
- bamboo (diameter ± 10 cm)

ANIMAL BARN FRAME



6. Bracing :

- a. makes the entire construction stable
- b. materials :
 - wood $\pm 12 \times 6$ cm
 - bamboo (diameter ± 10 cm)

7. Walls :

- a. functions as a barrier to keep the animals in the pens and can provide protection against the wind and rain
- b. materials :
 - wooden boards
 - small bamboo poles (diameter ± 5 cm) or split bamboo.
 - The distance between the bamboo poles is $\pm 5 - 10$ cm apart for adult animals and less than ± 5 cm for lambs and kids
 - The distance between the bamboo poles for the front wall should be ± 20 cm.
 - bamboo mats

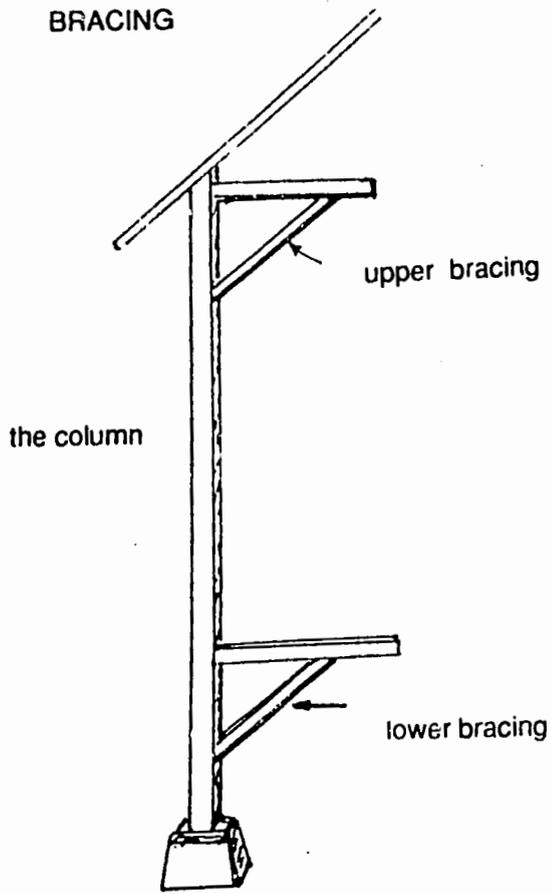
8. Floor :

- a. provides a platform for supporting the weight of the animals
- b. materials :
 - wooden boards with ± 2 cm thickness
 - split bamboo ($\pm 3-4$ cm width)
 - the spaces between the floor boards is ± 1.5 cm

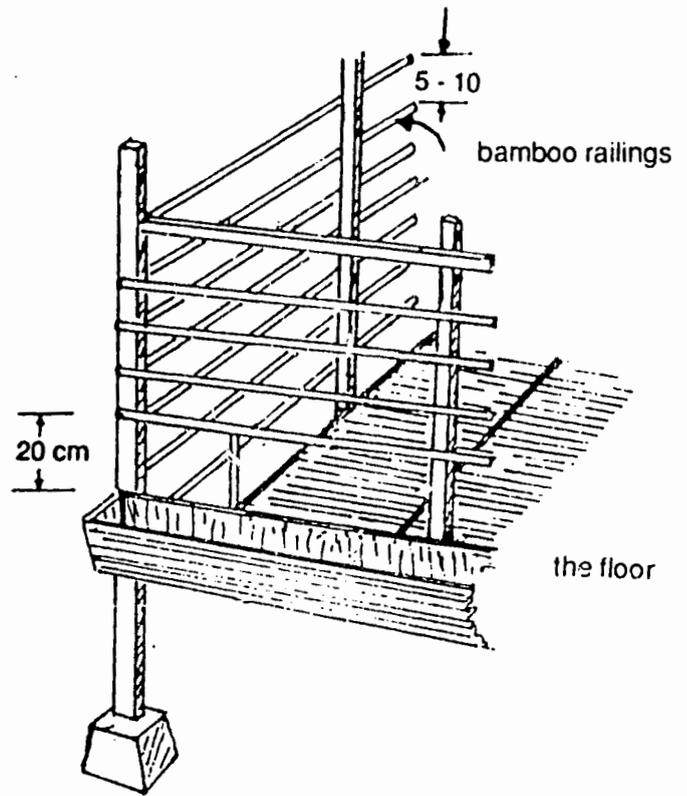
9. Floor supports:

- a. supports the weight of the floor and the weight of the animals
- b. materials :
 - bamboo poles (diameter $\pm 7 -8$ cm)
 - timber
 - distance between the floor supports is ± 20 cm.

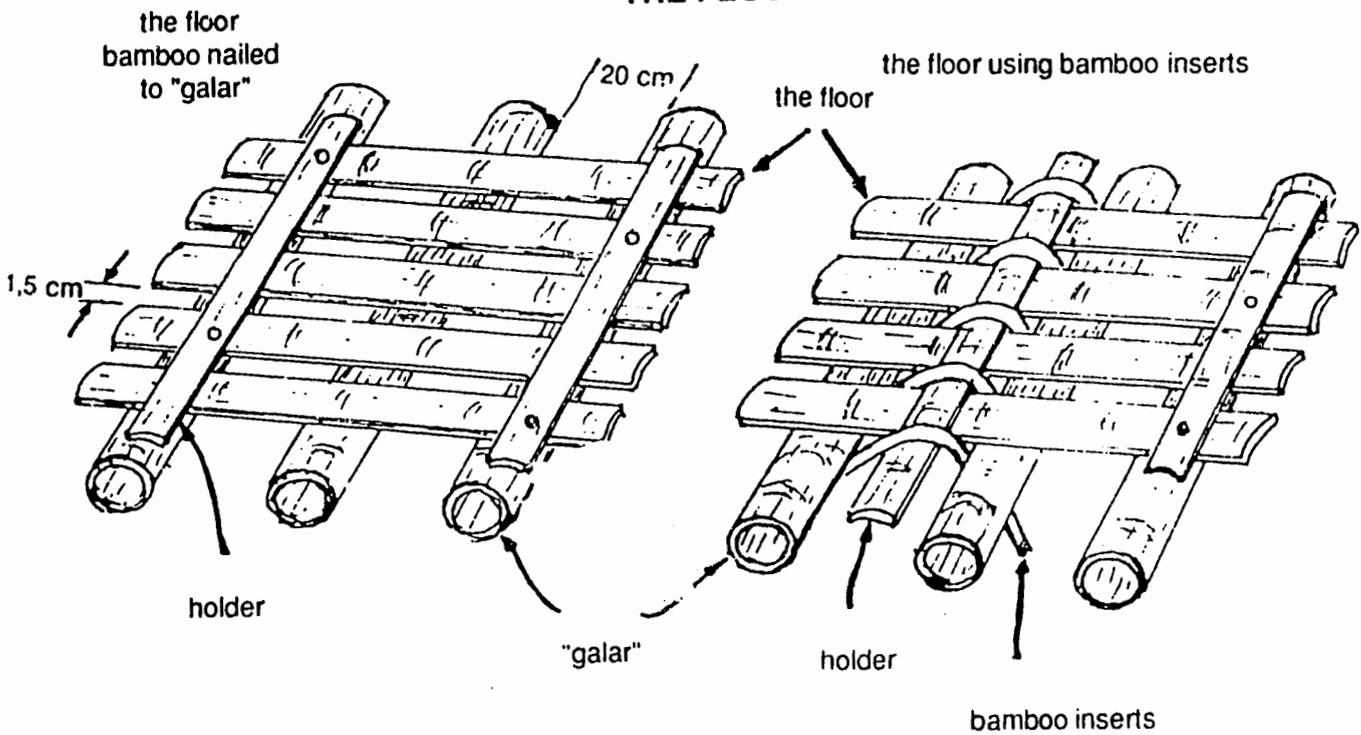
BRACING



THE WALLS



THE FLOOR



10. Feed trough :

- a. keeps the forages from falling on the ground and should prevent the animals from walking on their feed
- b. materials :
 - boards
 - bamboo mats
 - usually hung on the wall outside the pen
 - the feed trough can have hinges so it can easily be opened and cleaned.
 - the width is \pm 30 - 40 cm
 - the depth is \pm 20 - 25 cm
 - the young lambs can not usually reach the feed trough, therefore, there should be a step inside the pen that allows the young lambs to step-up and reach the feed.

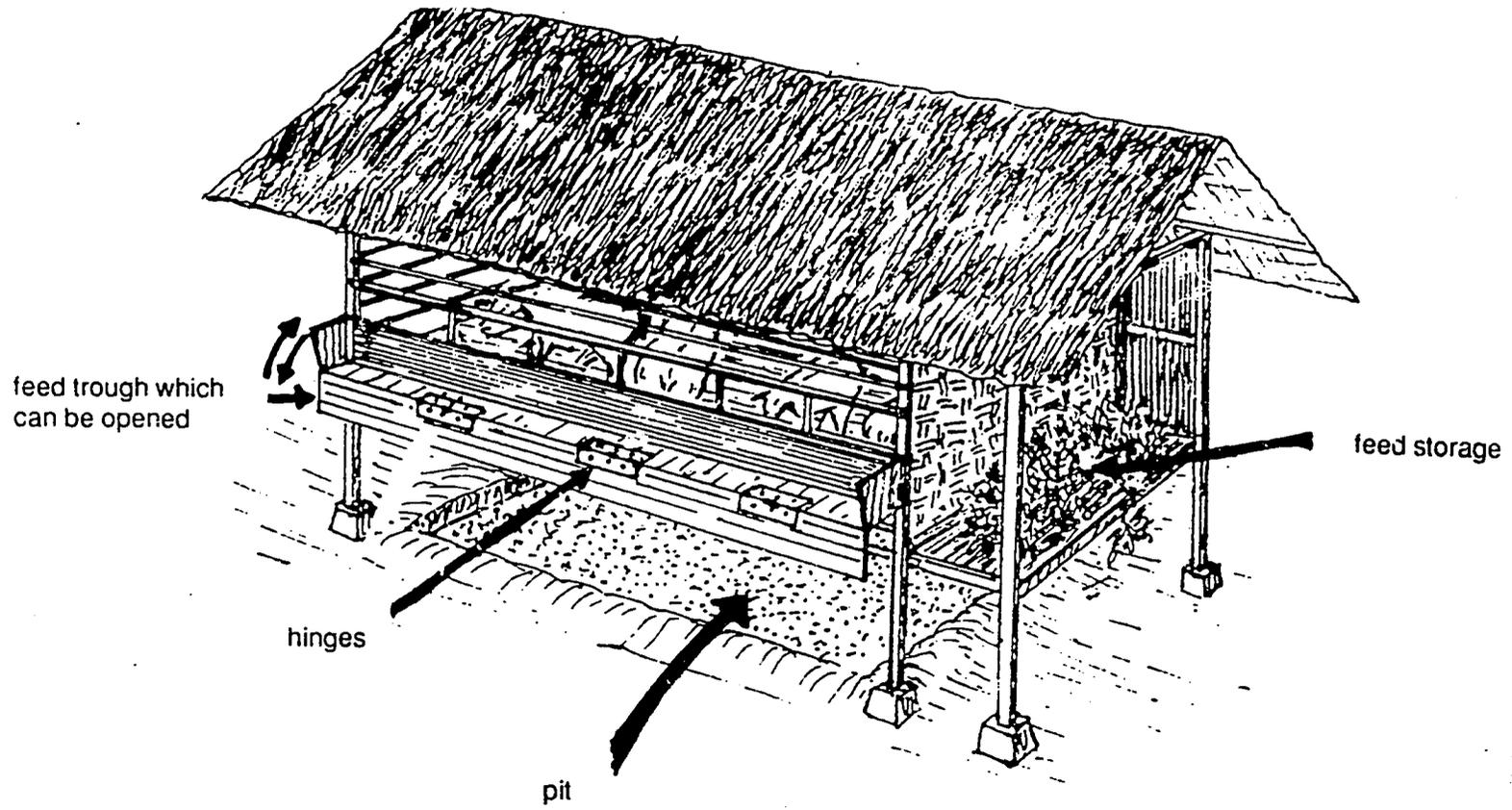
11. Feed storage :

- a. provides an area for storing the forages before being offered to the animals.
- b. do not locate it too close to the animal pens or it may be contaminated with manure.

12. Underneath the pen :

- a. provides a waste area for feed residues, manure and urine.
- b. The hole for this collection area should be dug 40 - 50 cm depth. A ridge around the pit should be dug higher than the ground level to prevent the hole from being flooded.
Clean the manure pit every 1 - 2 weeks.

FEED TROUGH AND FEED STORAGE



PARTITIONS FOR AN ANIMAL BARN

A. Animal barn partitions (pens)

- It is necessary to have separate pens in an animal barn.
- The advantage of the partitions is to separate the animals based on their physiological status. There are several advantages in partitioning the barn:
 - feeding the animals according to their needs is easier.
 - a mating schedule is easier to follow
 - helps prevent inbreeding.
 - the males will not disturb the other animals
 - lactating ewes can look after their lambs better.
 - the pregnant ewes can give birth in a more relaxed environment
 - mating before maturity can be prevented.
 - sick animals can be isolated.

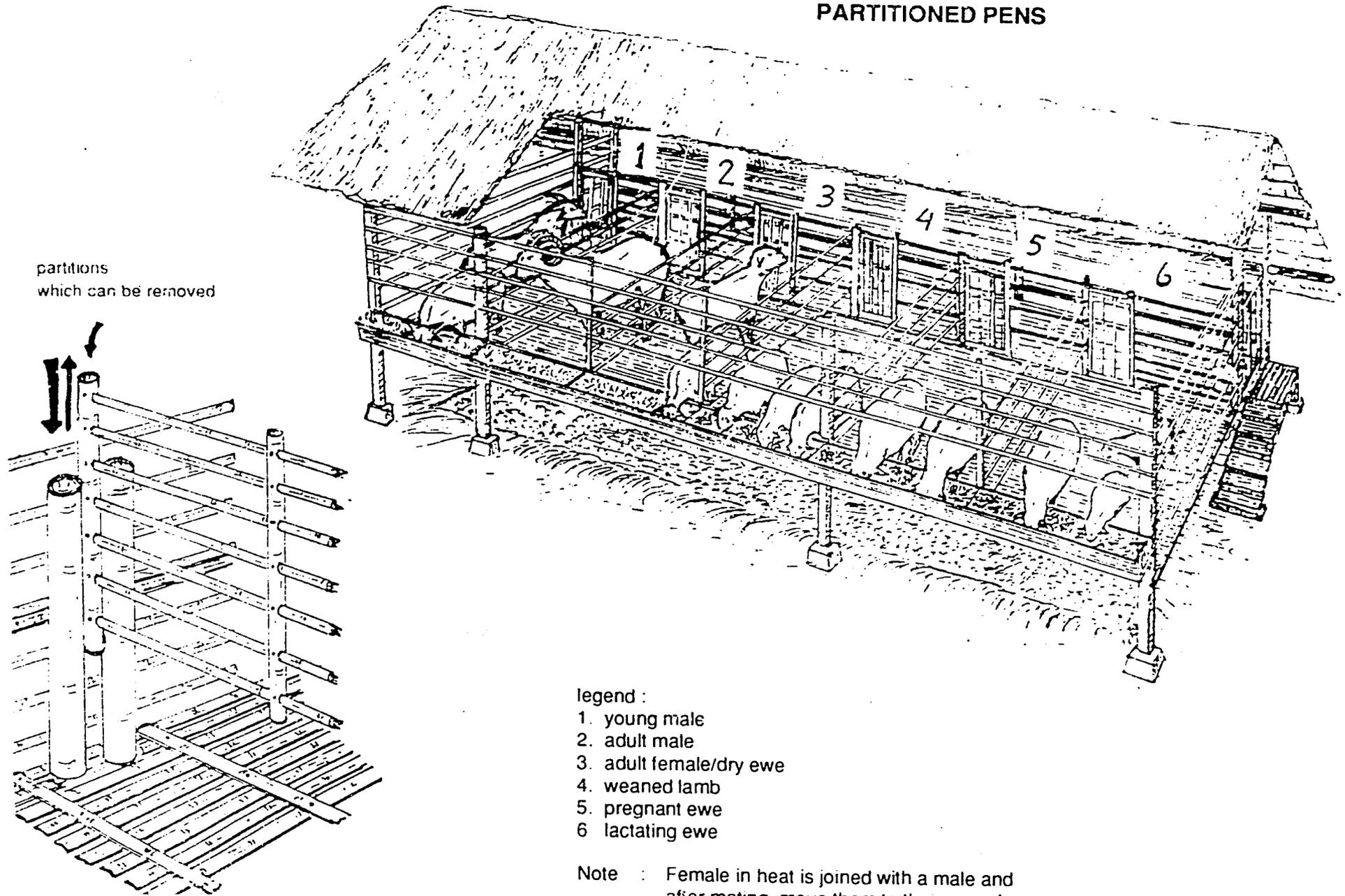
B. Size of pens / animal :

- adult males (12 months old) 1.2 m²
- adult females (12 months old) 1.0 m²
- lactating ewes 1.0 m²
+ 0.5 m for each kid/lamb
- young males/ females (7 - 12 months old) 0.75 m²
- weaning kids/lambs (3 - 7 months old) 0.50 m²

Note :

If the space is limited, there should be separate pens for adult males, young males (individual/ groups of 2 - 3), pregnant ewes (individual/ groups of 2 - 3). Partitions should be moveable so that the pen size can be adjustable according to the need and the height should be 70-80 cm.

PARTITIONED PENS



partitions
which can be removed

legend :

1. young male
2. adult male
3. adult female/dry ewe
4. weaned lamb
5. pregnant ewe
6. lactating ewe

Note : Female in heat is joined with a male and
after mating, move them to their own places

DESIGN OF ANIMAL BARN

Basically, there are 2 barn designs :

A. Barns without an aisle.

- a. animal barn with one door :
 - each pen is connected by a door on each partition.
 - this design is not advised as the animals often have difficulty with going in or out.
- b. each pen has a door to go out, the disadvantages are :
 - each pen requires an outside door and stairs
 - cleaning each pen is more time consuming

B. Barns with an aisle.

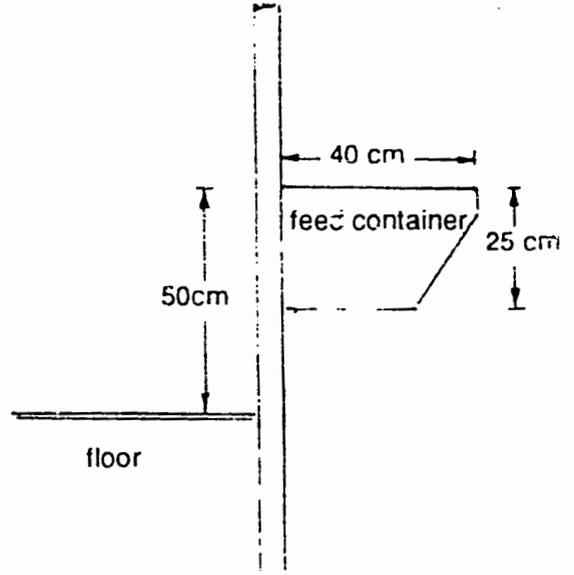
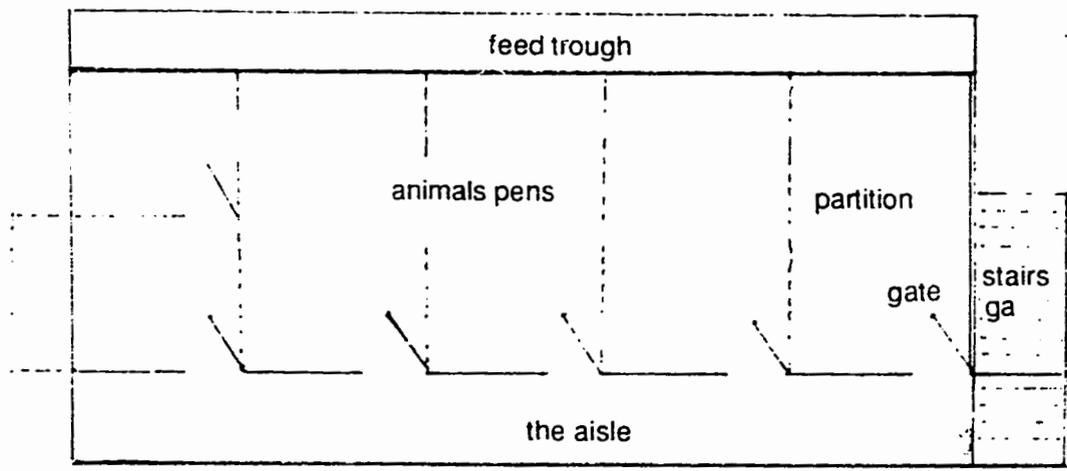
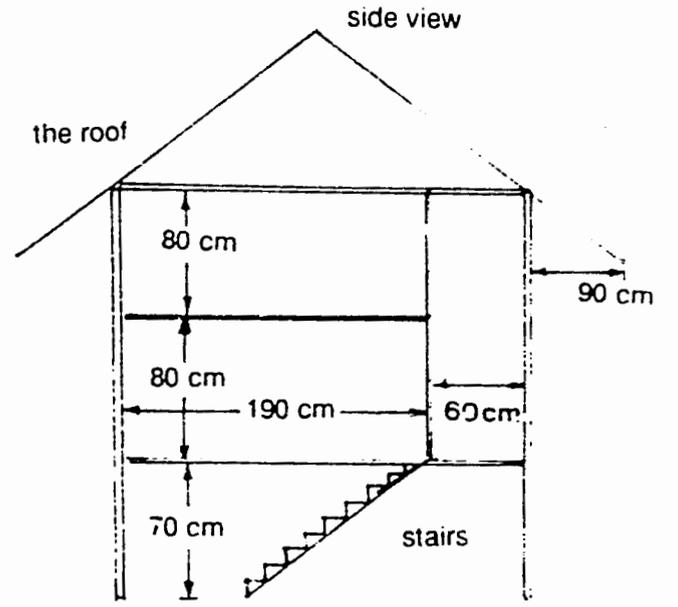
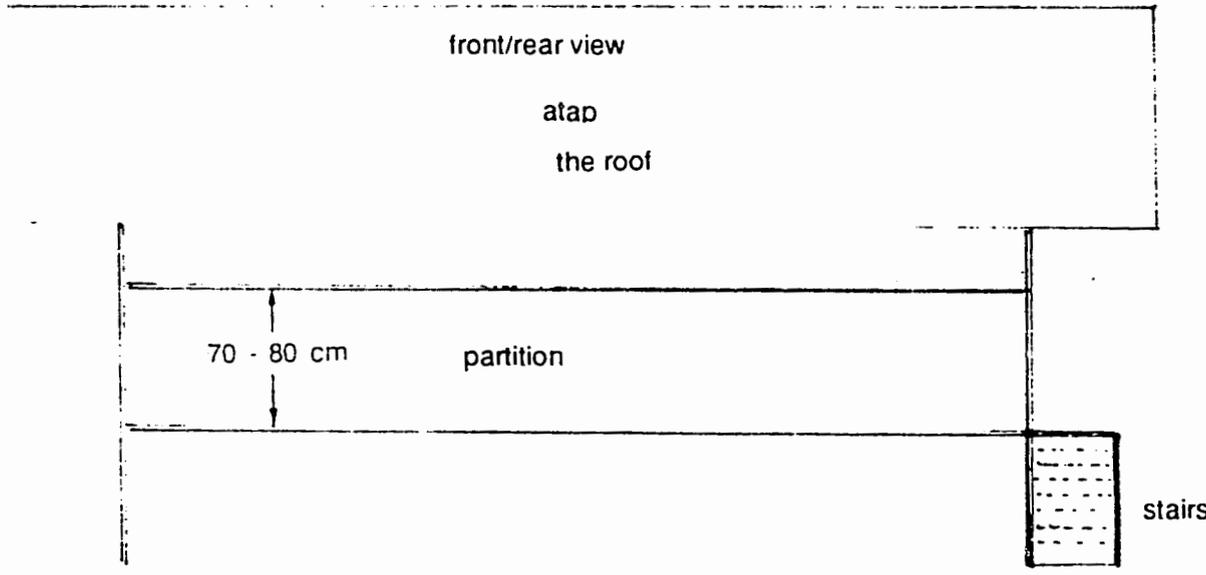
- a. The aisle is in the middle of the barn with pens on both sides.
- b. The aisle may be on either side of the barn.

With this design, each door is opened toward the aisle.

The advantages of this design are:

- there is only one outside door.
- the animals have no difficulty with entering and exiting.
- it is easier to clean the barn. If necessary, the aisle can be used temporarily to separate the animals, especially the weaning lambs.

THE CROSS SECTION OF ANIMAL BARN WITH AN AISLE



top view

MANAGEMENT OF THE BARN

1. The animal barn must be well-maintained.
2. The barn has to be kept clean and dry.
3. The damaged areas must be repaired immediately.

Areas that need constant attention include :

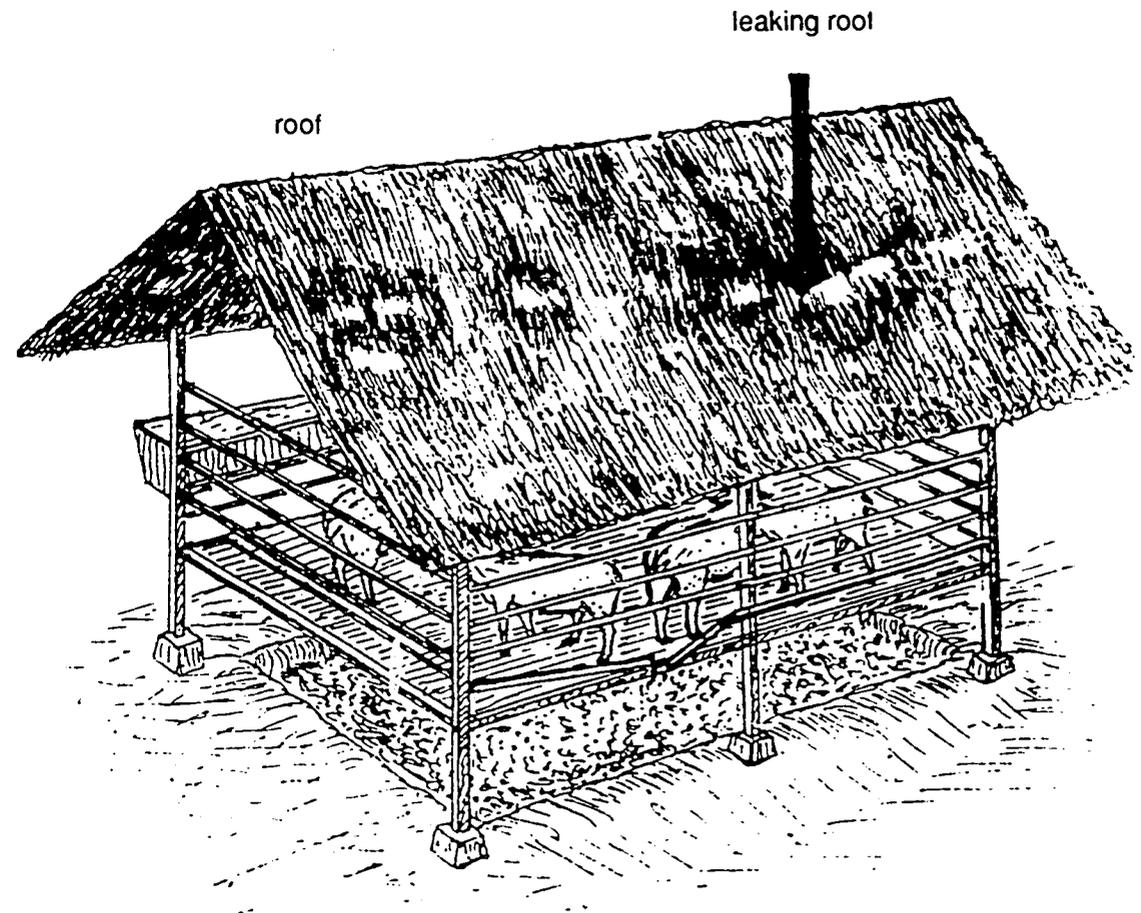
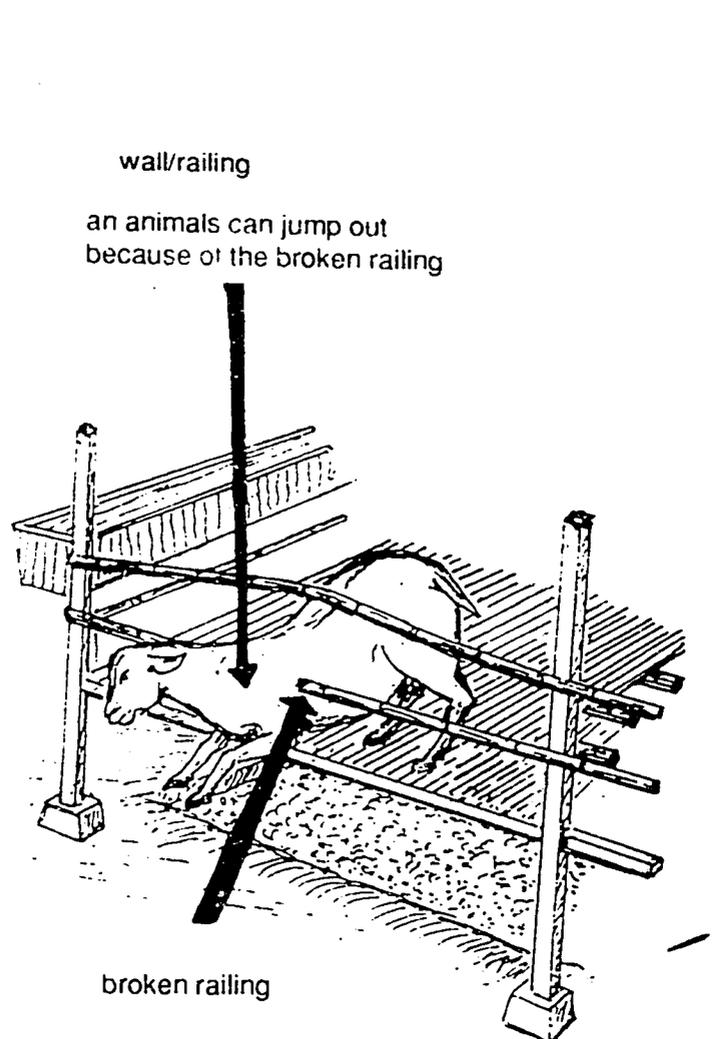
1. Roof :

- if the roof is made from palm leaves/ grasses it will need to be repaired every 1.5 - 2 years.
- a leaking roof can cause other areas to be gradually damaged.
- a leaking roof has to be repaired as soon as possible
- a roof made from palm leaves/ grasses has to be replaced after 3 years (depending on rainfall)

2. Walls :

- the walls can be easily broken if the animals hit them
- the broken walls should be repaired immediately to prevent the animals from escaping or being injured on the damaged wall.
- the males are usually more active and stronger and may hit the walls with their heads or horns, thus the walls must be strong.

DAMAGED ROOF AND WALL



leaking roof can cause :

1. other parts to be damaged especially the floor
2. animals will get wet and cold

3. Floors made of slatted bamboo

- these parts are easily broken because :
 - the materials are gradually rotten caused by manure, urine or leaks in the roof
 - they support the heavy animal loads.

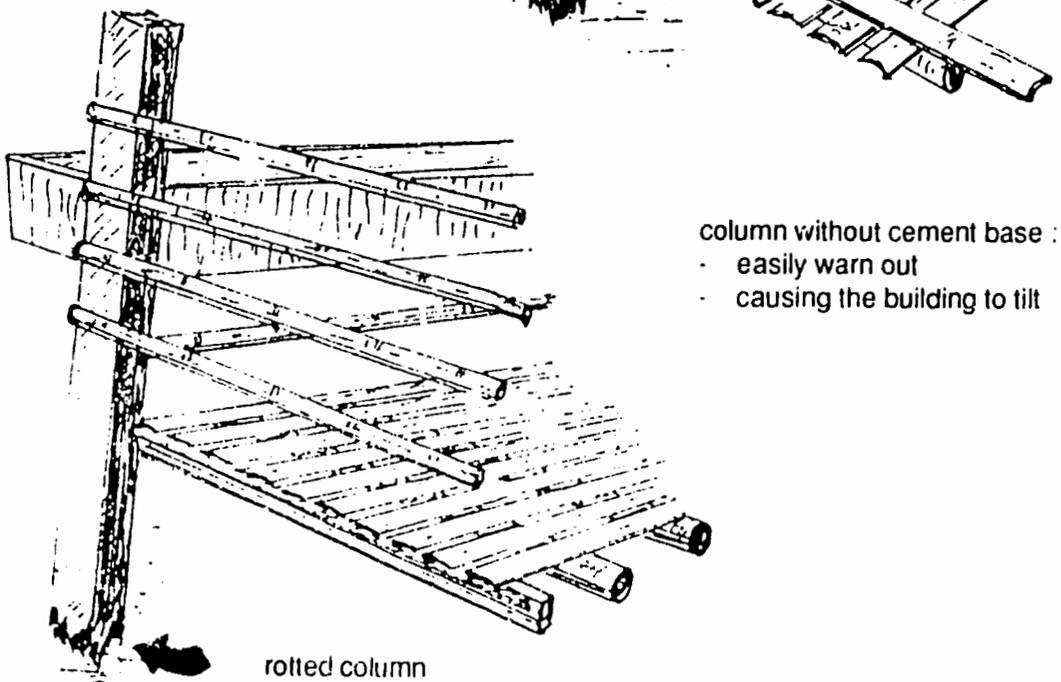
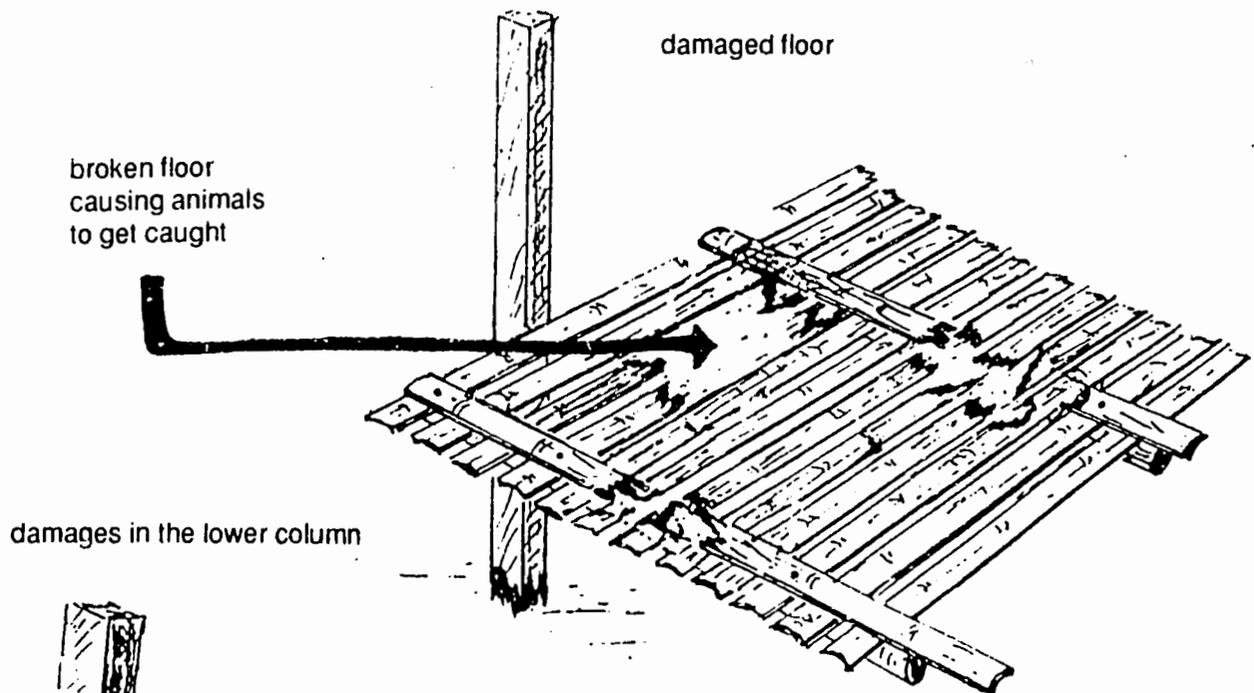
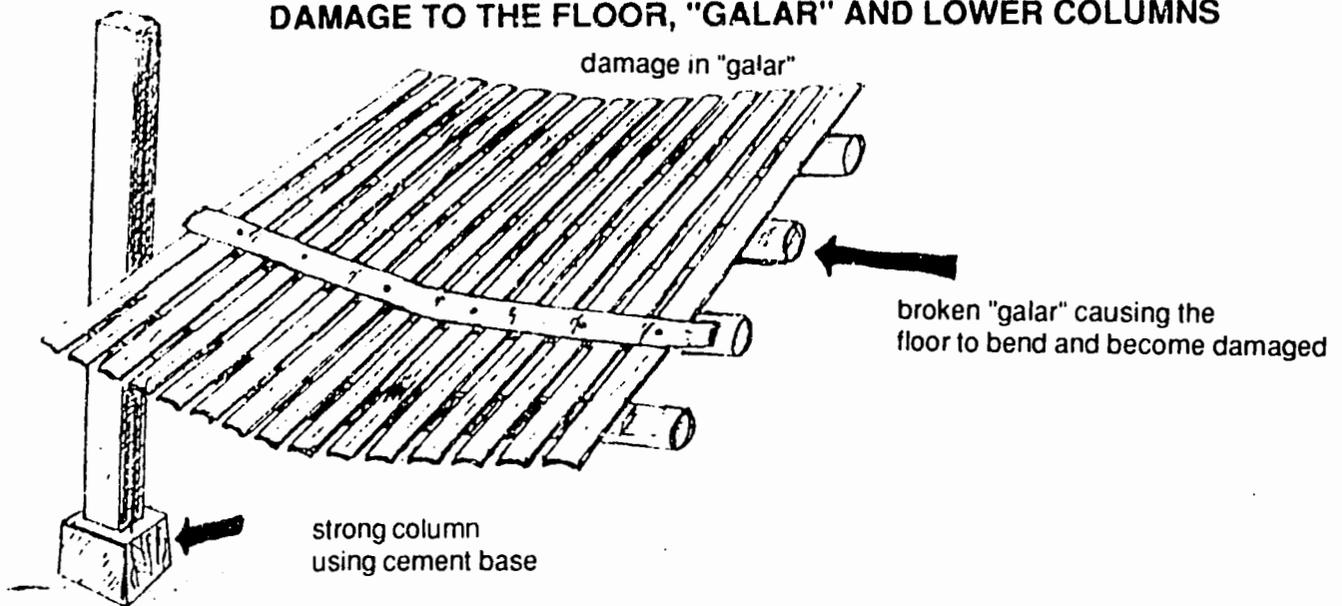
- prevention of damage :
 - the floor has to be cleaned regularly to keep it clean and dry.
 - the leaking roof has to be repaired immediately.
 - bamboo for the floor should be thick and mature

4. The main support frames :

- the main columns should be strong as they support the whole barn

- preventing damage :
 - a base of cement or large stones should support the main columns.
 - if the main supports are rotten, the barn may lean to one side or fall down.

DAMAGE TO THE FLOOR, "GALAR" AND LOWER COLUMNS



management

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MAINTAINING CLEANLINESS OF THE ANIMAL BARN

The cleanliness of the barn and health of the animals is based on the following:

1. The floor :

- a. the floor may be easily broken or rotten
- b. pathogenic bacteria and fungi can grow well in a dirty area
- c. the animals can be easily infected from a dirty floor and cause:
 - unhealthy animals
 - a high death rate
 - a slow growth rate
 - low productivity
- d. to help prevent these unhealthy conditions, the floor has to be cleaned regularly.

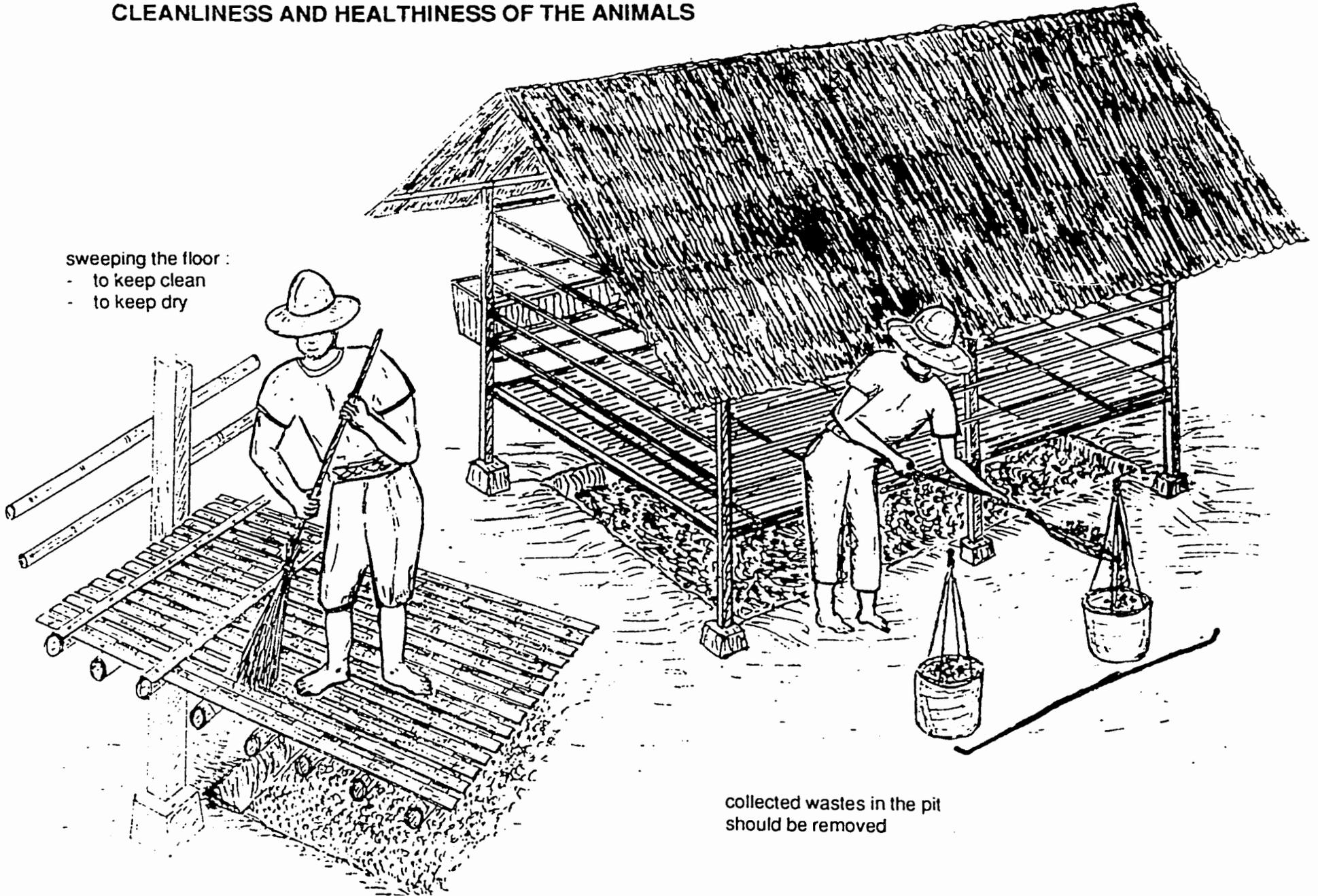
2. Underneath the barn :

- a pit or trench underneath the barn collects all the rubbish and manure.
- this area can become a source of disease, parasites and fungi that can affect the animal's health.
- to help prevent diseases, the pit should be cleaned every 1 - 2 weeks.
- remove the manure from the pit to a special area for composting.

CLEANLINESS AND HEALTHINESS OF THE ANIMALS

sweeping the floor :

- to keep clean
- to keep dry



collected wastes in the pit
should be removed

MAKING MANURE COMPOST

- A mixture of manure, urine and uneaten grasses from the pit under the barn is a good source of compost to make fertilizer.
- Usually a fresh mixture of manure gives off too much heat, so it should be composted first.

Composting process :

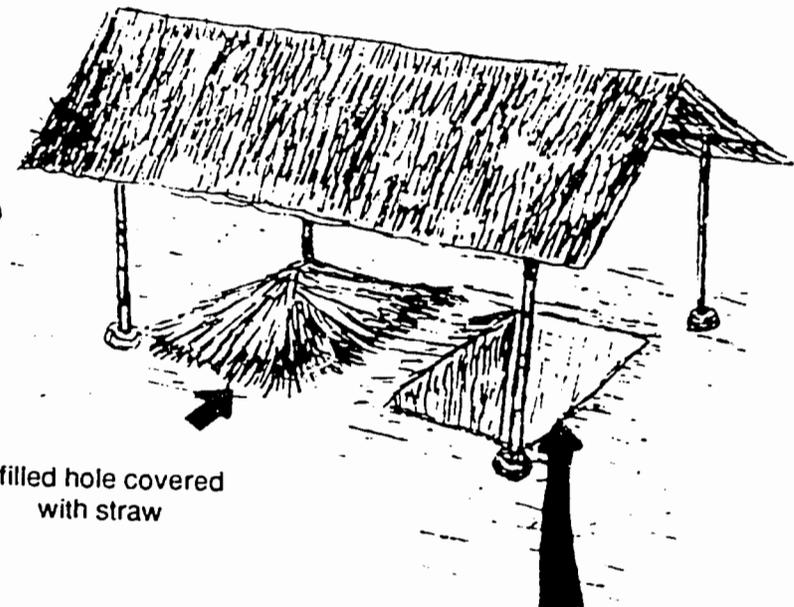
- the fresh mixture from the pit should not be thrown away or burnt, but be transferred to a composting pit.
- the ridge of this pit has to be higher than the surrounding area in order to prevent heavy rain from washing into the pit.
- the depth of the hole should be ± 1 m, whereas the length and the width depend on the number of animals being raised.
- after the pit is full of the fresh mixture, cover it with some soil, plastic, straw or banana leaves so the flies will not gather on top of it.
- let this pile stand for ± 3 months.
- check the compost regularly, adding water if it is dry and mixing the manure soil and uneaten grasses so that the composting process continues
- this pit should have a roof over the top to prevent the compost from drying out or from becoming too wet from the rain.

The advantages of the composting process :

- the compost does not give off heat that can harm the plants.
- the compost provides the plants with a continuous supply of nutrients.

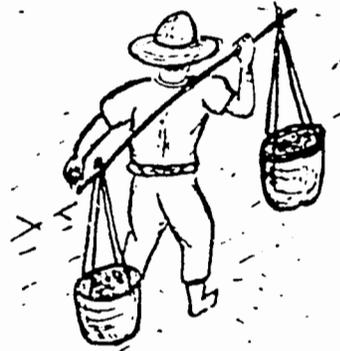
MANURE AND ITS PROCESSING

compost transferred to the rice fields

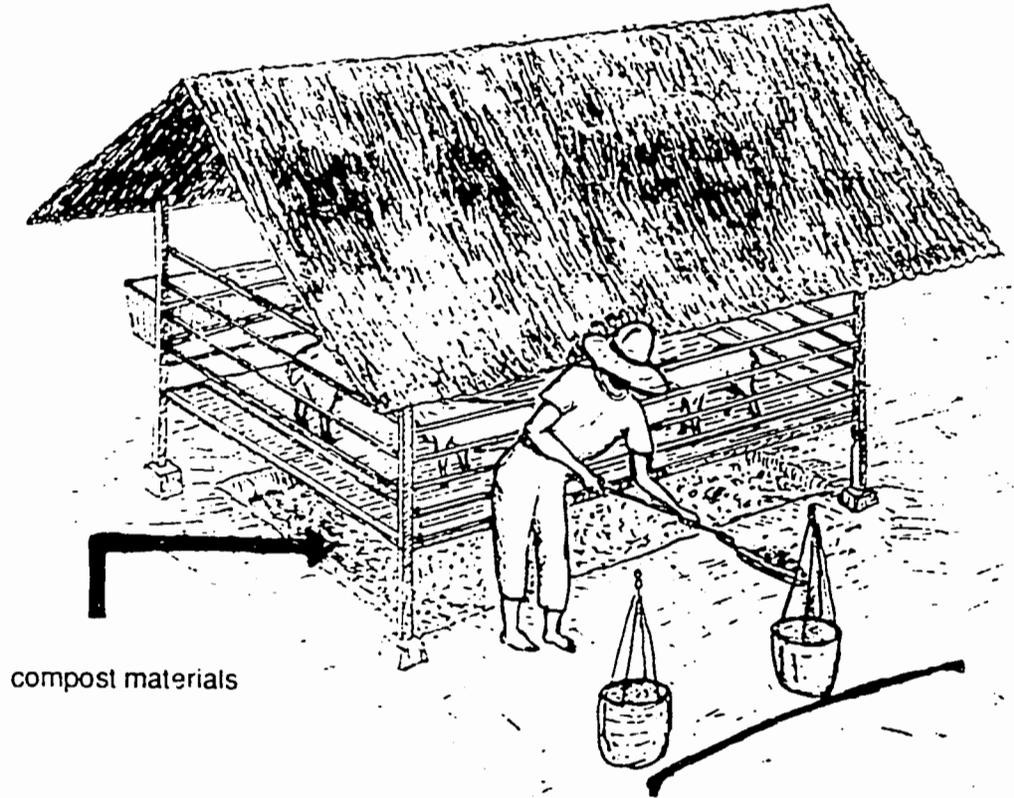


filled hole covered with straw

a hole dug for composting



carried to the composting area



compost materials

ANIMAL HEALTH CARE

Sheep and goats require basic health care which includes washing, shearing the wool and cutting their hoofs.

1. Washing the animal.

- The hair on the animals which are never washed will be dirty, wet and sticky.
- This condition is suitable for the pathogenic bacteria, parasites and fungi to grow and harm the animals.

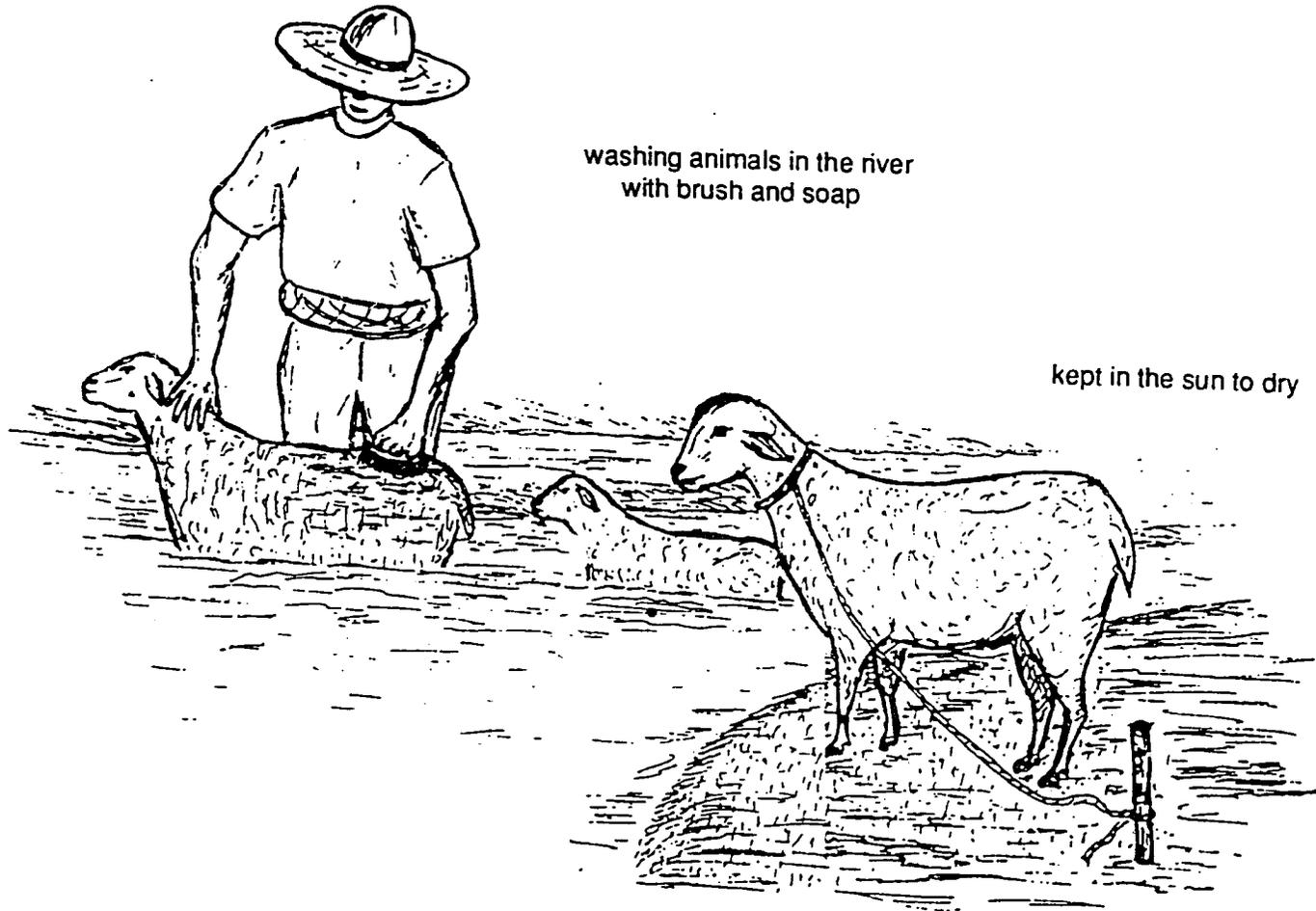
To prevent this situation therefore :

- wash the animals regularly (once a month)
- during the wet season, wash the animals on a sunny day.
- use clean water.
- use soap and scrub the hair to get rid of the pathogenic bacteria, parasites and fungi.
- after washing the animals put them in the sun to dry completely

The purpose of washing the animals :

- the pathogenic bacteria, parasites and fungi can be eliminated.
- after washing, the animals look cleaner and healthier.
- the sale price may be higher.

WASHING ANIMALS



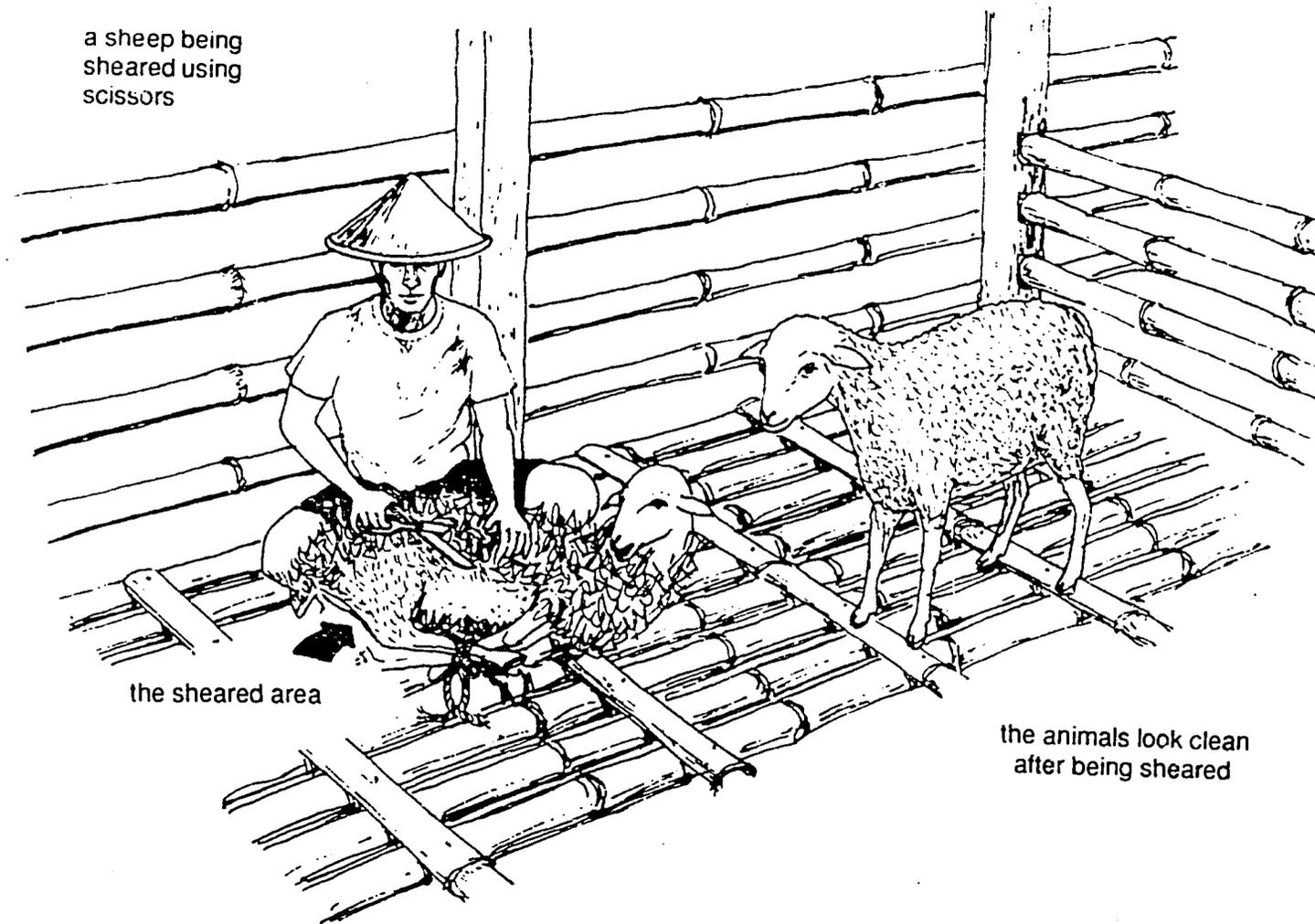
2. Shearing the hair (only for sheep)

- if the hair is never sheared it will stick together and be difficult to clean.
- if the sheep are never washed or sheared they will be sticky, dirty and wet.
- this condition is suitable for pathogenic bacteria, parasites and fungi to grow and harm the animal.

To prevent this situation therefore :

- sheep should be sheared at least twice a year.
- use an ordinary scissors or hair scissors.
- before shearing, the sheep can be washed first to ease the shearing.
- the shearing is started from the stomach area to the front parallel with the animal's back.
- be careful not to cut the skin when shearing the hair.
- leave the hair 0.5 cm in length.
- the first shearing is done after the sheep are 6 -7 months old.

SHEARING SHEEP



a sheep being
sheared using
scissors

the sheared area

the animals look clean
after being sheared

3. Cutting the sheep and goat hoofs

- sheep and goats that are continuously inside a pen will have longer nails than those that graze
- it is not a good practice to let the hoofs grow long because :
 - a. it can cause difficulty in walking for the animals.
 - b. the males may have difficulty when mating.
 - c. the hoofs may break and cause injury and infection.
 - d. the space underneath the long hoofs usually becomes full of dirt and pathogenic bacteria and fungi that can harm the animal.
- cut the hoofs of the sheep and goats regularly or else they will be difficult to cut when they become long and hard.

Methods of cutting the hooves with hoof-cutters and utility knife

The animal's neck is tied with a rope to a pole as near as possible so it can not move.

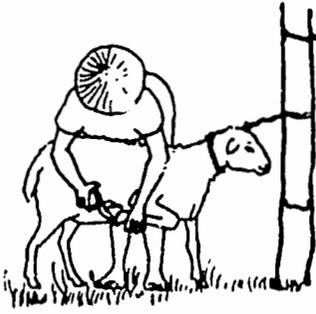
- a. cutting the hoofs of the front right foot :
 - in a bent over position, hugging the animal's body.
 - then, raise the foot by bending its knee.
- b. cutting the hoofs of the front left foot :
 - in a squat position at the front left of the animal
- c. cutting the hoofs on the back legs:
 - stand over the animal and hold it tight with your legs.
 - lift each leg up while the hoofs are cut.

TRIMMING THE HOOVES

trimming the hooves
by using scissors



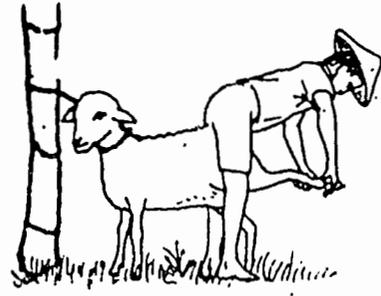
long hooves



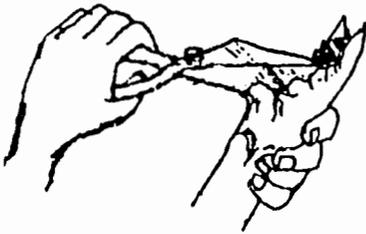
trimming the right
front hoof



the position for trimming
the left rear hoof



the position in trimming
the rear hooves



remove any dirt



trim the entire hoof
flat



cut any bump
under the heel



remove any cuttings



smooth the soft tissue
under the heel



finish

health

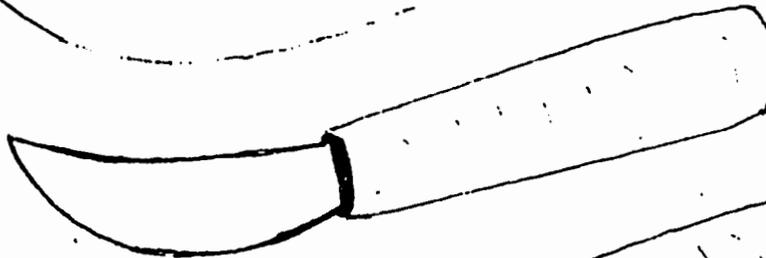
Baitrak / SH - CRSP

Simple tools to use :

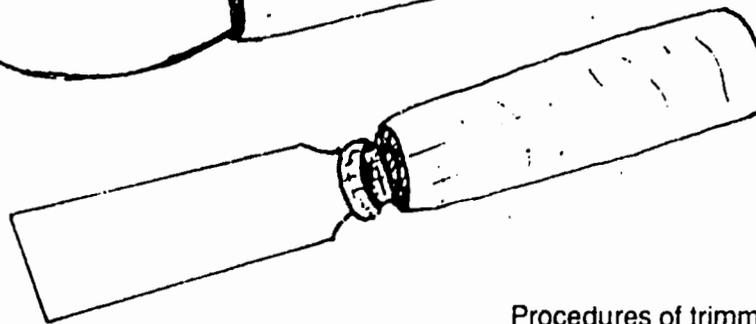
1. dagger
2. carving knife
3. chisel
4. shoe sole knife



dagger



carving knife

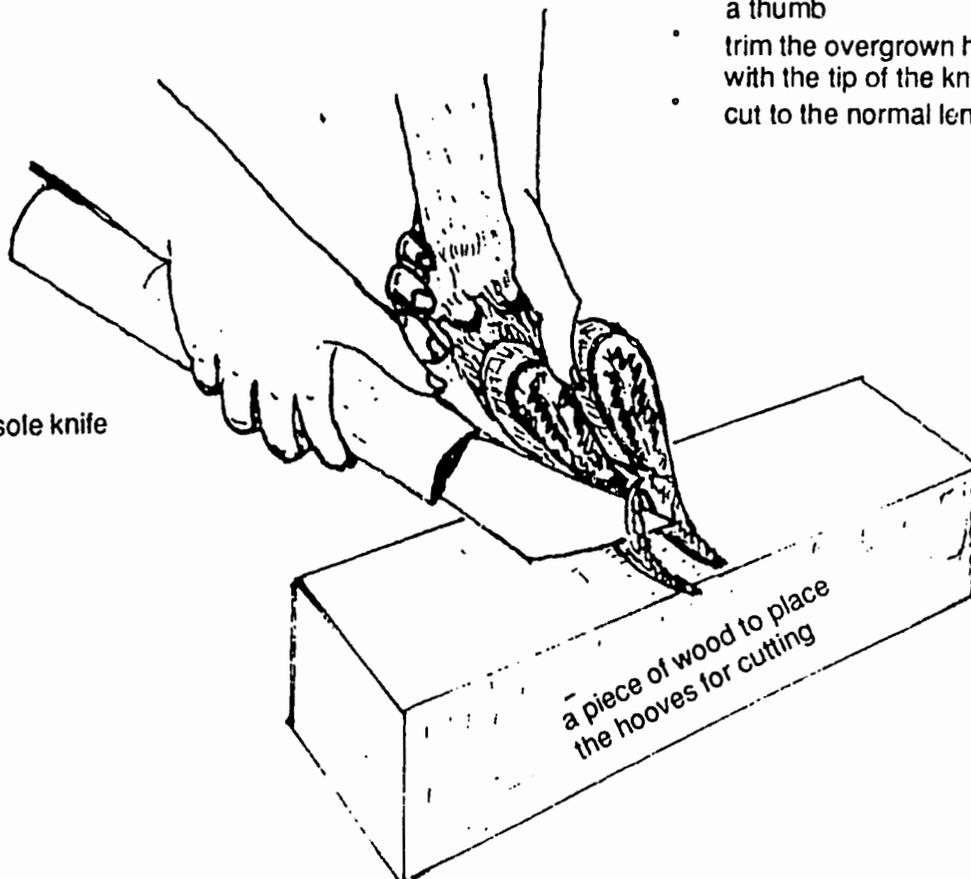


chisel

Procedures of trimming :

- bend the animals leg
- place the hoof on a piece of wood, while pressed by a thumb
- trim the overgrown hoof with the tip of the knife
- cut to the normal length

shoe sole knife



management

Balitnak / S.R - C R S.P

Diseases and Their Treatment

by

Abdul Adjid

Research institute for Animal Diseases

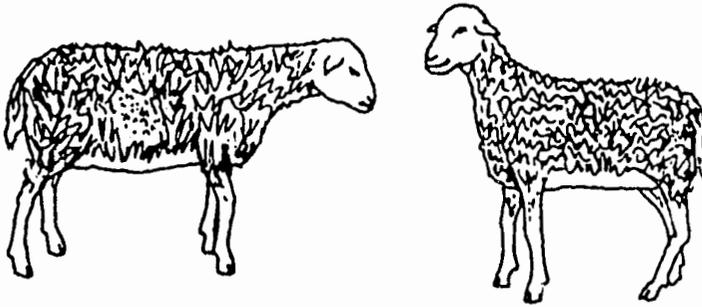
OCCURENCE AND TRANSMISSION OF DISEASES IN ANIMALS .

Based on their characteristics, diseases can be classified into infectious and non-infectious. An infectious disease is one which can be transmitted from a sick animal to other sensitive animals. The agents for infectious diseases are germs such as viruses, bacteria and fungi, and several parasites such as blood parasites, worms, and ticks. Non-infectious diseases are mainly related to feed such as mineral deficiencies, toxic plants, and poisons.

1. The occurrence of a disease may be due to contact between a sensitive animal and the source of the disease or another sick animal.
 - a. A healthy animal may come into contact or be near a sick animal, such as in the same pen or during mating. Several diseases are transmitted in this fashion.
 - b. A healthy animal eats toxic plants. Several local plants contain substances toxic to animals. In small amounts, they may not cause any sickness however, in excessive amounts or above the toxic level, the toxic effects appear as a disturbance in the animal's condition.
 - c. A healthy animal may accidentally eat or drink poison. Poisons such as insecticides and rodenticides carelessly stored can be consumed by animals and may have a fatal effect. It could also be caused by improper cleaning of a poison container later used as a drinking container.

THE INCIDENCE OF DISEASES IN ANIMALS

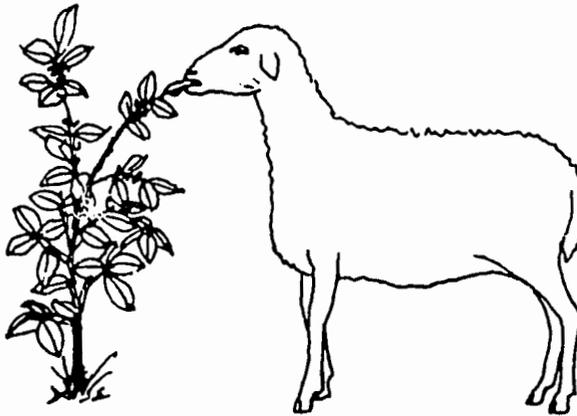
1. Direct contact



a sick animal

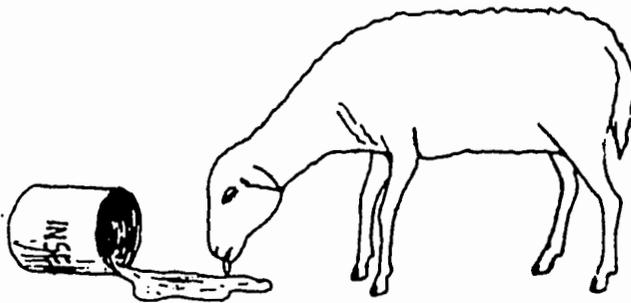
a healthy animal

a. a healthy animal is in direct contact with sick animals



toxic plant

b. a healthy animal consumes toxic plants



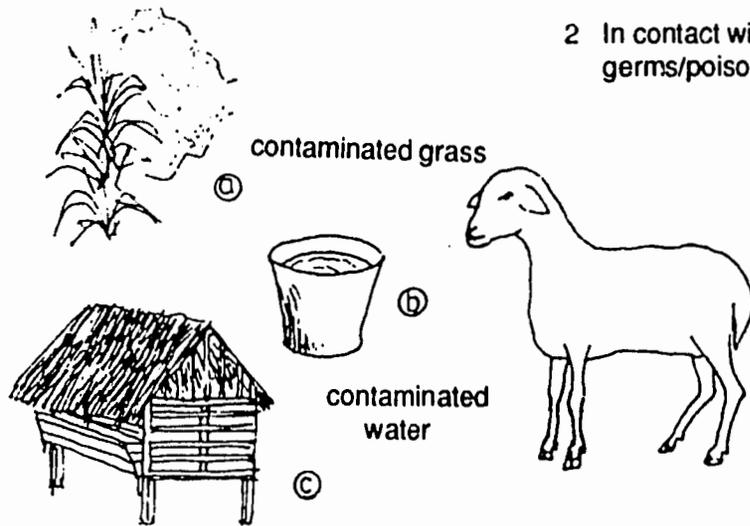
poison

c. animals drinks/licks poison or its empty container (insecticides, rodenticides, etc) carelessly stored.

2. The incidence of a disease may be due to contact between an animal with material contaminated by germs or poison.
 - a. An animal consumes grasses or plants contaminated with germs, parasites or poison.
 - b. An animal drinks contaminated water.
 - c. An animal is placed in a pen which was used by a sick animal, where the germs are still present in the pen.
3. Transmission of the disease may be caused by germs which are carried by insects, a farmer who just took care of a sick animal, or by the wind.
4. Disease prevention is carried out by controlling any possible means for transferring diseases in general. Vaccinations are the best prevention against infectious diseases. Be careful when purchasing or borrowing an animal, it must be healthy clinically and not have any past record of serious disease and should come from a group of healthy animals.

THE INCIDENCE OF DISEASES IN ANIMALS

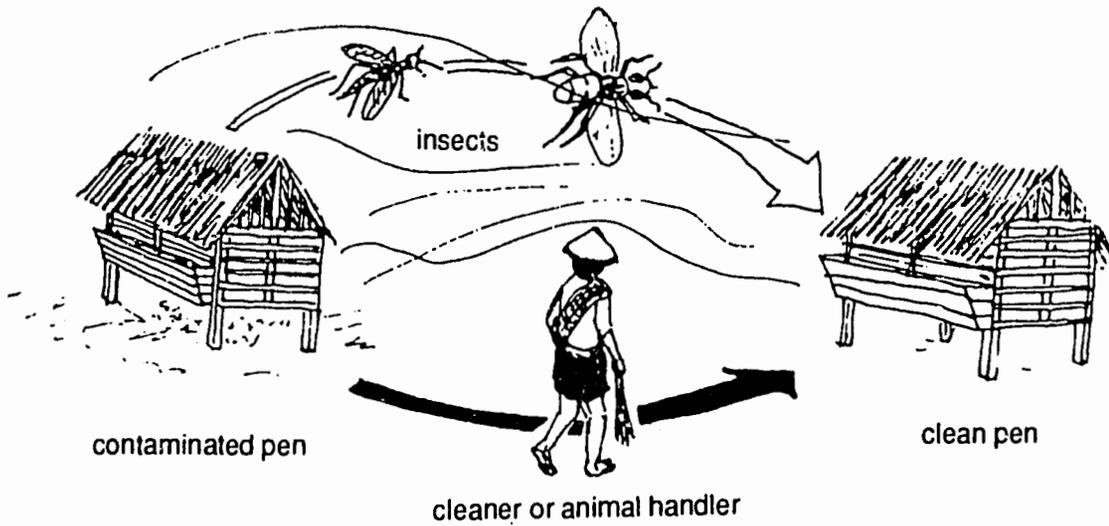
2 In contact with contaminated materials.
germs/poisons



- a. an animal eats grasses contaminated by germs
- b. an animal drinks contaminated water
- c. an animal is placed in a pen used for sick animals not yet disinfected

pen used for sick animals

3. Germs carried by insects, animal handlers, wind



contaminated pen

clean pen

cleaner or animal handler

B. DISEASE PREVENTION

- avoid any means of transmission
- vaccinate the animals



health

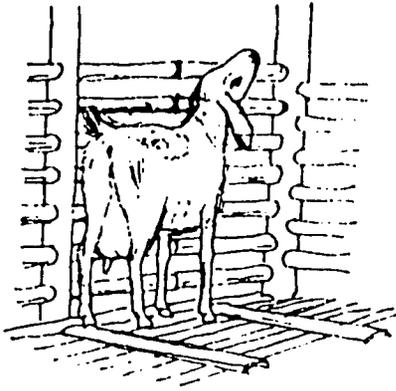
Balitnak / S.R. - C.R.S.P

SCABIES

1. Scabies is a disease caused by infection of skin parasites. The clinical symptoms are, the presence of scales on the skin surface, the animals scratching the infected skin on a wall or tree, falling hair and thickening of the skin. In a serious case, the whole surface of the body may be infected. In a mild case, scabies can be seen only on certain areas such as legs, mammary glands, or ears.
2. Scabies can be treated by giving an injection of Ivomec, or applying a mixture of sulphur mixed with oil. Ivomec is available in an animal medicine supply store. Follow the instructions carefully for all medicines. A mixture of sulphur and used engine oil can also be used to treat scabies. Before applying the mixture, wash the animal thoroughly with soap and let it dry. Then apply the mixture on the infected area evenly. Place the animal in a separate pen away from the rest of the flock. Repeat the treatment every 3 days until it is cured. The use of insecticides to treat scabies should be done carefully, following the proper procedures. An insecticide (such as Basudin 60) should be diluted to 0.1 % (1 ml Basudin into 1 liter of water). Then, the animal is cleaned and washed using the solution evenly. If scabies cover the whole body, dip the animal for a period of time being carefully that the solution does not get into the mouth or eyes. Let the animal stay in the sun until dry. Treatment is repeated every 3 days until the animal is cured.

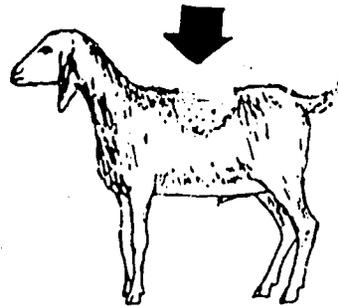
1. Clinical symptoms

SCABIES



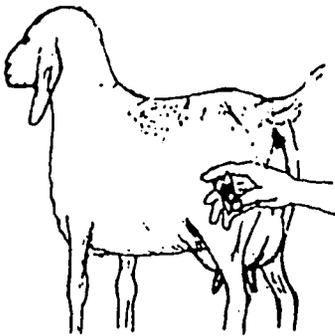
animals scratching their bodies

- hair falling
- scaly skin



2. Treatments

a. Ivomec injection



injection : IVOMEC subcutaneous

Perscription

1 teaspoon (5 cc)
Basudin 60

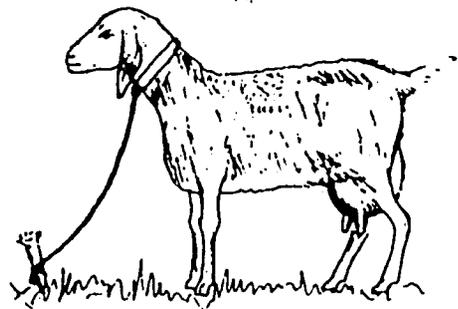
+

1 bucket of water (5 l)

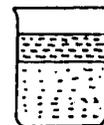
b. sulfur + used engine oil or Basudin 60



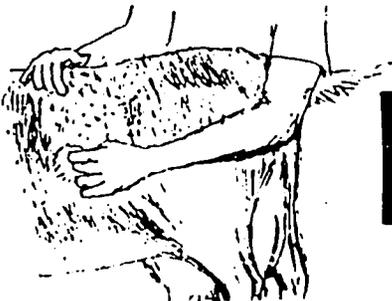
animals washed and scrubed



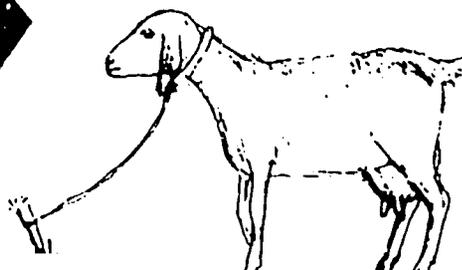
under the sun until dry



used motc sulfur



brush with sulfur + oil/
Basudin evenly



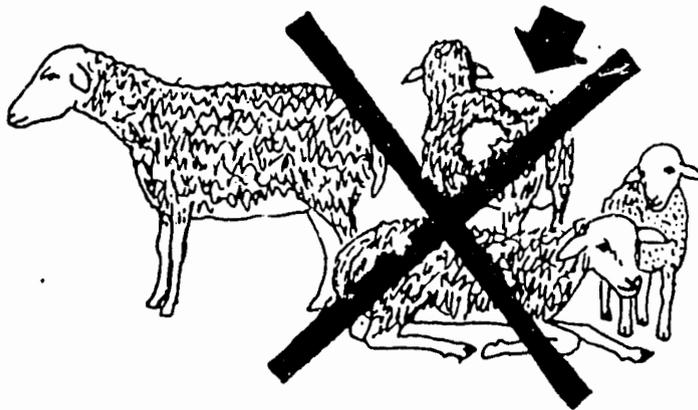
treatment is repeated
3 days later

health

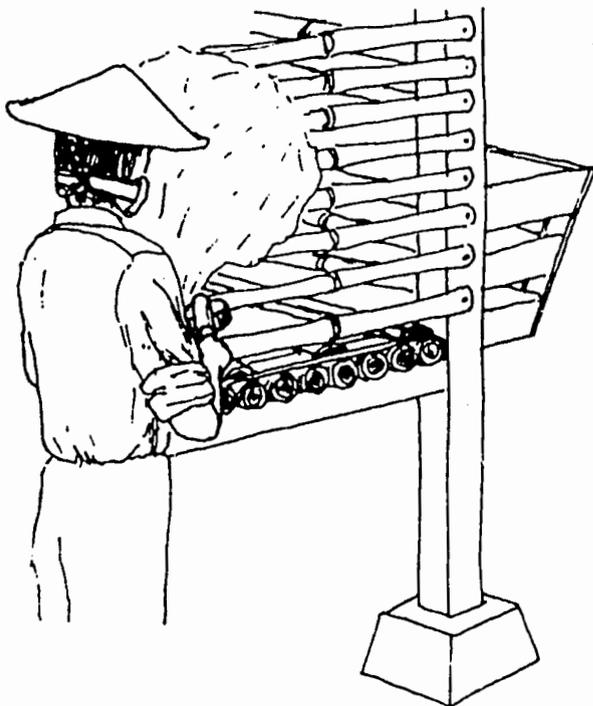
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3. Prevention is carried out by avoiding body contact with infected animals. When purchasing animals from the market or borrowing rams or bucks for breeding, they should be free from scabies. Also, when grazing the animals, avoid contact with infected animals. If an animal is infected, isolate it in a separate pen and give treatment immediately, then clean and fumigate the pen where the animal came from.

3. PREVENTION



- a. - animals with scabies should not be mixed with healthy animals
- animals just purchased or borrowed for mating should be free from scabies
- b. - fumigate the pen used by animals with Basudin 60 with a concentration 0,1 % (1 teaspoon in a bucket of water)
- wash the pen with water first



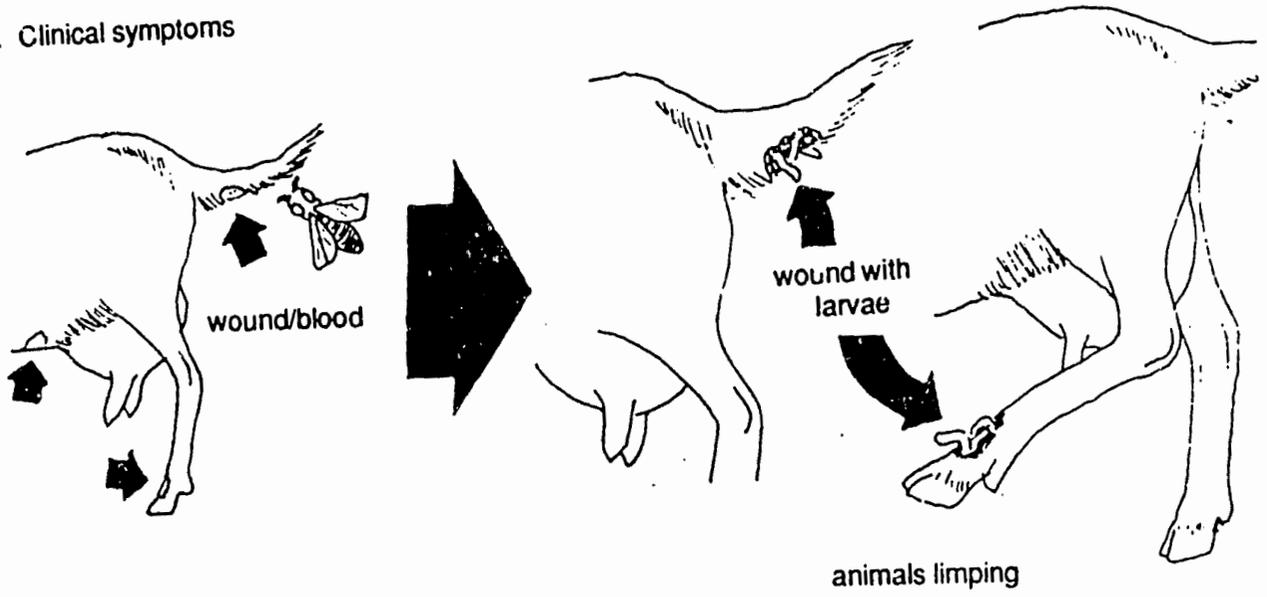
MAGGOTS

1. Maggots are caused by a wound becoming infected by flies, that breed and produce larvae. The clinical symptoms can be seen clearly by the presence of larvae moving in the wound area. If maggots occur in the hooves area, the animal may limp.
2. The treatment is by cleaning and getting rid of the larvae using an insecticide. Be careful when using the insecticide (see the instructions). Another medical treatment is by using Gusaneks. Mothball powder or tobacco can also be used to get rid of the larvae. Then, the wound should be dressed using bandages to prevent another wound or dirt from entering. On the following day the wound is reopened, treated and dressed again. Usually 2-3 treatments should be sufficient. After getting rid of the larvae, apply an iodine solution to speed up the recovery.
3. Prevention is accomplished by keeping the flies away from the pens. Avoid any cause of injuries to the animals. When an animal is cut or wounded, immediately treat and dress the wound. The presence of blood attracts flies to come and breed, so when bleeding occurs it should be cleaned immediately. Apply an iodine solution after cutting the placenta of a newborn lamb to prevent maggots.

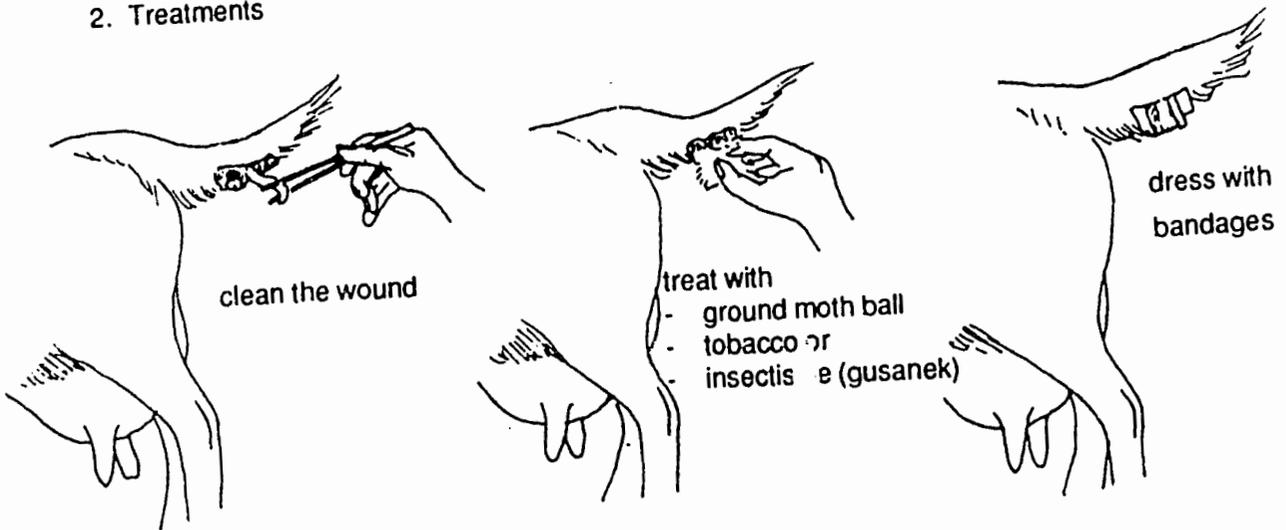


MAGGOTS

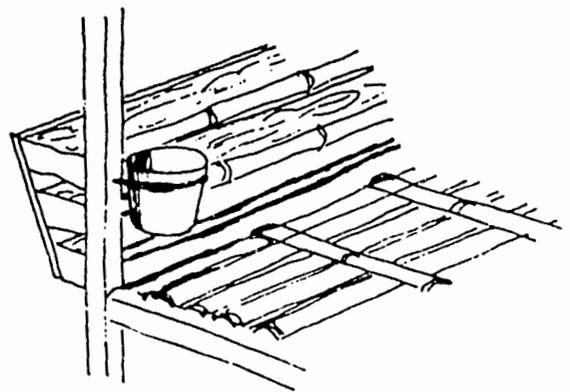
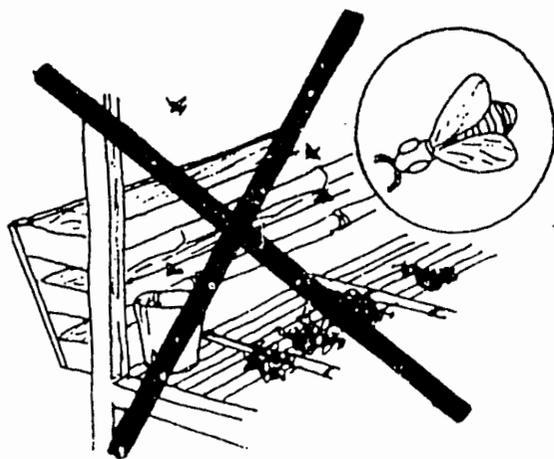
1. Clinical symptoms



2. Treatments



3. Prevention



health

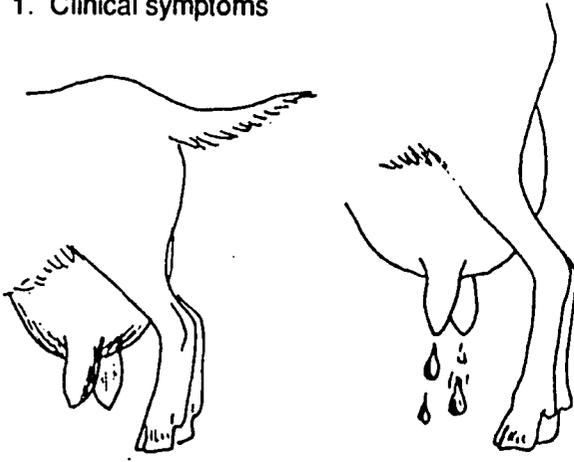
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MASTITIS

1. Mastitis is caused by an infection in the cells of the mammary glands. In a serious case, the clinical symptoms are swollen glands which are reddish, hot and painful when touched. When the animal is milked, the milk can be pale, dark yellow, greenish or reddish. Milk can be thicker or more diluted.
2. The treatment is by giving an antibiotic injection into the muscle or mammary glands. In serious cases, the combination of both is recommended. Use broad spectrum antibiotics following the instructions on the medicine package. Before injecting the antibiotics through the hole in the nipple, the milk should be milked out. Then, the antibiotics are injected carefully. Afterward, the glands are squeezed gently and evenly. Everyday the milk should be milked out at least 3 times. To reduce the pain and swelling, the glands are washed using warm water 2-3 times a day. Depending on the antibiotics used, treatment can be repeated everyday for 3-4 days.
3. Prevention is undertaken by keeping the pen clean and dry. Dirty and wet floors can be a source of infection. For dairy goats, cleanliness before and after milking should be maintained. Hands must be washed with soap thoroughly before and after milking. Areas around the mammary glands should also be washed with soap. After milking, the tip of nipples should be dipped into a cleaning solution to prevent infection.

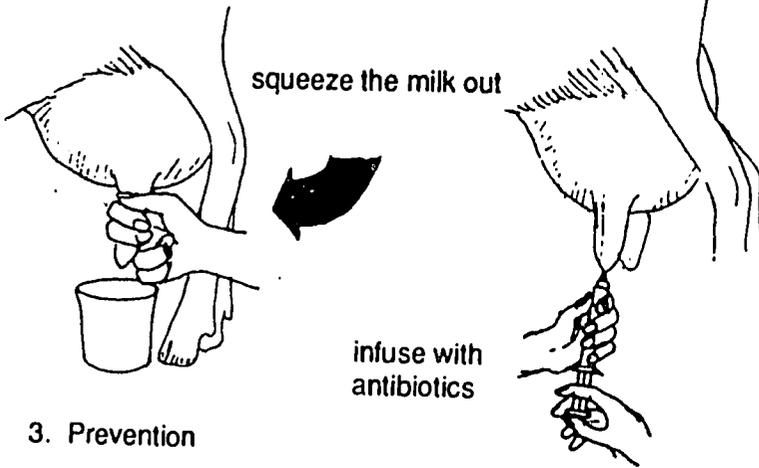
MASTITIS

1. Clinical symptoms



- swollen glands, painful when touched
- Milk : reddish/yellow/greenish
: very thick or diluted

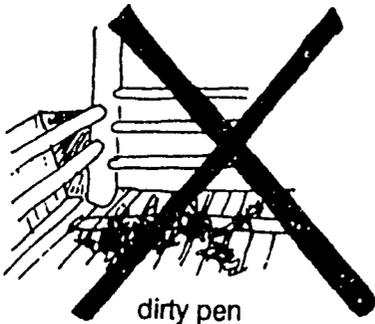
2. Treatment



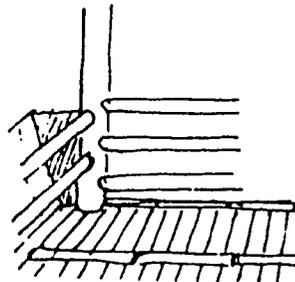
or

combination of injections :
through nipples and muscles
in a serious case

3. Prevention



dirty pen



clean and dry pen



after milking, dip nipples into
a solution to prevent infection

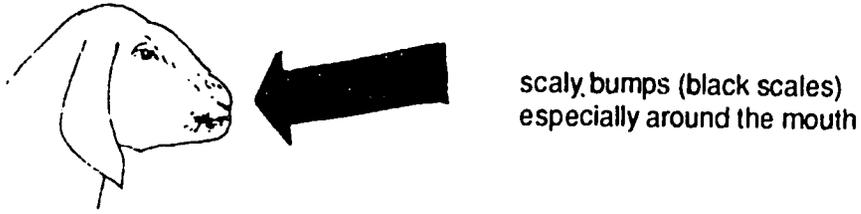


ORF/SORE MOUTH

1. Orf is an infectious skin disease causing lesions in the mouth area, caused by a virus. The main clinical symptoms are the lesions in the mouth area (lips, nostrils). Lesions are usually seen first at the corners of mouth, then spreading to the nose area. The mouth area may be seen larger or swollen and have a bad odor. Lesions may also occur on the eyelids, legs, mammary glands and scrotum.
2. Treatment is provided by treating the secondary infections caused by the germs, reducing the pain and increasing the appetite. Medicine to kill the virus is still not known. A sick animal can be injected with a broad-spectrum antibiotic and given vitamins to improve body condition. An ointment containing antibiotics can also be applied evenly to lesions. Feed the sick animals with soft feed or grasses.
3. Prevention is by giving immunity to healthy animals through vaccination. Vaccinations should be given only in areas where Orf is a major problem. In areas free of Orf, vaccination for this disease should not be given. When purchasing animals from the market or other farmers, or borrowing bucks for breeding, they should be healthy and free of Orf.

ORF/SORE MOUTH

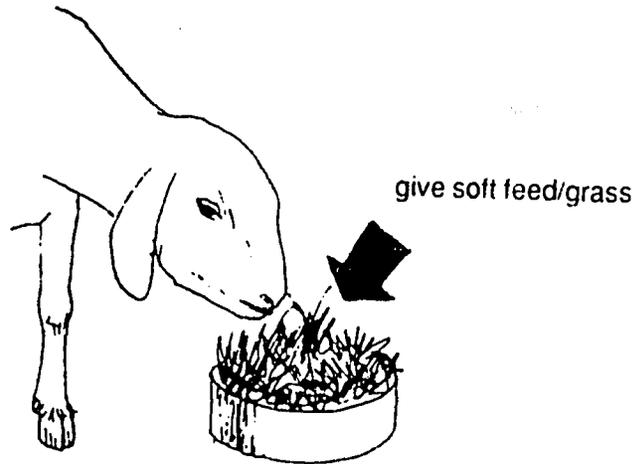
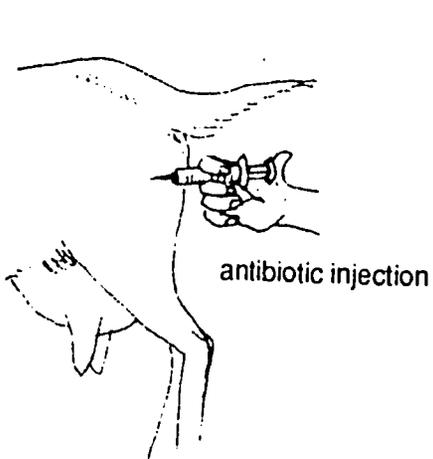
1. Clinical symptoms



2. Treatments



or

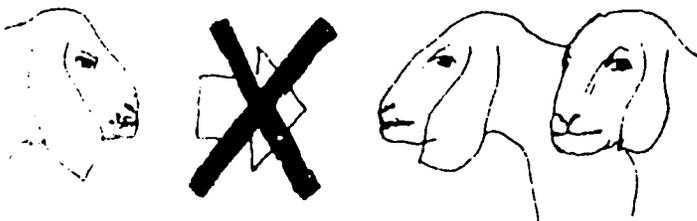


3. Prevention

a. vaccination

c. keep animals in pen

b. animals from outside must be free from ORF



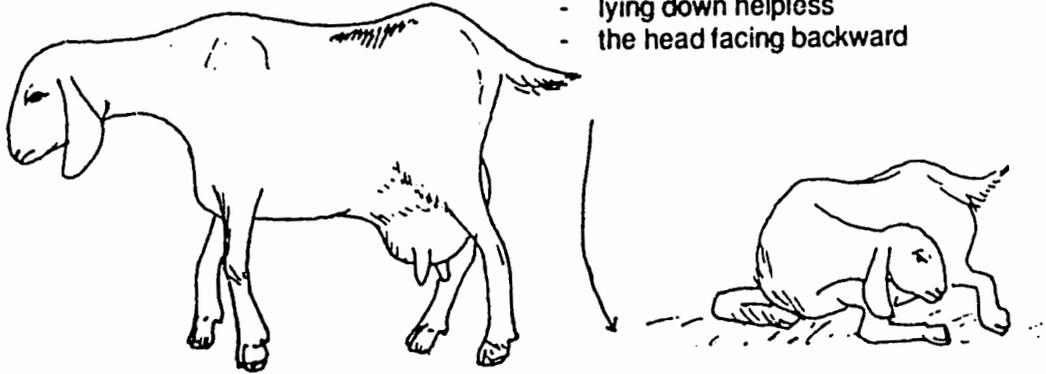
MILK FEVER

1. Milk fever is an abnormality in a pregnant ewe, related to the lambing process, in which the blood calcium level is below normal prior to, during or after lambing. The clinical symptoms are uncontrolled movements (rigid, unsteady, shaking) weakness and restlessness followed by rapid breathing. In later stages, the animal lies on its chest while turning the head backward. The body temperature is usually normal. When left untreated, it can be fatal.
2. Treatment is provided by injecting a solution containing calcium (calcium borogluconate) into the vein or subcutaneously, (about 50-100 ml). Treatment can be given more than once as appropriate.
3. Prevention is undertaken by giving feed/grasses rich in calcium to pregnant ewes early in pregnancy. The animals should be given feed/grass rich in protein, such as legume leaves. Avoid giving grasses containing a lot of oxalic acid, such as sorrel, pig weed, soursob *ioxalis percaprae*, including young grasses. During pregnancy, the animals should receive enough sunlight, in order to obtain vitamin D for the body. A month prior to lambing, the amount of feed/grass rich in calcium should be reduced. After lambing, give the ewes feed/grass rich in calcium to replace the losses through milk production.

MILK FEVER

1. Clinical symptoms

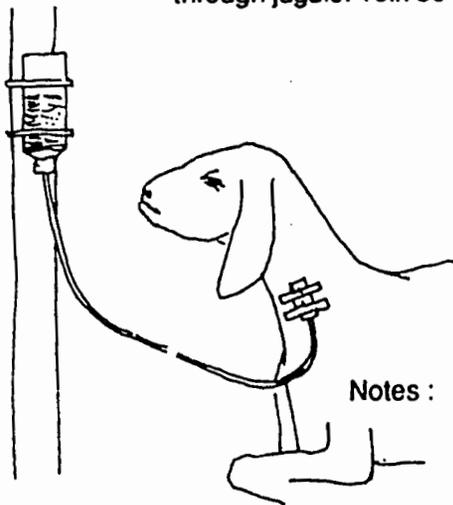
- weak, stiff and unsteady movements, shaking body
- lying down helpless
- the head facing backward



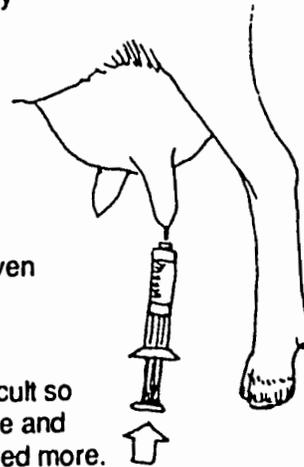
pregnant ewe

2. Treatments

- a. infuse with 25% calcium solution (calcium borogluconate) through jugular vein 50-100 ml and subcutaneously



- b. infuse some air through the nipples



Treatments can be given more than once

Notes : These treatments are difficult so learning about the disease and its prevention is emphasized more.

3. Prevention

1. Care for pregnant ewes

- feed containing a lot of calcium and protein
- avoid giving young grasses
- provide enough sunlight

1-4 months pregnancy : feed rich in calcium
4-5 months pregnancy : reduce the grasses rich in calcium

2. After lambing :

- give feeds rich in calcium

GRASS TETANY

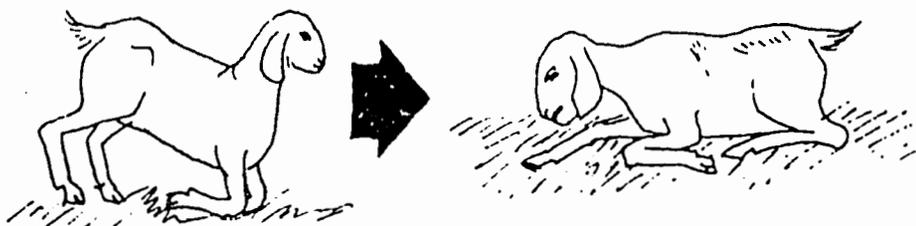
1. Grass tetany is an abnormality due to a blood magnesium level which is below normal. The clinical symptoms in an acute case are, the animal falling down suddenly, spasms, and death. In a mild case, the animal initially walks stiffly, is easily affected by touches or loud noises, urinates frequently, and experiences spasms for the following 2-3 days. The cause for the grass tetany, is feed without enough magnesium ion.
2. Treatment is by injecting a solution containing magnesium ion into the vein. Injections should be given carefully and appropriately. Medication for milk fever usually contains magnesium ion, so they can be given to treat grass tetany also.
3. Prevention is by providing proper care and feed containing enough magnesium ion. Do not feed too much young grasses, because the magnesium content is low. Also, do not graze the animals on new pasture with flourishing grasses. If there is no choice (feeding young grass), they should be mixed with legumes hay or rice straw to reduce the consumption of young grasses.

GRASS TETANY

1. Clinical symptoms

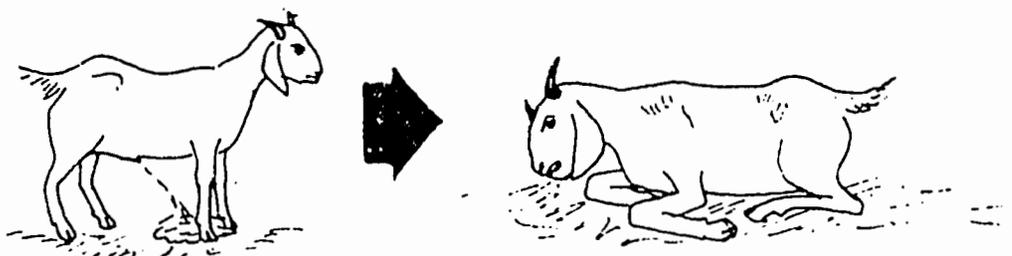
a. acute case

- falling suddenly, stiff, spasms, then death

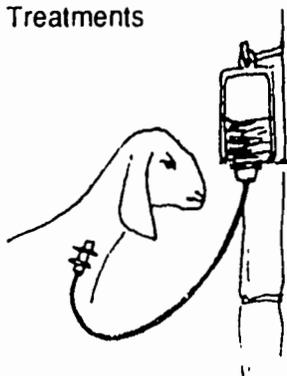


b. mild case

- stiff, urinate frequently, spasms often followed by death



2. Treatments



- give the animal and infusion with a solution containing magnesium ions through the vein
- adjust the flow very slowly

Notes : The treatment is difficult, so learning about the disease and its prevention is emphasized more.

3. Prevention



young grass



mature grass

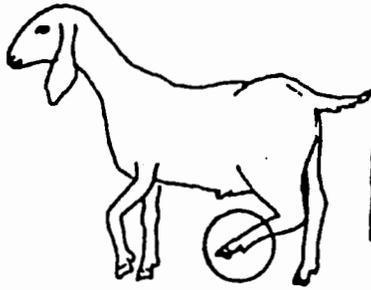
- do not give too much young grass, give mature grass containing magnesium ion

FOOT ROT

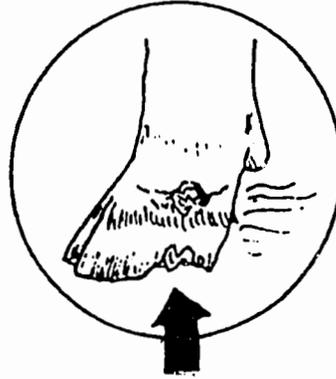
1. Foot rot is caused by an infection (mainly by *fuso-bacterium necrophorus* and *fasiformis nodosus*) in the hooves. The clinical symptoms are walking with a limp, chips on the bottom and sides of the hooves and a bad smell.
2. Treatment is carried out by first cleaning the rotting area. Then, the hooves are clipped until the healthy part is seen, and the infected area is soaked in a solution containing antibiotics or antiseptics such as Formaline 10 %. The infected area is then dressed with bandages as protection and to restrain movement. If foot rot is accompanied by maggots, the larvae should be cleaned first. Place the animals in a clean and dry pen.
3. Prevention is by keeping the pens clean and dry. Dirty and wet floors can be a source of infection for the hooves. Avoid any cause for injuries to the hooves such as, sharp objects (nails, splinters) and broken slates on the floor. Hoof clipping on a regular basis can also help prevent foot rot.

FOOT ROT

1. Clinical symptoms



walking with a limp



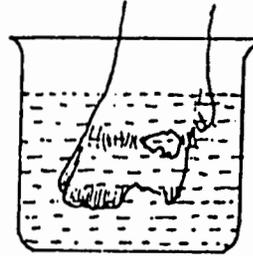
chips on the bottom and the side of the hooves, bad smell



2. Treatments



clean until the healthy tissues are seen

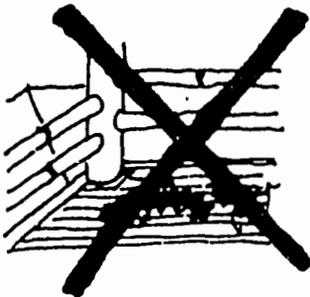


soak in an antiseptic solution, such as Formaline 10 % or antibiotics

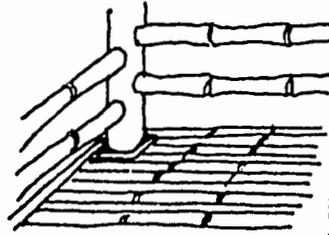


dress with bandages

3. Prevention



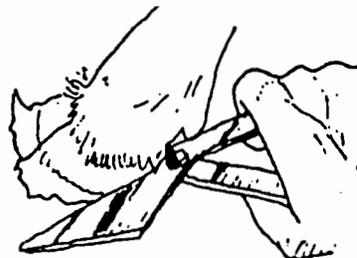
dirty pen



pen should be clean, dry, no broken floor board



long hooves



trim the hooves regularly



trimmed hooves can prevent foot rot

health

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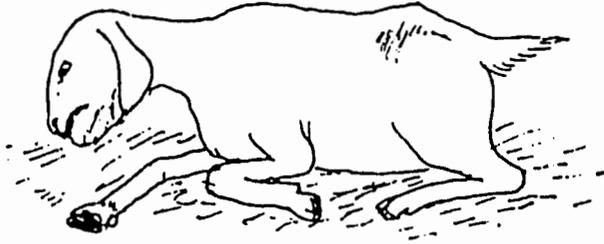
PLANT TOXINS

1. Several plants including grasses and legumes contain toxic substances. When they are consumed by animals the animals may suffer from the toxin. The clinical symptoms are : death, foaming mouth, spasms, blue spots on the mucus glands, peeling skin, or bleeding (bloody faeces).
2. Treatment is rarely successful, especially when the toxin is already in the blood system. At an early stage, the animal can be treated by giving charcoal tablets (such as Norit tablets) or the juice from young coconuts. Force feed the animal with 2-3 tablets of Norit or the coconut juice.
3. Prevention is by keeping the animals away from the toxic plants. If you have to feed the plants, mix them with other grasses. The types of toxic plants can be seen on the table.

PLANT TOXINS

1. Clinical symptoms

- sudden death
- spasms



foaming at the mouth



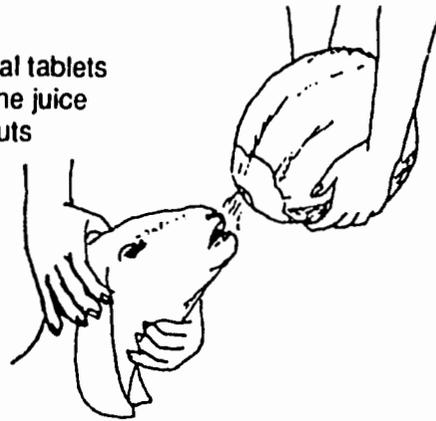
bloody faeces

2. Treatments

- early stage



give active charcoal tablets such as Norit, or the juice from young coconuts

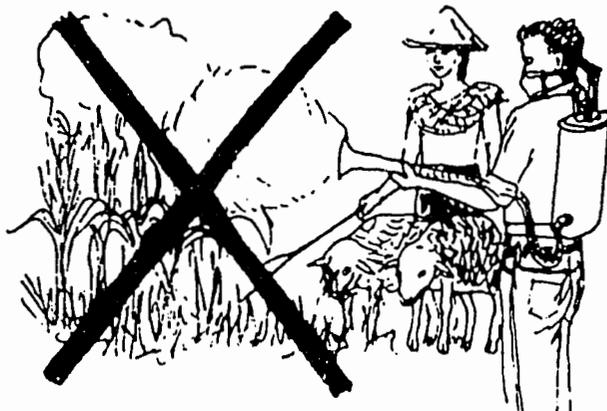


- late stage : difficult

3. Prevention



toxic plants



do not graze the animals around pasture/ rice fields/crop estates which have just been sprayed with insecticides/poisons

health

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A LIST OF TOXIC PLANTS

No.	Local Names (Sundanese)	Scientific Names	Types of toxin
1.	Antanan beurit	<i>H. sibthorpioides</i>	alkaloid
2.	Antanan gede	<i>Centella asiatica</i>	alkaloid
3.	Antanan gunung	<i>Pimpinella alpina</i>	alkaloid
4.	Arey kacang	<i>Clitoria laurifolia</i>	alkaloid
5.	Babadotan	<i>Ageratum conyzoides</i>	alkaloid
6.	Babakungan	<i>Crinum asiaticum</i>	alkaloid
7.	Bayem ber reum	<i>Iresine herbtisii</i>	alkaloid
8.	Bayem se ggang	<i>Amarantus spinosus</i>	alkaloid
9.	B. Jalakina	<i>Synedrella nodiflora</i>	alkaloid
10.	Bayondah	<i>Pollinia ciliata</i>	alkaloid
11.	Bengberitan	<i>Spinifex littoreus</i>	alkaloid
12.	Bonteng	<i>Cucumis sativus</i>	alkaloid
13.	Bobontengan	<i>Melothria indica</i>	alkaloid
14.	Cente	<i>Lantana camara</i>	alkaloid
15.	Dadap laut	<i>Erythrina variegata</i>	alkaloid
16.	Eceng	<i>Ottelia alismoides</i>	alkaloid
17.	Gambas	<i>Sechium edule</i>	alkaloid
18.	Gigiwangian	<i>Pratia mummularia</i>	alkaloid
19.	Gewor	<i>Aneilema nodiflorum</i>	alkaloid
20.	Hiris	<i>Cajanus cajan</i>	alkaloid
21.	Hui boled	<i>Ipomoea batatas</i>	alkaloid
22.	Jagong	<i>Zea mays</i>	alkaloid
23.	Jarak	<i>Ricinus communis sp</i>	alkaloid
24.	Jawer kotok	<i>Celosia orista</i>	alkaloid & cyanide
25.	Jelatang	<i>Acalypha indica</i>	alkaloid & cyanide
26.	Jeruju	<i>Acanthus ilicifolius</i>	alkaloid
27.	Jonghe	<i>Senecio sonchifolia</i>	alkaloid
28.	Jukut bau	<i>Hyptis pectinata</i>	alkaloid
29.	Kakacangan	<i>Cassia leschenaultiana</i>	alkaloid
30.	Kakangkungan	<i>Ipomoea crasscaulis</i>	alkaloid
31.	Karembi	<i>Homalanthus populnea</i>	alkaloid
32.	Kasc/gelagah	<i>S. spontaneum</i>	alkaloid
33.	Kecibeling	<i>Hemigraphis colorata</i>	alkaloid & cyanide
34.	Kekrekan leutik	<i>Clotalaria striata</i>	alkaloid
35.	Kibarera	<i>Vitis geniculata</i>	oxalat
36.	Kicarang	<i>Cyatula prostrata</i>	alkaloid
37.	Kidenok	<i>E. Pulcherrima</i>	alkaloid
38.	Kimput	<i>Luffa acutangula</i>	alkaloid
39.	Kipongporang	<i>Oroxylum indicum</i>	alkaloid & cyanide

No	Local Names (Sundanese)	Scientific Name	Types of Toxin
40.	Kiremek	<i>Alternanthera sessilis</i>	alkaloid
41.	Lame/pule	<i>Alstonia scholaris</i>	alkaloid
42.	Leuleuncaan	<i>Vernonia cinerea</i>	alkaloid
43.	Malela	<i>Panicum muticum</i>	alkaloid
44.	Memeniran	<i>Phyllanthus niruri</i>	alkaloid
45.	Memerakan	<i>C. Pulcherrima</i>	alkaloid
46.	Palandingan	<i>Leucaena glauca</i>	alkaloid
47.	Pakis haji	<i>Alsophila glauca</i>	alkaoid
48.	Pakis kembang	<i>Lygodium japonicum</i>	alkaloid
49.	Paku pandan	<i>Asplenium nidus</i>	alkaloid
50.	Paria leuweung	<i>Momordica charantia</i>	alkaloid
51.	Peupeteuyan	<i>Aeschynomene indica</i>	alkaloid
52.	Puring	<i>Codiaeum variegatum</i>	alkaloid
53.	Renghas	<i>Gluta renghas</i>	alkaloid & cyanide
54.	Saga	<i>Abrus precatorius</i>	alkaloid
55.	Salasih	<i>Ocinum basilicum</i>	alkaloid
56.	Sampeu karet	<i>Manihot utilissima</i>	cyanida
57.	Sembung	<i>Blumea Lacera</i>	alkaloid
58.	Sembung utan	<i>Blumea Balsamifera</i>	alkaloid
59.	Singungu	<i>Clerodendron indicum</i>	alkaloid
60.	Sintrong	<i>E. valerianifolia</i>	alkaloid
61.	Sulanjana	<i>H. horsfieldii</i>	alkaloid
62.	Talingkup	<i>Claoxylon polot</i>	alkaloid
63.	Tatarompetan	<i>Thumbergia alata</i>	alkaloid
64.	Teklam	<i>Eupatorium rivarum</i>	alkaloid
65.	Urang aring	<i>Eclipta alba</i>	alkaloid
66.	Walang	<i>Achasma walang</i>	alkaloid

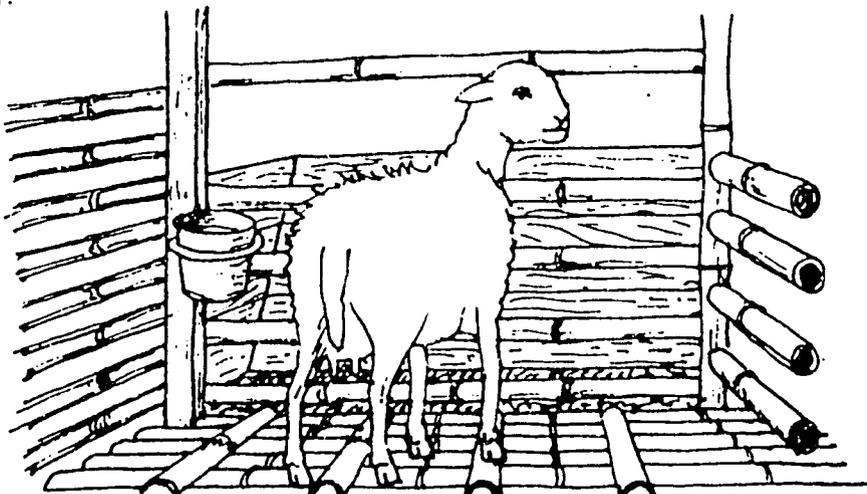
Source : Ginting et al. (1981)

CARE FOR PREGNANT EWES AND NEWBORN LAMBS

1. Care for pregnant ewes is undertaken to keep them healthy before and after lambing in order to produce healthy offspring. Pregnant ewes should be kept separate from early pregnancy. .
2. Pregnant ewes require extra care, feed and water at all times. Feed them fresh grass and leaves (legumes) in adequate amounts. Do not give young grass because its nutrient content is low and it may cause health problems. Concentrates such as rice bran can be given. Provide clean drinking water and salt in a bamboo tube at all times. Pens should be kept clean and in good order so that the animals can not get trapped in a broken floor.
3. After lambing, the ewe is cared for and cleaned of any blood. The lamb is looked after and its navel is dabbed with a 5% iodine solution. The lamb should be able to suckle within the first few hours, and if there is a problem, such as the ewe refusing to be suckled, they should be helped so that the lamb can suckle the ewe soon after being born (the ewe should be held in place as the lamb suckles). The lamb must receive its mother's milk within 12 hours, because the milk contains a substance to provide immunities to diseases for the lamb.
4. Place the ewe and the lamb in the safe, clean and comfortable pen where the animals will not suffer from heat or cold stress.

CARE FOR PREGNANT EWES AND NEWBORN LAMBS

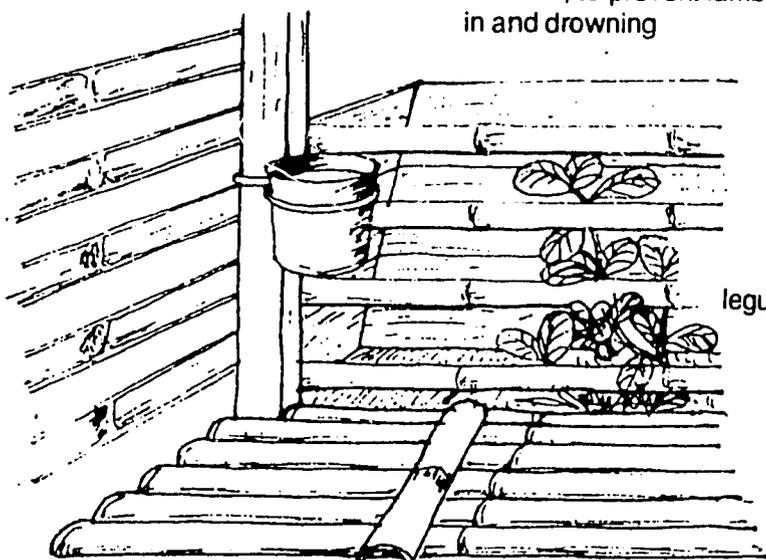
1.



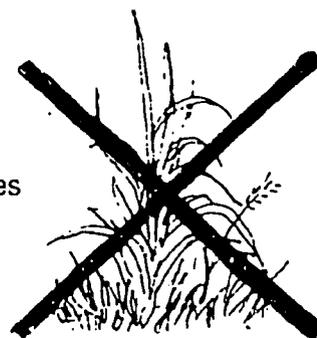
a. pregnant ewe is isolated in a clean pen

2.

Raise the bucket 300 - 350 mm above the floor, to prevent lambs from falling in and drowning



legume leaves

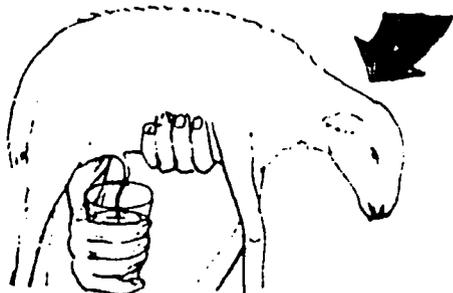


young grass

offer fresh feed + water + salt, not young grass

3.

after birth, dip the navel into iodine solution



4. Keep the pen clean

the lamb should suckle as early as possible (within 12 hours)

health

ABORTION

CAUSES

Abortion in sheep and goats can be caused by several factors, physical factors (such as injuries from the buck, falling) and diseases (caused by salmonella, brucella, chlamydia, foot and mouth, listeriosis, toxoplasmosis, nairobi sheep disease, rift valley fever, bluetongue). Abortion can be diagnosed only through laboratory observations.

TREATMENTS

Treatments are given depending on the causes. Abortions due to viral infections can not be treated. Abortions due to bacterial infections are treated with antibiotics or sulfa tablets. When an abortion is caused by brucella, the animal must be slaughtered and the meat can be consumed only after boiling. Other animals from the same pen must be transferred to another pen and vaccinated or given medication to prevent the transmission of the disease. Then the dead foetus should be disinfected and burned or buried. The contaminated pen should be cleaned with antiseptics. Be careful in helping the sick animal, clean yourself thoroughly because the disease can be transmitted to humans.

PREVENTION

Pregnant animals should be kept separately. If the area has a history of an infectious disease causing abortions, the animals should be vaccinated. Do not purchase or borrow animals which come from a group which often experiences abortions or bloody diarrhoea.

ABORTION

1. Causes



injured by the buck



falling from the pen

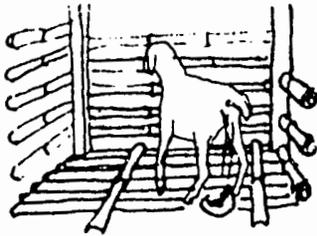


diseases



caused by germs
(brucella, salmonella, chlamydia,
foot & mouth, listeriosis, toxoplasmosis,
Rift valley fever, blue tongue, etc).

2. Treatments



the aborted animal
stays in the pen



the pen used by the sick
animal is disinfected

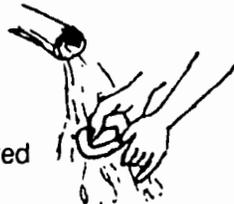


aborted materials must be
disinfected, buried or burned

healthy animals are
transferred to other pens

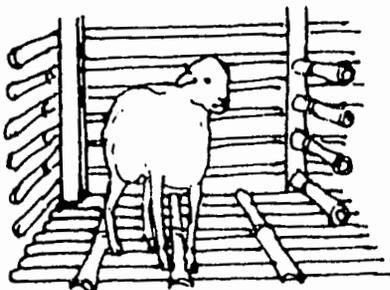


the animal that
aborted should be
treated or slaughtered



clean-up thoroughly after
helping the aborted animal
to prevent transmission to humans

3. Prevention



pregnant ewe is isolated

(b)



vaccinate against
any germs causing
abortions

(c)



- buy healthy animals
- do not buy from a group with
the history of abortion or bloody
faeces

health

Balitnak / S.R. - C.R.S.P

WORMS

SYMPTOMS

Worms may cause respiratory diseases common in animals. Various types of worms can infect an animal. In a serious case, the animal will show symptoms such as thin body, hair standing up and dull, pale and weak, little appetite, constipation or diarrhea. Infection by some types of worms also shows other symptoms such as swelling under the chin. By observing the faeces we can find pieces of worms. Observation of the faeces under the microscope will show the worm eggs in large amounts.

TREATMENT

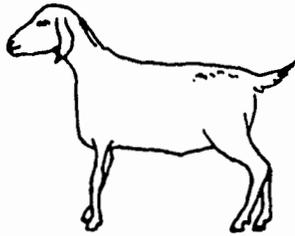
Medication is given according to the type of worm. Use the medication by following the instructions on the medicine container. The use of traditional medicines to reduce the number of worms is highly recommended. Treatments should be accompanied by prevention as well, especially in keeping the pens clean.

PREVENTION

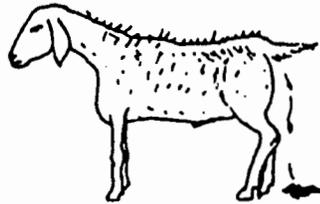
Animal pens should be kept clean to prevent reinfestation or the transmission of worms to other animals. Cutting grasses should be done when the day is getting hot, between 12:00-15:00 o'clock. When grazing the animals, do not take them near water such as swamps, rivers, rice fields where there are many water snails. Grazing is also done around 12:00-15:00 o'clock, the grazing area is moved everyday and returning to the previous grazing area after 30 days.

WORMS

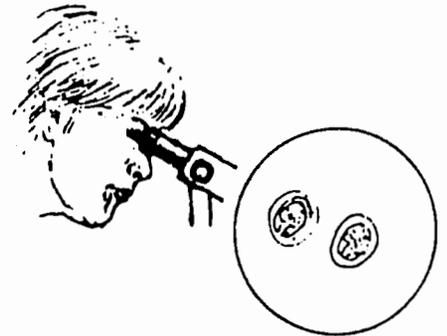
1. Clinical symptoms



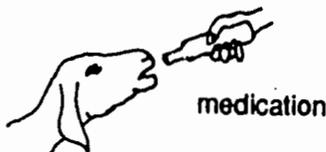
healthy, fat and agile



- Sick animal :
- thin, hair slightly standing up and dull
 - constipation or diarrhea
 - weak and pale
 - jaws appear swollen
 - sudden death

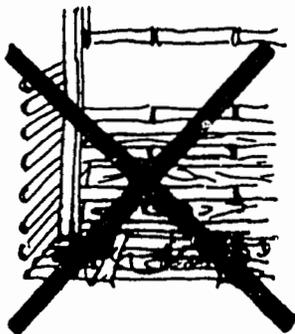


2. Treatments

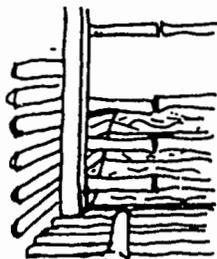


regular medication against worms or traditional medicines

3. Prevention



dirty, wet



clean and dry

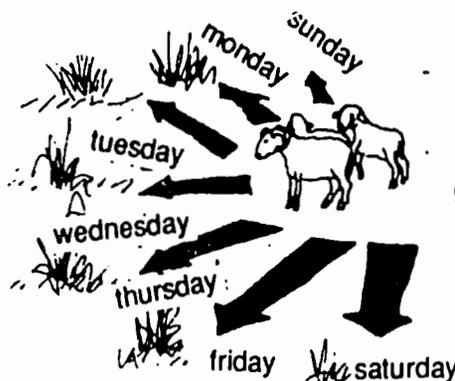
- pen raised above the ground
- clean and dry pens
- animals remain in pens.



cut grass afternoons between 12.00-15.00



cut only the top part of grass



- let animals graze between 12.00-15.00
- move the area of grazing daily and return after 30 days

health

TICKS

SYMPTOMS

Ticks are very harmful because they suck blood and cause skin irritations. In small numbers, they don't show any problems, but in large numbers they can reduce the animal's health. An animal infected by ticks in large numbers will look thin, pale and weak. On observing the coat, the ticks can be seen and appear reddish white.

TREATMENTS

The animal's hair should be shorn first, then treated. An insecticide such as Basudin 60 can be used with a concentration of 0.1 % or Asuntol 0.1 % (1 ml in 1 liter of water). The solution can be sprayed on the animal or used for dipping the animal. Then, the animal is placed under the sun to dry. Apply the solution carefully and avoid getting it in the mouth or eyes.

PREVENTION

Washing the animals every week or every two weeks and shearing the hair regularly can help prevent the ticks from multiplying rapidly. Wash the animals with soap while scrubbing the body. Check the animals which have recently been purchased or borrowed for ticks especially around the shoulders and those with dark coats. Young animals with dark coats are more susceptible to tick infestations. If ticks are seen on an animal, it should be treated immediately to prevent transmission to the other animals.

TICKS



- small amount : do not cause troubles
- large amount : suck blood
animal can not rest
animal becomes skinny

1. Symptoms



- animals appear weak and pale
- coat appears dull
- animal condition declines progressively
- when closely checked, there are many redish ticks



2. Treatments



- shear the hair
- spray with insecticides
(Basudin 60 Diazion,
Asuntol 0,1% etc)
- offer good feed and drink
- place in a clean pen

3. Prevention



- shear the wool regularly
- wash animals regularly with soap
and brush
- watch particularly for young and dark
coated animals, they are more susceptible
- when purchasing animals, check for
the presence of ticks

DIARRHEA

1. SYMPTOMS

Diarrhea is an indicator to an ailment in the alimentary tract. The causes can be feed, germs or a combination of both. The faeces of a sick animal may look light green, dark green, shiny green, reddish green, or yellowish green. The animal is weak and may die if not given proper treatment.

2. TREATMENTS

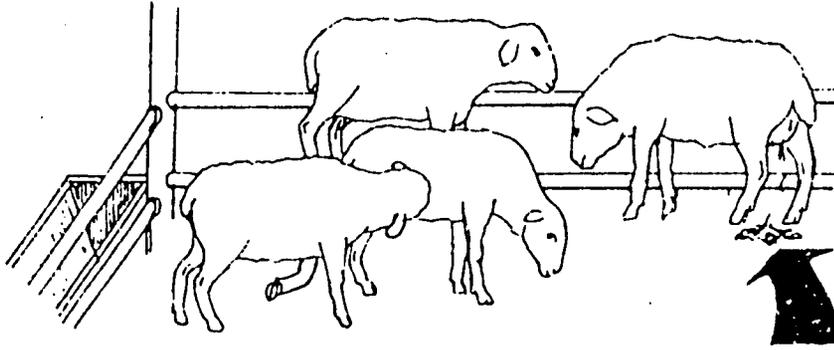
A sick animal must be isolated immediately and checked for the condition of the faeces. If it is serious and the condition worsens, the animal must be treated immediately. To improve the condition, force the animal to consume a solution of salt and sugar. The solution is prepared by dissolving a tablespoon (10 grams) of salt and a tablespoon (10 grams) of sugar in 2.5 liters of cooled, boiled water. Give the animal as much as 1/6 of its body weight. Oralit can also be used in the solution. The animal can also be given active charcoal tablets such as Norit, (2-3 tablets). Report the case to the local veterinarian for further tests and treatment.

3. PREVENTION

Isolating the sick animal will prevent the transmission to other animals in the flock. Move the healthy animals to a clean pen. Do not buy a sick animal or animals coming from a group with a history of serious diarrhea problems. Reduce or do not give any feed/grass which may cause diarrhoea. Mix them with other grasses.

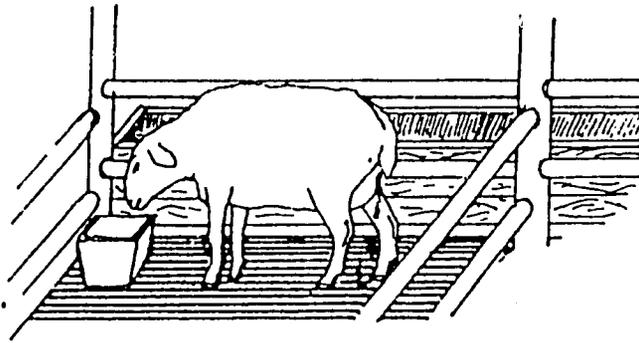
CARE FOR DIARRHEA

1.



Check animals with diarrhea, observe the color of the feces (red, green)

2.



animal with diarrhoea isolate and give fresh feed

+
water
+
salt

3. Animals is weak



give about
1/6 of body weight

(if body weight is 10 kg, give 7 glasses of the mixture)

force feed with the mixture

sugar
1 tablespoon

salt
1 tablespoon

water 3.5 sauce bottles (2.5 liters)

4

Pens must remain clean

5 REPORT



Report to the group leader,
then he will report to the animal
extension service

health

BLOAT/TIMPANY

CLINICAL SYMPTOMS

Bloat or timpany is the result of a failure in expelling gas normally, caused by the rapid production of gas from feed in the stomach. The clinical symptoms are restlessness and difficulty in breathing. The upper left side of the stomach appears bigger and when tapped it will sound hollow. If not treated, it will be fatal.

TREATMENTS

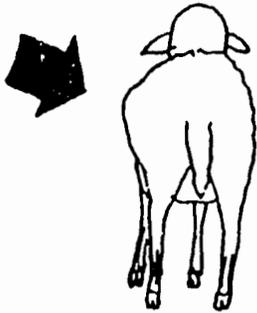
During treatment, keep the animal in a standing position. Use a piece of wood to keep the mouth open. Forcefeed the animal with cooking, coconut or peanut oil, 1/2 - 1 glass (100 - 200 ml). Apply side or lifting pressure to the stomach to help expell the gas by lifting the animal from below the stomach. If the condition does not improve, the gas should be expelled by inserting a small tube into the stomach through the side of the animal. First, a small area on top left area of the stomach is shorn and dabbed with iodine solution. Determine the area to stab, about 3-4 fingers from the back bone in between the ribs and the hip bone. Stab the area with a short piece of narrow (5 mm in diameter) metal tube or bamboo with a pointed tip, after being dipped in an iodine solution. Before stabbing, pull the skin slightly so that after the tube is pulled out, the wound will close again. The gas coming out through the tube will have a bad smell. After the gas is released entirely, pull the tube out and the wound should be dabbed with an iodine solution.

PREVENTION

Animals should not be offered too much wet grass, legumes, and grains which may cause bloating. If there are no other choices, mix the feed with coconut or peanut oil before feeding it to the animals. Also, the animals can be forcefed with the oil first before eating the feed.

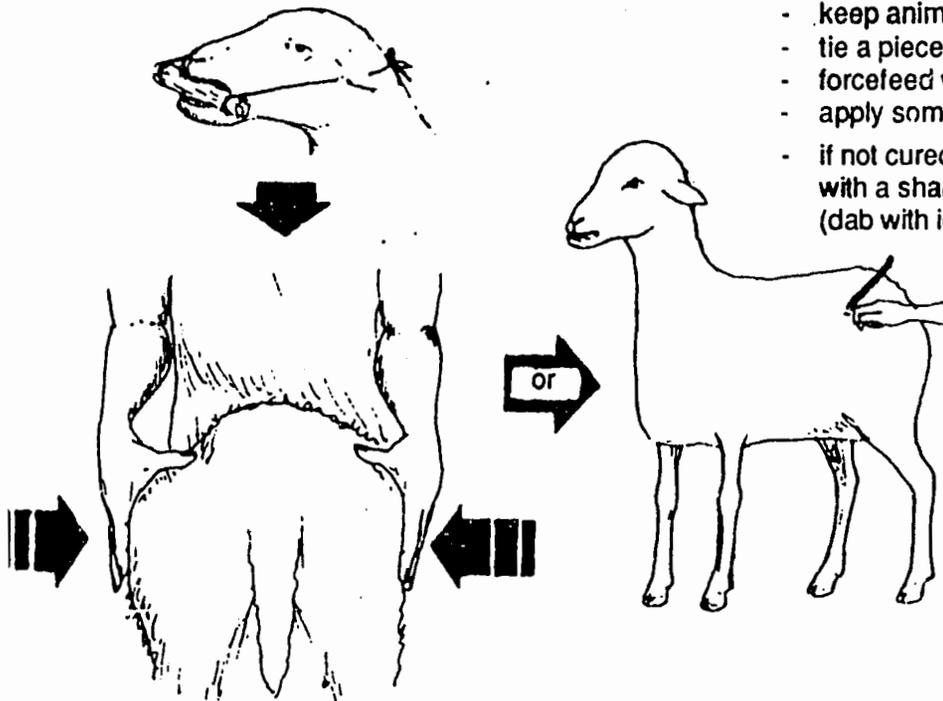
BLOAT

1. Symptoms



- restlessness, difficulty in breathing
- the left side of stomach is inflated
- when tapped, it sounds hollow

2. Treatments



- keep animal standing
- tie a piece of wood in the mouth
- forcefeed with coconut or peanut oil, 1/2 glass
- apply some pressure to the inflated stomach
- if not cured, stab with a small piece of bamboo with a sharp tip in the stomach toward the back (dab with iodine solution before stabbing)

3. Prevention



- do not give too much young grass
- do not give much wet grass and grain in pods



PINK EYE

1. SYMPTOMS

Pink eye is an infection of the mucous membrane in the eye. The causes can be physical (sharp objects such as thorns, dust, grass tips) or germs (virus, bacteria, rickettsia or chlamydia). The clinical symptoms are watery eyes, difficulty in opening them, blinking to avoid light, swollen eyelids, and red eyes. In a serious case, the eyes can be cloudy and there is an abscess on the mucous membrane, which may cause blindness.

2. TREATMENTS

Check the eyes carefully and observe closely for the presence of sharp objects. If it is caused by a sharp object, remove it and clean the eyes. Then, apply an eye ointment Terramycin 0.1 %. Apply the ointment evenly, following the instructions on the label.

3. PREVENTION

Isolate the animal with the problem and immediately treat the animal. Keep the pens clean to keep away the flies which may carry and spread germs. Protect the animals from sharp objects such as nails, thorns and sharp grasses in the feed.

PINK EYE

1. Clinical symptoms



watery eyes, redness, always closing and swelling

causes :

- small sharp objects (grass tip, splinters, thorn, dust)
- germs (virus, bacteria, rickettsia, chlamydia)

2. Treatments



check the affected eye closely

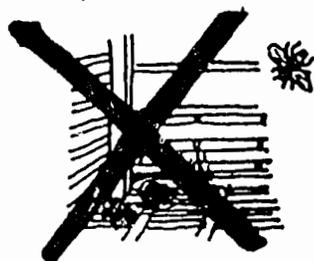


if small objects are found, remove and clean them carefully



apply eye ointment, Terramycin 0.1 %, evenly following the instructions

3. Prevention



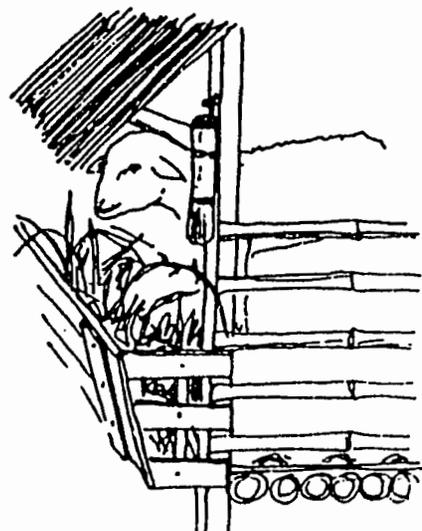
dirty pen attracts flies/mosquitoes



a clean pen is free flies/mosquitoes



a sick animal should be isolated from the rest



avoid small sharp objects (thorns, grass tips) in the feed trough

health

Balitnak / S.R. - C.R.S.P

ECONOMICS

by

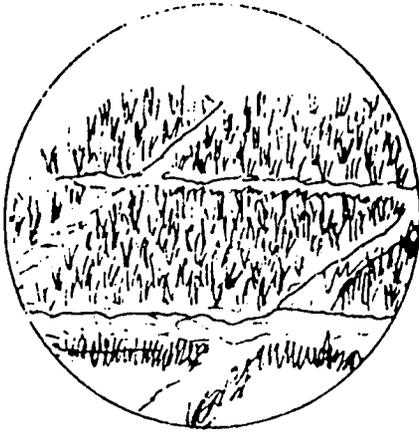
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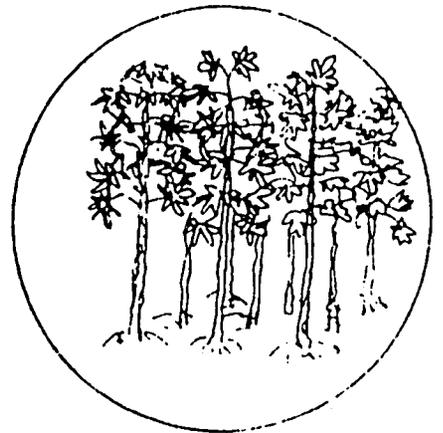
REDUCING THE RISK OF A DECLINE IN INCOME

- Farm enterprises in the villages are usually based on a small area of land, limited capital, and seasonal family labor availability. Family income must be provided according to the needs of the household through mixed farming practices.
- Mixed farming can reduce the risk of income loss due to a failure in the harvest of one crop or farm enterprise with other sources of income from the other farm activities.
- Mixed farming also spreads out the risks of losing sources of income by allocating farming activities that correspond to the availability of land, capital and labor.
- Raising animals has proven to be beneficial to crop farming. Apart from using the manure for the plants, animals can also utilize crop residues as forages.
- Sheep and goats are one of the most appropriate commodities in a farming system based on a small piece of land. The risk of investment loss in the death of an animal is smaller for sheep and goats than for larger animals, and with the same capital the farmer can own more sheep and goats, compared with larger animals.
- Sheep and goats can : adapt to various environments, are easy to raise, can be sold anytime, are faster in reproducing, can utilize almost any forages and agricultural residues, and the cost for pens and maintenance are usually lower.

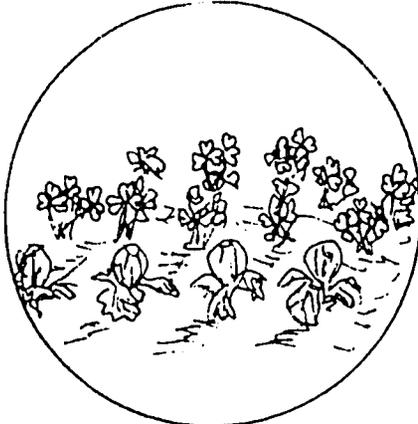
REDUCING THE RISKS OF A DECLINE IN INCOME



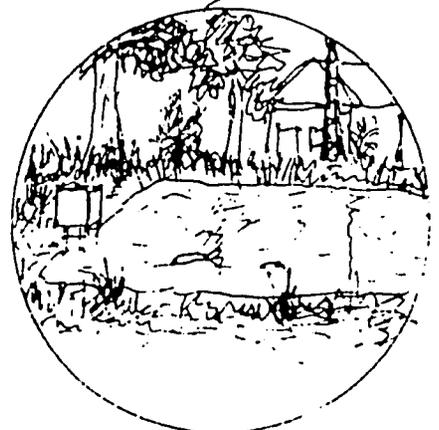
rice



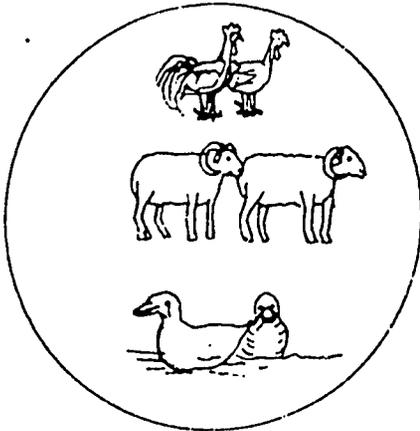
cassava



food crop:



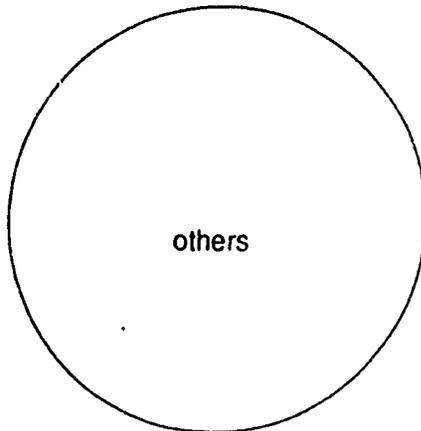
fish pond



animals



industrial labor



others

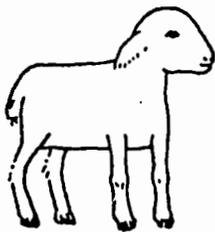
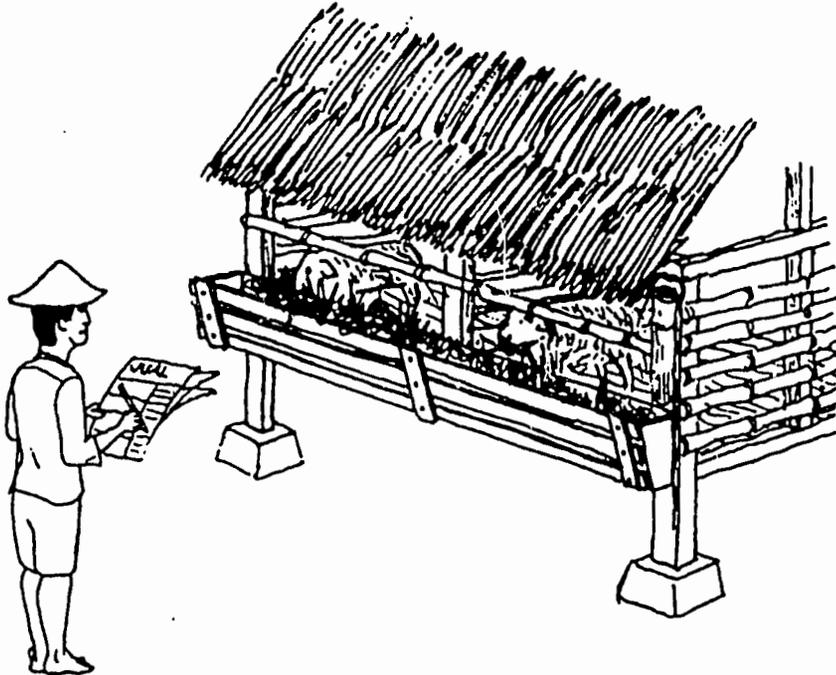
INCREASING BUSINESS PROFITS

Mastering the art of farming may increase profits, because the running costs and the expected sales can be well planned.

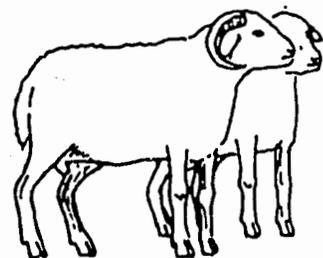
- Try to find alternatives for combinations of feed resources for various ages of animals so that the feed costs can be minimized. For example, a combination of feed resources for every planting season and the utilization of agricultural residues at harvest is the best way to reduce the feed costs and make feed available all year.
- Try to keep records on simple methods of animal care with maximum output. The most important record in this program is the birth date, to determine when to wean and when to sell the animals. The date of mating is used to predict the lambing period, and the amount of cash required for the fixed and operational costs.
- It is preferable to have records on the additions and reductions in the number of animals at any given time. For instance, the additional animals may come from newborn lambs, purchases, profits from lending animals, gifts, etc. Reduction in numbers may be caused by death, sales, payment of debts, and slaughtering for family consumption.
- The use of production records removes any doubt in making decisions. A good management plan helps to make important decisions and are usually very beneficial.

INCREASING PROFITS IN BUSINESS

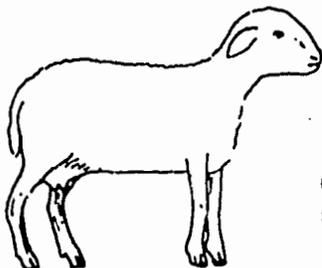
production records can help to increase profits



buy weaned lambs
for fattening



age at selling : 1 1/2 years



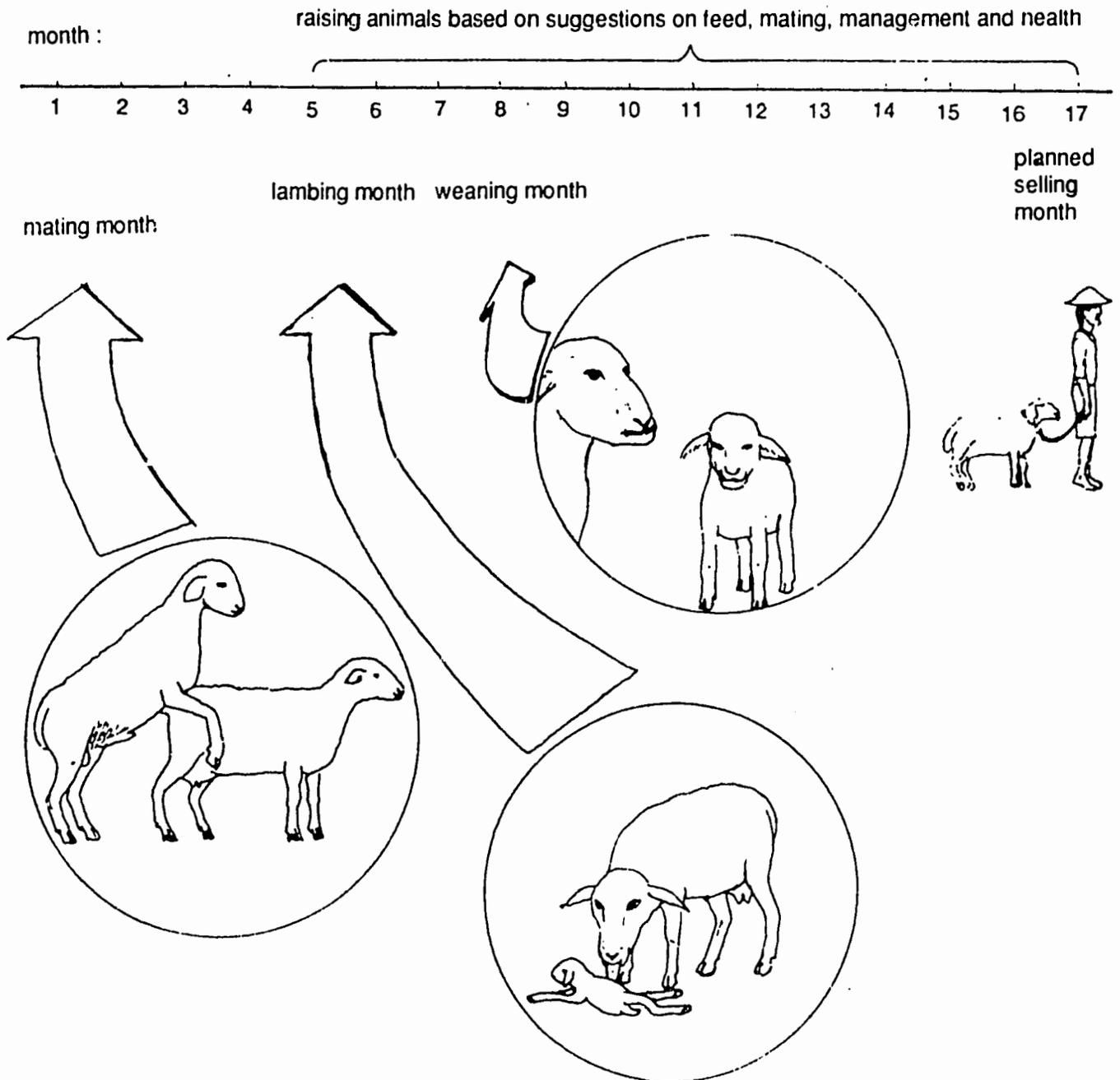
or good female breeding
stocks to replace the old ones

REGULATING THE SALES BASED ON PRODUCTION PLANNING

- Careful planning for regular sales is one way of increasing income from raising sheep and goats.
- Planning the production cycle can help plan the buying and selling of the animals, estimating the requirements for capital and labor, and estimating the income.
- Production can be arranged by taking into account the gestation period, weight at weaning, age at marketing, age for replacing the dams, age for replacing the bucks, choices of rams/bucks and stocks, and the market demand which is seasonal or for special demand periods such as during Idul Adha.
- The gestation period is 5 months and the age at weaning is 3 months, so the production calculation can be based on the number 8 (eight) as the unit of production for the offspring.
- If a farmer has 8 ewes to be mated in consecutive months, then 18 months later, which is 8 months after mating plus 9-10 months for growth, the farmer can start selling animals monthly, for the next 5 years until its time to replace the ewes.
- If a farmer has only 4 ewes, the sales can be carried out every 2 months. Likewise, if there are only 2 ewes, the farmer can sell only every 4 months. In other words, the selling interval is the number of ewes divided by 8.
- Planning the production and marketing may increase family income because the selling rate depends on production level, age at selling, and market demands.

REGULATING THE SALES BASED ON PRODUCTION PLANNING

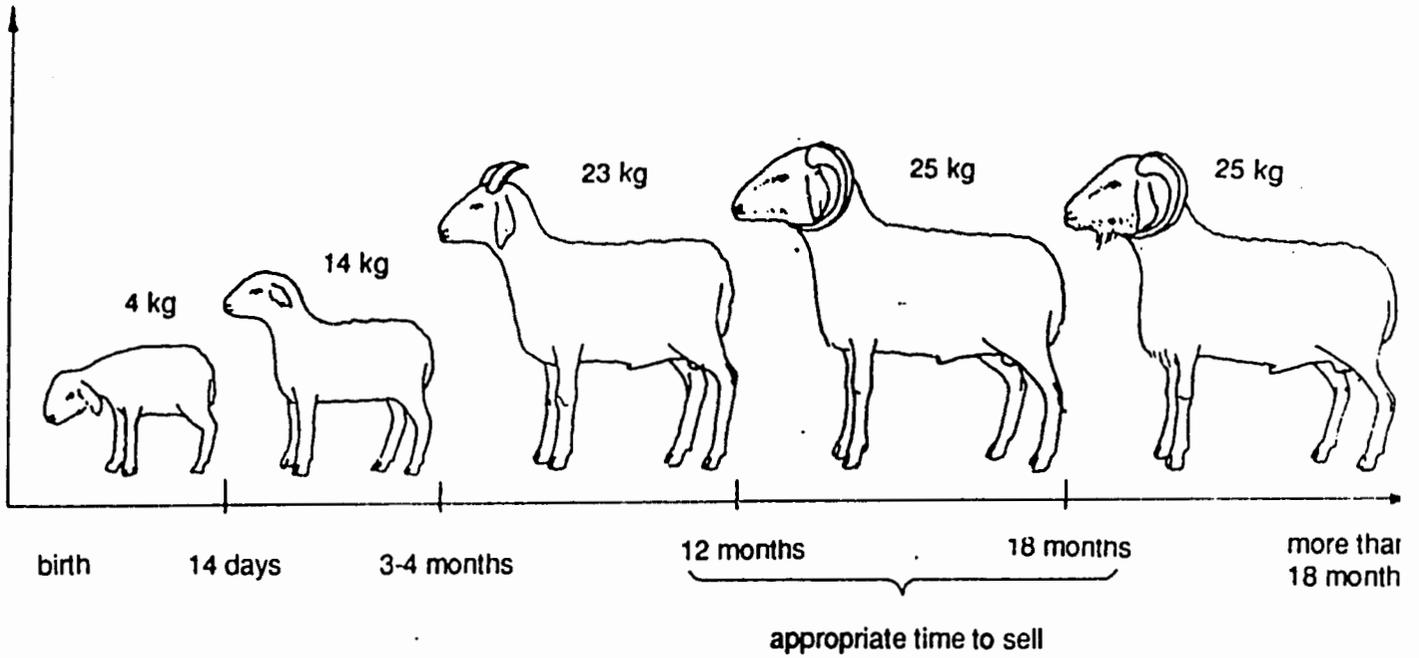
- Plans for regular selling are closely related to mating plans
- Suggested to sell animals at the age of 1 1/2 years depending on their condition
- Sell animals according to carcass calculation and the shortest market channel possible



THE APPROPRIATE TIME TO SELL ANIMALS

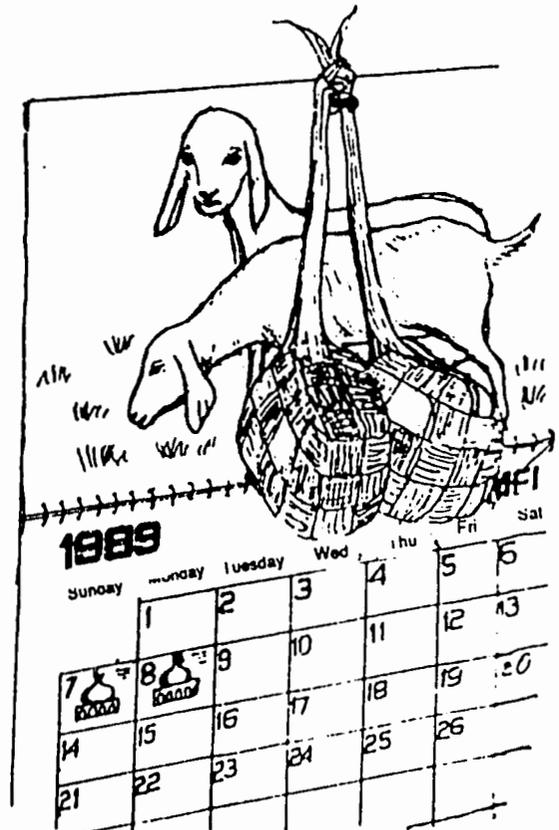
- Sheep and goats will gain body weight daily depending on the feed given and the breed used. However, at one stage the body weight will not increase anymore because the animals have reached their mature sizes.
- Animals can be sold when the body weight does not increase anymore, which is about at 1 - 1 1/2 years of age.
- Try not to sell younger animals because the price is usually low and the chance for rapid growth will be lost.
- Selling the animals can be postponed if a festival is approaching. However, the extra maintenance cost should be calculated as not to exceed the expected price increase during the festival periods.
- Postponing the sale of animals too long will result in a loss, because there is no more increase in body weight to cover the extra maintenance cost.

THE APPROPRIATE TIME TO SELL ANIMALS



Selling price is high on :

1. Idul Fitri, for males and females
2. Idul Adha (festival of sacrifice for males)

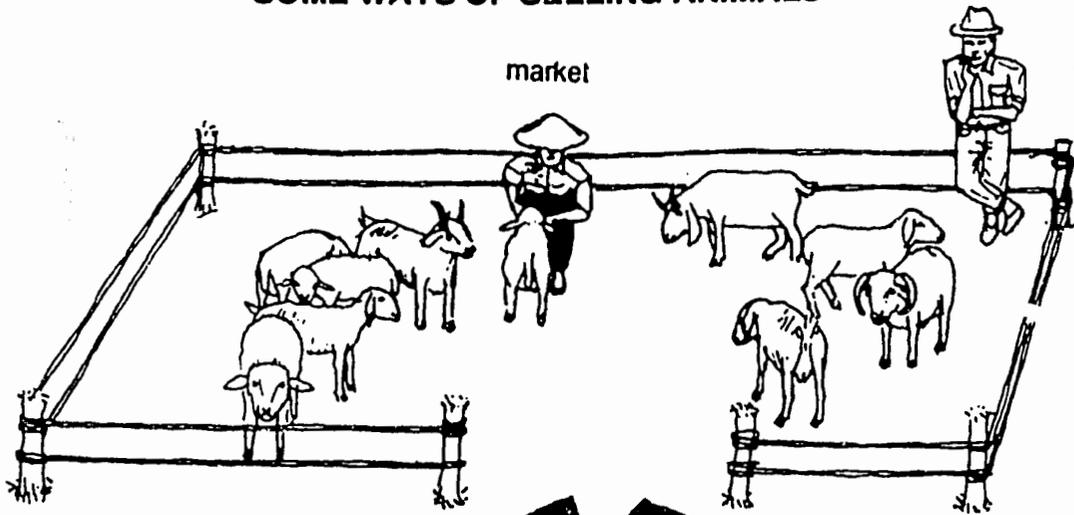


SOME METHODS OF SELLING ANIMALS

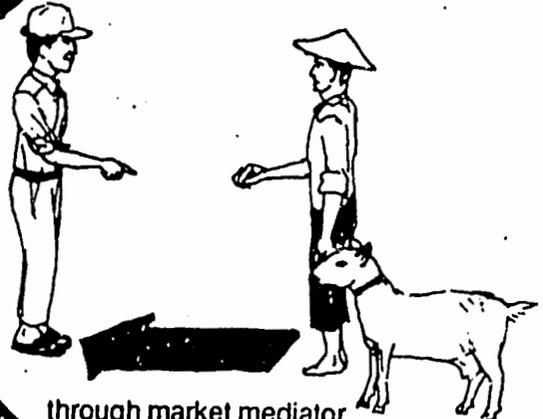
Sheep and goats can be sold by farmers in several ways. Each method of selling gives different profit levels depending on the number of parties involved in the selling process.

- **Selling directly to buyers** is the best way because the full selling price is received entirely by the farmer.
- **Selling animals in the market** usually creates extra cost for marketing, and also may waste time which can be used to work in the field.
- **Selling through village mediators** will reduce the farmers income because he has to pay for the mediator, and also the actual returns will be lower to cover the cost of transportation to the market.
- **Selling animals to pay debts** often results in the highest losses because the farmers are forced to do it, the price was determined long before the sale, and it is not possible to calculate the maintenance cost properly.

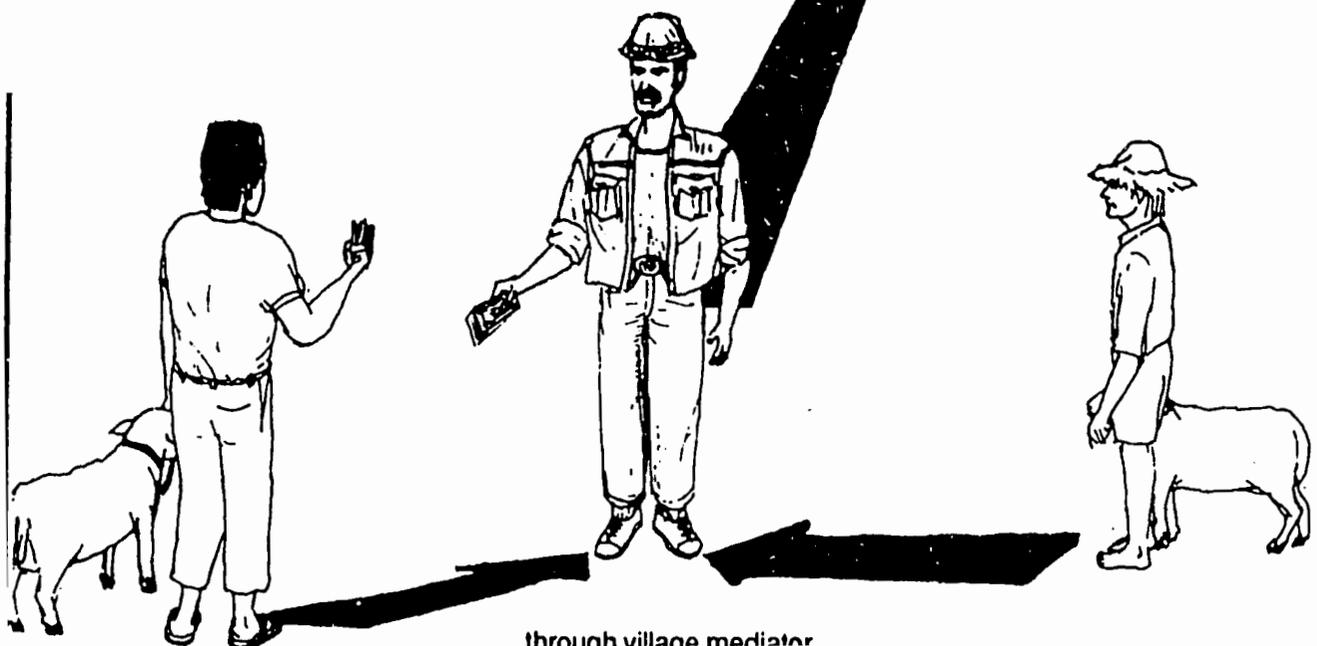
SOME WAYS OF SELLING ANIMALS



a farmer sells directly



through market mediator



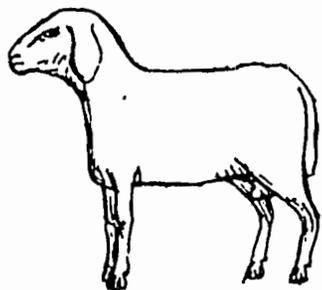
through village mediator

ESTIMATING THE PRICE OF SHEEP AND GOATS

- Sheep and goats can be marketed easily because the need for meat is always increasing.
- Selling animals through someone other than the final buyer will reduce profits because the cost of transaction increases.
- A mediator usually makes profits from the sale of the skin, the head, the offal and the lower legs. Therefore, a farmer should try to adjust the selling price up to the level of the retail price.
- To estimate the selling price based on the retail price and the liveweight at the time of selling use the following formula : (liveweight x 45 : 100 x retail price.)
- Therefore, in bargaining, the sale price of the skin, the head, the offal and the lower legs, should be taken into account. The number 45 in the formula is the lower limit, which means that the farmer will obtain the lowest estimate of selling price. The upper limit is 50.

AN EXAMPLE OF ESTIMATING THE PRICE OF SHEEP/GOATS PER HEAD

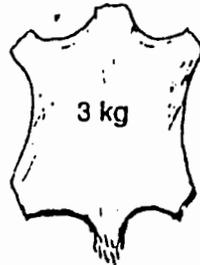
I. Estimate live weight



20 kg Rp 1200/kg

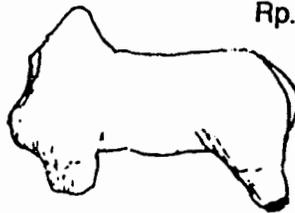
II. Estimate carcass

skin



15% (3kg) value = Rp 3000,00

carcass



9 kg (45 %)
Rp. 3000.00/kg = Rp 27.000,00

head



1 1/2 kg (7 1/2 %)
Rp. 1000.00/kg = Rp 1500,00

legs



2 kg
Rp. 1000,00/kg = Rp 2000,00

offal



1 1/2 kg
Rp. 3000,00 = Rp 4500,00

manure



value Rp. 24.000,00

Total value

= Rp. 38.000,00

INCREASING THE SELLING PRICE OF ANIMALS

- Another aspect of increasing the selling price of animals is to observe the levels of supply and demand.
- Demand is the amount of sheep and goat meat sought by buyers in the market. The demand is usually higher during festivities because more meat is required.
- Supply is the amount of meat produced from slaughtered animals which depends on the number of animals in the market.
- If demand is larger than supply, the price will usually go up, such as during festivities. On the contrary, if demand is lower than supply then the price will go down.
- Likewise, if supply is larger than demand, the price will go down. If supply is lower than demand, usually the price will go up.
- The demand for sheep and goats is high during festivals, especially at Idul Adha, also when the farmers need animals. For example, at the beginning of the dry season, the areas relying on rainfall do not produce many crops therefore, they rely on their sheep and goats.
- Supply will be very high when many farmers want to sell their animals. For example, at the beginning of the wet season many farmers need more cash to work the land. At the beginning of dry season, the forage availability in crop estates is limited and the farmers may sell many of their animals.
- Based on this information, try not to sell animals when many other farmers also want to sell their animals. In this situation, it is possibly the best time to buy animals, of course when the need for cash money is not pressing. Also, do not buy animals during festivals or during other high demand periods, when many people want to buy animals. Try to wait until the demand is lower and the price of each animal will be lower also.
- Try sell animals in their best condition, healthy, high body weight and ready for marketing.

INCREASING THE SELLING PRICE OF ANIMALS



The appropriate time to sell
* there are less sellers than there are buyers

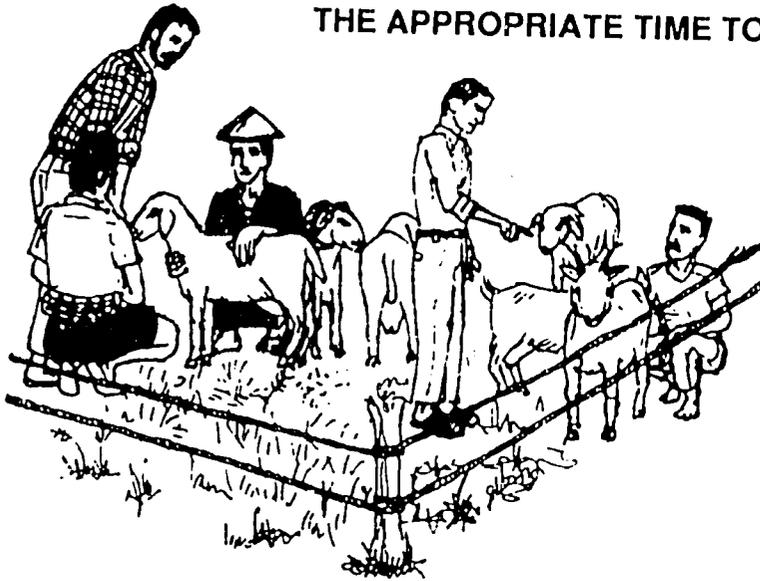


Inappropriate time to sell
* there are more sellers than there are buyers

THE APPROPRIATE TIME TO BUY ANIMALS

- Sheep and goat production is profitable, when started at the appropriate time in purchasing the animals. Preferably do not buy animals during the time when many other farmers also want to buy, because the price will be high. Try to buy when there is only a few buyers, so that the price will be low because there are many animals in the market.
- The purpose of buying animals is not only for breeding stock, but also to replace old animals or for fattening. Use proper judgement in selecting animals for breeding stock and for fattening by choosing animals which are less than one year old.
- Try to buy animals directly from the owners. This will not only cut the marketing channels to get a lower price, but the farmer will also find out the background information on the animals such as whether they come from singles, twins or triplets.

THE APPROPRIATE TIME TO BUY ANIMALS

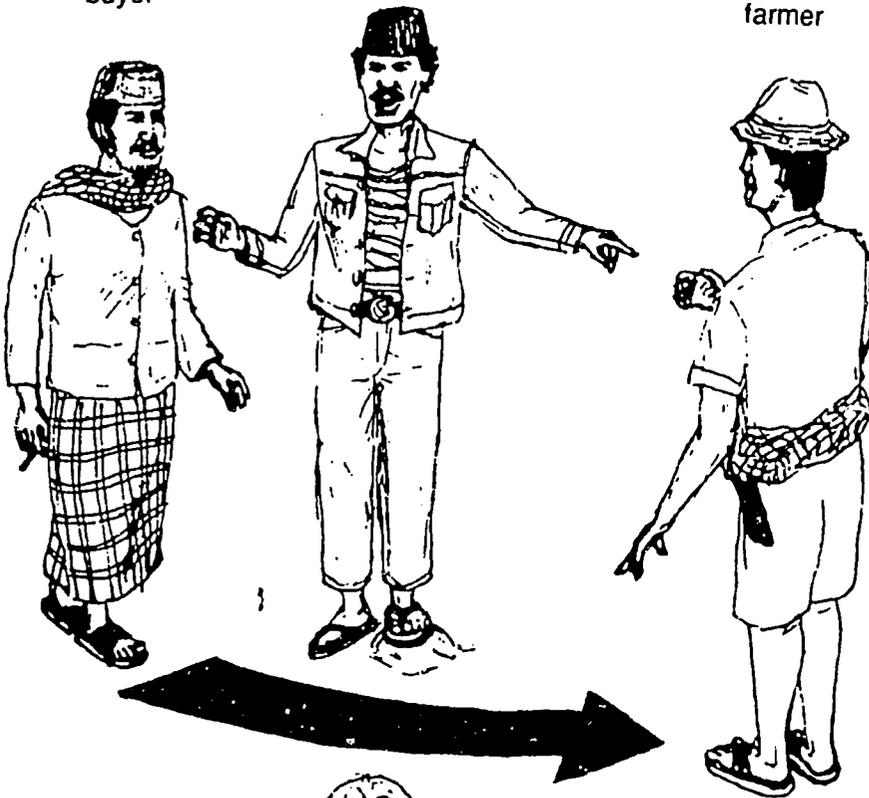


1. buy when the buyers are few
2. select good stock
3. fattening -----> select animals less than 1 year old

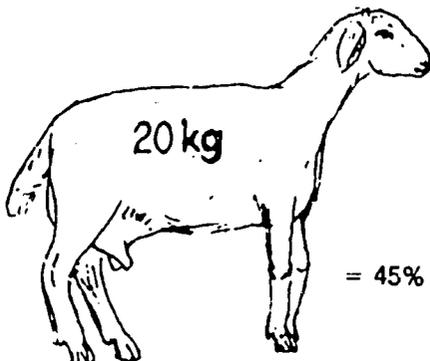
mediator

buyer

farmer



4. buy animal directly from owner/farmer or by shortening the market channels



= 45% meat - bones

5. Use the calculation of production cost and an estimate of selling value, based on the initial condition (body weight) of the animals

CALCULATING THE BENEFITS OF THE NEW METHODS WHEN COMPARED TO THE OLD METHODS IN SHEEP AND GOAT PRODUCTION

- Sheep and goat production has been practised for a long time by farmers in the villages. However, various new methods can be applied to expand the business.
- Farmers would certainly consider adopting a new method if it is more beneficial than the old ones. Therefore, it is necessary to compare the advantages and disadvantages of both.
- Farmers desire a method which is the most profitable, so that either the new or old method can be adopted or even upgraded.
- An example for this comparison is in handling the lambing process.

(a) The old method : no help provided at lambing, no additional milk for more than 2 lambs in the litter and no additional feeds or care given to the ewes.

– Advantages : no extra cost, time and materials are used to help in the lambing process and reducing the deaths of offspring.

– Disadvantages : high lamb mortality, low weaning rate, production level and selling ability is consequently low.

(b) The new method : assisted lambing, extra milk provided when required, extra care and feeds are provided.

– Advantages : low mortality rate, high weaning rate, production level and selling ability are increased.

– Disadvantages : extra handling and care are required, additional cost for extra milk and other materials are also required.

– The choice of new or old method is based on :
the difference between the advantages minus the disadvantages of the new method and the advantages minus the disadvantages of the old method.

$$\begin{array}{rcccl}
 \text{New method} & & & & \text{Old method} \\
 \text{advantages} & & & & \text{advantages} \\
 \text{minus} & & \text{minus} & & \text{minus} \\
 \text{disadvantages} & & & & \text{disadvantages} \\
 & & & & = ?
 \end{array}$$

– Conclusion :

If the value is larger than zero, then the new method is more profitable.

If the value is equal to zero, both methods are equal.

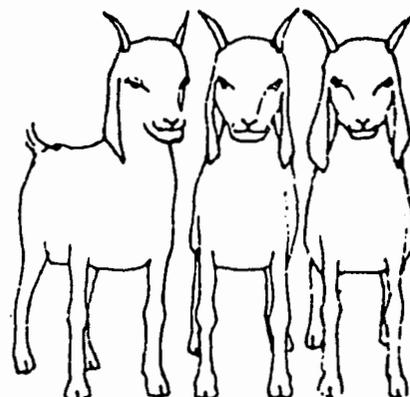
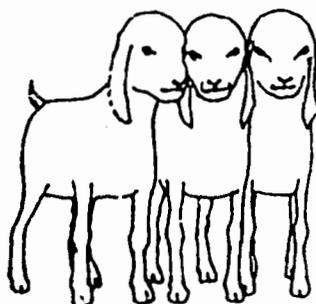
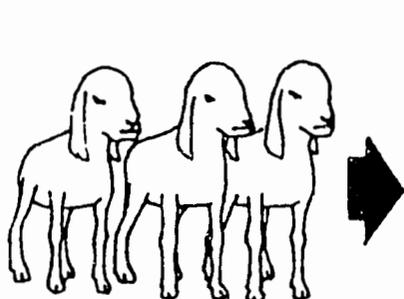
If the value is less than zero, then the old method is more profitable .

COMPARING BENEFITS OF 2 DIFFERENT METHODS

(an example of lambing procedure)

(a) New method :

additional cost : labor, time,
milk for more
than 2 lambs

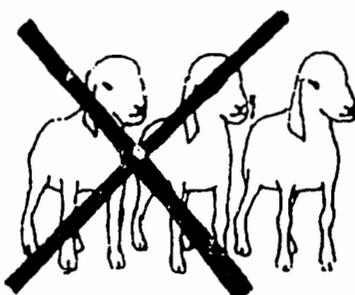


advantages : - low mortality
- more lambs weaned
- more animals to sell

Difference - A : advantages minus additional cost

(b) Old method :

Cost savings : labor, time,
extra milk



production level : - high mortality
- few lambs weaned
- few animals to sell

Difference - B : production level minus cost savings

- If difference A minus difference B is larger than Zero, then the new method is more profitable than the old method.
- If equal zero, both methods are equal!
- If smaller than zero, then the old method is more profitable than the new method

economics

CALCULATING THE MINIMUM PRICE

- The minimum price or the lowest price that can be accepted by a farmer is the price level which covers the entire cost of production until the animals are ready to sell.
- The production cost generally consists of the initial capital, fixed cost for pens and other equipment with long duration, and the running costs such as labor, feed, medications, and marketing. A selling price lower than the minimum price means a loss for the business.
- The minimum price can be calculated in 2 ways :

(a) The minimum price for the entire farming period, by taking into account the initial capital, fixed cost and the cost of raising the animals.

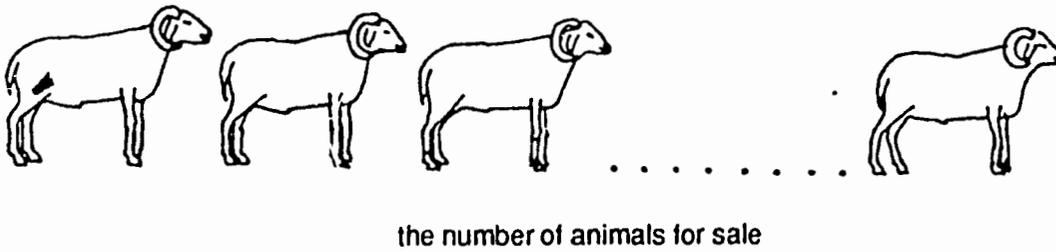
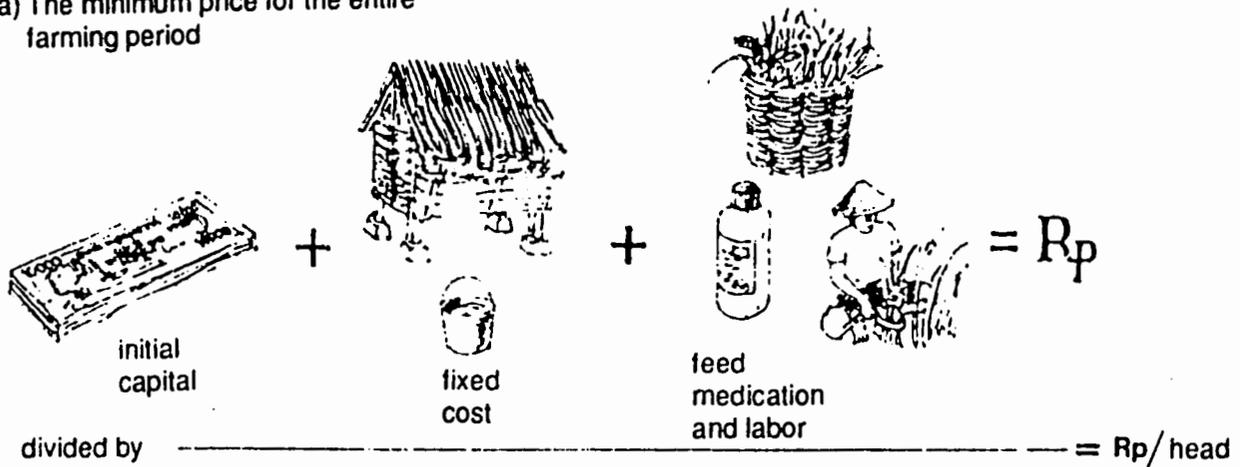
The minimum price = $\frac{\text{initial capital (Rp) + fixed cost (Rp) + production cost (Rp)}{\text{total number of animals for sale}}$

(b) The minimum price for one production process, for instance in the case of fattening, one production process includes all costs from buying the animals to selling them.

The minimum price = $\frac{\text{production costs (Rp)}}{\text{number of animals for sale}}$

CALCULATING THE MINIMUM PRICE

(a) The minimum price for the entire farming period



(b) The minimum price for one production process

