



## DAIRY GOAT FARMING MANUAL

### LOCAL BREEDS

#### Toggenburg

#### Characteristic

- Well adapted in the tropics
- Have white legs, white stripe from nose to eyes
- White triangle at the back



- Mature males weigh 65kg and females 45kg
- Milk males weigh 65kg and females 45kg
- Milk production is about 3 litres per day
- Can produce milk for a long time if not served and are good for upgrading local breeds
- do well in cold region

## SAANEN

### Characteristics

- White to pale cream in color
- They have black spots on the nose and udders and the skin is black spotted
- They are usually polled
- The ears are normally pointed facing forward



- Mature males weigh about 75kg
- Females 50-65kg
- The breed is used to upgrade local goats
- The highest milk yield is 3.9kg/day
- Butter fat content is around 4%

### Problems associated with saanen

- Sensitive to strong sunlight therefore skin cancer
- Sensitive to high temperatures
- Hermaphrodites are very common

## ALPINES

### Characteristic

- More adapted in the tropics better than the saanen
- White front quarter and black hind
- Grayish front and black hind



- Black neck and white hind
- Female weigh 60kg and male 65kg
- Milk yield per day is 4.5kg
- Butter content is at 3.6%

### **Feeds**

Goats require five major classes of feeds,

- Energy
- Protein
- Vitamins
- Water
- Mineral salts

### **Nutrition and Feeding Practices**

- Dairy goats should be fed similarly to dairy cattle.
- Good quality hay should be the basis of the ration, and a 14 percent to 18 percent protein concentrate should be fed as a supplement during lactation
- Higher-producing does may require higher protein in the ration
- Fat goats are more prone to go off-feed and have problems at kidding as well as pregnancy toxemia. Additionally, overfeeding grain may lead to foundering the animal.
- Loose trace mineral salt (TMS) should be available at all times.
- Goats are susceptible to copper deficiency and, unlike sheep, are fairly resistant to copper toxicity.
- Cattle TMS, rather than sheep salt with very low copper, should be offered.
- The salt and other feeds should be kept dry and off the ground.
- In general, the less expensive the mineral, the lower the availability of important trace minerals.
- Provide fresh, plentiful supplies of water to avoid a decrease in water consumption, especially for high-yielding does.

- Bucks and wethers fed substantial amounts of grain are prone to develop urinary calculi. Genetics may also be a factor in the disease.

Goats consume a wide variety of grasses, weeds and small branches of bushes and trees. They can consume leaves, peelings and roots of vegetables, husks of corn, citrus and banana peeling and other waste plant residues. Goats are ruminant and therefore chew cud and are able to utilise roughage with high fibre content. They produce protein, vitamin B and K in the rumen.

Goats are fastidious feeders as a result they are the last animals to die from drought

### Sources of Protein

- Leucaena



- Grevellia



- Calliandra



- Sesbania



- Mulberry



- Tithonia



- Lantana camara



- Sweet potato vine



- Clitoriatarnatae



- Desmodium,

Most of these herbaceous legumes have anti-nutritional factors (eg tannins and cyanides). It's recommended that these should not exceed 25% of the total feed requirement per day. They should be wilted before feeding.

#### **Agro industrial by products.**

- Groundnut cake
- cotton seed cake
- Sunflower cake.

#### **Energy feeds**

- Rhodes grass
- Napier grass
- Panicum spp
- Cenchrus spp
- Sorghum
- Bana grass.
- Banana stems and leaves should be fed as a last resort to feed demand.

- Maize
- Millet
- Rice
- Wheat
- Barley
- oats Sorghum

#### **Agro industrial by-products.**

- Maize germ
- Maize bran.

#### **Crop residues;**

#### **Care of Pregnant Doe (She-goat)**

- Protein supplements are important during the dry period (non lactating period). This is because the kids are growing faster at this time.

- If you have been feeding legumes which are high in calcium its best to replace these with high energy feeds (e.g. hay) at least three weeks before kidding to prevent milk fever. This forces the doe to mobilise its own body stores and prepare for milking.
- Deworm the doe two weeks prior to kidding
- A goat requires 3% (of its body weight in dry matter approximately 1.5 kg) per day or 5 kg of fresh materials should be availed to the doe per day. The complete meal should comprise of both the protein and energy feed.
- Provide the does with salt lick and at least either half a kilo of dairy meal per day or a mixture of pollard and bran
- Provide adequate clean water all the time.

### **Care of lactating doe**

At the end of the 5th month, check for the following signs of approaching birth;

- Reduced feed intake
- Rapid breathing
- Doe will constantly look back unto her sides as if expecting to see young ones.
- Enlarged udder that may or may not discharging colostrum.
- Swollen vulva
- And thick mucus discharge from the vulva.
- The hair around the tail and the rear should be clipped and fresh beddings (straw or grass) provided.
- The kid is born after short labour but in case of difficult kidding expert (Vet doctor) should be consulted.

### **Feeding lactating doe**

- Amount of concentrates fed should be in proportion to the amount of milk being produced.
- A small quantity of concentrates should be fed to the dry doe in order to build up the body reserves and help in the development of her unborn kid. The following table provides a guide to feeding concentrates to a lactating doe

**Feeding of concentrate (dairy meal)**

Dry female	0.5 Kg dairy meal
Female milking 1 litre	1.0 Kg dairy meal
Female milking 2 litre	1.5 Kg dairy meal
Female milking 3 litre	2.0 Kg dairy meal
Female milking 4 litre	2.5 Kg dairy meal
Female milking 5 litre	3.0 Kg dairy meal

The dairy meal fed should be divided into 2 portions daily.

**Care of the kids.**

- To prevent naval infection the stump of the umbilical cord should be cleaned and disinfected with iodine, strong salt solution or traditionalherbal remedy.
- The new born kid should be placed in a warm area to protect it from strong winds (draft) and cold that may expose it to pneumonia.
- Kids are allowed suckle the colostrum in the first three days after birth, the colostrum is very important to the health and growth of the kid. The colostrumcontains antibodies that protect the new kid against diseases until they are able to protect themselves.
- The kid should be allowed to suckle the mother enough milk so as to have the kid as future basis for breeding stock.
- Fostering is advisable if the mother dies or in case of infection of the udder (mastitis).
- Bottle feeding is also an alternative in the absence of the mother.
- Introduce green chop and water after 1 week.
- Kids can be withdrawn from the mother at night so that the doe can be milked in the morning.

Weeks	Amount of milk (mls)
1	200-600
2	800
3	750
4	750
5	500
6	300
7-14	200
15-16	100

- Kids should be weaned at 4 months. Weaning before this time should be compensated with high protein supplements.
- When bottle fed the kid should be fed as follows

### **Advantages of Rearing Dairy Goats**

There are many advantages that can be realised from keeping the dairy goats. These include

- Have a superior production capacity than a cow. A dairy cow is bigger in size and therefore requires more feeds, water, mineral salt and labour than the dairy goat
- Can be reared in urban and peri-urban plots. This is because the faecal consistence (pellets) is easier to handle and dispose than the bulky cow dung of the dairy cattle
- Requires relatively smaller space than a dairy cow
- Dairy goats are much easier to convert to money than a cow
- Dairy goats are less vulnerable to diseases especially tick borne diseases e.g. anaplasmosis, babesiosis and is not susceptible to ECF
- Goats are fastidious feeders as a result they are the last animals to die from drought.
- Goats consume a wide variety of grasses, weeds and small branches of bushes and trees. They also act as scavengers consuming discarded leaves peelings and roots of vegetables, husks of corn, citrus and banana peeling and other waste plant residues that would otherwise cause pollution

### **Other Products**

Other products include. castrates, culls, breeding stock, and skins.

### **By-products**

Include; Hooves , manure, bones, horns, blood

### **Opportunities**

- Availability of goat rearing space.
- High demand for goat's milk.
- Availability of goat's semen at CAIS.
- High nutritional and medicinal value of goat's milk.
- Highly trained personnel are available.
- Credit facilities available. acaricides successful

### **Breeding**

#### **Selection of the breeding Buck**

There are several important things when selecting for breeding

- A healthy and good quality buck (he goat).

- The buck must be healthy.
- strong and should have a well-developed body frame.
- It must be of productive breed.
- It must have normal sexual organs and well developed testicles.
- The buck must be selected from does that produce a high volume of milk and are prolific.
- Control mating i.e. Limit the number of does per male (the recommended ratio is 1 male for 35 does)
- The Buck must be free of any physical defects e.g. undershot jaws, overshot jaws
- It should have a strong masculine head and neck and noisy and should seek out females on heat and mate them. If it's shy and timid it should be culled.
- Badly worn teeth indicate old age. Males with split, missing or worn teeth should not be selected for breeding as they are physically unable to browse or graze properly.
- Legs should be checked for deformities and hooves trimmed.

### **Selecting a Replacement Buck**

- A healthy a well developed male for mating should be identified by the second month of birth. It should be used for breeding when it is 11 months old. Depending on the dairy breed the buck should weigh 10-15 kg at six months and about 20-25 kg at 11-12 months of age.
- At the beginning the use of young buck should be limited to 10-15 does per male, but at the end of the second year the number of does can be increased and maintained at 35-40 does per buck. One active buck can deal with 20-25 females per season
- Bucks should be properly utilised to control their temperament. Under-utilised bucks tend to be vicious and very destructive. At least 3 services per week will keep the buck busy.
- Breeding of male and female polled goats may result in hermaphrodite kid(s).
- Replace bucks after 18-24 months of active service to prevent inbreeding.

### **Selection of the breeding doe**

The productivity of a flock depends on the good quality of the mother.  
Select does with high milk production and high fertility rate.

- The doe must be well built and healthy. A female should not be mated unless it's physically fit. Thin females will not come into heat, will be become pregnant and abort, and reabsorb the foetus at early stage. Those which are mated and carry their kid will be unable to rear it satisfactorily.
- Legs should be checked for deformities and hooves trimmed. Good strong legs are essential for breeding doe. Weak bent hind legs are highly heritable factor and females with this should not be selected for breeding.
- It should produce kids every 8-10 months
- It should produce twins frequently
- It should produce enough milk to rear the twins and for the household consumption
- The udder should be soft to touch with two functional teats. Any hardness indicates the female has had a problem e.g. mastitis. Long pendulous udder is highly heritable and females with this should not be used for breeding. Big udder is liable to tearing by thorns and kids have difficulty in suckling them. It also predisposes the doe to mastitis.

- Badly worn teeth indicate old age. Females with split, missing or worn teeth should not be selected for breeding as they are physically unable to browse or graze properly.
- Any female with physical deformities (e.g. bad feet, hard udders, blind eyes ) should not be selected for breeding

### **Breeding systems**

There are several breeding systems that can be used in breeding of dairy goats depending on the environment and purpose.

Heritability factors (Inheritable traits)

Many of the qualities in goats are highly heritable and knowledge of those which can be passed on from parents to the progeny is useful to the breeder who wishes to improve his stock

#### **Highly heritability factor**

Live weight at 6 months  
Age at first kidding  
Body weight  
Milk yield

#### **Low heritability Factors**

Birth weight  
Litter size  
Kidding interval  
Milk flavour

### **Inbreeding**

This is mating of closely related individuals without the introduction of new animals from outside. If the process continues animals with undesirable characteristics are likely to appear e.g. physical deformities, sterility and reduced body sizes.

### **Line breeding**

This is a mild form of inbreeding designed to concentrate the genes of a specific ancestor

### **Crossbreeding**

This is system where two different parent breeds are mated. The first generation crosses are intermediate to the parent breeds. The offspring are superior to the parental breed in some cases (hybrid vigour). The offspring's displays increase in size better live-weight gains fertility and viability

### **Backcrossing**

This involves crossbred offspring's being bred to one of the parents

### **Upgrading**

Foundation refers to an F1 (first generation) at 50%, Intermediate (second generation) is at 75%, an appendix (third generation) is at 87.5% and pedigree (Fourth generation) is at 92.5%. The percentage represent the proportion of the exotic blood in the resultant cross (breed)

## **Signs of a doe on heat**

For a doe to come on heat it should be nutritively fed under proper alongside appropriate supplementary feeding of concentrates and mineral licks.

A doe on heat will show the following signs

- The vulva appears swollen and reddened
- loosing of appetite and restlessness
- Frequent urination
- Bleating and nervousness
- Wagging of the tail
- Slight mucus discharge from the vulva

The presence of a buck has been shown to induce heat in a doe that could have been problematic in detection of heat.

Heat can also be induced by rubbing a piece of cloth around the base of the bucks horn and then taking the clothe to the doe.

## **Mating**

- For successful fertilization to occur the doe has to feed well and kept in good shed. She must be in good health. To become pregnant the doe and the buck must mate.
- A doe noticed to be on heat should be brought to the buck and remain with it for a period of not less than 36 hrs for effective mating to take place. If mating is successful, heat signs will not appear and pregnancy will be assumed to have occurred.
- The gestation period lasts for 5 months. If mating has not been successful heat signs will occur and a second mating service will be necessary.
- Repeated signs of heat even when the doe has been mated could be due to a problem with either the buck or the doe and therefore the doe and the buck should be examined by a vet.

## **A.I. Services**

- Artificial Insemination services for Dairy Goats are available at the Central Artificial Insemination Station (Kabete). The semen available is for German Alpine sold at kshs 500 per straw.

## **Management practices**

- These are a series of activities like spraying, de-worming, de-budding, castration, hoof trimming, proper milking practices and general hygiene.

## **Management of parasitic infestation**

- Most animals carry parasites burdens, but the pressure of parasites is not serious until the population rises to the extent that the host animals start showing signs e.g. weight loss, diarrhoea, unthriftiness, bottle jaw, coughs, loss of hair, scratching against the wall.

The parasites are divided into ecto and endo –parasites.

### **Ecto-parasites (external)**

- These are mainly the ticks, biting flies, fleas, mites.
- This can be controlled by spraying with appropriate acaricide or using a pour-on acaricide.

### **Endo-parasites (internal)**

- These are mainly worms e.g. round worms, tapeworms, lung worms, flukes.

### **Control**

- Regular deworming of goats and kids after every 3 months. Repeat deworming to any animal showing worm infestation.

### **Hoof trimming**

- This is a management practice to control abnormal growth of hooves that may lead to lameness in goats.
- The overgrown hooves can be trimmed using hoof knife and dipping the hooves in copper sulphate solution.
- The stock should have their feet regularly checked for damage due to overgrown hooves.

### **Castration**

- Castrate the young males not intended for breeding at six months  
This can be done by using the rubber-ring elastrator

### **De-budding**

- This done at 3 months of age using hot bars (de-budding irons)  
Its done to both male and female kids

### **Disease Control**

- Only healthy dairy goats grow well, produce kids at regular intervals, produce milk and can live long productive life.

And its all due to goat health management and control of diseases.  
Some diseases can be controlled by vaccination.

The table below shows some diseases and their control measures & treatment.

Disease	Symptoms	Predisposing factors	Treatment	control
Contagious Caprine pleuropneumonia (ccpp).	High fever. Harsh cough. Nasal discharge. Grunting and grinding of teeth.	Caused by <i>mycoplasma spp</i>	None	Vaccination.
Mastitis	Swollen udder. Painful to touch and hot.	<i>Staph. aureus.</i> <i>Pasturella.spp</i> <i>E.coli</i>	Intramammary infusion	Observe cleanliness during milking.
Brucellosis	High abortion rate at around the final 4 -6 weeks of pregnancy High fever Diarrhoea	<i>Brucella spp.</i>	Penicillin injection	Vaccination
Abscesses.	Suppurative swellings.	Injuries due to thorns ect followed by infection e.g. <i>corynebacterium</i>	Systemic antibiotics.	Avoid sharp surfaces, objects that can cause injuries to the animals.
Foot rot	Lameness, reddening around the coronet.	Wet & dirty floors	Parenteral antibiotics. Copper sulphate for foot.	Clean and dry beddings.
PPR, <i>Peste-des-petits-ruminatis</i>	Emaciation, nasal discharge, Profuse (frequent) diarrhoea, high fever.	Viral disease	none	Vaccination.
Rift valley fever	Emaciation, nasal discharge, bloody diarrhoea, high fever.	Viral	None	Vaccination.
Orf	Occurs in young kids in the first 6 month of life, Inability to suck or feed Lesions (wounds) on mouth nose and on feet and genitals in severe cases.	Viral	None	Vaccination
Enterotoxaemia	Convulsion, Sluggishness, Staggers Loss of appetite Affect animals in good condition Death within 24 hrs	Clostridium bacterias	None	Vaccination

## Contagious CaprinePleuropneumonia

(viral disease)

### Symptoms

- High fever.
- Harsh cough.
- A lot nasal discharge.
- Grunting and grinding of teeth.
- High mortality rate
- The lung sounds are raspy (like paper rubbing)

- At post mortem the thoracic cavity contains a lot of fluid and adhesion of pleural to the lung surface

**Treatment**

- None

**Control**

- Vaccination twice a year

**Mastitis**

(bacterial disease)

**Symptoms**

- Swollen udder.
- The udder is painful to touch and hot.
- The walking gait is not normal
- The doe refuses to nurse the young

**Treatment**

- Antibiotics

**Control**

- Observe general hygiene

**Brucellosis**

(Bacterial Disease)

**Symptoms**

- Abortion at around the final 4 -6 weeks of pregnancy
- High fever
- Diarrhoea

**Treatment**

- Antibiotics

**Control**

- Vaccination

**Abscesses**

(Secondary bacterial infection)

**Symptoms**

- Suppurative (pus developing) swellings
- High fever

**Treatment**

- Draining of pus and use of antibiotics

**Control**

- Prevention from exposure to injuries and wounds

**Foot rot**

(Bacterial disease)

**Symptoms**

- Lameness,
- Foul smell in the foot

**Treatment**

- Wash with copper sulphate

**Control**

- Keep the goats in a clean and dry environment

**PPR**

(Peste des petits ruminants) - Viral disease

### **Symptoms**

- Emaciation,
- nasal discharge,
- Profuse (frequent) diarrhoea,
- High fever

### **Treatment**

- None

### **Control**

- Vaccination

### **Rift Valley Fever**

(Viral disease)

### **Symptoms**

- Emaciation,
- nasal discharge,
- bloody diarrhoea,
- High fever

### **Treatment**

- None

### **Control**

- Vaccination

### **Orf**

(Viral disease)

### **Milking & Marketing**

- Ensure cleanliness in the milking place.
- Clean the udder with lukewarm water and dry with udder towel, strip milk on strip cup to check on mastitis and after milking dip the teats in teat dip solution to prevent infection.
- Milk the doe twice each morning and evening on regular schedule.
- When milking squeeze the teat down and avoid pulling the teat.
- Strain the milk through a filter or cloth into a clean container to remove any hair or dirt that could have fallen into the milk.

### **Symptoms**

- Occurs in young kids in the first 6 month of life
- Inability to suck or feed
- Lesions (wounds) on mouth nose and on feet and genitals in severe cases

### **Treatment**

- None

### **Control**

- Vaccination

### **Enterotoxaemia**

(Bacterial disease)

### **Symptoms**

- Convulsion,
- Sluggishness,
- Staggers
- Loss of appetite
- Affect animals in good condition
- Death within 24 hrs

### **Treatment**

- Antibiotics in the early stages

### **Control**

- Vaccination

- Measure and record the amount of milk produced every time.

### **Marketing of goat's milk**

- If the milk is to be sold raw it's important to package it depending on your customers.
- There is a ready market for goats milk in various hospitals
- Prices range from Kshs.60-100 per litre

### **Value addition**

- Value addition on goat's milk can be done to produce yoghurt, and cheese
- Goats milk can also be pasteurized