

KUJENGA MAISHA EAST AFRICA-KUMEA



INTERGRATED RURAL DEVELOPMENT PROJECT FOR VIHIGA & SIAYA COUNTIES

Report for Animal Husbandry
training for Dairy Goat farmers
groups in Vihiga & Luanda sub
counties at Chenzaywe Vocational
& Technical Training Center
, May, 2024

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[Date]

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1.0 EXECUTIVE SUMMARY

Goats play an important role in food production systems in developing countries. Their great popularity can be explained by their good adaptation to many different climates (ecological adaptation) and the many uses for which they can be kept. Goats are especially important in developing countries: in 1981, 96% of the world's goat population of 496 million goats was to be found there (476 million). In those countries, goats make up 20% of the ruminants which are kept as livestock. Dairy goats were introduced in Kenya by the white settlers / colonialists from Europe in early 1900s. Local people learnt from them the importance and related advantages of dairy goat farming as early as those days.

Presently dairy goat farming presents the rural farmers with opportunities for sustainable income due to their resistance to diseases and reliability towards reproduction. Therefore, the Integrated Rural Development is engaging rural farmer's groups in goat rearing to improve their livelihoods and enhance environmental protection through agro forestry.

The project organized a 3 day training on animal husbandry for the 2 groups involved as from 2nd May, 2024 to 4th May, 2024 at Chenzaywe Vocational Training Center. The training had 46 (17 men and 29 women) participants drawn from the two target groups mainly Iguzuru Self-help group from Vihiga sub county and Universal Self-help Group from Luanda sub county. The objective of the training was fivefold as follows;

- a) Develop capacity of the livestock beneficiaries on livestock husbandry & management**
- b) Acquire skills and capacity in livestock disease prevention and management**
- c) Liaise with livestock production officers to improve reproduction of the goats**
- d) Ensure quality feeding & management of the livestock to enhance wellbeing of the livestock**

Towards completion of the training participants appreciated the skills provided and gave positive acknowledgement to the project for alleviating poverty and supporting/facilitating them to enhance community sustainable livelihoods opportunities and development.

2.0 KEY RECOMMENDATIONS & WAY FORWARD

- i. That training of project participants has prepared the farmers groups on the expectations and requirements for dairy goat rearing. Therefore, there is need for the groups to start preparing the planting of the relevant shrubs and Napier grass for feeding of the goats apart from animal shed preparation**

- ii. All the beneficiaries need to be linked to the livestock extension support officers in the respective locations to facilitate follow ups and backstopping to ensure the community is well supported to manage their livestock without any challenges. The rationale for this involvement is to include the community into the Livestock support program of the County so that the communities benefit from various livestock support services& interventions.**

- iii. Gender considerations need to be taken into account in future so that all the groups are included in the program. The youth farmers in the groups need to be considered during the distribution of the goats so that their livelihoods can also be supported.**

- iv. In distribution of the goats to the farmers' group members' priority will be given to the group members who have attained the set criteria for financial contribution to the group, preparation of the animal shed and capacity for effective management of the goats.**

- v. That groups benefitting from the Dairy goats need to scale up the pass-on of dairy goats to other groups in the sub county annual to expand the dairy goat management to other groups for improvement of dairy goats breed and livelihoods in the target sub counties.**

- vi. That all the groups need to develop SACCO to facilitate value-additions scaling up i.e. production of soaps & lotions from dairy goat's milk hence diversify income and improve incomes for farmers' groups**

WORKSHOP PROCESS

DAY ONE: THURSDAY, 2nd MAY, 2024

ACTIVITY 1: PARTICIPANTS INTRODUCTIONS & WORKSHOP OBJECTIVES

Purpose

To reduce social distance, informally build group spirit and break the ice among participants with view of improving/facilitating interaction

Participants discussed and agreed on the following workshop norms and leaders

WORKSHOP NORMS

1. Phones on silent mode
2. Minimize movements
3. Respect each other's opinion
4. Active participation
5. Keep time

WORKSHOP OBJECTIVES

- a) **Develop capacity of the vulnerable beneficiaries on livestock husbandry & management including production**
- b) **Acquire skills and capacity in livestock disease prevention**
- c) **Liaise with livestock production officers to improve reproduction of the shoats provided**
- d) **Ensure quality feeding & management of the livestock provided**

ACTIVITY 2: OVERVIEW OF KUJENGA MAISHA EAST AFRICA-KUMEA

Purpose

To understand and appreciate the role and mandate of Kujenga Maisha East Africa in facilitating project development and quality of life improvements in various development sectors

Development Sectors	Key projects & interventions
Water ,Hygiene and sanitation	<ol style="list-style-type: none"> 1. Eastern Kenya Water and Sanitation Improvement project-EKAWASIP Completed 2years ago with water and sanitation facilities done for over 40 schools in Kitui and Makueni(Construction of 16 hand dug wells fitted with hand pumps,Construction of 21 ferro-cement tanks in schools and construction of 55 VIP latrines In schools) 2. Kitui community Borehole project-Drilling and equipping boreholes for community water supplies 3. Mukuru informal settlements-Construction of bio-center and provision of safe water –On-going 4. Afya Jijini/USAID funded project targeting 3no.informal settlements in 3No. sub counties of Embakasi, Starehe and Makadara in Nairobi County- On-going
Rural livelihoods	<ol style="list-style-type: none"> 1. Support farmers with Provision of dairy cows in Western Kenya for improved livelihoods-Kakamega County 2. Support bee-keeping initiatives in Kitui County 3. Support Igembe Phase 1 Project through provision of Dairy goats –Completed 4. Support Phase 2 of the Igembe rural livelihoods project covering agro-forestry and dairy goat rearing
Drought recovery & emergencies	<ol style="list-style-type: none"> 1. Provide relief support to drought stricken families and households in Baringo County 2. Provide support to pastoral communities in Turkana County with Livestocking restocking program 3. Provision of relief food and support in Kitui,Baringo and parts of Turkana

ACTIVITY3: RATIONALE OF DAIRY GOAT REARING

Goats play an important role in food production systems in developing countries. Their great popularity can be explained by their good adaptation to many different climates (ecological adaptation) and the many uses for which they can be kept.

Goats are especially important in developing countries: in 1981, 96% of the world's goat population of 496 million goats was to be found there (476 million). In those countries, goats make up 20% of the ruminants which are kept as livestock.

Dairy goats were introduced in Kenya by the white settlers / colonialists from Europe in early 1900s.

Local people learnt from them the importance and related advantages of dairy goat farming as early as those days.

Importance of dairy goat farming:

- ✓ These are small breeds that can be handled by farmers with small land sizes.
- ✓ Produces 2-5 litres milk for domestic use and for sale
- ✓ They mature at 1 year and kid at 17 months
- ✓ Dairy goats' often twin hence multiplies very fast.
- ✓ Has a short gestation period of 5 months.
- ✓ The kidding interval is 8 months hence can kid 3 times in 2 years
- ✓ It requires simple housing made of locally available materials
- ✓ It produces quality and nutritious milk than a cow
- ✓ Produces manure that can be used to grow fodder and crops in the farm.
- ✓ Dairy goats eat a wide variety of fodder in the farm for growth and milk production.
- ✓ Kids and surplus milk can be sold as a source of income to the household,

Common dairy goat breeds in Kenya

- Toggenburg
- German Alpine /British Alpine
- Saanen
- Anglo-Nubian

These breeds are able to tolerate a wide range of climatic conditions. It is possible to refer breeds as per ecological zones suitability i.e. low, medium and high altitude breeds:

Breed suitability per ecological zone

Zone	Recommended breeds
1. High altitude	Saanen, toggenburg, Anglo-Nubian
2. Medium altitude	German Alpine, Anglo- Nubian, Galla goat, Toggenburg, Angola goat.
3. low – altitude	Togen-burgs, anglo-nubian gala goat

Our region lies between 800-1300M asl thus German Alpine and Toggenburg breeds are best suitable.

IMPORTANCE OF GOATS	ATTRACTIVE PROPERTIES
<ul style="list-style-type: none"> ✓ Goats are of high importance to people because of the many functions they provide: they serve as bank account which can be drawn upon when cash money is needed, kids are the interest given; they are used as gifts to strengthen relationships; they are used as sacrificial animal. ✓ Furthermore, goats provide milk and meat which are high-grade foodstuffs for people. Goats are much tougher than cattle, they are small animals and costless per animal. Each farmer usually owns a number of goats. Goat keeping therefore touches on many people's lives. 	<p>For the small-scale herder, the goat has a number of attractive properties:</p> <ul style="list-style-type: none"> ✓ The goat is a small animal. Compared to the big animals as cows its value is not very high. This means keeping goats is not too risky. ✓ It is easier to find feed for a small animal. Even small children can control them. ✓ It is a quickly maturing animal with a high fertility. ✓ Animals are regularly available for sale or other uses. ✓ Restoration of the herd size is also quickly done. ✓ Goats can maintain themselves well in poor and dry areas, where other ruminants do not succeed. ✓ In places where sleeping sickness is present, goats can still be kept where cows cannot survive, because there are resistant goat breeds.

ACTIVITY 4: DIFFERENT TYPES OF DAIRY GOATS

Toggenburg	German / British Alpine
<p>General Appearance</p> <ol style="list-style-type: none"> 1. This is a robust dairy type, active and vigorous being well proportioned with strong backline straight to the hips. Full chested with large deep wedge shaped body. 2. Well boned and strong straight legs. 3. Goat color may be from light fawn to dark chocolate with white 4. They have facial stripes from eyes to muzzle around edge of ears, on the legs from knee and hocks to feet, on rump and tail. 5. Ideal height for does is 79 cm and bucks 90cm 6. The goat can be with or without horns 7. Males weigh 80-100kgs 8. Females weigh up 50-60kg 9. Dairy goat are doing well within Meru County since their introduction of an elaborate breeding program by an NGO - Farm- Africa in early 1990's 10. Milk yield – recorded between 2-3- litres at second –third kidding 	<p>General Appearance</p> <ol style="list-style-type: none"> 1. Alpine is a striking, rangy, black animal with white legs and facial markings, white under the tail with ears outlined in white color. 2. Facial line is dished or straight, with strong broad muzzle, ears erected pointing slightly forward. 3. Back straight or rising slightly on the hips 4. Body deep and wedge shaped legs strongly boned and straight. 5. Skin is darkish. 6. Ideal height for does is 83m and bucks 95cm 7. Largely reared in Nyeri, Kirinyaga and Embu counties under dairy goat association of Kenya. 8. The Alpine is a more social animal and relates well with the owners. 9. Milks yield – local milk yield recorded is 2 - 3litres per day.
Saanen	Anglo –Nubian
<p>General appearance</p> <ol style="list-style-type: none"> 1. Is an attractive dairy type, 2. Tan or olive skinned- black spots may appear on the skin of ears, nose or udder. 3. It has short fine white coat. 4. It has a slender head with a dished or straight facial line, ears and erect and backline straight. 5. The legs are straight and strong. 6. It has a wedge shaped body with well sprung ribs. 7. The ideal height for a doe is 81 cm with a weight of around 61 kgs 8. The bucks height is 94cm and weighs around 81kgs 9. Milk production is 2-5 litres 10. They do best in high altitude areas. 	<p>General appearance</p> <ol style="list-style-type: none"> 1. This is a cross breed of British and Indian goat breeds 2. They are dual purpose goats. For milk production and for meat hence dual purposes breed. 3. The main identifying feature of this breed is the head, which has a pronounced “roman “nose and long drooping ears. 4. A production of 2-3 litre milk is possible

ACTIVITY 5: SELECTION OF GOATS

The reason for selecting animals is maintaining or improving the properties of a group of goats. The relevant properties for production are: reproduction, growth (meat production) and/or milk production.

A goat doing well for all properties does not exist. The goat keeper tries to get goats which are most suited to local circumstances and requirements. To achieve this, goat keepers select goats with desirable properties from the herd and use those goats for breeding. Otherwise you can buy animals from outside, in order to improve the properties of the herd.

<i>Environmental factors</i>	<i>Animal factors</i>
The properties of a goat are not only determined by its genetic characteristics but also by the possibilities to manifest this characteristic. The extent to which it is possible to do so is determined most by the environmental factors, such as climate, feed (quality and availability), hygiene, housing and general care. It is pointless to start selecting animals if you do not first ensure optimal environmental conditions. By doing so, you will have more rapid results than by selecting for hereditary properties.	Apart from the environmental factors, animal factors also influence the properties of a goat. Animal factors are: the age, the sex, being in heat or not, carrying young or giving milk, first time bearing young or having had more litters, etcetera. During selection, it is necessary to compare those animals which live under the same conditions and which have the same set of animal factors.

ACTIVITY 5B: SELECTION PROCEDURE

Compare the results of the goats within the group, and compare them with those of the neighbors (which keep the same kind of goats under similar circumstances). The more animals you have, the more difficult it is to weigh all the different factors and make a good choice. An important aid in doing so is a good administration of the data of each animal..

Before discussing the selection process any further, we must point out never to select for one specific property only, without considering the other characteristics of a goat. This can have negative consequences.

The main selection goals:

- a) improvement of reproduction;
- b) improvement of milk yield;
- c) improvement of meat production (growth)

In the following sections the selection procedures for each selection goal are described. You should treat the selection procedure seriously and carefully because you gain easily by making a good start with a strong goat that will live long and that will be a good producer for a long period of time. Before a selection for the specific production goals a first selection almost happens unnoticed: selection by judging the exterior of the goat.

SELECTION CRITERIA OF THE GOATS

Judging the exterior	Measurements	Judging the age of an unknown goat
<p>When judging the exterior it is good to systematically make use of fixed criteria.</p> <ul style="list-style-type: none"> ✓ Look for good legs. ✓ A deep and wide chest gives more room for the organs and indicates that they are well developed. ✓ The animal can also eat more and therefore produce more. ✓ Look for a good and proportional general development, a shiny at, well-placed and developed sexual organs. ✓ With a (milking) goat, you should look for a well-placed (between the hind legs) and developed udder, strongly veined with good large teats which point straight down. 	<ul style="list-style-type: none"> ✓ To objectively determine the proportions of the body, it is good to take some measurements. ✓ A goat with a good-looking colour pattern which is nice and calm, is unconsciously valued more. Some measures are the shoulder height, circumference of the chest just behind the forelegs and the length of the back. ✓ This last measure is the distance between the highest point of the shoulder blade and the hipbone. 	<ul style="list-style-type: none"> ✓ When judging an unknown goat, it is useful to also be able to estimate its age. This can be done by checking the teeth: The teeth give an indication of the age of the animal and without good teeth a goat cannot eat as much. ✓ Goats have 4 pairs of teeth. Up to one year of age, a goat has only small milk teeth, which are changed in the years following. ✓ The age of an animal can be determined by looking at the number of teeth the goat has changed and, in older animals, to what extent they are worn down. ✓ At 1½ year: 1 pair has changed UUUU UUUU ✓ At 2 years: 2 pairs have changed UUUU UUUU ✓ At 2½ years: 3 pairs have changed UUUU UUUU ✓ At 3½ years: all 4 pairs have changed UUUU UUUU ✓ After the teeth have changed, they start wearing down. The extent of wear is an indication of the age of the animal. It also depends on the kind of feed

ACTIVITY 5C: SELECTION FOR REPRODUCTION

Selection for reproduction properties is important for every goat keeper. The things you must look at are the servicing results:

- ✓ how often does each goat give birth per year (time between litters)
- ✓ how many kids does are born per litter
- ✓ How many kids die and how many survive

Together this gives you: the number of successfully weaned kids per goat per year.

KEY SELECTION ASPECTS FOR REPRODUCTION

Keeping reproduction records	Putting the selection into practice
<ul style="list-style-type: none"> ✓ By carefully recording the above mentioned data, you can evaluate the results of each individual goat. Your ability to judge your goats improves with the amount of data available per goat. It is best to follow the goats for two years, for example, before you draw definite conclusions. ✓ Goats which are judged not to produce well are replaced as quickly as possible 	<ul style="list-style-type: none"> ✓ Goats, of which the number of successfully weaned kids per year is disappointing without any clear reason, are replaced. ✓ There are two ways of getting replacements: ✓ buy good goats from a reliable address (judge them on the exterior and possibly ask about their history); ✓ Keep young from your own very best goats. ✓ If the overall number of kids born per goat for the whole herd is low, and it cannot be due to poor conditions on the farm, then the billy goat(s) could be the cause. Try borrowing a good billy goat from a neighbor and see if the results improve. ✓ Regularly replace the billy goat(s) with new billy goats to avoid inbreeding (once a year). ✓ Buy these billy goats preferably from other breeders of whom you know that in their selection they pay attention to those factors which are important for you.

ACTIVITY 6: GOAT BREEDING

Rationale for goat breeding

For the breeding of goats, a good reproduction is of immediate importance to the goat keeper. Good reproduction is the capability of a group of goats to produce many young in a year. Goats can have up to three litters in two years; one litter a year is usual. If more kids mature, you can sell, slaughter or give away more goats. For milking goats, giving birth to more litters also means a greater milk production.

Breeding of goats

In a herd, a billy-goat services a young goat as soon as she is sexually mature and the first time she is in heat (see section 2.3 - symptoms of being in heat). At that stage the young goats themselves are still growing. If they get with young, they must divide their energy between their own growth and the development of the kids growing in their womb. The milk production to raise these kids also competes with their own growth. As a result, the goat herself remains smaller and the kids born are smaller and weaker. The death among these kids will therefore be higher.

When can a young goat best be serviced?	Breeding billy-goats	Hornless males
<p>For this you should look at the weight and not at the age of the goat. You should only let young goats be serviced when they have reached three-quarters of the normal, mature weight for that breed. With good nutrition and care, that weight will quickly be reached. If a goat is not in good health, she will get in heat less regularly and less obviously. That makes it difficult for the goat keeper to control the mating period. To avoid this problem, it is better to first ensure that the animals are in good condition. Good nutrition and the prevention and timely treatment of disease and parasites will help. Of course it is also important that there is sufficient feed available during the gestation and suckling period. By correctly planning the delivery date (5 months after servicing) through planning of the servicing you avoid problems.</p>	<p>After about 4 months of age, a billy-goat is sexually mature. What you should look for is that both testicles have dropped into place. If that is not the case, the sperm production will be insufficient and perhaps even nonexistent. One billy-goat can service 10 to 20 goats. Young billy-goats should not be offered too many goats; the quality of the services will decline and the billy-goat becomes exhausted. On the other hand, if you have an exceptionally virile billy-goat then it is possible to share him with your neighbors should both of you have small herds of goats. The same applies here: the billy-goat must be healthy and not too fat. If he is too fat, then his rutting desire will decline and the quality of his sperm will decrease.</p>	<p>In hornless breeds, so-called intersexes can occur. These are animals which look like males but are completely infertile. They occur because their sex changes during their development in the womb. Usually they are females which become males. The female sexual organs do not develop and the male sexual organs develop incompletely; thus an infertile animal is created. Should you discover after some time that you are trying to breed with such a billy-goat, then the best solution is to slaughter the animal. Also in breeds which normally do have horns, hornless billy-goats do sometimes occur. Even if they are fertile and produce offspring, it is better not to use them for breeding purposes as there is a chance of getting intersex offspring.</p>
<h3>Symptoms of being in heat</h3>	<h3>Servicing</h3>	
<p>A healthy, sexually mature, not pregnant goat gets in heat every 17 to 21 days. She can then be serviced during 24 - 36 hours. In temperate areas there is usually a clear mating season, which is usually not the case in the tropics. A season-linked rut can occur as a result of a seasonal food shortage: alternation of a dry and a wet season with a great feed scarcity in the dry season. If such a shortage does not occur, there is no clear rutting season. If the goat keeper wants to decide himself when a goat should be serviced, he will have to look himself for the signs of being in heat:</p> <ul style="list-style-type: none"> ✓ wagging of the tail, also when you place your hand on the loins of the goat; ✓ bleating, restless behavior and jumping on the backs of other goats; ✓ slightly red and swollen labia (vulva); ✓ Provocative urination in the presence of a billy-goat. <p>If a billy-goat is nearby, the indications are often more clear. By placing a billy-goat in the pen next to the goats you can easily see which goat wants to be covered; she will stand as close as possible to the billy-goat. A so-called search billy-goat can indicate which goat is in heat. Walk with him past the goats. Once you know which goat is in heat, you can offer her to the desired billy on the day chosen by you. Be careful that the search billy does not outsmart you! If you wish, you can tie a cloth around the belly of the billy-goat which catches the sperm and thus prevents impregnation</p>	<p>If the billy-goat has unrestricted access to the goats, you can usually expect kids all year round. A billy-goat which freely walks among the goats will service the goats which are in heat exactly at the right time during the heat and often several times. For certain reasons it may be that you wish to limit the birth of kids to a certain time of the year. To achieve that, you must then also limit the servicing to a certain period. The reasons can be:</p> <ul style="list-style-type: none"> ✓ Avoiding the merging of work peaks (kidding and harvest for example) ✓ Avoiding an unfavorable season, in which for example too little protein-rich feed is available. If you keep the goats and the billy-goat separate, we advise you to let a goat be serviced twelve hours after the first indications of being in heat. If you wish, you can repeat this 6 hours later. More frequent servicing is unnecessary and the quality of the sperm might decrease. <p>When a goat is pregnant, she will not come into heat any more. If she does get in heat again after 17 - 21 days, then the goat has not been impregnated. Pay extra attention therefore to the signs of being in heat in those goats which have been serviced after this time period. Let the goat be serviced again if necessary.</p>	

INFLUENCING REPRODUCTION

There are a number of ways of influencing the reproduction.

Permanently separating billy-goats and goats	Billy-goats and goats to be serviced are kept together
<p>In this system, you bring the goat to the billy only at the moment she is in heat. Thus you know the exact moment at which the goat has been serviced. Determining when the goat is in heat is therefore done by the goat keeper. This task requires much awareness and is not always easy. The danger is present that you do not notice the heat or too late, with the result that you miss a mating period of the goat concerned. You must then wait 3 weeks before you can again present the goat to the billy. If this occurs regularly, the result will be fewer kids at the end of the year.</p>	<p>In this system, only those goats which should not be serviced are kept separate from the billy-goats. Those goats which must get with young can be kept either the whole day with the billy, or kept in the same stall only at night. The advantage of this system is that the billy-goat ensures that no period of heat is lost. The disadvantage is that you cannot be entirely certain whether a goat has been serviced and when that happened</p>

OTHER REPRODUCTIVE ISSUES

Gestation	Birth
<ol style="list-style-type: none"> 1. Only several months after the servicing can you be entirely certain if a goat is with young. Her belly will get larger and you can feel the fetuses and see them move (right flank of the goat). The goat has a gestation period of 145 - 150 days (21 weeks). 2. During this period the animals must be left undisturbed as much as possible to avoid them aborting. Especially during the last six weeks of the pregnancy, you must pay extra attention to the feeding of the future mother goat. Give her your better feed (i.e. feed with plenty of protein and minerals). 3. Eight weeks before the birth, any milk production still remaining from the pregnant goat must be stopped. Wean the existing kids and stop milking (for milking goats). The unborn kid will then continue to grow well and the mother will be able to produce enough milk again after the birth. 	<ol style="list-style-type: none"> 1. The birth is announced several days before the event by the swelling of the vulva and udder of the goat. 2. On the day of the birth, the goat becomes restless and will alternate between standing and lying down. She no longer drinks or eats; her udder is very tense. She sniffs at kids in her neighborhood. The goat will isolate herself from the herd and will, for example, stand in the corner of the stall. 3. The vaginal secretion (a slime which protects the birth canal against infections) hangs as a long thread of slime out of the vagina. Usually the goat lies down now, but a standing birth is also possible. The contractions increase in number and intensity. 4. At the moment of birth the opening in the cervix and the vagina widen. 5. The kid is surrounded by two bladders (membranes): the inner membrane is the food bladder and around that is the water bladder. These are squeezed out first. These bladders must not be punctured as they help stretching and widen the birth openings. 6. Eventually the bladders burst one after the other. With a normal positioning, first the two forelegs and later the head of the kid become visible (still covered by the inner membrane). The rest of the kids body follows in short time, being squeezed out by the continuing contractions.

Cross breeding

To improve hereditary properties, use is sometimes made of crossing local goat breeds with other breeds to more rapidly achieve a certain result. However, care should be taken in doing so; the new breed may not be well adapted to the local conditions and the end results are minimal or maybe worse. The animal with which a cross is made may be more susceptible to locally occurring diseases or need better feed than is locally available. First look at the results of others in the area around you (country, region) who have tried the same cross. Breeding goats is an enjoyable and useful occupation, which you will get better at the more experience you have. Do not be discouraged if the first results are not those desired.

CARE AFTER BIRTH

In general, the goat is very well capable of caring for her new born kids and if the birth happens without problems, the little ones can already start grazing with the herd the day after the birth. Still it is a good idea to keep an eye on how the birth progresses and how the young are coping. Problems may occur and your help and care might be needed.

OTHER RELATED ISSUES

The afterbirth	Difficult births
<p>The afterbirth usually lets go within twelve hours and is forced out by contractions and the pull of membranes which already hang out. For two to four weeks after the birth, some fluid will still be excreted from the uterus. This is how the uterus cleans itself. The flow of fluid changes colour, from red to brown to clear. If it does not become clear and/or it stinks, then there is an infection of the uterus. The infection must be cured using antibiotics. Internal disinfection of the uterus using a salt water solution (one teaspoon of salt per liter of water) is also possible.</p>	<p>If a goat has been showing signs of wanting to give birth for a long time and she has strong, continuous contractions but no kid is being born, you must intervene. Regularly contractions exhaust the mother animal. Probably the kid is lying in such a position that it cannot come out, despite the contractions and the pressing. You can help the goat by turning the kid in the womb, so that it lies in a suitable position for being born. To do so, you (or better somebody who is experienced) must carefully (!) insert your hand and arm into the vagina and birth canal. Feel in what position the kid lies in the womb, the following positions can occur:</p> <ul style="list-style-type: none">✓ The kid is lying with its hind legs towards the vulva is impossible to change its position. In this case, the kid should come out backwards (breach birth); the birth should not take too long because if the navel cord breaks and the kid still has its head inside the mother goat, it may suffocate.✓ The kid lies backward with folded legs or the head of the kid is turned . In these positions it is necessary to first carefully push the kid back towards the uterus, where there is more room to unfold folded legs or turn the head or turn the whole body. Push in between the contractions when the goat is not squeezing. Remember also that the birth canal points down and that you must therefore never pull upwards towards the tail. <p>Note: The tissue in the animal is susceptible to wounds and infections. Therefore it is important that:</p> <ul style="list-style-type: none">✓ someone with small hands does this;✓ nails are cut short and are not sharp;✓ all rings are taken off;✓ the hand and arm to be inserted are washed well and disinfected;✓ a lubricating fluid is used.

DAY TWO: FRIDAY, 3rd MAY, 2024

ACTIVITY 7: HOUSING UNIT OF A DAIRY GOAT& FEEDS ESTABLISHMENT

A dairy goat house should:

- ✓ Be simple and of local materials as much as possible.
- ✓ Be built using a plan provided by the Department of livestock Development.
- ✓ Well ventilated for good air circulation
- ✓ Well roofed – Corrugated iron sheets/ polythene papers or grass thatched.
- ✓ Should be built against the wind direction.
- ✓ In well-drained soils.
- ✓ Have a slatted floor of 3x3 inches timber with 1 inches gap to allow dung pass through.
- ✓ The floor should be raised 2 feet above the ground.
- ✓ Should have several compartments as per the age groups – Buck, Doe, and kids
- ✓ The house should provide facilities such as- sleeping area, walking area, water and feed troughs and a mineral box.
- ✓ Be easy to clean and maintain good hygiene always.
- ✓ Apply used motor oil to the unit timber against wood weevils on yearly basis

Fodder establishment, management and conservation

Objective

- Planting of fodder ensures year round feed availability and reduced production costs.
- Every farmer must strive to obtain at least 70-80% of total roughage from within the farm.

Common fodder types for dairy goats in Igembe Sub- Counties	The most common fodder types include
<ul style="list-style-type: none"> • Napier grass • Fodder trees- calliandra & leucaena • Boma Rhodes • Brachiaria • Fodder maize • Natural grass • Farm weeds • Farm by products • Sweet potatoes vine • A banana leaves 	<ul style="list-style-type: none"> • Napier grass – KK I & KK II • Fodder trees – calliandra & Leucaena • Fodder maize as silage • Boma Rhodes – in domestic and commercial production

Establishment of fodder crops

Napier grass	Fodder trees
<p>Land preparation – Prepare land to a fine field like you are planting maize. Napier grass is established as pure stand, contour line or Tumbukiza method.</p> <p>Planting material Canes or root splits</p> <p>Spacing 3 x2 feet, plant canes sloping at an angle of 45° to the ground.</p> <p>Tumbukiza method Dig holes 2x2x2 feet dip -fill the hole halfway with Soil and manure, then plant 4 canes per hole.</p> <p>Contour lines Plant along terraces for control of soil erosion. Spacing should be 2ft between the plants.</p> <p>Weed control Regular weeding is necessary. Avoid use of herbicides in weed control in fodder establishments.</p> <p>Cutting time First cutting is possible after 60-90 days in an ideal climatic condition. It should be cut 1-2 inches above the ground.</p> <p>Fertilizer Application Requires Nitrogen replenishment at a rate of 100kg CAN per year per acre Manure should be dug into the ground to avoid nitrogen losses.</p>	<ul style="list-style-type: none"> ▪ Calliandra & Leucenia seeding are available from the forest department nurseries especially at Farm nurseries – Igembe south sub-county ▪ The seedlings can be planted strategically along the border lines as a hedge or intercropped with Napier grass. ▪ The seedlings can be raised in a nursery and then transplanted to the intended place at 20-30 cms high. I.e. 3-4 months ▪ These are good nitrogen fixtures in the soil ▪ The seedlings are planted in holes 5 cm deep. ▪ A handful of well cured manure and 5-10 grams of phosphate fertilizer per hole is used during planting time. <p>First cutting</p> <ul style="list-style-type: none"> ▪ Maintain the bush at 1 meter high to allow stem and branches development. The young shoots can be harvested at 40-50 days internal. <p>Feeding: The fodder tree leaves and stalks are of high protein value. They should make at least 30% of the daily total roughage to the dairy goat.</p> <p>Conservation Feed is conserved during times of plenty. After the rains there is over production of fodder hence the surplus should be conserved for a needy day.</p> <p>Other legumes</p> <p>Lucerne: This is a leguminous fodder established on a pure stand plot. The spacing on establishment is 30cm between rows. It is harvested when it flowers pinkish. It can be fed green or dried in shade and stored as hay.</p> <p>Desmodium This is also a leguminous fodder that is intercropped with Napier grass and harvested and fed to livestock together.</p>

Conservation methods

Method	Process
Silage	This is fermentation of thick stem and high watery feed like Napier and green maize. To understand the process a practical demonstration is necessary at farm level.
Hay	This is the dried thin stemmed grasses or foliar from thick stemmed grasses. Drying under a shade removes excess water and the dry content of the grass remains for baling. These are baled or stored as loose hay. Drying prevents rotting thus preserving the grass.
Standing Hay	Napier grass can be left for a long time in the field only to be harvested during time of need. However quality is really compromised hence requires a lot of supplementation.
Fodder trees	The tree stalks can be harvested dried under the sun. Put in bags and stored in a sheltered store. This can be mixed with wheat bran at a rate of 2kg dry fodder tree leaves and 8kg wheat bran to supplement the normal roughage
Maize	Yellow maize is the preferred type for silage making. The seeds are planted in rows 50cm apart and seeds drilled at 10cm apart. The harvesting takes place when the maize is at milk stage for low lying areas. In Nkiiri and Akui areas it takes 65-80 days to mature under irrigation.

Silage making process:

This skill is best understood when demonstrated practically at farm level.

Boma Rhodes

- This grass is harvested and fed to livestock while green or harvested, dried up and stored as hay to be used during the dry season or time of need.
- Land preparation is done in time and soils well manured harrowed.
- Seed rate should be 3-4kg/ acre broadcasted or drilled in small furrows of 30cm apart during the rains.
- Weeding should be done manually.

Harvesting

- First harvesting is between 70-90 days after planting. The grass can be fed green or dried and conserved in form of hay bales.

Feeding of a dairy goat

- A dairy goat needs nutrients for its maintenance, mobility, growth, reproduction and milk production.
- The goat is a ruminant (animal that chew cud) and possess a large rumen which is full of micro-organisms which help in converting roughage into usable nutrients.
- The healthy co-existence of these micro-organisms with host goat is a well-balanced equilibrium and must always be considered when feeding.

Nutritional needs

- Energy and protein are the two major requirements for feeding dairy goats.
- Energy is the most common nutritional deficiency limiting productivity, whilst protein is a vital requirement for growth, pregnancy and milk production.
- Good pastures and fodder provide adequate protein for these needs.
- Roughage has a low energy density and high fibre content. Straw and maize husks are examples of roughages. Roughages are usually cheaper.
- Concentrates have a high energy density and low fibre content. Rice bran and maize flour are examples of concentrates, Concentrates are usually expensive.

NB

Feeding value: this is a general term which refers to the overall nutritional value of food.

Other nutritional needs:

- Major minerals- calcium, phosphorus, potassium, some minor minerals (eg copper, iron, selenium, cobalt) and vitamins are essential feed components but are rarely limiting factors if grazing or green feed is provided.

NB

- Fresh water should be provided at all times to dairy goats.
- To produce lots of kids and milk feed them well.
- Pregnant and milking goats need extra feeding.
- The last month of pregnancy, dairy goats need twice as much energy, protein and protection as normal.
- Do not let them start using up their body reserves as their kids and future milk production will suffer.
- Level of feeding depends on
 - Size of goat
 - level of activity
 - Production level.

DAY THREE: SATURDAY 4TH MAY, 2024

ACTIVITY 8: KIDDING

This is the birth of young goats - Kids

It takes 5 months for a goat to give birth after it has been served, by a male

Preparation for kidding

There are three very important rules for kidding.

- ✓ **Rule 1:** Ensure the kidding doe is put in a dry clean and quiet place at the time of kidding.
- ✓ **Rule 2:** The kidding place should be under a shelter (in the house) or shade. This is to protect the kid from too much sun
- ✓ **Rule 3:** The Doe must have water as soon as she has given birth so she can make sure she has enough to balance the loss of water from giving birth and to have enough milk to feed the new born. Kidding should be done where you can see what is happening easily and often.

OTHER ISSUES ON KIDDING

Signs of kidding	Kidding process	Helping the doe during kidding
<ul style="list-style-type: none"> ✓ Enlarged vulva ✓ Restlessness of the doe ✓ Doe seeks a quiet place away from other goats ✓ Udder is enlarged, full and firm ✓ Muscles either side of tail will become sunken and on either side of tail a hollow appears ✓ Often stand or lie down and stretch her neck pointing her head skyward. ✓ Will have a clear discharge from the vulva 	<ul style="list-style-type: none"> ✓ Keep the kid in a cool dry place away from too much heat and draught ✓ Disinfect the navel immediately using a disinfectant e.g. dettol or Tin cure of iodine ✓ Ensure kid suckles colostrums within 20-30 minutes after birth ✓ Stimulate mother-kid bond by encouraging mother to lick the kid ✓ In case of breathing problems ,help by tickling the tongue, and removing all mucus from the nostrils 	<p>Try and make sure everything is as clean as possible</p> <ul style="list-style-type: none"> ✓ Normally goats do not have problems giving birth or kidding but sometimes a kid may get stuck during the process of birth ✓ If you need to help then be sure that before doing so that you wash hands with dettol, make sure nails are cut and remove any jewelry – like rings ✓ If you can get proper plastic gloves use these to protect yourself and the goat from infections ✓ When helping kids to be delivered be gentle and make sure you understand the problem before exerting any force ✓ Be careful when pulling the kids legs that the head is forward and down ✓ Be careful that you are dealing with one kid at a time and not holding one foot from two kids

Kid feeding regime

Age in weeks	Kids rearing practices	Doe (mother) Milking
1-2 weeks	<ul style="list-style-type: none"> Suckling colostrum at free will Kid stays with the mother all the time-i.e. day and night 	<ul style="list-style-type: none"> Milk the doe in the morning and evening to clear the udder. Provide good quality fodder, water, mineral and concentrate.
2-4 weeks	<ul style="list-style-type: none"> Separate kid at night Provide kid with good quality fodder at night in the kid pen, Kids stay with mother daytime throughout. Fodder and water available to the mother during the daytime. 	<ul style="list-style-type: none"> Milk the doe in the morning ONLY. And empty the udder in the evening
6-12 weeks	<ul style="list-style-type: none"> Separate kid from mother day and night. Kid suckles morning and evening only. Provide good quality fodder, water and minerals in the kid pen. Deworm kid 	<ul style="list-style-type: none"> Milk the mother empty after each suckling.
12-24 weeks	<ul style="list-style-type: none"> Separate kid from mother day and night. Provide kids with good quality fodder, water, minerals and concentrated. Wean the kid gradually 	<ul style="list-style-type: none"> Milk the mother in the morning and evening

NB- As from 2 weeks of age feed kids with supplements at 50-200gms per day per kid.

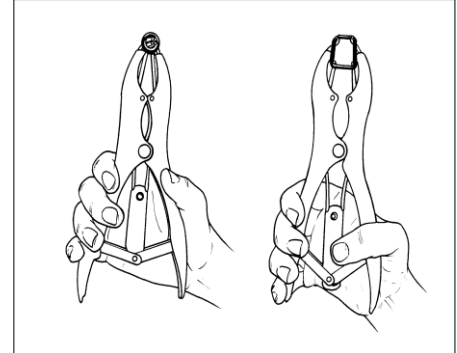
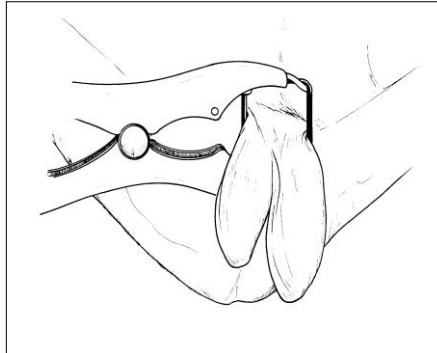
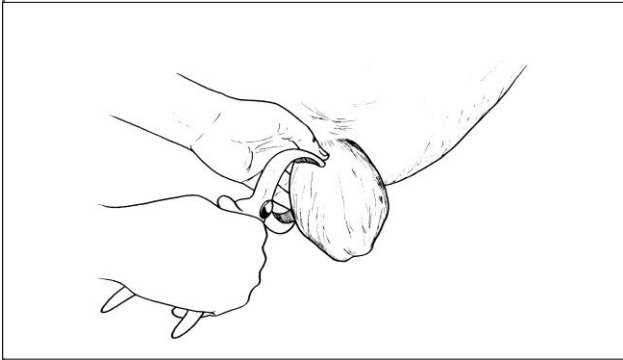
- De-worm regularly

ACTIVITY 9: HUSBANDRY TECHNIQUES

Once the kid is born there are a number of things to be done

Disbudding	Castration
<ul style="list-style-type: none"> ✓ This is removal of very young horns that have not grown ✓ Usually done first to second week of age ✓ Should be performed by a vet using a hot iron under general anesthesia using a drug called SAFFAN 	<ul style="list-style-type: none"> ✓ Male goats that will not be bred should be castrated early in life (in the first 2 months) and kept for meat ✓ Can be done by use of rubber rings, burdizzo castrator, or open methods <p>Rubber rings A2</p> <ul style="list-style-type: none"> ✓ Using an applicator insert the Rubber to the testis as shown, make sure it is as high as possible ✓ Make sure the testis are in the scrotum, below the ring and release carefully ✓ This can be done on farm after a little practice

Burdizzo Process



Burdizzo B2

- ✓ Hold the spermatic cord with your fingers right at the top, one testicle at a time
- ✓ Clamp the Burdizzo on one cord and press the levers to snap it. Repeat for the other testicle

Open methods

- ✓ It's complete remove of testis by an operation
- ✓ This is an operation that you can request your vet to perform for you in cases of trouble

ACTIVITY 10: FEEDING PRACTICES OF GOATS

1. The goats are left free to find their own food

The goats find their own food, they are browsing, grazing, or on tether. If the rangeland is fresh and green they should normally find enough for their needs by browsing and grazing.

2. Goats are free-range, extra food is given

The goats can be left to forage free-range for part of the day but are brought in to be fed the main part of their ration. The browsing supplies some of the goats. needs, but manual feeding provides the greater part.

In the dry season free-range goats will only find dry vegetation or crop residues in the fields. These may supply some energy, but the protein content is very low. Even by cutting and carrying such foodstuffs to enclosed animals it will be hard to meet their requirements.

Nutrition and feeding	Supplying the essential requirements
<ul style="list-style-type: none"> ✓ Goats are essentially browsers. They can feed themselves off trees and bushes in places where there is not enough vegetation for sheep and cattle. Their tongues and flexible top lips make it easy for them to pick leaves from between the thorns. They will even eat bark and exposed roots. ✓ Goats can keep themselves in reasonable condition in difficult circumstances, because the first part of their stomach system. ✓ Their digestive system is actually an adaptation to drought. Their liking for tree leaves also means that they have an extra supply of protein, with the result that they are usually in better condition at the end of the dry season than sheep or cows who can't make such good use of tree leaves. ✓ It is particularly the pregnant and milking nannies that need extra feeding. In the last month of pregnancy they will need twice as much energy and protein as normal. Don't let them start using up their body reserves, as their kids and future milk production will suffer. Once nannies start producing milk they will continue to need quality feed. Without it they will lose weight, using up their body reserves. This means that their milk production will drop. If this happens you will probably not be able to get their milk levels up again. 	<p>Water</p> <p>Although goats obtain some water from the natural moisture in their food, this will rarely be enough. This is especially so during the dry season when the feed is very dry. Dry grass or straw only contains 10 -15 % water. As temperatures rise, goats lose more and more body water, and their need to drink increases. If goats don't find enough water, they will eat less food and their production will drop.</p> <p>In the wet tropics, on the other hand, feed can actually contain too much moisture (more than 80 %). This can result in inefficient digestion and the goats will have to eat tremendous amounts to take in sufficient nutrients. Goats need between 3 and 8 liters of clean water per day. Milking goats need plenty of water (milk production makes all the animals organs work at peak performance), whilst meat animals will need less Water goats once a day and at a regular time, so that they develop a routine and learn to expect it. The temperature of the water itself is also important. The cooler it is, the less they will need and the more they will eat. So keep the water cool and change it frequently so that it does not heat up. This will also keep the water clean - this is important as goats will refuse dirty water.</p> <p>Minerals</p> <p>Goats cannot live without minerals. Salt, calcium, phosphorus, and trace elements like iron, copper and iodine are very important. They not only help to maintain and regulate the bodily functions, but they also strengthen the teeth and bones. They are also especially important for young kids, and for pregnant and milking nannies. A lack of minerals will lead to a poor appetite, a dull coat, poor growth and reduced fertility. An animal will lick all kinds of objects and even try to eat them in the search for extra minerals. Remember that a goat will first draw on its own body reserves to compensate for any deficiency. This means that you may only begin to notice the problem long after it has set in. The best way to avoid mineral deficiencies is to supply as varied a diet as possible.</p>

FEEDING SITUATION FOR GOATS

Many factors affect the nutritional requirements of small ruminants: maintenance, growth, pregnancy, lactation, fiber production, activity and environment. As a general rule of thumb, sheep and goats will consume 2 to 4 percent of their body weight on a dry matter basis in feed. The exact percentage varies according to the size (weight) of the animal, with smaller animals needing a higher intake (percentages) to maintain their weight. Maintenance requirements increase as the level of the animals' activity increases. For example, a sheep or goat that has to travel a farther distance for feed and water will have higher maintenance requirements than animals in a feedlot. Environmental conditions also affect maintenance requirements.

THE GOATS DIGESTIVE SYSTEM

To understand why goats have a special need for protein it is necessary to understand how they digest their food. There are two main stages in the digestive process:

- ✓ The high-fibre food or roughage. eaten floats as a thick layer on the fluid in the goats rumen. This fluid is home to countless microorganisms who start breaking up the coarse plant material. These microorganisms themselves live off the fibrous food that the goat eats. They need fibrous food and nutrients to function well and multiply. They live and die in the rumen, and their remains become an important source of protein for the goat.

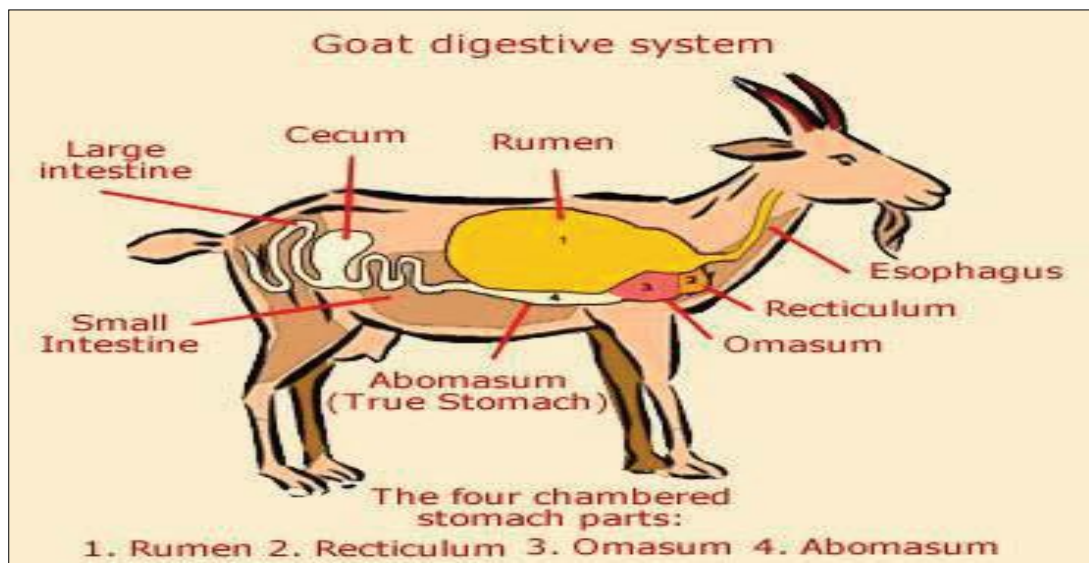
- ✓ After the food has passed through the rumen, the rest of the digestive system starts to work on what remains to be digested - principally those nutrients that escaped the rumen process, plus the remains of dead and dying micro-organisms. This is all then absorbed into the blood, which carries the nutrients to the other parts of the body.

ACTIVITY 11: HEALTH, DISEASES AND PARASITES

Prevention is better than curing

Just as in human health care, the rule applies. It is better to prevent than to heal.. It saves a lot of money and unpleasantness if goats are and remain healthy, because of good care:

- ✓ Insufficient or incorrect feeding weakens animals and can cause serious disorders (for example bloat).
- ✓ Incorrect management of pasture, whereby the goats graze too often successively on the same pasture, increases the contamination of the pasture with parasites (worms, ticks). The degree of infection with these parasites will increase



Characteristics' of a healthy goat

- ✓ Goats are generally energetic animals and walk at a good pace. They are curious and have a bright look in their eyes. They have a good appetite and chew their cud when they have eaten enough.
- ✓ The coat should be smooth and shiny, and the animal should not be skinny.
- ✓ If you look more closely at the appearance, start with the mucus membranes; these are good indicators of the general condition. A healthy animal has pink mucus membranes of the eye, mouth, nose and vulva (only females).
- ✓ One of the most important life functions is the good intake and digestion of feed and water. A good intake can be judged on the basis of the eating habits of the goat, a good digestion can be seen by the dung: many round and firm droppings.
- ✓ Other life functions are good blood circulation, breathing and urination: the result of heart, lung and kidney processes. The heartbeat of a healthy resting animal is, respectively for a young, yearling and mature goat, 110-120, 80-120 and 70-80 times a minute. The heartbeat is raised by high production levels or in highly pregnant animals.
- ✓ A good functioning of the lungs can be seen by calm breathing: young, mature and old animals respectively 12-20, 12-15 and 9-12 times a minute. The proper functioning of the kidneys is seen by clear, yellow urine.
- ✓ A practical indicator of the health is the temperature. By holding a thermometer for at least one minute in the anus of an animal, its temperature can be measured. Young goats have a high temperature (up to 39.0 °C = 102.2 °F). Among mature goats their temperature is about 38.5 °C (101.3 °F). Also during the first few hours after eating a ruminant can have a higher temperature.
- ✓ The milk production, finally, is a characteristic life function of goats. A healthy udder is soft and supple. Just before kidding it can swell up and harden without in fact being infected. The milk should have a homogenous consistency and must not smell strange.

Diagnosis of a sick goat

- ✓ As we assume that you have a basically healthy herd, a sick goat will be noticed as it differs from the rest of the herd. Especially for acute (quickly developing) diseases, the symptoms are often obvious. The condition of the animal suddenly changes. Rapid intervention is necessary because acute can also mean fast declining; in that case you will lose your goat.
- ✓ With chronic (long-lasting) diseases the symptoms are not as obvious. Sometimes you will only notice that a goat is getting thin and produces less. Such diseases are therefore difficult to detect. By comparing with other goats within the herd and of neighboring herds, you should be able to see whether or not you are dealing with a chronic disease.

ACTIVITY 12: TYPE OF DISEASES, SYMPTONS & TREATMENT

TYPE OF DISEASES& CAUSES	SYMPTOMS	TREATMENT
<p>1. Peste des petits ruminants (PPR; Small ruminants pest) This disease, which resembles cattle pest, is caused by a virus and is found especially in Africa. Infection takes place by inhaling the virus which is released together with the nasal mucus of sick animals.</p>	<p>After an incubation period of 4-5 days, 6-8 days of high fever follow. Decomposition of tissue in the mouth, inflammation of the mucous membranes with excessive nasal mucus production, diarrhoea. High death rate within one week. Secondary lung infections. Especially affects young animals.</p>	<p>preventive vaccination is best. Treatment of sick animals is too expensive but possible in an early phase. Slaughtering is better. Limit the mobility of the animals to prevent the disease from spreading. Secondary lung infection can be treated with medicines.</p>
<p>2. Contagious caprine pleuro-pneumonia (CCPP) This form of contagious lung infection, caused by the mycoplasma (small, one-celled) <i>Mycoplasma mycoides var. Capri</i>, is spread by drop infection (nasal mucus). When kept permanently stalled, the entire herd can be infected. Death rate can rise to 100%.</p>	<p>Rapid breathing with coughing. The animal groans when breathing out and usually secretes much nasal fluid. High fever.</p>	<p>Preventive vaccination, arsenic preparations and antibiotics</p>
<p>3. Pasteurellosis- Pasteurellosis, too, is a contagious lung infection, caused by two types of <i>Pasteurella</i> bacteria. Affects goats, sheep and cattle. Spreads by drop infection, usually only several animals per herd. Stress (for example during transport) stimulates the outbreak of this disease.</p>	<p>Rapid breathing with coughing. The animal groans when breathing out and usually secretes much nasal fluid. High fever.</p>	<p>Sulphonamides and antibiotics. Vaccination only has a limited effect. It is most effective to avoid stress by treating animals gently.</p>
<p>4. Haemorrhagic septicaemia Caused also by <i>Pasteurella</i> bacteria (<i>P. multocida</i>). All ruminants can fall victim to it. Especially in humid lowland tropics or at the start of the wet season. Spreads through drop infection. After having passed through a number of victims, the bacteria is more virulent. Stressed animals are more susceptible. Death rate: 80-90 % of the animals infected.</p>	<p>Incubation period 2 days, after that high fever, no appetite, rapid breathing, strong saliva production, rapidly developing eye infection, mucus membranes red and swollen. If the disease is less acute, symptoms are: infection of throat and tongue. Suffocation is possible. Bloody diarrhoea in later phase of the disease.</p>	<p>There are various preventive vaccinations, to be given 1-2 months before the hot/wet season when the disease manifests itself strongly. Sulphonamides and/or antibiotics for curative use</p>
<p>5. Foot-and-mouth disease This viral disease affects, as the name implies, mouth and hooves of goats. The disease is transmitted by direct contact,</p>	<p>Incubation time 3-8 days, followed by excessive saliva production and frothing at the mouth. Small blisters are formed in the mouth, on the legs</p>	<p>Preventive vaccination is possible. If only isolated groups of goats are affected, slaughtering those animals is an effective way of limiting further spreading of the disease. If there is widespread</p>

via contaminated food, by the wind or by birds.	and on the liver. The goat has difficulty walking and limits its own movements. Animals do not die from the disease, but their production is stopped for a number of weeks.	contamination, slaughter is not a realistic solution. Quarantine of sick animals, disinfection of all animals (foot baths) and immobilization of animals at district or provincial level.
6. Anthrax Anthrax is sporadically found among goats. Cattle, sheep, pigs, horses and humans are susceptible to this disease. The organism causing the disease is the bacterium Bacillus anthracis. Transmission via water and food which is contaminated with blood and excrement.	Incubation time 1-3 days or more. Initial symptoms are very high fever and sudden death. After death, blood flows from the body's openings.	Annual vaccination campaigns (preventive) are very effective. Antibiotics (curative) are also effective, but due to the rapid development of the disease treatment is often too late. To avoid the disease spreading, carcasses of dead animals must be completely burnt or buried in unslaked lime (quicklime) 2 meters underground. This is to prevent possible spreading via scavengers (also dogs).Autopsy to determine cause of death to be done only by highly specialized personnel because of high risk of infection. Better when animals suddenly die to assume it is caused by Anthrax (if there is reason to suspect this) and to take the appropriate measures described.
7. Ecthyma Especially in the humid tropics, this disease often occurs among goats. Usually it is not serious. The disease is highly contagious through direct contact.	Sores in and around the lips. Due to sores growing and merging, at a certain moment goats can no longer eat and rapidly get very thin.	Isolation of contaminated animals and frequent disinfection of the sores.
8. Brucellosis This form of infectious abortion which is infrequently found among goats is especially well known as it can be transmitted to human beings. The disease is known as Malta fever. It is caused by bacteria of the type Brucella, in particular Brucella melitensis.	Abortion takes place in goats as a result of Brucellosis, but the goat is not necessarily obviously sick. The infection does, however, remain and the carrier does not get young. There is a danger that the Malta fever is transmitted to humans if they drink contaminated milk.	Vaccination is possible. Always think of the possibility of Brucellosis if abortion occurs in a goat. If possible, let a milk sample be tested for the presence of the bacteria. For your own protection, boil the milk before use.
9. Mastitis Mastitis or udder infection is a disease found all over the world. Both acute and chronic forms are found. Bacteria of the type Staphylococcus and Streptococcus are usually the cause. In particular poor hygienic conditions in the shed and unhygienic milking promote the disease. Production decreases strongly among affected animals and the milk is not suitable for human consumption.	Sick animals have a swollen udder, sometimes it is only partially affected. The milk can become lumpy and stinking. The goat does not permit its young to drink and is unwilling during milking.	milk the infected udder empty as often as possible and massage it, at least seven times a day. Inject antibiotics into the udder via the teat opening and canal after milking it empty. To avoid passing on the disease, disinfect hands after milking each goat, before milking the next.

Diseases due to feeding mistakes

TYPE OF DISEASES& CAUSES	SYMPTOMS	TREATMENT
<p>1. Bloat An excessive intake of feed which quickly starts to ferment in the rumen causes a sudden accumulation of gasses in the rumen of the goat. Especially limp, recently wilted green fodder which has been heating up for some time on a heap can have this effect. Also tuber crops, which are no longer very fresh, legumes (nitrogen-fixing plants) and sour grasses can have the same effect. The important thing is that goats slowly get used to a new kind of feed. Especially when grazing, bloat occurs more the less used the animals are to fresh pasture and green forage and the juicier the green forage is, for example at the start of the wet season. Wet feed given in the stall or drinking a lot of water after eating stimulate bloat.</p>	<p>The swelling of the rumen can be seen by the sudden and rapid, frequent swelling of the rear of the body, especially in the left flank. The animals do not want to eat any more and do not chew their cud. They are frightened, jumpy, breathe rapidly and become dazed when short of breath. They wobble and finally collapse, after which they often quickly die due to suffocation.</p>	<p>If you do not wish to let things get as far as this, then prevent the accumulation of gasses. Rapid handling is essential. Position the animal so that the front of its body is raised and get rid of the gasses (make the animal burp) by pushing on and rubbing the left flank. You can also try to insert a firm hose into the rumen via the gullet so that the gas can escape. Make sure that the hose does not enter the windpipe! In serious cases, make an opening in the left flank using a trocar (thick, hollow needle) or if necessary even with a sharp knife, through the skin and the wall of the rumen. Leave the trocar or knife in the flank until the gas has escaped. Disinfect the wound.</p>
<p>2. Diarrhoea Here, too, a sudden switch from one kind of feed to another can be the cause: from dry roughage to fresh, wet, young grass for example. Worms, liver fluke or a disease called Coccidiosis can also cause diarrhoea. Young and weak animals are most sensitive to this.</p>	<p>Thin faeces. The animals are listless and eat little or not at all. They drink a lot; they can be feverish. Due to dehydration they can die within several days. In case of worm infections and Coccidiosis it is possible to detect blood in the faeces. Anaemic symptoms (look at the mucus membranes) also indicate worms or Coccidiosis. A laboratory can confirm the diagnosis by checking the excrement.</p>	<p>Let the animals fast for a day, keep them warm and dry. Give them unrestricted access to clean, fresh drinking water. If the animals are too weak to drink, you must force them to do so! One tablespoon of salt and a handful of sugar per litre of water has a positive effect. Mash up some Norit and give a teaspoon twice a day. For worms, see the next section (6.5) on parasites. In case of Coccidiosis treat all animals with sulphonamides, treat also animals who are not (yet) sick. Coccidiosis is very contagious. Good hygiene and preventing overpopulation is the best way to avoid the disease. Allow the animals to graze in the same place only 2-3 days in a row so that they cannot take in an infectious phase of the parasite (it develops in 3-4 days in manure).</p>
<p>3. Mineral deficiencies Minerals such as salt, calcium and phosphorus are important for the proper functioning of the life processes. A shortage is only noticed after the animal has used up its reserves, the deficiencies have then existed for some time.</p>	<p>Decreasing appetite, declining fertility, a dull coat and poor growth. The animal licks at all kinds of objects and even eats them, in an attempt to satisfy its mineral needs.</p>	<p>Always have kitchen salt accessible for goats in the form of a salt lick or such like (described in 4.1). By giving a varied diet, you can generally avoid shortages developing. Mineral preparations are available, but use them with reserve as an excess of minerals can also be harmful.</p>

ACTIVITY 12B: INTERNAL PARASITES

Worms	Ways to avoid infection by worms
<p>Infection with worms is common to occur. Contamination with a few parasites is unavoidable, not to worry about and can even be useful in building up resistance to those parasites. However, too many parasites weaken a goat. The goat is more susceptible to diseases and can even die. Some parasites also transmit diseases. Production and growth decline even while no symptoms of disease show. Only if the infection is severe do the animals suffer from it. Well-fed and cared for animals suffer less from parasites. Worms are found in the lungs, stomach, intestines and liver, and possibly other places. There are:</p> <ul style="list-style-type: none"> ✓ Flatworms, one-segmented, these are worms with head and tail in one segment for example liver fluke ✓ Flatworms- consisting of multiple segments, for example tapeworm. Roundworms, of which only the maw worms are of importance to us. 	<p>Try to avoid continual grazing by many animals. Otherwise a high level of contamination of grazing areas will occur due to larva in the excrement.</p> <ul style="list-style-type: none"> ✓ Management practices, such as rotational grazing, and regular preventive treatment of the animals against worms can prevent any damage from occurring. ✓ As many parasitic worms are host specific, alternating the grazing of horses and/or cattle with goats and/or sheep can lower the extent of contamination of a pasture. Cattle eat the larva of the species which have the goat as host but which cannot harm the cattle and vice versa. ✓ De-worm both mother and kids when weaning and keep the weaned kids separate from the rest of herd on as clean as possible pasture.

NOTE

When treating animals with anti-worm medicines, the prescribed dose and method of administering it must be strictly followed. Overdosing is harmful for the animal. Especially young, weak and pregnant animals are sensitive and it is sometimes better not to treat them. There is often local knowledge about medicinal plants which get rid of worms.

OTHER PROBLEMS ASSOCIATED WITH WORMS

TYPE OF DISEASES& CAUSES	SYMPTOMS	TREATMENT
<p>Liver fluke (fascioliasis) The liver fluke causes much damage. It can grow to at least 3 cm long and 1.3 cm wide. The liver fluke lives in and damages the goats liver. By sucking blood, anaemia is caused.</p>	<p>The acute form (which occurs rarely) is an infection by very many flukes. The liver and stomach get badly damaged. Moisture enters the chest and stomach cavity, seen by the increased girth. The goat becomes sluggish, has difficulty breathing and can die within a few days. The chronic form leads to anaemia, sluggishness and thinning. Only rarely does death occur, in which case dozens of liver flukes are found in the liver.</p>	<p>Apply worm cures which are also effective against young liver flukes. If re-infection might occur, in the wet season or in boggy pasture, repeat the cure every 6 weeks. Treat the entire herd. Prevent infection by avoiding moist places when grazing. Ensure good drainage around the water trough. Do not use any snail-killing chemicals as they are also very poisonous for other animals !</p>

ACTIVITY 13: ACTION PLANS FOR IMPLEMENTATION

ACTIVITY	WHERE	WHEN	HOW/RESOURCE	WHO IS RESPONSIBLE
1. Establish fodder trees /vegetation for dairy goats	All target farmers	May,2024 to June ,2024	Procure seedlings	Farmers Groups Universal/Inguziru groups
2. Construction of dairy goat stables/units	All target farmers	May,2024 to June ,2024	Use local materials /resources	Farmers Groups Universal/Inguziru groups
3. Monitoring fodder & stable construction	All target farmers	May/July,2024	Group meetings Farm visits Compile inventory of farmers complying	Sub county livestock Officer Project Officer- KUMEA
4. Delivery of Dairy Goats	Farmers Group centers	June,2024	Based on groups inventory of complying farmers	KUMEA/Groups Sub county livestock officer
5. Dairy goat management follow up	Farmers	June- December,2024	Group meetings Field visits to farmers	Sub county Livestock officer Project Officer - KUMEA
6. Feeding & Breeding training	Farmers Groups	August/September 2024	facilitation	KUMEA/Livestock department

ANNEX 1: WORKSHOP PHOTOS



1. Principal of Chenzaywe welcoming participants 2, Plenary Discussions



4. Participants follow proceedings

5. Participants participating in discussions

ANNEX 2: TRAINING SCHEDULE & WORKSHOP PROGRAM

DAY ONE	<ul style="list-style-type: none"> • Climate setting • Training norms • Overview of KUMEA & Integrated Rural Development Project • Importance of dairy farming • Breeding of dairy goats 	Project Officer-KUMEA Livestock Officer
	<ul style="list-style-type: none"> • Dairy goat housing. • Construction plan interpretation • Fodder establishment • Energy feeds • Legumes • Fodder trees • Fodder preservation and conservation i.e. mainly hay and silage makin 	Livestock Officer
DAY TWO	<ul style="list-style-type: none"> • Kid rearing • Management of dairy goat at kidding • Kid feeding regime • Kid rearing practices • Doe at milking • Health maintenance of dairy goats 	Livestock Officer
DAY THREE	<ul style="list-style-type: none"> • Common parasites and diseases of dairy goats and their control • Routine management of dairy goats • Action plans /Way forward • Closure and departure 	Livestock Officer Project Officer-KUMEA

ANNEX 3: LIST OF PARTICIPANTS