



Biovision  
Africa  
Trust

# RABBIT PRODUCTION TRAINING MODULE

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## Project Title:

Enhancing food and nutrition, market linkages and resilient livelihoods for smallholder farmers through agroecology in Kitui and Nakuru counties of Kenya with a special focus on women and youth

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## Acronyms and Abbreviations

BvAT	Biovision Africa Trust
SMEs	Small and Micro Enterprises
VSLA	Village Savings and Loans Associations

# Chapter 1: Project Background & Purpose of the Training Module

## 1.0 Background

Food insecurity remains a pressing issue in Kenya, with many communities experiencing limited access to nutritious and affordable food.

BvAT in pursuit of its goal of contributing to alleviation of poverty and improvement of the livelihoods of smallholder farmers particularly women and youth in Kenya and other African countries addresses food insecurity challenges through the dissemination of relevant knowledge and information and building the capacity of farmers and partners for the ecological transformation of agriculture and food systems. The efforts aim to sustainably improve the health and prosperity of people in Africa while conserving the environment.

BvAT believes agroecology is one of the most important nature-based solutions to the challenges of unsustainable food production, land degradation, depletion of soils, frequent droughts, food and nutrition security, and poor livelihoods. However, transitioning to agroecological practices as solutions to these challenges requires knowledge, relevant skills, technologies, and financing. This project will establish, strengthen, and expand agroecological agribusinesses in two counties in Kenya. Successful innovative agribusiness models will be scaled to other counties in the country.

By connecting directly with the Agro-enterprises as off-takers for farmers' produce, the farmers will have access to the markets for their products and market information intelligence on the market demand. The farmers will access funding through affordable and friendly scheme, the Village Savings and Loans Associations (VSLA) model, as well as technical assistance as most of them lack financial literacy to invest in their farms. The VSLAs and small agro-enterprises will enable farmers to benefit from innovation grants and technical capacity-building programs for agro-enterprise development. The farmers and youth targeted by the project will eventually increase their incomes and improve their livelihoods.

In summary, this project aims to promote the adoption of agroecological agricultural practices by smallholder farmers especially women and youth and strengthen their engagement with market linkages in Kitui and Nakuru counties of Kenya. The intervention is expected to lead to increased food and nutrition security, enhanced income, stable livelihoods, and environmental sustainability.



## 1.1. Project Goal & Rationale

The Project aims to promote selected agroecological practices to enhance food and nutrition security, strengthen access to markets and improve resilience of livelihoods by smallholder farmers specifically women and youth in Kitui and Nakuru counties of Kenya.

To achieve this objective, BvAT will promote both crop and livestock production through four strategic interventions namely:

1. Resilient agroecological crop value chains (Indigenous vegetables, legumes, and cereals)
2. Livestock diversification through Apiculture, poultry & small ruminants (Goats and Rabbits) production Revolving Fund
3. Market linkages through development of agro-enterprises (SMEs)
4. Enhance capability to access and control resources through Village Savings and Loans Association (VSLA)

The factors considered in selecting the four interventions are informed by the need to invest in addressing opportunity gaps that are most promising to generate the most benefits to target groups within 3 years.

The project will be a huge relief to smallholder farmers and their families who have been adversely affected by the effects of climate change, Covid-19 pandemic, and the Ukraine-Russia war among others.

## 1.2. Project objectives

- i. Enhance adoption of agroecological farming practices (agroforestry, water harvesting techniques, soil health management, crop diversification, conservation agriculture practices, etc.) among smallholder women farmers and youth.
- ii. Develop a revolving fund scheme of livestock production (small ruminants -improved dairy goats and rabbits) and beekeeping as alternative livelihood sources.
- iii. Enhance capability to access and control resources through the establishment of local-level institutions (VSLAs) for farmers and youth to access financial and market functions/services for supporting agroecological farming transitions.
- iv. Enhance access to markets by smallholder farmers by supporting existing agroecological enterprises (SMEs) to off-take farmers' produce and ensure farmers are making profits from agroecological farming.
- v. Enhance the delivery of project goals and objectives through structured management and monitoring and evaluation.

## 1.3. Purpose Of The Training Module

To kick off the rabbit production activities of the project, Biovision Africa Trust has developed this training module in collaboration with County Livestock Officers of both Nakuru and Kitui Counties. The process involved reviewing various training modules currently used by the counties and other stakeholders, like the private sector and civil society organizations.

The training module will be used to train small-scale farmers supported by the project in the 2 counties. The module will further be used by other projects running in the organization and is open to other stakeholders to use.

Locating this project in Kitui and Nakuru counties in Kenya is justified by several factors, including the potential to enhance food security, improve livelihoods, mitigate climate change impacts, and promote sustainable agriculture. Kitui County has faced recurrent food insecurity due to unreliable rainfall and droughts.

This intervention will help diversify crops and improve soil moisture retention, thus increasing food production. The county is prone to climate-related challenges. Focusing on sustainable water management and soil conservation will enhance resilience to climate change impacts. Soil degradation is also a significant issue in Kitui.

Nakuru County has diverse agroecological zones and agricultural practices, therefore, this project will help maximize the potential of these varied landscapes. Introducing Agroecology will lead to improved soil health and fertility.

Like many regions in Kenya, the county faces the challenges of climate change due to carbon emissions, and thus, this intervention will contribute to carbon sequestration and reduced greenhouse gas emissions.

Nakuru County is strategically located, providing opportunities for farmers to access markets. Agroecology-focused SMEs can help farmers tap into these markets.

## 1.4. Training Modules Outline

### 1. Chapter1: Project Background & Purpose of the Training Module

- *Foodsecurity challenge, BvAT's agroecology approach, project goal, rationale, and objectives, and the module's role in training farmers*

### 2. Chapter 1: Introduction to Rabbit Farming

- *Introduction to Rabbit farming*

### 3. Chapter 2: Rabbit Breeds and Selection

- *Rabbit breeds ,criteria for selecting healthy breeder stock*

### 4. Chapter 3: Housing and Equipment

- *Rabbit hutches structure*

### 5. Chapter 4: Nutrition and Feeding Management

- *Rabbit feeding ,nutritional requirements for healthy growth*

### 6. Chapter 5: Reproduction and Health Management

- *Breeding practices, disease prevention, and parasite control*

## 1.5. Period of Training

This module will be executed within six weeks, with each chapter covering 2-3 hrs. The module will be executed at the group level. Most farmer groups consist of 15-25 farmers

#### **Week 1:** Introduction to Rabbit Farming

- **Focus:** *Introduction to Rabbit farming and farming systems (extensive, semi-intensive, intensive).*

#### **Week 2:** Rabbit Breeds and Selection

- **Focus:** *Meat breeds (New Zealand White, California), dual-purpose breeds (Chinchilla, Dutch), and criteria for selecting healthy breeder stock*

#### **Week 3:** Housing and Equipment

- **Focus:** *Designing predator-proof hutches (indoor vs. outdoor), key equipment (feeders, nest boxes), and maintenance routines (cleaning, disinfection).*

#### **Week 4:** Nutrition and Feeding Management

- **Focus:** *Balanced diets (forage like sweet potato vines, concentrates), feeding schedules for life stages (growers, pregnant/lactating does), and avoiding toxic plants.*

#### **Week 5:** Reproduction and Health Management

- **Focus:** *Breeding practices, disease prevention, and parasite control.*

#### **Week 6:** Field Practical & Consolidation

- **Focus:** *Hands-on training, hutch hygiene checks, and drafting farm plans (breeding cycles, market linkages).*



## CHAPTER 2: INTRODUCTION TO RABBIT FARMING

Domestic rabbit (*Oryctolagus cuniculus*) production is one of the livestock enterprises with the greatest potential and room for expansion in Kenya.

This is partly because with decreasing grazing acreage in the high agricultural potential areas, farmers are being encouraged to keep pigs, chicken, dairy goats, bees and rabbits which require less space (Kiptarus, 2005).

Additionally, the rising cost of agricultural input, high unemployment rate, and malnutrition occasioned by the rising cost of cereal grains have caused poor farmers to resort to rabbit production in many developing countries (Lukefahr & Cheek, 1991; Owen, 1981).

### 2.1 Benefits of Rabbit Production

1. Capital requirement is minimal. With some scrap wood or bamboo, a hutch can be constructed.
2. Spacing is minimal. It can be set up in the backyard.
3. A rabbit is a convenient 'one meal size', thus avoiding the need for storage.
4. Rabbit keeping is not restricted by any taboos or particular beliefs that prevent eating of rabbit meat or its promotion as food.
5. Feeding rabbits is very cheap. Rabbits are able to utilize fibrous forages because they have post-gastric fermentation and practice caecotrophy.
6. Rabbits can be tended by women, children or men unlike bigger animals since it needs no force to be restrained.
7. Because they produce offspring regularly (gestation period of 28 – 32 days), they form a regular source of income.
8. It matures for table between 5 -6 months, breeding (5 – 7 months).
9. Rabbit is a prolific animal.
10. It produces rich manure for gardening and the urine is used as a biofertilizer.
11. Unknown to many, rabbit meat has very superior nutritional characteristics.

Table 1: Rabbit meat characteristics compared to other livestock (% protein and fat)

	Rabbit	Chicken	Lamb	Pork
Protein	21	20	16	12
Fat	8	11	27	45

Source: Gosh and Mandal (2008); Usakowski (2011)



Photo Credit: Freepik.com

## CHAPTER 3: RABBIT BREEDS.

### Dutch:

- The Dutch is a small breed with a mature liveweight of 2.5-3.5kg.
- It has a wide white band of fur around its body at the shoulders as well as a white stripe down the middle of its face.



### New Zealand White:

- This breed is used widely throughout the world for meat production. It is all white and usually weighs 3-5 kg when mature.



### New Zealand Red:

- This is essentially red but has not been intensively selected for growth rate. Mature live weight is 3-4.5 kg.



### Chinchilla:

- This breed is blue-grey in colour with a white belly.
- There is a thick fold of skin around the front of the chest which is very obvious when the rabbit is in good condition and sitting in a resting position.
- The weight range for the mature Chinchilla is 3-4.5 kg.



### California:

- This is the second most popular breed for meat production.
- The colour is all white but with black tipping on the nose, ears, feet and tail.
- The weight range for the mature Californian is 3-4.5 kg.



## CHAPTER 4: HOUSING AND EQUIPMENT.

Rabbit housing and equipment differ from country to country.

Factors that affect their design include;

- Climate
- Raw materials (Availability and cost)
- Scale (large or medium) and system of production (Intensive, Extensive or semi-intensive)
- Expertise in rabbit production

### Housing requirement

Housing should be able to provide:

- **Adequate space:** Since a rabbit spends its entire life in its hutch, it therefore needs sufficient space to avoid the stress caused by restriction of movement. Space should be able to provide good ventilation to prevent the animal from being choked up by ammonia (NH<sub>3</sub>) from their urine.
- **Protection:** Housing should be able to prevent the rabbits against injury within the hutch, rain, direct sunlight, direct and indirect wind and predators such as dogs, cats, rats, ants, man, etc.

### Types of cages/hutches

#### Indoor hutches/cages:

These are kept inside a house (stable). The stable is a place in which or under which the hutches are placed.

#### Advantages

- It provides good conditions for the rabbit and the rabbit keeper
- Easy access to animal (even when there is rain or high sunlight)
- For animal adequate protection
- The individual hutch can be easily cleaned and disinfected
- It allows easy increase in production

#### Disadvantages

- It is an expensive rabbit hutch



#### Outdoors hutches/cages:

The requirements of space, protection and ease of management can be achieved through appropriate design, construction and siting.

**Design:** A typical rabbit hutch's dimensions are as follows;

- 1m above the ground
- Height of hutch: 60cm at the front, 50cm at the back for easy drainage
- Width: 50-60cm
- Length: 90-120cm

**Construction:** The materials used in construction would usually be locally available materials

**Siting:** Common aspects of the siting include the following;

- It should be placed near a house wall / fence to provide shade and protection (from sunlight, rain and wind).
- It is important to site hutches under trees in a very hot environment
- The site must ensure security against predation. This is achieved when hutches are kept near the keeper's house.

#### Advantages

- It requires low capital
- Materials are locally available
- Appropriate when starting production

#### Disadvantages

- No perfect protection against a predator
- Difficult to clean
- Not easy to increase the number of hutches quickly (it limits production)

### Housing Equipment

Water trough, Feeder, Kindling (nest) box, Forage / Roughage rack and Water/Feeding Trough

The material for water/feeding trough should provide the following;

- It should be impossible to tip over
- Deep enough to discourage scratching out the contents
- It must not cause injury to the rabbit
- It should not be expensive to prevent increase in cost of production
- Roughage / forage rack (it can be fitted inside or outside of the hutch)
- It must not limit feed intake
- It must contain fresh succulent forage

### Nest box

- This can be open or closed. An open top 12" x 18" x 10" plywood box works well. This comes in when the animal is about to kindle.
- It should not be placed until the animal is about to kindle
- It should be draught free/ proof
- It should prevent the young rabbits leaving until they are at least 2-3 weeks old.

### Maintenance of equipment

1. Water and feeding trough must be washed regularly (daily)
2. Use clean rag (cloth to dry the feeder)
3. Disinfection of the water and feeding trough at least once in a week to remove feed adhered to feeder and prevent disease outbreak.
4. Roughage rack and cage must be cleaned once in a week and disinfect when young ones are not there.
5. Checking for the development of sharp edges in hutches and on equipment which may cause injury.
6. Nest box must be removed after weaning (5-6 weeks), wash and disinfect in preparation for the next breeding season.



## CHAPTER 5: RABBIT FEEDING AND NUTRITION

Success in rabbit production is impossible, if one does not give enough attention to its diet and provide wholesome feeds in adequate quantity every day.

- Feed is one of the most expensive inputs in rabbit rearing.
- The health and vigour of the rabbits depends on how well one feeds them.
- The rabbits MUST get all the protein, energy, vitamins and minerals required for their growth and development.
- Rabbits are fed according to the different stages of development and function they perform

Based on their dietary needs, rabbits are divided into the following four classes:

1. Growing and fattening rabbit
2. Resting does (non-pregnant and non-lactating female rabbits) and bucks (male rabbits)
3. Pregnant does
4. Lactating does

### 5.1 NUTRITION

#### Carbohydrates and Fats

- Carbohydrate and fats provide energy.
- It is worth knowing that rabbit adjust their food intake to try and satisfy their energy requirements.
- A general recommendation of energy requirement for breeding rabbits is 2600-2700 Kcal DE/KgDM.

#### Minerals

- Most of the minerals in the rabbit's body are in the bones and teeth which contain large amounts of the two minerals; Calcium (Ca) and Phosphorus (P).
- These minerals help to give the bones their hardness.
- They are also involved in maintaining the acid-alkaline balance in the blood.
- Phosphorus also involves in energy transfer within the body cells. Ca, P, and Vitamin D are often considered together because they interact with each other.
- Other minerals are Mg, Na, K, and Cl (major minerals). Examples of trace minerals are Fe, Cu, S, Co, Zn, etc.

### Nutrition Requirements of Rabbits

Sl.No	Nutrients	Growth	Maintenance	Gestation	Lactation	Breeder buck
1	Digestible energy (Kcal/kh concentrate)	2500	2100	2500	2500	2500
2	Crude fibre (%) (Upper limit)	10-12	14	10-12	10-12	10-12
3	Crude protein (%)	16-18	12	15	17	15-17

## Vitamins

- Vitamins are chemicals that are require in very small amount to speed up chemical reactions within the rabbit body.
- The most important vitamins are vitamins A and D and the B vitamins, Choline and Thiamin.

## Rabbit Rations

- Rabbit ration consists of two types of feed: concentrates and roughage.
- In order to provide a balanced diet to the rabbit, it is necessary to keep a balance between the concentrates and the green roughage.

## Concentrates

- The concentrate is a mixture of energy feed, consisting of grains and husks of cereals and millet, and protein feeds consisting of legumes, byproducts of legumes and oil cakes.

## 5.2 FORAGE

Forages are essential for their roughage and vitamin value. In addition, forages greatly economize the amount of concentrate feed.

Examples of fodder plants

### 1. *Amaranthus* spp.

- This forage has a 20% protein content.
- It can supplement a concentrate containing 39.5% maize grain, 26% maize bran, 34% groundnut cake, and 0.5% salt.

### 2. Groundnut

- Groundnut tops provide green forage and has a high protein content.
- The tops can also be used after the groundnuts have been harvested, but their protein content is less:
- it is about 15% before the groundnuts are removed and less than 10% after threshing.

Requirement of Concentrates		
Sl No.	Category of rabbits	Amt. Of concentrates (in gm)
1	Weaners (6-10 week)	50-100
2	Growers (10-12 weeks)	120-240
3	Maintenance (resting) bucks and does	120
4	Pregnant does	240
5	Lactating does with litters (average 8-10 bunnies)	480

### 3. Water hyacinth

- Rabbits will eat the leaves and bulbs of water hyacinth, but only 24% of the carbohydrates present is digestible.
- Incorporating 25% water hyacinth meal in a balanced feeds gives good results.

### 4. Lucerne

- Lucerne is a standard rabbit forage. Breeding and growing rabbits can be fed solely on green Lucerne as forage. The hay is harder for them to ingest.
- Lucerne's rather high saponin content makes it especially palatable to rabbits.

### 5. Banana

- Rabbits can be fed on banana rejects. Bananas are rich in energy but poor in protein content (5-6%).

The leaves with higher protein content (10-11%) can also be used as green forage.



kales (*Brassica oleracea* L.)



*Bidens pilosa* (black jack)



Muthunga (*Launea cornuta*)



*Galinsoga parviflora*



Sweet potato vines



Bitter lettuce (*Launaea cornuta*)

## Precautions in feeding forage

Some precautions need to be taken while feeding forages. Some of them are mentioned below:

1. While feeding the rabbits, do not pile up the feed as they will become heated and cause digestive disorders due to fermentation.
2. It is most important that the rabbit keeper knows which plants are poisonous. Rabbits cannot know if a plant is poisonous or not. They may eat the poisonous plants offered to them and die.
3. Forage collected from places where dogs and cats and other animals commonly defecate should not be fed as this may cause tapeworm infestation or coccidiosis.
4. Feeding forage sprayed or recently in contact with insecticides is harmful to the rabbits.

## Practical feeding hints

- Do not change feed suddenly.
- Do not get desperate if animals don't like seemingly good feed at first glance. Try it for a few days, if necessary, starve them a little.
- Green feeds should not be too wet, because it will upset the stomach and cause trouble, diarrhea, and death.
- Do not feed more than they will eat; remove old (muddy, dirty) feed. Especially rice bran and oil seed cakes tend to become rancid, so do not feed them too much.
- The concentrate should not be in powder form to avoid feed getting into the trachea and lung.
- The rabbit practices coprophagy. It is the consumption of feces and thus re-circulating a part of the feed through the body. During the night or in the early morning, the rabbit produces a soft faecal pellet which has some undigested food in it.
- Rabbits like fresh food, so bulky food (green forage) should be provided fresh two to three times daily.
- Rabbits are most active in the evening and early morning. Therefore, it is a good idea to give them plenty of food in the evening.

## 5.3 COPROPHAGY

This is the eating of faecal-like pellets produced in the caecum. These caecal pellets are sometimes called soft faeces.

- Consumption of the soft faeces starts when the rabbit is about 4 weeks old.
- Soft faeces are higher in crude protein and lower in crude fiber than hard faeces.
- Coprophagy is a very important part of the rabbit's digestive processes.
- It recycles some unabsorbed nutrients as well as returning protein and vitamin B rich bacteria for enzyme digestion in the small intestine.

## CHAPTER 6: PRODUCTION SYSTEMS

**Extensive system:** Total dependence on forages and kitchen wastes/refuse.

### Advantages

- Cheap
- Easy to provide the quantity of food required

### Disadvantages

- Forage availability varies with season
- The quality of the forage reduces during dry season
- It is labor intensive
- It can introduce diseases and health problems from the surrounding environment

**Intensive system:** Total dependence on prepared concentrate foods from the feedmill.

### Advantages

- High levels of production
- Little risk of disease introduction

### Disadvantages

- Very costly
- Depends on the feed miller (in terms of availability and quality)

**Semi-intensive system:** The use of forages supplemented with prepared concentrate foods.

It falls between the extensive and intensive system in terms of advantage and disadvantages.

It is also the system that is most suitable for the small-scale producer.



An example of rabbit house in Kenya



# CHAPTER 7: REPRODUCTION AND HEALTH

## 7.1 SEXING OF RABBIT

Determining the sex of rabbits is not difficult with a little practice.

It can be carried out shortly after weaning at six to eight weeks. This is the time when the males and females should be separated, the rabbit should be held on its back, put one finger on the tail side of the genital opening and on the abdominal side.

Press down gently and stretch the organ with the finger and thumb. If it is a doe, a long slit will appear, if it is a buck, a small rounded tube-like structure will show.

### The male

- *The proper age for the first mating depends on the breed and individual development.*
- *It varies between 4-12 months.*
- *One male can easily handle up to 8 - 10 does.*

### The female

- *The female does require more care and attention. Like the males, the proper age of first mating depends on the breed and individual development.*
- *Mate does when they reach maturity (4-9 months).*

## 7.2 BREEDER STOCK

Purchase a good breeding stock. Poor breeding stock will produce poor offspring. You must begin with good stock.

The price a breeder asks for stock does not reflect the quality of the rabbits. Only time, records, and results can prove the worth of breeding stock and the reputation of the breeder.

Look at the records of the breeder's rabbitry to see the quality of the stock:

1. *Good health*
2. *Average litter size (8 or more)*
3. *Death rate (not over 5%)- MORTALITY RATE*
4. *Conception rate (90% or better)*
5. *Dressing percentage (55-60% including heart, liver and kidneys)*
6. *Select rabbit based on the feeding style/system*

## Mating

Experience suggests that early morning or evening mating is best.

For mating, always take the doe to the buck's cage. If they fail to mate within a few minutes, take her to a different buck.

Do not leave the doe with the buck all day or even an hour in an attempt to solve a mating problem.

If the doe is ready to be mated, she will stand still within a few seconds, stretch out, and slightly raise her hindquarters to allow the buck to mount and mate.

Successful mating is signaled by the buck thrusting forward and falling off the doe. Often, the buck makes a characteristic cry of pain or joy.

If the buck slides backwards off the doe and does not fall, the mating has not taken place.

If mating was successful, put the doe back in her hutch.

## Kindling and Mother care

When the doe is almost ready for kindling (about 4 weeks after mating) you can put a nest box in the cage (hutch).

Kindling can take place in this nest box at any time of the day but early morning seems to be the most popular time.

All she needs now is rest and feed.

## Cannibalism or Abortion

Cannibalism and abortion are common problems. The causes are many and mostly undependable. These are some of the causes:

- *First-litter does are extremely nervous. Give them one more chance and then cull if cannibalism recurs*
- *Unbalanced diet*
- *Lack of water*
- *Predators can cause the doe to stamp her feet and mash the young*
- *Unusual noise can cause the doe to injure the young and can result in cannibalism*
- *Moving nest box after young are kindled*
- *Shallow nest box makes the does feel insecure and she is easily disturbed*

## Weaning

Weaning is the separation of the doe and the young.

This usually takes place between 5-6 weeks. After weaning, the doe should be allowed to recover her body condition before re-mating.

Much will depend on the level of feeding but the doe should normally have rest of at least four weeks.

**Pseudo Pregnancy:** *A doe may exhibit pseudo pregnancy (behaves as if pregnant when it is not) but the symptoms do not usually last beyond the 18th day.*

*The best way to confirm pregnancy is to palpate the abdomen gently on the 10th - 14th day.*

**Miracle births:** *Cases of "miracle births" have been observed. This takes place when a doe produces young when it is certain that she has not been to a buck.*

*Some does who will not accept the buck may already be pregnant even though they have not been with a buck. It has also been recorded that a doe that is on heat is sometimes able to retain sperm from a different covering, to produce another litter later.*

**Fostering:** *This means taking kits to another doe.*

*This could be an option if a mother dies or abandons her litter or does not allow them to suckle.*

*The other reason is if the litter is bigger than 8 kits, when it is advisable to foster the excess to mothers with less than 8 kits.*



## 7.3. CARE OF THE YOUNG

- A couple of days before giving birth, the doe will start collecting hay in her mouth to make a nest. She will then pull hair from her chest and under her neck to line the nest. She will pull out more hair after having given birth and cover the babies. This is the time when the young have to be watched carefully:
- Kits are born blind and naked. The first 35 days of their life are crucial. They are usually confined to the nest for at least two weeks, sometimes longer. They should not be separated from their mother before 4 weeks of age. If they are weaned early, they may die of separation shock.
- For the first 20 days the only food for the kits is their mother's milk. The mother feeds her young only once in 24 hours and only for 3 - 5 minutes. The doe must, therefore, have access to plenty of good food and water to ensure that she has enough milk for the litter.
- It is essential that the kits do not get cold, especially in the first few days after birth. The nest needs to be checked to ensure that the babies are not carried out of the nest by the mother after feeding (check early mornings as feeding normally takes place during the night).
- It is quite safe to handle the young and return them to the nest.
- If they are found outside the nest and cold, (the kits will feel cold and the skin will be wrinkled and 'sticky' to the touch) it is essential to warm them up quickly or else, they will die.
- Once they are warm (the kits will become a healthy pink color, warm to the touch) they can be returned to the nest. Warming them can be done by wrapping them lightly in a cloth and putting them on top of a hot water bottle in a box. Make sure that the kits are protected from the plastic cover. They should be turned a couple of times to make sure that they are properly warm.

## 7.4. HANDLING AND SLAUGHTER

### Handling

- *Rabbits should always be handled gently but firmly. If the rabbit feels insecure or afraid, it will damage itself and, in all probability, the handler.*
- *NEVER lift a rabbit by the ears. The most common and safest method is to grasp the ears close to the head with one hand, while the other hand takes the full weight of the rabbit. The hand holding the ears restrains the rabbit and prevents it from struggling, without damaging the joints where the ears meet the head.*
- *When handling kits, they should be picked up by placing the whole hand, gently, over the kit and curling the fingers around it. Care should be taken not to squeeze the kit as they are very fragile and it is very easy to damage them.*
- *When handling rabbits, of any size, for whatever reason, the easiest and safest way is to wrap the rabbit in a cloth and pick it up. The cloth or sack will give the rabbit a sense of security and it won't struggle.*

### Viciousness in rabbits

- *It occasionally happens that a rabbit becomes vicious and attacks those who attempt to handle it. A doe may become very aggressive when she has young - this is an instinct and should be respected. Bucks can also become aggressive for no obvious reason. However, aggression is almost always as a result of bad handling or teasing. It can also be the result of a lack of water, so make sure that water is always available.*
- *There are instances where a rabbit may become aggressive for none of the above reasons. If this behavior becomes habitual, culling should be considered. A rabbit can open its mouth very wide, their teeth are very sharp and their bites are deep and painful.*

### Slaughter

- *It is important that the rabbit is killed very quickly and in the most humane way possible.*
- *The quickest and kindest way to do this is:*
- *Hold the rabbit in your left hand by its back legs. With your right hand hold the rabbit's head between your index and middle fingers, under the chin and against the base of the skull.*
- *Lift your right hand to shoulder height, stretching the rabbit, and pull the head quickly and sharply. If you try to do this any other way, it will not work.*
- *When the rabbit is dead, it should be hung by one back leg. The head is removed. The feet are clipped off. A small slit should be made on the inside of the back leg that is not attached to the slaughter post.*
- *The skin is peeled off this leg. The skin is then gently loosened round the body and front legs.*
- *You will then be able to take the skin off the remaining back leg, and by pulling down, so that the skin is now inside out. You will be able to peel the skin off like a sock.*
- *The rabbit is then gutted and entrails removed.*

## 7.5 RABBIT DISEASES

Some of the commonly occurring diseases in rabbit units are:

### a) Coccidiosis

This is probably the most common disease in rabbit units. Once a farm is infected with coccidiosis, it is very difficult to eliminate it completely or permanently. It is difficult to cure hepatic coccidiosis.

#### Symptoms:

- Anorexia (not eating)
- Pendulous and distended abdomen followed by progressive weakness, diarrhea, constipation and jaundice.

#### Prevention

- It is best prevented in well constructed rabbit units, where the rabbits are not living in cramped, crowded or dirty conditions.
- Cages should be disinfected at regular intervals and cleaned daily. Nest boxes should be disinfected between kindlings.
- Water bowls and feeders must be cleaned and disinfected regularly.

#### Treatment

- All the drugs used are prophylactic (preventing infection) and should be given when there is risk of disease.
- There are many coccidiosis preventative drugs on the market in East Africa, most of them for poultry, but these are suitable and effective in rabbits.

### b) Pasteurellosis (snuffles)

The bacterium *Pasteurella multocida* causes a variety of diseases in rabbits. These include: snuffles, pneumonia, otitis media, conjunctivitis and abscesses. Snuffles is not a fatal disease but the animal can develop pneumonia, pleurisy or acute pasteurellosis as secondary infections.

The disease may migrate from the nasal cavity through eustachian tube to the middle ear, causing inflammation and may lead to torticollis, uncoordinated gait, inability to take food and water and loss of weight. This particular disease does not respond to treatment.

#### Symptoms:

- In snuffles, the main symptom is a thick sticky, white discharge from the nose which the animal wipes away with its fore legs.
- There is also constant sneezing, which will encourage the spread of the disease.

#### Prevention

- Avoid cold draughts in the house.
- Construct rabbit hutch according to the recommendations.

#### Treatment

- Snuffles and pneumonia can effectively be treated by a combination of penicillin and streptomycin administered intramuscularly by injection.

### c) Pneumonia

It is caused by poor housing, overcrowding and poor ventilation especially in cold areas. Ensure that there is sufficient bedding to prevent draughts coming through the floor, and that the rabbits are not subjected to cold winds, especially at night.

It is advisable to have the ends of the units protected with plastic or heavy-duty shade netting. It is also advisable to have roll-down 'curtains' over the front of the unit, made of plastic or shade netting, that are let down at night to keep the whole unit warm.

### d) Conjunctivitis

*P. multocida* goes from the nasal cavity to the eye through the tear duct and causes reddening of the conjunctiva and a discharge from the eyes.

#### Treatment

- It can be treated with antibiotic ophthalmic ointments and drops.

### e) Abscess

Subcutaneous and visceral abscesses are quite common in rabbits.

Subcutaneous multiple abscesses may be found on the face, body, and lower jaw, containing thick cheesy pus. Visceral abscesses, however, may be found on the liver, heart, and lungs.

They may cause sudden death

#### Prevention/ Treatment:

- Drain the abscess of all pus.
- Irrigate with a solution of hydrogen peroxide and water, flush again with saline, and then irrigate with iodine. If the abscess has been drained completely, one treatment may be sufficient.
- The hole will close spontaneously.

### f) Sore hock

Ulcerated sores will develop on the back leg joint (the hock).

#### Prevention/ Treatment:

- Keep the cages clean. Dirty wet cages are the source of the infection.
- Open the ulcerated sores and clean thoroughly.
- Apply antiseptic dressing.
- Failure to treat will certainly be fatal.

### g) Heat prostration

If the temperature soars beyond 35 degrees centigrade, the rabbits will become restless. They will start panting and blood will ooze from the nostrils followed by death.

#### Prevention/ Treatment:

- The only way to prevent this is to transfer the animals to a cooler place.

### h) Hind quarter paralysis

Sudden disturbance, fear or excitement may leave rabbits paralysed. They become helpless creatures and their activity is restrained.

There is no cure for this deadly disease. The breeder should avoid strangers entering the unit for curiosity and fun.

### i) Hairball occlusion

Sometimes fur and wool are accumulated in the stomach, blocking normal passage of food. This may be cured with mineral oil or surgery.

## k) Incurable diseases

The following diseases are incurable and culling is the only way out:

- Infections arthritis (thickening of the knee, hip, shoulder)
- Kidney fibrosis
- Leucosis (enlargement of liver, spleen, lymph nodes, whitish tumour foci in liver)
- Uterus carcinoma (tumour in uterus and lungs)
- Rabbit pox
- Paralytic tremor
- Epilepsy
- Encephalitis
- Spinal column injuries
- Syringomyelia.

## 7.6 PARASITES

### a) Ecto-parasites

These include ear mange or canker, skin mange, mites, fleas, ticks etc.

#### Ear Canker and Mange

Ear Canker and Mange are caused by two types of mites - *Psoroptes communis var. cuniculi* and *Chorioptes cuniculi*. The mites attack the inside of the ear and cause inflammation and severe irritation.

The animal will be restless and will shake its head from side to side. It is possible that the ears will become damaged from banging against the side of the pen. This can lead to 'cauliflower' ear which look like bubbles under the skin on the inside of the ear.

At the onset the ear will feel hot and will be painful to touch. With time, the blisters (which can be quite big) will become very hard.

#### Treatment/Prevention:

- It is essential that the mites are dealt with as mites travel from one animal to another.
- Ears of the animal should be checked at regular intervals.
- Remove the crusts, scales with the help of cotton wool and then apply ear canker preparation (readily available in veterinary outlets). Alternatively, use ear drops.
- Until the mites are dealt with, the rabbit will continue to shake its head. You can easily test for them by gently inserting a cotton bud into the ear and wiping it round. If there are mites they will be stuck to the cotton bud with a brown substance. The mites look like tiny fleas. They cause a lot of distress to the rabbit and will spread if left unchecked.
- Alternatively, dust the rabbits with recommended chemicals or try diatomite powder if available. If you keep your houses clean and dry, the risk of infestation by the above is minimized



Example of ear canker

## Body or Skin Mange

This is not quite as common.

It is caused by one of two species of mites: *Sarcoptes cuniculi* and *Notoedres cuniculi*. The mites burrow into the skin causing intensive irritation. Scratching will cause open sores. If the disease is not treated the animal is sure to die within a few weeks.

#### Prevention/ Treatment:

- Keep the environment clean. Dirty units will harbour and encourage the spread.
- Hygiene cannot be emphasized enough.

## f) Endo-parasites

These include Tapeworms, roundworms, etc.

#### Prevention/ Treatment:

- Deworm rabbits regularly with recommended drugs which are readily available in EA.
- It is advisable to do this every three month. This is a good time to check the teeth. Sometimes rabbit develop crooked front teeth.
- This greatly inhibits their eating. The crooked teeth should be clipped with nail clippers. Be careful not to cause injury to the jaw. The best clippers are those used by vets to clip dogs' nails.
- It is also a good time to check the claws, which tend to grow very long and sharp because the rabbit is on wire. These should also be clipped if they are too long.

## 7.7 RABBIT PRODUCTS

Rabbit meat is becoming more popular in some of the more upmarket restaurants, especially where they are catering to European (French, German, Italian and Belgium) markets. However, it is still a relatively new market.

### 1. Meat

Rabbit meat makes an excellent roast meat (nyama choma) if cooked quickly. It is a tender meat and cooks very quickly. If the meat is being sold into butcheries or restaurants, it should be well presented and it is essential that the carcasses be cleaned properly. This can be done in three ways:

- Lie the rabbit on its side. Push the back legs into the empty cavity and under the breast bone. Fold the front legs down, and pack into plastic bags.
- Lie the rabbit on its chest with its front legs together in front of it and the back legs folded underneath (as if it is crouching), and pack into plastic bags.
- Debone the flesh and cut into neat pieces or mince. This is a fiddly job and mincing rabbit meat can be difficult as it is soft and tends to block the mincer.

### 2. Hides

- These are more often referred to as pelts. Most tanneries in Kenya will not accept rabbit pelts for tanning as they are considered too delicate.
- They are probably one of the most difficult skins to tan, but are much sought after. Pelts for tanning should be left inside out, no more than 4 together, packed into strong plastic bags.

- The air should be squeezed out of the bag and it should be securely tied. The bags can then be frozen for delivery to the tannery.
- The heads, spleens, kidneys and heart make excellent dog food. The liver is a delicious delicacy and highly nutritious
- **NEVER** feed rabbit bones to dogs. They are very brittle and will splinter, either becoming stuck in the throat or piercing the intestines.
- The bones do, however, make very good stock for soup. Make sure the bones are then disposed off safely.

### 3. Manure/Compost

- Rabbit manure is one of the most valuable manures of all livestock. Sweep all the droppings and soiled bedding into a pit or a neat, square heap every day.
- If possible, sprinkle with water or, better still, with effective microorganisms (EMs).
- After two weeks, turn it over and keep moist until you have a lovely dark compost.
- If you keep other livestock (cattle, sheep, goats, donkeys, and chickens) their droppings can be added to this compost for an even better end product.
- This would give you an endless supply of good compost for your shamba or a byproduct that you can sell.

## 7.8 RABBIT PRODUCTION RECORD KEEPING

Doe name----- Date of birth-----							
<i>Date mated</i>	<i>Buck used</i>	<i>Expected date of kindling</i>	<i>Date kindled</i>	<i>No. born alive/dead</i>	<i>Date weaned</i>	<i>Number weaned</i>	<i>Remarks</i>

- *The records should be simple, easy and quick to interpret.*
- *In all records, there should be a 'Remarks' column/entry explaining the reasons behind any unusual observation.*
- *This is very essential in interpreting the implications of the records, particularly for a third party who may have not been directly involved in taking the records, but needs to make informed/accurate decisions.*



## 8. SOURCE OF INFORMATION

1. Ministry of Agriculture, Livestock and Fisheries manual
2. Infonet Biovision
3. KALRO
4. Icipe

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## 10. APPRECIATION

The training module has been developed by Biovision Africa Trust in collaboration with the Nakuru and Kitui counties





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