

HOUSING & BREEDING OF RABBIT

A good housing facility with adequate arrangement of ventilation is the most important factor in rabbit house. Good house denotes proper cages or hutches and arrangement for feeding, watering, cleaning. There are several ways of housing rabbits. This depends on financial involvement and the climate of the place.

Location and Housing:

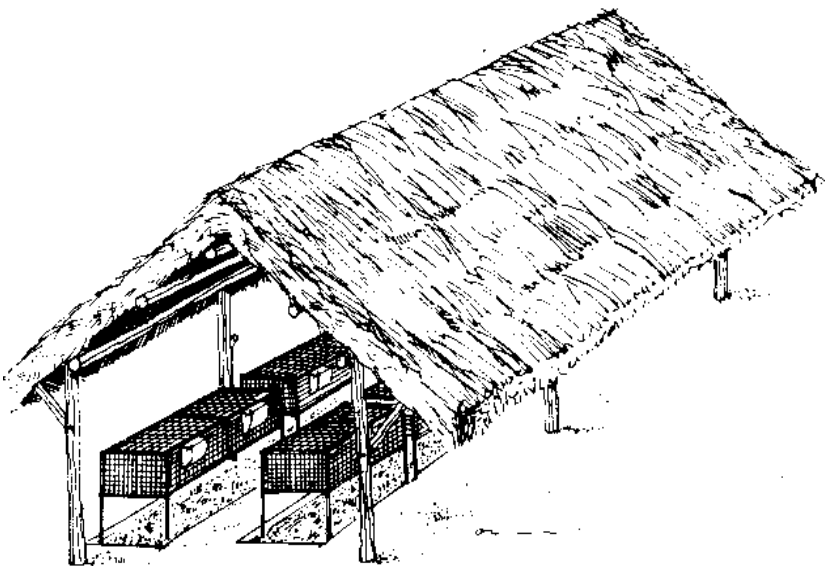
Ensure adequate facility for clean water, electricity, approach road, supply of breeding stock, feed, fodders, veterinary aid and nearness to market for sale of rabbit. For small size rabbit farms hutch system may be adopted which is a self contained cage-cum-nest box with its own roof. In case of larger farms cages may be arranged inside the sheds in single or two tier under hanging or step wise rack system. Rabbitry roofing should be preferably of asbestos, wood, thatch or other locally available cheaper materials. Construct sheds in such a way that predators and birds do not enter the shed. In case of open hutches proper fencing should be provided to protect the rabbits from their predators. Construct rat proof civil structures for feed storage. Keep the shed/pens clean by regular cleaning and disinfection to make it free from flies/mosquitoes and a foot dip should be maintained at the entrance of the sheds. Rabbit cages should be cleaned regularly, especially disinfected before kindling. During kindling period cage/hutch nest box should be kept clean so that kits do not pick up diseases like coccidia. Feeders and waterers should be cleaned regularly and mash feed should be removed from the feeders which can be used for feeding other livestock species.

In backyard rabbit locally available materials are used. The commonly used materials include tin cans, bamboos, old boxes, wood, bricks, asbestos sheets etc. Katcha floor and walls may be the components of the house.

Ideal Environment for Rabbit Rearing

(a) Lighting

Light has got paramount importance concerning reproductive efficiency. Natural or artificial light is required to be provided. If a buck is not provided with light exposure at least for 8 to 12 hours, its spermatogenesis will be hampered. On the other hand, a breeding doe will require at least 16 hours light exposure for its sexual performance and fertility. It is better to provide artificial light in the rabbit as per situation of natural light. It may be suggested to use 100 watt bulb or 40 watt fluorescent tube 2 metre above



the cages. It may be suggested to use 100 watt bulb or 40 watt fluorescent tube 2 metre above

the ground at a difference of 3 metre for a period of additional 4 hours .Light should not be switched on or off very suddenly since this may make the rabbit to leap here and there due to agony leading to fracture and other injuries.

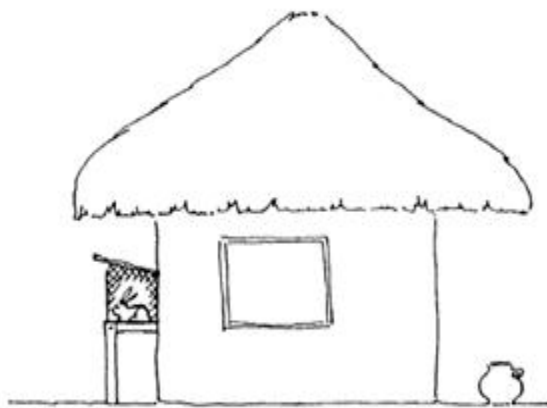
(b) Temperature

Rabbits can tolerate a wide variation of temperature ranging from 5°C to 33°C. But, the ideal comfortable temperature required by the rabbits ranges from 10°C to 26°C. For Angora rabbit it is 10° C and 20° C. The winter temperatures in Indian climate in most of the places excepting hilly regions are conducive to rabbit's health. Rabbits in general, can tolerate the cold wave rather than the heatt wave. Temperature in summer time may cause heat stress in rabbits. Therefore, adequate measures should be taken to reduce heat stress through cooling and good ventilation. Care should be taken to avoid draught. Adult rabbit can minimize hot through stretching of their bodies. Similarly to conserve heat they curl in lowered environmental temperature. But, young rabbit may not adjust with the surrounding fluctuation of temperature and may die.

(c) Humidity

From physiological point of view rabbits can not tolerate too much moist condition. Humidity in rabbit house should remain within 50%-60% level. All devices should be applied during rainy season to minimize humidity level. High temperature along with high humidity may adversely affect the health of rabbits. All the watering equipments should be kept in such a way so that there is no leakage of water. Water bottles can be kept outside to avoid breakage and thus accelaration of humidity level.

(d) Ventilation



the hutches are placed under the back roof of the family house

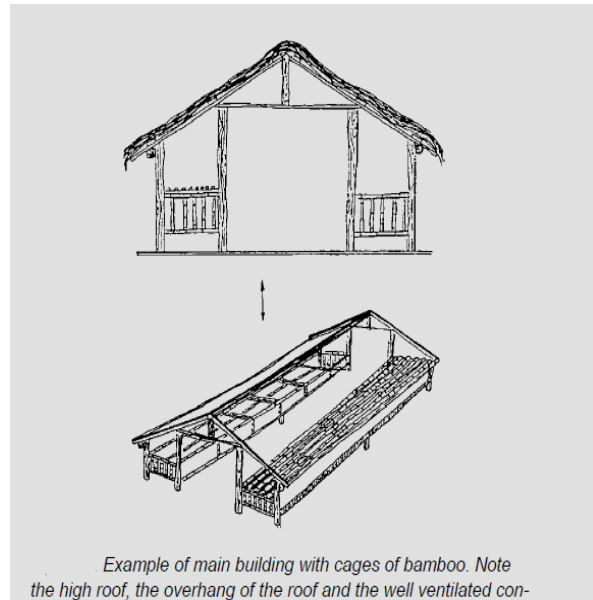
A clean dirt and smoke free environment are the essential attributes for free breathing of rabbits. There should be proper arrangement for free movements of air. The location for air free zones in the house should be taken care of. The requirement of comfortable fresh air is most needed during the hot days in the summer. Strong draught should be avoided as far as possible. Some shady trees may be planted near and around the rabbitry to allow cool air during summer.

(e) Noise

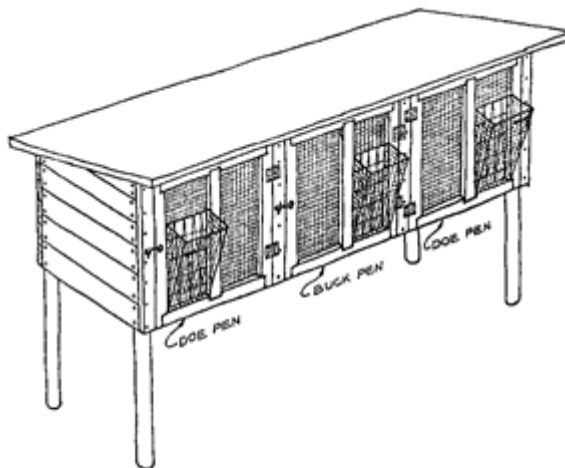
Though there is no specific information available regarding the impact of sound pollution of rabbits but as a general practice noise should be avoided as far as possible. Noise may pose detrimental effect on the health of the rabbits since it may interfere with the copulatory instinct and maternal characters.

Rabbits are housed in cages, pens and hutches

Cages: Cages of does should be of **90 cm length, 70 cm breadth and 50 cm height**. Those of bucks should be of **60 cm length, 60 cm breadth and 45 cm height** for bucks. Cages are made out of wood, bamboo, or welded mesh. The size of wire mesh should be 1cm x 1cm for the bottom and 2.5 cm x 2.5 cm for the sides. From the ground to bottom to of the cage should be 75 cm to 90 cm high. The legs of the cages should be in such a manner that rats and snakes could not cause nuisance and it is advised to fix metal guards to the legs. The ideal gauge for floor of the cage is 14-16 ; The walls and roof can be constructed with lighter gauge i.e. 16-20. Cages should be placed in a shed that is constructed in cooler surroundings.

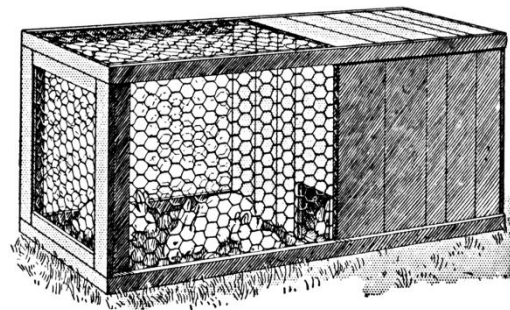


Example of main building with cages of bamboo. Note the high roof, the overhang of the roof and the well ventilated con-



Three compartment hutch

pen. Once rabbits attain puberty, they may be housed singly; especially those adult males. If they are kept together they will fight and get injured.



Pen: Young rabbits after weaning are kept in groups in the pens. Each pen measures **1.2 m breadth, 1.5 m length and 0.5 m height**. About 20 weaning rabbits are housed in each

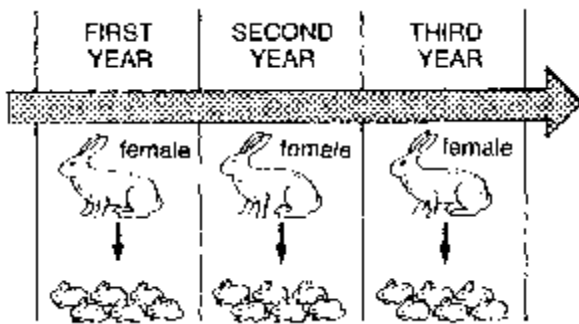
Hutches: Outdoor hutches should be in a sheltered location, raised and with a slopping waterproof roofing. Hutch should be well protected from predators. Hutch is made out of (i) wood (ii) asbestos, and (iii) welded wire mesh.

Nest box: Nest boxes vary in size and design but in general the size is 50 cm long, 30 cm broad and 15 cm high. Nest boxes are made out of wood and should have provision for adequate drainage and ventilation. It is advisable to have a wire mesh bottom.

Feeders and waters: Feeders are generally made out of Aluminum or galvanized iron sheets. Feeders may be designed in such a way that they can be attached to the front panel of the cage and can be filled from outside without opening the doors of the hutch or cage. Automatic pipeline or bottles watering system are used widely in commercial rabbit farms. Glazed earthenware pots can be used for watering in cages. The feeders should be designed and placed in such a manner that the feed can be poured from outside and should be 5-7.5 cm. above the cage floor to avoid contamination by urine, faeces or water. The rim of the feeders should be round and turned inward ½" so that the rabbits do not spill the feed. The watering equipment of 400-500 ml. capacity made up of aluminum, earthen or any other locally available cheaper material may be used.

Breeding Management:

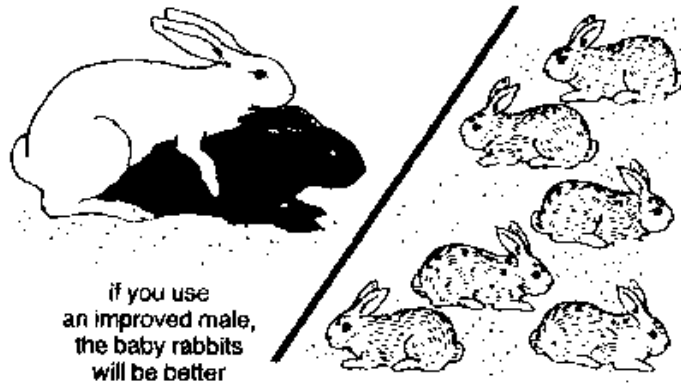
Select right type of the breed for maximization of economic benefits. Breeding males and females should be of different sire lines, below one year of age, devoid of visual deformities like patchy wool, buck teeth, sore hock, visual reproductive defects and should be true to the breed. Purchase of breeding stock should be avoided from rabbitries with high incidence of diseases like pneumonia, sore hock, coccidiosis, enteritis or with poor reproductive efficiency i.e. <50%. Though that female rabbits are ready to be mated when they are 4 to 4 1/2 months old, and male rabbits when they are 5 to 5 1/2



months old, the average age at first mating is about 5-7 months and it varies with the physical maturity of individual rabbit and also breed. Mate females (does) when they reach 75-80 % of mature body weight (4-5 months of age for the lighter breeds, 7-9 months for the heavy breeds). Does mature earlier than bucks. Mating should be done either early in the morning or in the evening. The doe is to be taken to the buck cage and never vice-versa. The breeding should be planned in such a way that at least 3 to 4 litters per doe are obtained per year. The nest box is kept in the cage around 25th day of pregnancy with loosened jute wool or wood shavings or soft dry grass. Male rabbits can be used for mating until they are about three years. In order to prevent inbreeding depression rabbits from the same family should not be bred. Therefore, replace male rabbit about once every year. After

months old, the average age at first mating is about 5-7 months and it varies with the physical maturity of individual rabbit and also breed. Mate females (does) when they reach 75-80 % of mature body weight (4-5 months of age for the lighter breeds, 7-9 months for the heavy breeds). Does mature earlier than bucks. Mating should be done either early in the morning or in the evening. The doe is to be taken to the buck cage and never vice-versa. The breeding should be planned in such a way that at least 3 to 4 litters per doe are obtained per year. The nest box is kept in the cage around 25th day of pregnancy with loosened jute wool or wood shavings or soft dry grass. Male rabbits can be used for mating until they are about three years. In order to prevent inbreeding depression rabbits from the same family should not be bred. Therefore, replace male rabbit about once every year. After

Does mature earlier than bucks. Mating should be done either early in the morning or in the evening. The doe is to be taken to the buck cage and never vice-versa. The breeding should be planned in such a way that at least 3 to 4 litters per doe are obtained per year. The nest box is kept in the cage around 25th day of pregnancy with loosened jute wool or wood shavings or soft dry grass. Male rabbits can be used for mating until they are about three years. In order to prevent inbreeding depression rabbits from the same family should not be bred. Therefore, replace male rabbit about once every year. After



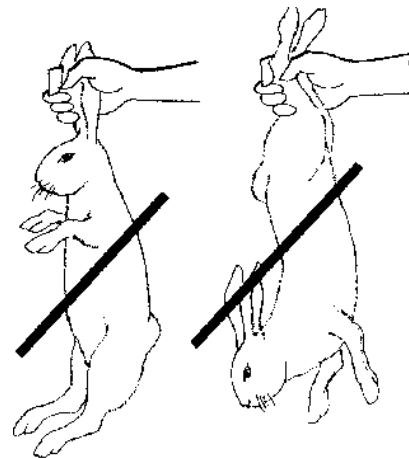
In order to prevent inbreeding depression rabbits from the same family should not be bred. Therefore, replace male rabbit about once every year. After

three years, the full grown female rabbits should be replaced either by new purchases or females of own farm. Rabbits are selected that come from big families of five to six babies that weighed at least 1 1/2 to 2 kilograms when they were three to four months old. In addition, new females should have eight teats. A young buck may be allowed to mate one doe at an interval of 3 to 4 days. But, from 12 months of age onwards it may mate 4-6 does in 7 days.

Induced ovulation in rabbit

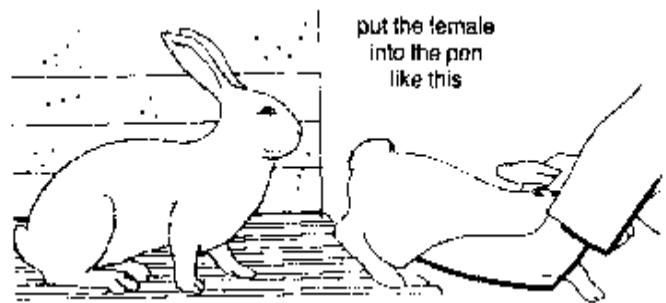
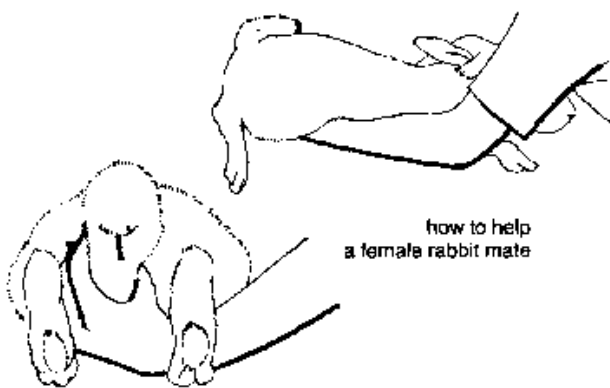
Induced ovulation is when a female animal ovulates due to an externally derived stimulus during, or just prior, to mating, rather than ovulating cyclically or spontaneously. Rabbits are physically induced ovulators, although they may also ovulate spontaneously.

Mating Behaviour of rabbit



Never pick up a rabbit by the legs or the ears

Always put the female into the pen of the male. If the doe is in full sexual receptivity it will lift the tail and within a minute the buck will be mating the doe. Mating is successful when the buck falls to one side or backwards after mating.



Sometimes when a female rabbit is put into a pen with a male rabbit she will hide in the corner and the male rabbit will not be able

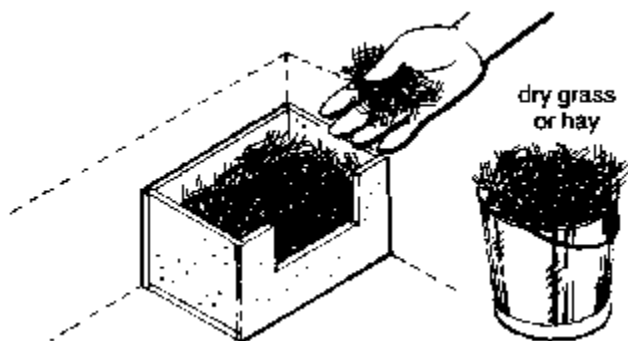
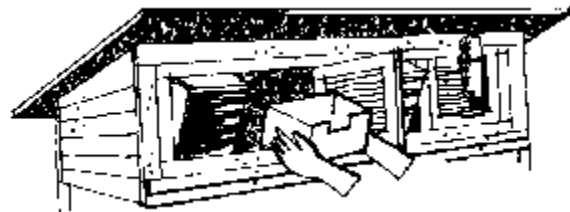
to mount her. If this happens, attendant can help them to mate. To do this, hold the female by the neck with one hand. Then, put the other hand under the female with one finger on each side of her tail and push gently backwards. This will make the female lift her tail so that the male can mount her. The drawings will show how to hold a female rabbit for assisted mating. If the female starts to run or fight it is better to try it again after a few hours, the next morning or evening.

Pregnancy diagnosis

- (a) Through palpation of abdomen by which embryos can be felt by hand. This is best done at about two weeks after mating. This technique can be perfectly done through experience. A completely relaxed doe should be placed on a table which has been covered in sacking to prevent her from slipping. The doe should be restrained by gently holding the fold of skin behind ears and over the shoulders. The left hand is placed under the body between the hind legs and in front of the pelvis. The uterine horns are felt gently using fingers and thumb. The thumb is placed to right of horns. Embryos can be located and felt like small marble shaped bodies slipping backwards between thumb and fingers when moved gently in a sideways direction. An experienced person can determine pregnancy by 8th to 10th day of mating using this technique.
- (b) Placing the buck near the doe for mating. A buck may not mate the pregnant one.
- (c) Uterine swelling-uterus may swell up to 12 mm at 9 days after mating. It may reach 20 mm at 13 days. Only experienced keeper may be able to predict the changes accurately.
- (d) Changes in body weight-There are significant change in body weight from mating up to 30 days. Average gain of around 300-400 gm has been suggested from mating to 30 days in large sized rabbit.

Kindling

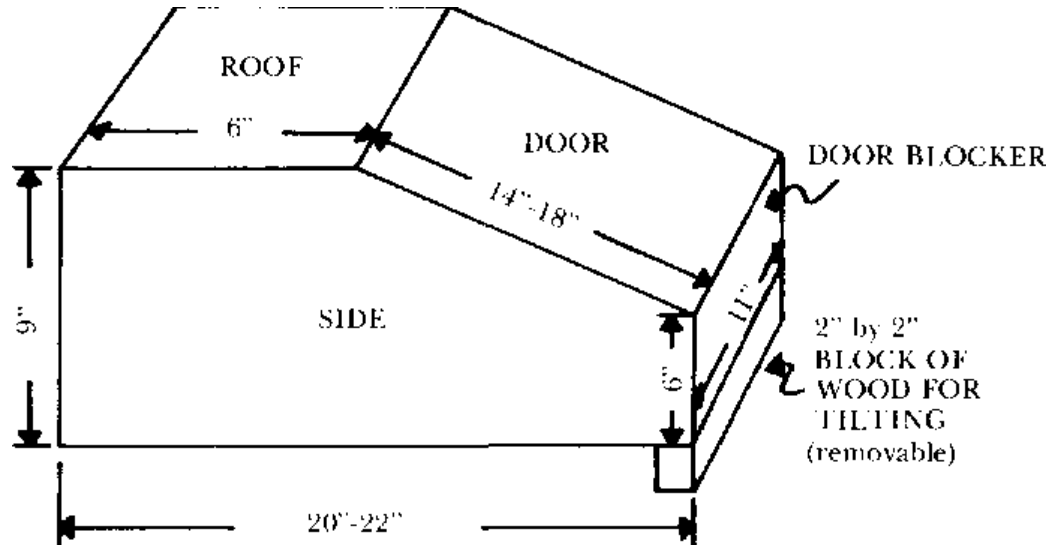
Process of giving birth of new baby of rabbit is known as kindling. It is a natural physiological phenomenon. The parturition very often takes place at late night or early morning. It may not require any interference by the keeper. The process usually completes within 7-30 minutes. Sometime all the litters may not be born on succession. Some may born after several hours or a day. The pregnancy may required to be terminated through injection of oxytocin. Following parturition the does used to lick the young and may eat the placenta. The baby rabbits will try to suckle the mother. If the number of litter is eight, all may be able to suckle since doe has eight teats. The baby rabbits



those will be unable to suckle may turn weak and susceptible to diseases. Many of them may even die prematurely. The does should not be disturbed during this time and be fed ad libitum. Adequate food and water should be provided so that optimum amount of milk is available to the baby rabbits. Rabbit used to nurse her young

usually at night or early morning only for once. A female rabbit gives milk to her babies only once a day. 6-12 baby kids may be born from a single kindling. Kindling takes place in nest boxes provided in female's cage.

Nest box



Weaning

Immediately following birth baby rabbits are solely dependent on their mother. They are born hairless, closed eyes. But at about 7 days, there is growth of hair and vitality of them. The eyes used to open after 10 days. The baby rabbits can lead their lives without mothers' milk at about 21 days of age. The young should be separated from their mother not before 4th week. The doe should be removed from the cage. Foods like concentrates and grasses should be provided. The baby rabbits can chew and eat after 3 weeks of age. The does can be rebred provided the physical conditions of them are satisfactory in nature after one week of kindling.

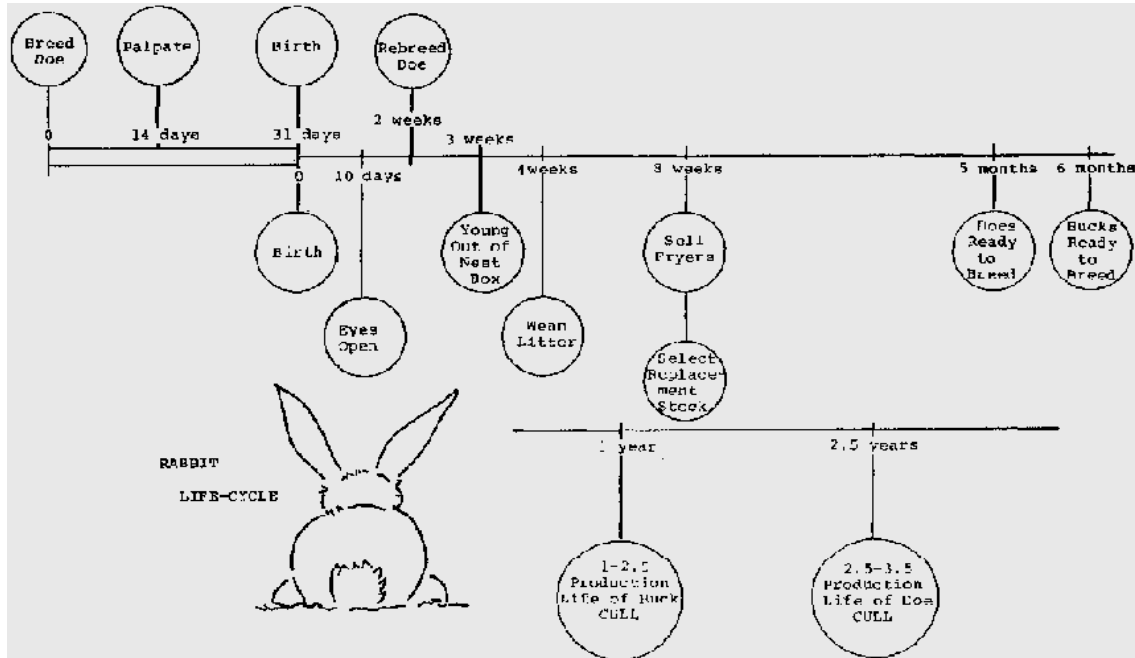
Care of young ones:

The nest box should be removed after 5 weeks of kindling. Kits should be examined and dead ones should be removed daily. If the bedding becomes wet it should be replaced by a fresh and clean one. Weaning should be done at 5th or 6th week after kindling depending on growth rate. No sudden change in feed is advisable.

When to mate the doe again

The rabbit can be mated the very day of kindling and she is likely to become pregnant. However, results might be disappointing. The litters will be smaller, lighter and with a higher rate of mortality, not forgetting the stress on the mother, being pregnant and lactating at the same time. Even where feeding and other conditions are optimal it is common to mate again only after 3-4 weeks. In backyard farming practice feeding can be assumed to be less than very good. Therefore giving the doe more time between matings (10-12 weeks) will probably be better and result in larger and healthier (although fewer) litters.

Breeding cycle of rabbit

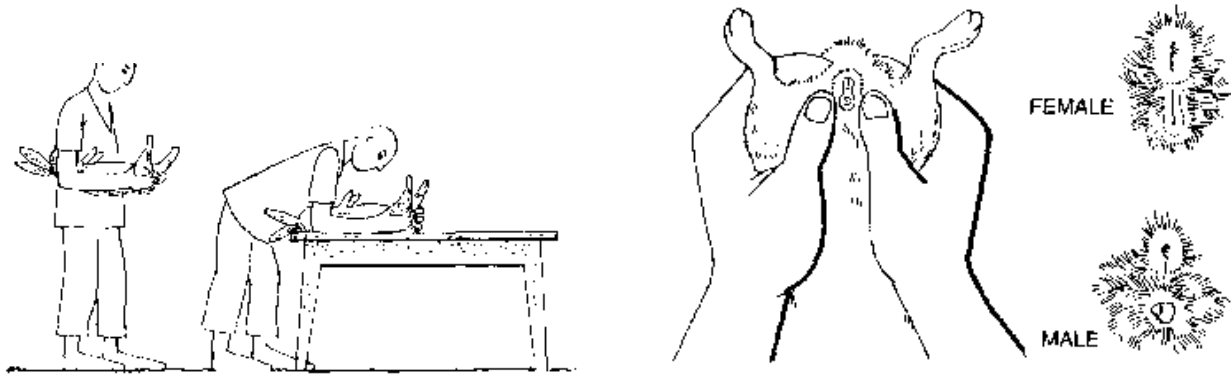


Litter weight at birth & weaning

In rabbits, individual birth weight is about 60-70 grams, but can range from 35-40 to 80-90 grams. Average birth weight of kits of a litter in broiler rabbits should be 40-50 g or more. Generally, individually birth weight decreases with increase in litter size. Kits of larger litters generally also show a lower weight at weaning than the corresponding weight for kits of smaller litters. This is because their weight gain depends on milk intake. The young kits depend fully on their mother for first 10-12 days of their life. At this time their eyes are not open and the sole feed is mother's milk. If the doe is good in its mothering ability the survivability and growth of bunnies will be more. The litter weight at three weeks age is taken as criteria for measurement of mothering ability of the doe. The optimum value for litter weight at 21 days age is 1.2 - 1.5 kg. The young bunnies are weaned between 30 days and 45 days. The weaning weight of the litter is an important selection criteria. At the time of weaning the body weight of bunnies should be more than 450 gm. Litter weight at weaning must be more around 3 kg.

Sexing of kits

Sexing is done at the time of weaning. Hold the rabbit in the arms or put it on its back on a table, as shown below. The baby rabbit has to be placed on the hand and by the pressure of thumb and forefinger the sex organ is to be pushed on either side. In case of buck the penis will come out as a protruded mass having rounded tip. But, a slit will be located in case of doe.

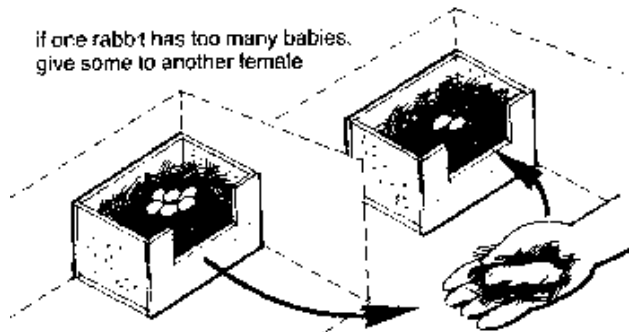


METHOD OF SEXING OF RABBIT

Fostering

A female rabbit with eight teats can feed only eight babies. If one rabbit female has too many babies, some may be transferred to another (Foster mother). However, the baby rabbits that are to be placed with another female should be no more than two days younger or two days older than her own babies. Gently rub the baby rabbits that are going to be transferred with some of the grass or hay of the new nest. This will give them the same smell as the new nest so that the new female rabbit will be more likely to accept the new babies as her own.

if one rabbit has too many babies,
give some to another female



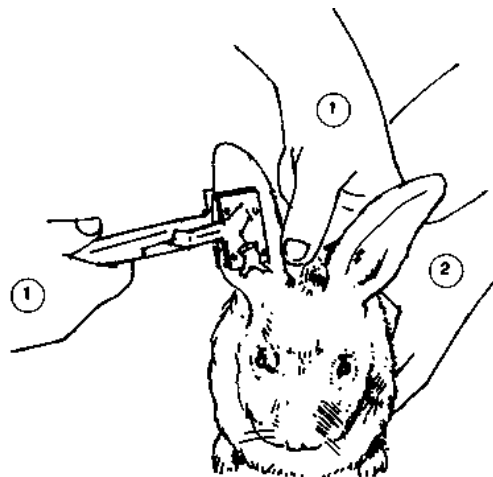
Cannibalism



Sometimes female rabbits will kill their babies and sometimes they will not feed them. This can happen if a female rabbit does not have enough milk and under nutritional or physiological stress. If she kills her babies or will not feed them the next time she will not be allowed to mate again. Replace her with a new female.

Identification of rabbit

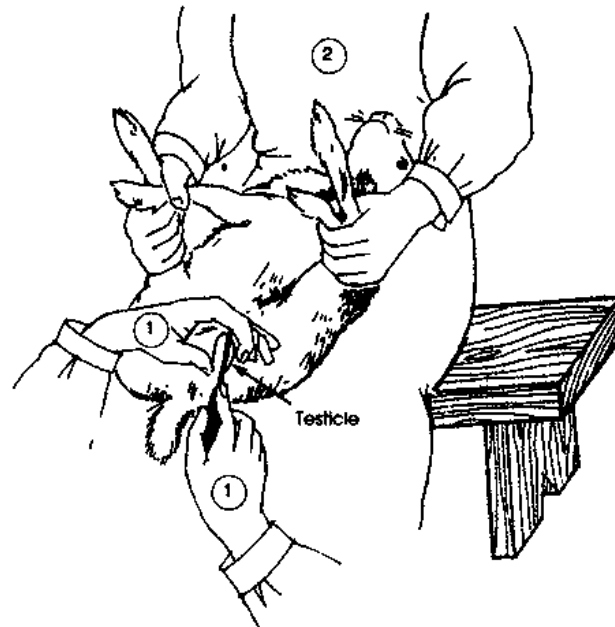
Tattooing or ear tagging is preferred



Note: 1 = operator's hands, 2 = assistant's hand.

Castration of male rabbit

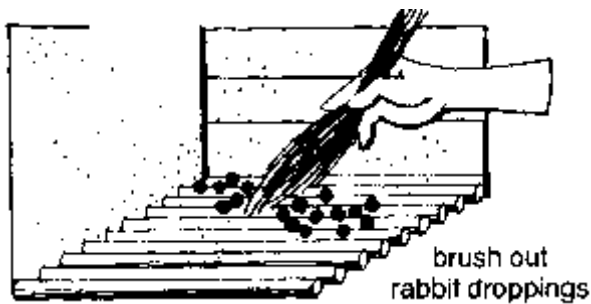
Male rabbits can be castrated at any age ;it's best to have them castrated as soon as their testicles descend (10–12 weeks).



The rabbit is held on its back on the lap of an assistant (2) who holds both legs on the same side in each hand. The operator (1) presses the rabbit's belly from front to back to make the testicle appear. Using a razor, he makes a deep incision, cutting the skin of the pouch and also the testicle. At this moment, by a reflex movement, the testicle comes out. It now remains only to cut the "threads" fixing it to the abdomen. Next disinfect with iodine. There is no need to stitch the wound as it heals in five or six days. Bleeding to any extent is very rare. However, for rabbits of four months and over it is best to crush the threads rather than cut them. There are castrating pincers which crush the threads, eliminating the need for an incision. Source: Lissot, 1974.

Sanitation in the farm

Strict sanitation practices are of paramount importance in rabbit farming. Improper or inadequate sanitation may lead to various infections through spreading of infective germs. Buildings should be well ventilated and sufficiently lighted. Over crowding should be avoided since many diseases spread through contact. Disinfection may not provide cent percent security. But, it must be done to minimize spread of infection. Regular and frequent, preferably daily removal of waste including manure, unused feed, soiled bedding and nesting material is absolutely essential in



either solid or wire floored cages. This is to be done to avoid breeding of flies and thus infection through them. Wastes should be removed from the premises each day. All equipments including water bottles, feed trays and nest boxes should be periodically washed with soapy (hot) water and rinsed with chlorine or other suitable disinfectant solution or steam. Rabbit hairs may pose a problem. Pregnant does may pluck hairs from their bodies to make nest. These hairs may stick to anywhere of the cages. These hairs are required to be removed. This is best done manually or to burn through flames.

Regular brushing may help to reduce hairs. In large farm vacuum cleaner will be the most suitable appliance for this purpose. Metal surfaces of the cages may be sterilized with blow lamp. Floor and the walls may be disinfected with 1 to 2% formalin or 1% sodium hydroxide or 10% ammonia solution. Cages of bucks should be disinfected at an interval of 3 days during mating period. The nest box should be adequately disinfected before it is used for the purpose. During kindling period, all the faecal materials should be disposed immediately otherwise the litters may lick them and pick up diseases like coccidiosis which is a faecal borne disease. In a nutshell, all the materials used for feeding, watering, rearing, breeding and weaning as well as maintaining of rabbits should be kept clean, free from contamination and infecting agents through strict hygienic and sanitary measures. Manure should be removed at periodical interval to lower down ammonia level in the farm. Ammonia gas has got detrimental effect on the health of rabbits especially it causes breathing problem.

Specimen Questions

1. Short note (a) fostering in rabbit (b) Cannibalism in does
2. Draw a flow chart of rabbit breeding cycle
3. What should be the minimum litter weight at weaning ?