

## **RABBIT PRODUCTION IN HOT CLIMATES**

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### **ABSTRACT**

In hot climates, rabbit production is faced with many problems. At environmental temperatures of 32° c and higher heat stress occurs, leading to production losses. when temperatures of 35° c and higher persist, the greatest losses from heat stress may result. In this article, the effect of heat stress on rabbits performance, all requirements of successful intensive rabbit production in hot climate are discussed.

### **INTRODUCTION**

If the high growth rate in meat consumption in future years will have to be met, much of the increase in production would have to come from short-cycle animals such as rabbit (FAO, 1981).

In recent years, the domestic rabbits have been recommended as a good alternative source of dietary protein for the increasing human population in developing countries (LUKEFAHR and CHEEKE, 1991). Now there is evidence that some developing countries are beginning to utilize the rabbit as a main source of meat.

In comparison to common livestock species virtues of rabbits are:

- Small body size.
- Limited cost of the animals and of the housing structures.
- Efficient reproductive ability. It is highly productive in terms of offspring (kg/year/dam) thanks to mating-induced ovulation, short gestation and lactation periods and great prolificacy;
- Early age of sexual maturity (4-5 months).
- Rapid generation turn over rate.
- Short fattening period (less than two month from weaning).
- The diet of rabbits is usually composed of fibrous plant material and agricultural by-products (that can not be effectively consumed by humans) rather than serial grain. Since cereal grain is either costly and limited or in direct competition with human food requirements, the rabbit represents an unique opportunity for the majority of small farms with limited resources in developing countries where animal protein is in short supply.
- Meat quality of rabbits is similar to that of the fowl and meat yields are high, they have a good meat-to bone ratio compared with other livestock. The rabbit meat has also been shown to be very high in protein, low in fat (triglycerides and

cholesterol), low in energy value and have a mineral percentage higher than other meats (SCHLOLOUT, 1992).

- Rabbit farms need less land than large livestock farms. This is important particularly in areas of intensive agriculture.
- Investment is low: infrastructure and equipment can easily be put together by the breeder.
- It is easy to transport and market and the recurrent costs for maintaining animals beyond the optimum age are low.
- Moreover, rabbit meat consumption has never violated any religious or social taboos.

In conclusion the rabbit seems to have good potential as a meat producing animal and suitable solution to solve the lack of animal protein, especially when its productive and reproductive efficiency is considered.

In hot climate regions, where most of the developing countries are localized, rabbit production as any other animal production, is faced with many problems such as heat stress, poor quality food, diseases and parasites of which heat stress is the most important one. Thus, applying the sanitary methods and adopting the modern experience in the field of raising rabbits and prevention from diseases are essentials for successful rabbit production in this regions.

#### ◆ Effects of heat stress on rabbits

At environmental temperatures of 32° c and higher heat stress occurs, leading to production losses. When temperatures of 35° c and higher persist, the greatest losses from heat stress may result.

The effects of heat stress on rabbits performance can be summarized as follows:

- Mortality is the most obvious sign of heat stress.
- Growth and feed traits declined dramatically through the summer months.
- Poor weight gain. The response of growing rabbits chronically exposed to high ambient temperatures has some times generally shown a masked decrease in live weight gain and feed intake.
- Impaired appetite.
- Impaired feed conversion.
- Impairment of milk production.
- Increase disease incidence.
- Decrease fertility.
- Reduce reproductive efficiency. Hot climate is one of the main causes for abnormal maternal and sexual behavior (VERGA MARINA, 1992). The heat stress will decrease the live weight of the personal maturity of the female rabbit. The breeding doe, after that, will decrease the feed intake, the litter weight, the litter size and ability to live. The mortality of suckling rabbits are also increased due to high temperature. With increasing temperature the amount of the most important milk-components hardly change.

- Such problem normally limit the duration of the breeding season of rabbits. Although the doe rabbit is capable to produce 10 litter a year, it gives only 4-5 litters in hot climate. i.e. during the period of the mild weather, since growth, milk production and reproduction rate are impaired as a result to drastic changes in the biological functions of the animals caused by heat stress.

All of which adversely affect production economics.

### **Requirements of successful rabbit production in hot climate**

- ◆ High productive efficiency breed
- ◆ Suitable building
- ◆ Comfortable cages
- ◆ Suitable reproductive scadual
- ◆ Good balanced pelleted feed
- ◆ Suitable drinking water
- ◆ Careful hygiene program
- ◆ Practical ways to avoid heat stress
- ◆ Enough experience to manage
- ◆ Types of animals suitable for intensive production in hot climate

In general, for intensive meat production, the medium heavy breeds are recommended for commercial rabbit farms. Just put in mind that any breed, large or small, can be good on the show table, but not all breeds can be called good meat producer especially under hot climate conditions. However, For intensive rabbit production, you have to search carefully about high productive suitable breed.

The main point in this respect is to buy pedigree rabbits from A good reliable source. The fact that buying junior stock, say about 2-3 months old, is the best idea for the new breeder. Because of good price (less expenses) compared with adult rabbits. Moreover, you will give your rabbits enough time to get adapted for your farm conditions before it reach to sexual maturity.

Generally, the characteristics should be considered when buying your breeding stock are bright - shiny eyes, bright - shiny hair, clean ears - front and rear legs, no running nose and no diarrhea.

Due to the results of most of the studies carried out in the hot climate countries, it could be stated that the NZW and Cal breeds of rabbits are more adapted than any of the other breeds in such countries (MARAI, 1997). Recently, V Line rabbit prove high efficiency production under hot climate conditions in Egypt.

#### ◆ Housing

There are now many rabbitries in hot climate region where from 100 to 500 does are being housed. Most all of these building have some way of closing up the building to keep out much of the cold in winter and some of these building have some means of cooling for summer heat.

With regarding to housing, there are some important recommendations should be consider when preparation of the breeding place. Remember that, the rabbitry must be adapted to your climate. Good housing means good rabbits health. Rabbits should be kept in protected areas. It must be protected from the extremes of heat, rain, sun, strong drafts and winds. It is recommended that semi-open, windowed, well naturally ventilated building may be suitable, under hot climate condition.

The rabbitry dimension should be east-west. It should provide good circulation of air (so the width must be not increase than 8 meters). Windows space must represent not less than 25 % from rabbitry floor space. The roofs should be 3.2-3.5 meters high, with slopes south-north to avoid exposure to vertical heat of the sun. The top & outer walls of the building should be painted white to reflect heat as much as possible. In practice, shade trees should be put around the rabbitry.

#### ◆ Comfortable cages

Just about all of these rabbitries use all wire cages. As we all know, rabbits require daily observation and care. So, the rabbit manager must be able to see readily into the cage to inspect the rabbits. He must also be able to reach easily into the cage to take the rabbit out for breeding, palpation, for cage cleaning, or for maintenance of the watering and feeding systems. So, the cages should be designed as comfortable as possible. In this respect, It is not recommended to house your rabbits in more than two levels cages. They should have automatic watering systems, which reduces the labor of a rabbitry. Also, they should have outside feeders, which again saves a lot of labor.

Under hot climate conditions, the main point should be conceder is to save enough space for breeding and rearing rabbits. Also, daily cleaning of the cages is a must to keep it allows clean. Even cages are self cleaning, it will need some help. some manure pellets may be to big to fall through the wire. The rabbit may have diarrhea that causes the manure to stick to the wire. In all these cases, it is necessary to use a brush to remove the manure from the cage floor. Also, it is necessary to remove regularly rabbits hair that cover the top and sides of the cages and the rest of the interior of the rabbitry to improve air circulation in the unit.

#### ◆ Suitable reproductive scadual

Generally, Production Methods classified according to the rates of reproduction to intensive, semi-intensive and extensive system. IN hot climate regions, the local conventional production systems, are normally extensive and are practiced in small hatches. In recent years, rabbit intensive production system applied in modern rabbitries with different sizes, began to spread in many parts of these regions. In general, Intensive production of rabbits is very essential because of immediate need for maximizing food production.

For successful rabbit production the choice of reproduction method must be preceded by careful study and planning. The goal is to increase doe productivity and reduce inputs. Productivity, defined as the number of young per doe per unit of times, depends on: the interval between successive kindling, litter size at birth, and the survival rate of the young. In practice, the most important factor in increasing productivity is shortening the

kindling -to- mating interval. This means non-productive period must be reduced to the minimum (1 day breedback schedule or 33 day's cycle).

Before such strategy is adopted the breeder should consider: whether or not it will be exhausting of the does (this depends mainly on productive efficiency of rabbits, feeding conditions, environmental conditions), whether or not it might cause a reduction in doe fertility and prolificacy, and whether it may led to more work for breeder.

However, A maximum of 11 litters per year is obtained by a mating interval of 33 days. Sex to seven litters for each doe of the original stock is a realistic average. Whereas, A maximum of 9 litters is obtainable with a mating interval of 42 days. An average of 4-5 litters can be estimated per doe of the original stock.

Most of the reviewed studies show that, the 33 days cycle require high productivity rabbits, optimum environmental conditions. Thus this intensive production scadual seem to be not suitable under hot climate condition. Whereas, the 42 days cycle is strongly recommended to hot climate region.

◆ Good balanced pelleted feed

With regards to feeds and feeding, a good balanced rabbit pellet is all the feeding needed. Pelleted rations makes feeding much easier and faster.

Generally, over -fat does will soon slow up on breeding and conception will become the exception rather than the rule. Does will die kindling or will fail to nurse their young well. Therefore, Bucks and dry does should be fed a measured amount each day to keep them in good condition, but not fat. on the other hand, Free choose pelleted concentrates must be available for growing rabbits, does after 18 days pregnancy and lactating does.

Under hot climate conditions, digestion of highly lignified fibrous feeds increases the heat output and heat load at a time the animal is already under considerable heat stress. Thus, arranging feeding with minimum lignified and / or containing ingredients with low fiber-high energy content will that produce less metabolic heat, is beneficial in such areas (MARAI, 1997). It is strongly recommended to commercial rabbit producer, in this areas, to introduce feeds during the coolest periods of the day.

◆ Suitable drinking water

As a general rule, rabbits drink a lot of water, but they will not drink dirty water. so clean fresh water must be available for rabbits all time. If you want to now if drinking water is suitable for your rabbits or not. test it first. If you like it you can introduce it safety to your rabbits.

Under hot climate conditions, it is recommended to introduce cool water to the rabbits. The water pipes should be placed at 20-25 centimeters below the ground surface to keep the water cool in the hot climate (MARAI, 1997).

◆ Careful hygiene program

Health caring is very important point especially under hot climate conditions, where the rabbits become more sensitive to suffering from health problems.

Actually, there are many advantages for the breeder to adopt Preventive hygiene vs. medication. These advantages can be summarized as follows:

- Less drugs usage, less time, less expenses.
- In case of medication, it might work or not then the animal dies.
- In case of animal death, the cost will not only be the medication fees, but it will be the producing animal price if it still alive.
- Even if the medication work out, the animal will not return to the original productivity which it used to be.

Moreover, the systematic use of antibiotics as a preventive measure is definitely not recommended. In addition, all drugs, at a certain dose, are poisons and must be used with caution. For these reasons, careful hygiene program (preventive hygiene) has been considered as essential for successful rabbit production especially in hot climate conditions.

Preventive hygiene is a key to a clean, well run rabbitry in which the producer can more effectively control any disease which might break out. Careful hygiene is usually enough to prevent major disease crises. Daily preventive cleaning will keep the contamination and pollution levels down and make the rabbitry viable and productive for longer period.

It is recommended to commercial rabbit producers in hot climate regions to adopt the basic rules of preventive hygiene as much as they can. These rules can be summarized as follows:

- Rabbit must have an environmental in which they do not constantly have to withstand external disturbances.
- The rabbitry should be located whenever possible far from noise and dust, sheltered from winds, shaded from the sun.
- Rabbits should be protected against dogs and cats.
- Cleaning should be constantly kept in mind in the designing and building of the rabbitry. Nothing cannot easily be cleaned and disinfected should be allowed.
- Cages, feeding racks and drinkers should be portable, so they can be regularly removed, cleaned, dried and disinfected.
- Metal should be used for the wire-mash hatches and accessories as it is the easiest material to clean and disinfect.
- “No visitors” Casual visitors such as feed suppliers, rabbit buyers and other breeders should be barred. (nobody except your team work should allow to enter inside the rabbitry).
- Working team are the most dangerous permanent vector of disease. They can bring in contamination from the outside and so should wash their hand, change their clothes before entering and don foot gear.
- Chronically sick animal, especially breeding animal, must be culled. One sick breeding animal in a rabbitry is of small value in relation to the danger it represents for the rest of stock.

- After weaning, the more animals per cage, the more difficult this is. The weaning rabbits must grow in clean, disinfected, dry cages. Using questionable cages should be avoided.
- Clean hands are extremely important, especially when handling rabbits and distributing feed.
- Disinfecting the rabbitry should be a routine matter. Dirty equipment cannot be disinfected. It must be washed first, then it must be dried as a first step towards disinfecting. Sun-drying well-cleaned equipments for several days is a simple, cost-free and very efficient means of disinfection.
- All rabbits in the affected section of the rabbitry must be culled. All equipment must be cleaned and disinfected. After that, the area must be left for one or two weeks before introducing new rabbits.

In conclusion, Disease prevention is very important in rabbit production. There are few drugs available to treat diseases of rabbits, and it is often difficult or impossible to know which ones to use until it is too late. Also, the cost of the drug is often more than the rabbit is worth. Furthermore, the onset of many rabbit disease is so fast, there is little time for treatment.

◆ Practical ways to avoid heat stress

In hot climate conditions, the major objective is to facilitate overcoming heat stress, although this criteria is sometimes difficult. In this respect, MARAI (1997) reported that, the managemental practices concerned in hot climate involve modification of the environment, reduction of the animal heat production, and increase of its heat loss.

Appropriate advices could be given to avoid the heat stress on rabbits during the summer season. These recommendations could be summarized as follows:

- Selecting a strain of rabbits that has shown the greatest degree of heat tolerance should be considered.
- Adding ice to the drinking water (drinking cool water).
- using iced sacks in the cages.
- Spray the roofs and outer wall with water during the hot climate. In all cases rabbits must be kept dry in order to avoid respiratory troubles.
- It is recommended to feed the rabbits during the coolest periods of the day, i.e. at early morning, late in the evening or by night which characterized with lower temperature and lower humidity in summer months.
- Adding vitamin C in drinking water.
- Adding vitamin E + Selenium in drinking water to increase fertility during the summer season.
- Injection vitamins A, D or E to the young may be optional measure practiced in many successful operations, especially under hot climate conditions.
- Stop the matings in order to avoid more stress on the does through pregnancy in hot weather.
- Rabbits that show signs of suffering should be removed to a quiet, well ventilated place.
- Immersing the entire rabbit in cold water for three seconds is emergency measure to save heat stressed rabbits.

- Regular training on the proper methods for rabbit husbandry, is a must.

◆ Enough experience to manage

Rabbit production is a complex activity that is not easy to manage. Inadequate housing, nutrition, control of diseases, management or productivity level of the animals can be responsible of a lack of profitability of this activity.

In hot climate regions, where most of developing countries are localized, the low degree of technical skill in rabbit raising, is another problem in such regions (MARAI, 1997). Thus, trainers actually specialized in rabbit disease and rabbit production are needed. They should have direct experience of rabbit production and be in a very close contact with the small holders, especially when they are going to start their activity. It is very interesting to increase the level of knowledge of the rabbit raisers, organizing small courses, lectures and similar activities on different topics of rabbit production, under the responsibility of real specialist of this topics in rabbits.

◆ Pitfalls in rabbit breeding

There are many mistakes that rabbit breeders make. However, the larger operation the more costly are the pitfalls. The breeders should believe that all of them, or any of them could be mean failure or very costly mistake in any event.

- Buying an inferior strain of rabbits for foundation stock, such as rabbits with no production recorded or with a poor record of production, rabbits with diseases or unhealthy conditions and / or buying breeding stock because of the cheap price.
- Buying inferior feed because of cheap price.
- Going into raising rabbits on a large scale without any experience.
- Not being selective on breeding stock kept for own use.
- Not keeping accurate production records.
- Not keeping proper costs and income records.
- Not having facilities to protect rabbits from heat and drafts.
- Having outdated cages.
- Not having a sanitary rabbitry.
- Not having enough time and effort on a planned breeding program.

## CONCLUSION

- ◆ In recent years, the domestic rabbits have been recommended as a good alternative source of dietary protein for the increasing human population in developing countries, where animal protein is in short supply.
- ◆ Intensive production of rabbits is very essential because of immediate need for maximizing food production.
- ◆ This system of production can be successfully applied in hot climate condition.
- ◆ Under these condition, the 42 days production cycle (*10 day breedback schedule*) is strongly recommended.
- ◆ It is recommended to rabbit breeders to search carefully about high productive suitable breed which is adapted for such system under such conditions.



- ◆ The rabbitry must be adapted to your climate. Good housing means good rabbits health.
- ◆ Raising of these rabbits should be conducted in comfortable cages and kept in semi-open windowed, well naturally ventilated building.
- ◆ The occurrence of disease could be largely avoided by a high standard of hygiene and careful management
- ◆ In hot climate conditions, the major objective is to facilitate overcoming heat stress, although this criteria is sometimes difficult.

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