Adaptability of rabbits to the hot climate

Yamani K.A.O., Khalil M.H.

in

Baselga M. (ed.), Marai I.F.M. (ed.).
Rabbit production in hot climates

Zaragoza: CIHEAM
Cahiers Options Méditerranéennes; n. 8

1994
pages 65-69

Article available online / Article disponible en ligne à l'adresse:

http://om.ciheam.org/article.php?IDPDF=95605280

To cite this article / Pour citer cet article

ADAPTABILITY OF RABBITS TO THE HOT CLIMATE

Kamal A. Yamani & Hassan M. Farghally
Department of Animal Production,
Faculty of Agriculture, Zagazig University, Zagazig, Egypt.

SUMMARY- The rabbit as a nocturnal animal happening and being very active at night, is recommended to feed during the cool period of the nights which characterized with lower ambient temperature and lower humidity in summer months and the other hot months of the year round. The maximum and minimum temperature and the relative humidity in the morning and after noon were analysed statistically and revealed seasonal, month, season X month significant difference. The hot months in summer and other hot months were discussed. The favourable effect of lower temperature on the performance and behaviour of the rabbit supported the proposal of the nocturnal feeding and diurnal feed utilization for rabbits under the different production systems.

Key Words: Rabbits; hot climate Summer, Nocturnal, Diurnal Feeding system, Performance and behaviour.

The rabbit, both wild and domestic, has enormous adaptability to exist in conditions ranging from the tropical to the arctic (very cold) or an exceptionally wide and varied diet. Rabbits can adapt to intensive husbandry systems in relation to the environment characteristics in which they are kept with the aid of man (Sanford, 1992).

The response of growing rabbits chronically exposed to high ambient temperatures has some times generally shown a masked decrease in live weight gain and food intake (Prud'hon, 1976 and Steplan, 1980).

Crimella et al. (1991) assessed the influence of season, temperature and relative humidity on the total weight loss (%) in rabbits. The results show that mainly the climate can affect animal performance. The summer (4.2% weight loss) and 90-95% relative humidity (3.0%) vs. 3.8% for 70-75%
while 80-85% the weight loss was 2.5% only. The higher the air temperature the higher was the weight loss.

One of the main causes for abnormal maternal and sexual behaviour is the hot climate (Verga Marina, 1992). Although the doe rabbit is capable to produce 10 litters a year, it gives only 4 to 5 litters in hot climate. Summer, is the main point as well as the hot months of the whole year round, to be studied in this conference of rabbit production in hot climates. It needs further investigation to give high lights to be considered to overcome the negatively and adverse effects on rabbit behaviour and performance.

Some times, beside the hot seasons and months of the year, the daily temperature raises over 32°C and may reach 45°C. 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. Mortality is the most obvious sign of heat stress. Poor weight gains, impaired feed conversion, increased disease incidence, decreased fertility, reduced reproductive efficiency and other conditions may also result, all of which adversely affect production economics.

Prior to covery and to delivery of the presexual maturity of the female rabbit the heat stress will decrease the live weight. The breeding doe, after that, will decrease the feed intake, the litter weight, the litter size and the ability to live.

Breeding does were fertilized under conditions of 34°C ambient temperature and had natural parturition at 36°C ambient temperature. However, the optimum mating and kindling took place between 26-30°C (Xulide et al., 1992).

Rectal temperature ranged between 38.4°C in Autumn up to 39.6°C in Summer. The difference between Autumn and Summer and the interactions of seasons and temperature were significant, but there appeared no change for the season. Both indices, rectal temperature and respiratory rate suggested a compensatory response of the animals to the imposed thermal stress.

The rabbit is a nocturnal animal happening at night and seeking its food at night. During different hours of the day, the lowest feed intake of the rabbits was recorded in Summer. During the different hours of the day, feed intake was 9% from 8 to 13 h., 17% from 13 to 18h and 74% from 18 to 8h. (Battaglini Marcella and Grandi Augusta, 1988).

The seasonal effect was also observed during the night hours. The animals consumed 82% of the diet during the night hours of the Summer season, while in Winter the rabbits consumed 70%. The worse digestibility
was obtained in Autumn, but the worst in Summer.

The diet was utilized much better during diurnal hours because of the small feed quantity passing through the digestive tract. The rabbits are more active during darkness mainly in relation to grazing (Myktytowicz and Rowley, 1958).

Air temperature and relative humidity according to different seasons and months in Sharkiya Governorate, Egypt:

The overall mean for air temperature and relative humidity during the year are presented in Table 1 in Sharkiya Governorate, Egypt. It seems that the minimum and maximum temperature may mask the high temperature in Summer days and the low temperature in Winter days, which may reach more than 34°C and less than 10°C in the two seasons; respectively. However, the difference between the minimum and maximum air temperature among lowest air temperatures among seasons and among months are highly significant (P ≤0.01). The lowest air temperatures are in January and the higher is July. The highest difference in humidity % is in Summer and the lower is in Winter between the early morning (8 h) and the afternoon (15 h) and the lowest humidity is in Spring. However, the difference among seasons and months is highly significant between the morning and the afternoon in this respect, but the humidity is not effective in comparison with the temperature as the rabbit may live in wide range of humidity.

It is worthy to mention that rather than the average, the air temperature may reach more than 34°C during the days and 100% relative humidity during the nights of the hot months.

Nocturnal feeding system is suggested for the production systems of rabbits in the hot months from 13 h to 8 h. daily. Hot months in Egypt are August, July, June, September, October and May (Table 1). Offering feed during cooler periods of the nights of these months means to adjust the feeding time clock and the workers schedules. The diurnal feed utilization will improve as the rate of passage of feed in the ingesta will be slower during the hours of the day. The feed intake, appetite, daily gain and feed conversion will improve in the lower ambient temperature (20-26°C) than in higher (26-31°C).

The cooler period during the night suggested to be the time of feeding and drinking in the hot months during the year; not only for the growth performance but also for better reproductive efficiency of the rabbit as well as in poultry (Miller, 1983).

Further investigations should be carried out to practice the nocturnal feeding for the nocturnal animal (the rabbit) under all the production systems
intensive, semintensive and the traditional system as the prevailing system in the countryside in Egypt. Similar studies should be carried out in this respect for all the countries of tropical and subtropical climates to get benefit for the welfare of rabbits production.

However, selecting a strain of rabbits that has shown the greatest degree of heat tolerance should be considered as well.

REFERENCES


Prud'hon M. (1976): Compartment alimentaire due lapin sounies aux temperatures de 10, 20 et 30°C.

Mideast M.S. Feed Grains Council, XXSettembre 5- Rone Italy.


Table (1): Least squares means ± S.E. of air temperature and relative humidity according to different seasons and months.

<table>
<thead>
<tr>
<th>Items</th>
<th>Air temperature (°C)</th>
<th>Relative humidity %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum</td>
<td>Maximum</td>
</tr>
<tr>
<td>Overall mean</td>
<td>21.3</td>
<td>25.7</td>
</tr>
<tr>
<td>Season:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Winter</td>
<td>17.7±0.18a</td>
<td>20.3±0.26a</td>
</tr>
<tr>
<td>Spring</td>
<td>19.5±0.18b</td>
<td>24.0±0.26b</td>
</tr>
<tr>
<td>Summer</td>
<td>24.7±0.18c</td>
<td>30.8±0.26c</td>
</tr>
<tr>
<td>Autumn</td>
<td>32.2±0.18d</td>
<td>27.6±0.26d</td>
</tr>
<tr>
<td>Months:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>January</td>
<td>17.6±0.25h</td>
<td>20.4±0.35hi</td>
</tr>
<tr>
<td>February</td>
<td>16.8±0.25i</td>
<td>19.6±0.37i</td>
</tr>
<tr>
<td>March</td>
<td>17.7±0.25h</td>
<td>21.8±0.35g</td>
</tr>
<tr>
<td>April</td>
<td>20.1±0.25f</td>
<td>23.7±0.36f</td>
</tr>
<tr>
<td>May</td>
<td>20.7±0.25d</td>
<td>26.5±0.35e</td>
</tr>
<tr>
<td>June</td>
<td>23.2±0.25d</td>
<td>30.0±0.36bc</td>
</tr>
<tr>
<td>July</td>
<td>25.0±0.25b</td>
<td>30.6±0.35b</td>
</tr>
<tr>
<td>August</td>
<td>26.0±0.25a</td>
<td>31.7±0.35a</td>
</tr>
<tr>
<td>September</td>
<td>24.0±0.25c</td>
<td>29.4±0.36cd</td>
</tr>
<tr>
<td>October</td>
<td>23.8±0.25dc</td>
<td>28.6±0.35d</td>
</tr>
<tr>
<td>November</td>
<td>21.8±0.25e</td>
<td>24.7±0.36f</td>
</tr>
<tr>
<td>December</td>
<td>18.7±0.25g</td>
<td>20.9±0.31f</td>
</tr>
</tbody>
</table>

Within each classification means with the same letter are not significantly different.