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STUDY OF SOME TRAITS ON THE LOCAL POPULATION OF RABBIT IN LEBANON IN AN EXPERIMENTAL RAISING

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SUMMARY: In order to identify and to preserve the local population of rabbit, a study has been carried out on some traits of production and reproduction. The experiment was conducted on 20 females and 8 males, randomly distributed between four equal groups of reproduction in order to control crossings. With a semi-intensive rhythm of reproduction (interval of 10 days between the parturition and the next mating), results indicate a very high variability of studied traits qualifying this population as heterogeneous. This heterogeneity could justify a selection program. Receptiveness of females having shown a red color of the vulva was 79% and the rate of gestation 35%. Prolificacy varied from 6 to 7 kits, with 2 to 3 kits at weaning indicating high mortality between birth and weaning (40 to 50%). Pre-weaning growth rate was about 15 ± 5 g/d leading to a live weight of 454 ± 157 g at weaning. At 77 days of age, the weight was 1.70 ± 0.28 kg and the post-weaning live weight gain was about 27 ± 5 g/d. The feed conversion ratio between weaning and 77 days of age was 4 ± 1.

Key-words: Rabbit, Production, Reproduction, Growth, Lebanon.

RESUME : *Dans le but d'identifier et de préserver la population cunicole locale, une étude portant sur les traits de production et de reproduction a été réalisée dans un élevage expérimental comprenant 20 femelles et 8 mâles, distribués en quatre groupes de reproduction égaux afin de contrôler les croisements. Avec un rythme de reproduction semi-intensif (10 jours d'intervalle entre la mise-bas et la saillie suivante), les résultats indiquent une variabilité très élevée des traits étudiés qualifiant cette population d'hétérogène. Cette hétérogénéité pourrait justifier un programme de sélection. La réceptivité des femelles ayant montré une couleur rouge de la vulve a été 79% et le taux de gestation 35%. La prolificité a varié de 6 à 7 lapereaux, avec 2 à 3 lapereaux au sevrage indiquant un taux de mortalité élevé entre la naissance et le sevrage (40 à 50%). La vitesse de croissance pré-sevrage a été de 15 ± 5 g/j aboutissant à un poids de 454 ± 157 g au sevrage. A 77 jours d'âge, le poids a été de 1.70 ± 0.28 kg et le gain moyen quotidien post-sevrage de 27 ± 5 g/j. L'indice de consommation sevrage-77 jours était de 4 ± 1.*

Mots-clés : *Lapin, Production, Reproduction, Croissance, Liban.*

INTRODUCTION

In Lebanon, local population of rabbit presents a high variability in general aspect, color and format; Besides, it is raised in a traditional way. The total number was estimated at 1540 rabbits (Chalah and Hajj, 1996) in all the country and development plans did never make any allusion to this sector. Taking into account the limited number and unplanned crossing of reproducers, this population is threatened of disappearance; Even more, the importation of races of a big format (Giant) interests breeders currently (Hajj et al., 1998). In order to determine parameters that characterize this population, a follow-up of a traditional raising has been achieved by Hajj et al. (1998). At the same time, this experiment was conducted to study the production and reproduction performance of this population in order to predict its survival.

MATERIALS AND METHODS

The housing of animals

Animals were raised at the Agricultural Research Institute of Fanar, northeast of Beirut with an altitude of 100 m. The total surface of experimental plot was 36 m^2, divided into three compartments: (i) stock for feed and tools (ii) reproducers unit (iii) fattening unit. Acclimatization was not guaranteed during the very cold or very hot periods. The temperature varied between 10 and 15 °C in Winter and between 25-35 °C in Summer; However, it could reach 0 °C in Winter and 40 °C in Summer.

Animals were raised in entirely wire cages, placed on two floors, provided with automatic trough and a nest box in wood (48x20x28 cm) for cages serving for reproduction; the opening of nests toward cages is 15x15 cm^2. These cages were: (i) 50x50x35 cm for reproducers and (ii) 70x70x36 cm for young animals during the fattening period.

Cages are provided with metallic feeder of two capacities: 1.75 kg of feed (reproducers) and 2 kg (fattening).

Choice of reproducers

The experimental set up of the population was based on the results of our previous survey (Chalah and Hajj, 1996). A group of 20 females and 8 males were chosen according to the sanitary state of animals. Their weight varied from 2.5 to 3 kg and age from 6 to 8 months. These animals were of hybrid origin and phenotypically heterogeneous. Descendants of French races (Fauve de Bourgogne and Papillon) were noticed among this population. To identify animals, the internal face of the ear was numerated.

Feed

For the development of the composition of the feed ration, we adopted the needs corresponding to the category "mixed feed" (motherhood + fattening) according to Henaff and Jouvé (1988).

The pelt feed for rabbit does not exist in the Lebanese market. Farmers nourished with a pelt destined to milking cows. However, we were able to manufacture a pelt that corresponds to the advisable dimensions for the rabbit (4 to 5 mm of diameter and 8 to 10 mm of length). The feed composition is presented in table 1. Animals were *ad libitum* for all physiological stages.

Table 1 : Composition of the ration adopted for the feeding of rabbits.

Components	Percentages
Barley	16
Corn	9
Soya 44	5
Straw	10
Alfalfa hay	20
Wheat bran	23
Ca_2PO_4	1
Molasses	6
Cottonseed	10

We added 0.18 kg of CMV and 0.5 kg of salt for 100 kg of feed.

Measurements

In order to delay the possible apparition of a common ancestor, animals were assigned to four groups of reproduction with 2 males and 5 females each. Females of one group were mated with males of the same group. The rhythm of reproduction adopted is the semi-intensive, with

an interval of 10 days between parturition and next mating. Weaning was realized at 28 days of age.

Females have been numbered and career-cards (INRA) have been established to note observations and symptoms of diseases. The temperature and humidity were weekly recorded with a thermohygrograph during the period of the follow-up (between May 15 and December 15).

Young animals have been weighed one time a week. Observations were made on sanitary state and the following parameters: receptiveness, fertility, prolificacy, litter size and weight at weaning, mortality at birth as well as between birth and weaning, and the quantity of feed ingested per week and per adult or per cage for kits.

Dry matter of the feedstuff was determined by subjecting the samples to 105 º C for 4 hours, crude protein by Kjeldahl method, fat by the extraction with petroleum ether; Crude fiber (Horwitz, 1980) and ash (incineration at 550 º C for 7 hours) were also determined.

RESULTS AND DISCUSSION

In our experiment, the obtained results did not express significant differences between the studied groups of reproduction for most of traits of production and reproduction which could be related to the observed high variability of the local population of rabbits.

Reproduction traits

With a semi-intensive reproduction rhythm, we should have got 80 gestations during 6 months for 20 females. Because of weak fertility of some reproducers (males and females) and low acceptance of females, only 25 gestations were realized, leading to a real rhythm of 65 ± 35 days.

Results obtained by Questel in 1984 and by Pla et al. in 1984 (cited by Boussit, 1989) illustrated relations between the color of vulva and the rate of females ovulating after mating. Females having a red color of vulva at the time of mating showed the highest ovulation rate. According to our results, among 48 females presenting a red color of the vulva, only 38 accepted the mating (79%), and the number of gestations was only 17 which is equivalent to 35% of females presenting a red color of the vulva and 45% of females that accepted the mating, have been impregnated. The color of the vulva was not a good sign of estrous period. However, it would be convenient to find a simple and reliable marker to discover females in heat. Rates of gestation of receptive females (45 to 52 %) were lower than those presented by Théau and Roustan (1980) (79%).

After 3-4 tests, 35% of females and 25% of males gave no descendants, and therefore are declared sterile. Of the 68 mating done during this study, only 25 gestations were possible (37%), among which only 19 parturition were achieved (28 %). While in the other six cases, abortion had taken place during the last week of gestation which could be related to the recorded high temperature during this period (29 to 33 º C).

Litter size was 7 ± 3 kits of which 6 ± 3 born alive. Mortality rate at birth was 12 ± 14 % and the individual live weight was 45 ± 20 g. During lactation, mastitis was observed. At the same time, the impossibility of adopting kits led to high mortality rate between birth and weaning (53 ± 38 %). Only 2 ± 2 kits reached the weaning with a live weight of 454 ± 157 g.

Growth

Live weight increase is clearly illustrated in figure 1. Kits having a live weight of 45 ± 20 g at birth, have reached an average weight of 454 ± 157 g, 2.5 ± 0.35 kg and 3.10 ± 0.35 kg at weaning, 120 days and at 180 days of age, respectively.

The growth rate between birth and weaning, was 15 ± 5 g/d. After that, it is increased to reach 27 ± 5 g/d between weaning and 77 days of age, then decreased to 12 ± 1 g/d between 120 and 180 days of age.

For the local population, to determine the most appropriate weight or age at which animals should be slaughtered, we prolonged the fattening period to 180 days. However, from the 120th day, the growth curve show a stability with high values of feed conversion. Indeed, it varied from 2 ± 1 at the first week after weaning to 4 ± 1 at 77 days of age. Thereafter, this value increased excessively to reach 16 ± 3 at 170 days of age (fig 2).

Feed consumption

Feed consumption was about 106 ± 30 g/d for adult males and 124 ± 34 g/d for adult females not gestating nor lactating.

Feed consumption of gestating and lactating females is presented in figure 3:

- In the first period (before gestation) feed consumption was about 133 ± 37 g/d for females which were not gestating or lactating.
- During the period of gestation, feed consumption decreased to120 ± 30 g/d in the first week. This fall could be related to stress caused by mating. The consumption of females increased the following two weeks to reach a maximum of 197 ± 267 g/d during the third week of gestation. The lowest value was observed in the fourth week (106 ± 31 g/d). This fall could be provoked by the approach of parturition.
- Concerning the lactation period, consumption of feed increased from 167 ± 43 g/d during the first week to a maximum of 222 ± 90 g/d at weaning. This increase corresponds to the food consumption of the female and its kits.
- During the fourth period, where females are not gestating nor lactating, feed consumption recovered the value of 125 ± 38 g/d.

Feed consumption of kits in the fattening period is presented in figure 4. The daily feed consumption varied from 64 ± 29 g/d the first week after weaning to 154 ± 27 g/d between 100 and 109 days. This consumption remains steady until 144 days then decreased to 116 ± 9 g, it reached a value of 214 ± 13 g/d at 180 days of age.

CONCLUSIONS

The high variability of parameters of production and reproduction shown in this population could be useful for a selection program. However and in order to exercise an efficient selection intensity on males and females, the number of reproducers should be increased.

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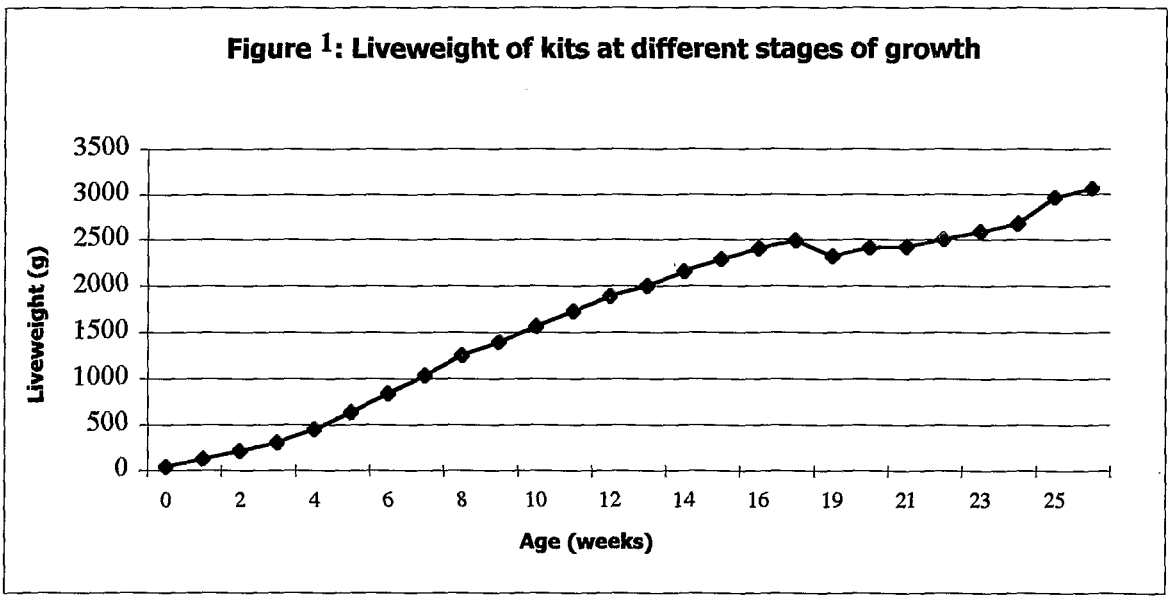

Figure 1: Liveweight of kits at different stages of growth

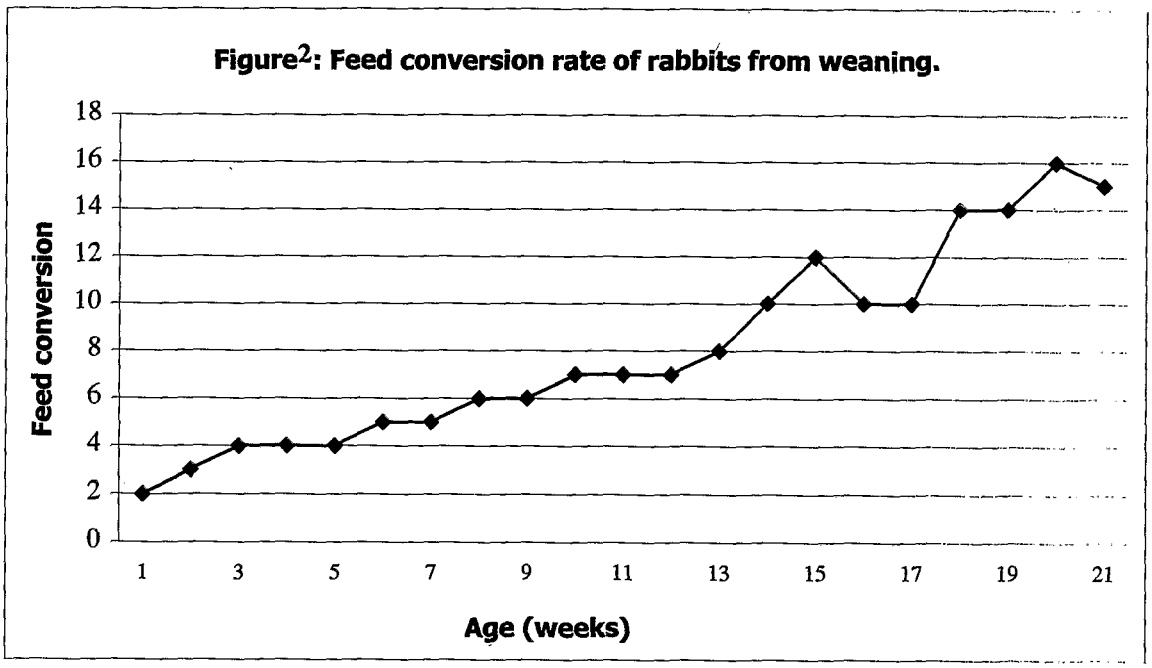

Figure2: Feed conversion rate of rabbits from weaning.

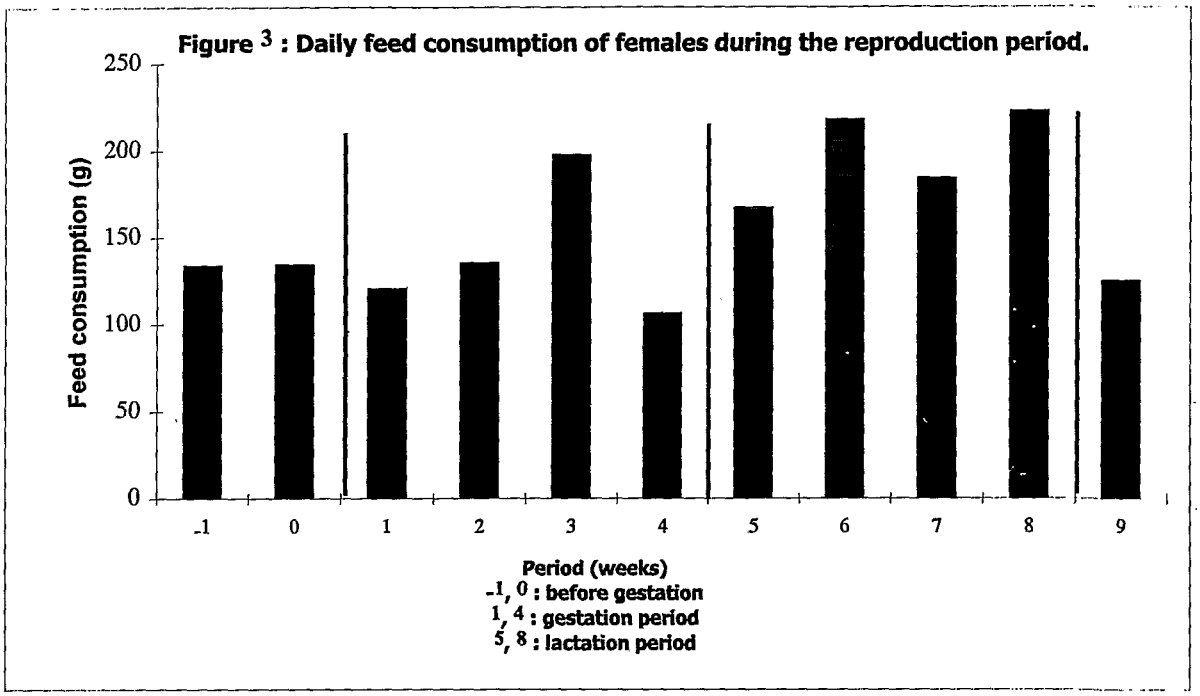
Figure 3 : Daily feed consumption of females during the reproduction period.
Feed consumption (g)
250
200
150
100
50
0
-1
0
1
2
3
4
5
6
7
8
9
Period (weeks)
-1, 0 : before gestation
1, 4 : gestation period
5, 8 : lactation period

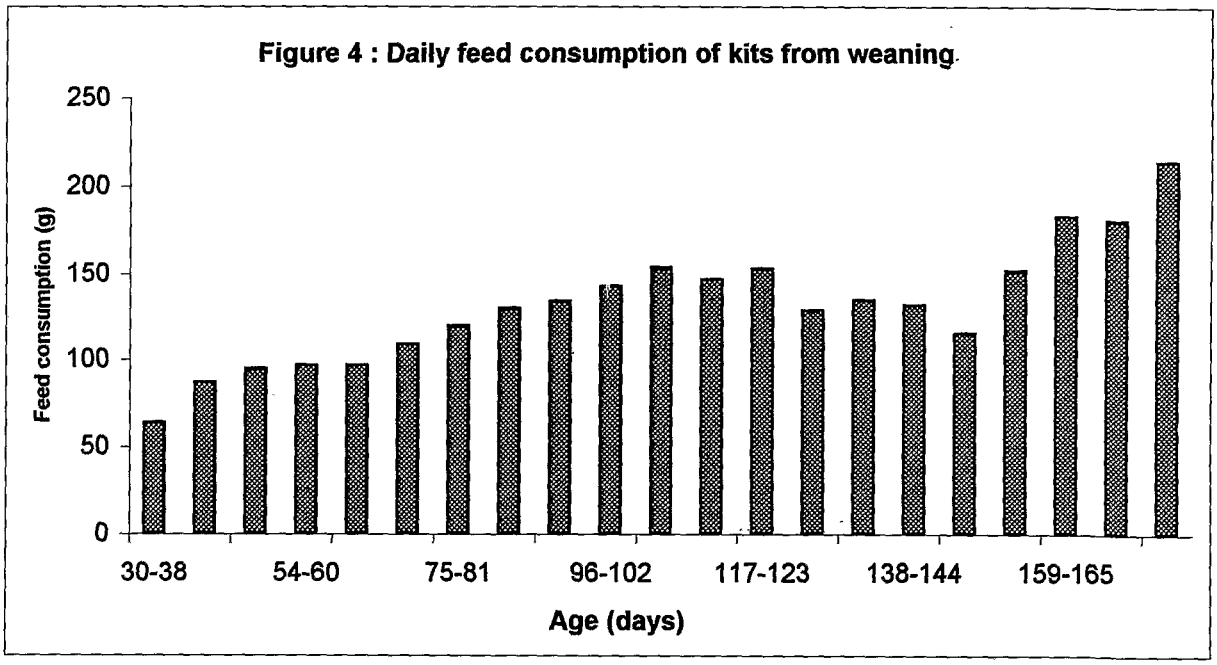
Figure 4 : Daily feed consumption of kits from weaning.
Feed consumption (g)
250
200
150
100
50
0
30-38
54-60
75-81
96-102
117-123
138-144
159-165
Age (days)