

Influence of Breeding Rate on Reproductive and Production Performance of Rabbits of Local Population

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Received: November 10, 2021

Published: December 16, 2021

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Abstract

The objective of the study is to evaluate the reproductive performance of the does of the local rabbit population.

Twenty rabbit does followed for six parities. Females have been breeding at the age of four and a half months in natural mating (rhythm semi-intensive). The estimate of dairy females between 0-21 days focused on 124 litters. These have served to analyze the growth of young rabbits under the mother from birth to weaning (28 days). Rabbits of this population are receptive and fertile (59.6 and 79.1%). They are characterized by modest prolificacy at birth and at weaning 6.9 and 4.8. The amount of milk produced in 21 days is low (2003.4g), this low production and low average birth weight (55.7g) are behind the low average weaning weight (396.5g). The weights of the rabbits and litter, as well as the quantities of milk produced per week and in 21 days increase with parity. Suckled litter size very significantly influenced milk production and the growth of rabbits during the period birth-weaning. The kindling season affected only partially the reproductive performance and growth of young rabbits. Stillbirth and birth-weaning mortality is very high (17.5 and 19.4%).

Keywords: Local Rabbit Population; Reproductive Performance; Milk Yield; Litter Size

Introduction

In recent years, several works have examined the reproductive traits of Algerian local population does [3,10,11,13] but no standardization study has been done on the plasmatic parameters of the Algerian population of rabbits reared in the Aures region during their different physiological stages.

The local rabbit, which starts to be appreciated by Algerians, is the result of unintentional and sometimes voluntary crosses (research of performance characteristics) with foreign breeds introduced in Algeria in the 70's (White New Zealand, Burgundy fawn, Giant of Flanders, Californian) [1,2,5].

The boy condition and energy balance of female rabbits appears to be correlated to short and long-term reproductive efficiency [6]. Metabolites concentrations and fat mobilization also affect the fertility rate [4].

The study of the metabolic profile is an alternative way for assessing the nutritional status of does.

The objective of the study was to characterize the reproductive performance (fertility, prolificacy, mortality) and weight of female rabbits from the local Algerian population, carried out at a semi-intensive rhythm (calving interval - mating 12 days).

Materials and Methods

The study was conducted in the experimental rabbitry of Batna 1 University. Rabbits does used in this study were issued from male and female of the local rabbit population collected near Batna (Aures area). Housing capacity of the rabbitry was 20 does reared at the same time, in individual wire mesh on one single level. All rabbits received *ad libitum* the same commercial pelleted diet: 16% crude protein and 12.5% crude fiber.

Water was always available from automatic drinkers. Females were presented to a male not earlier than 10 days after parturition, and then daily until effective mating. A nest box was placed in the cage 3-4 days before the expected day of parturition and maintained during all the 21 days of control following parturition.

Litters were weighted and litter size determined immediately after birth then every day.

Milk production was estimated as litter’s weight increase between the both weight determinations immediately before and after the daily suckling. Weaning age was 28 days.

Statistical study

The results were expressed as mean and standard deviation (X ± SD). They were subjected to statistical analysis with one-way analysis of variance (ANOVA) test. All statistical analyses were performed using statistical software MedCalc version 15. 2. A, p < 0.05 was considered statistically significant.

Results

Reproductive performances

The performances of 20 rabbit does were analyzed. 314 male presentations resulted in 184 mating, 148 parturition and 112 weaning with 22 litters lost during the birth-weaning phase. Table 1 presents the estimated means obtained for the different variables analyzed.

Parameter	Mean ± SD	Probability (P)
Acceptance rate (%)	59.6	-
Fertility rate (%)	79.1	-
Female weight at mating	2887.7 ± 467.3	***
Litter size and weight at birth		
Total born	6.9 ± 2.3	***
Born alive	5.8 ± 2	***
Average weight (g)	55.74 ± 16.1	***
Litter weight (g)	365.4 ± 104.2	***
Litter size and weight at weaning		
Number of weaned	4.8 ± 1.8	***
Average weight (g)	396.5 ± 133.6	***
Litter weight (g)	1741.3 ± 467.4	***
Weaning rate (%)	70.7 ± 8.3	***

Table 1: Average reproductive performance of local population rabbits.

***p < 0.001, **p < 0.01, *p < 0.05.

Milk production

Over the period 0-21 days, the total milk production was 2003.5g with a production daily average of 95.4g, the quantities of milk increase with the suckling week:435.1g, 851.8g and 934.5g, respectively in weeks 1, 2 and 3 (Table 2). The quantities of milk produced per day increase during the 21 days of observation, from 28g on the first day to 80g on day 21, the pic lactation in of our local population was situated between the 10th and 11th day (134g, figure 1).

	Mean	SD	VC (%)
Total milk production (g)			
Week 1	435.1	96.8	22
Week 2	851.8	137.6	16
Week 3	934.5	167.4	18
0-21days (g)	2003.5	336.9 17	17
Number of suckling young rabbits			
Week 1	5.9	1.9	32
Week 2	5.1	0.1	2
Week 3	5	0.1	2
0-21days (g)	4.9	0.1	2
Daily milk intake of kits (g/day/kit)			
Week 1	10.5	4.6	44
Week 2	23.8	6.1	26
Week 3	26.7	6.5	24
0-21 days (g)	19.5	5.3	27

Table 2: Average milk production observed during the suckling period with Auresian rabbit does.

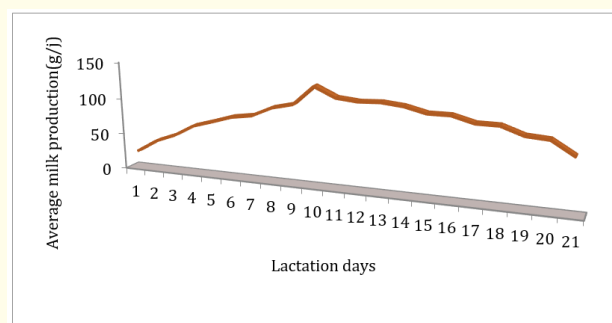


Figure 1: Evolution of the quantity of milk produced per day over the period 0-21 days after birth.

Discussion

The receptivity of local rabbits remains variable depending on the region. On the same population (in the region of Baba Ali, Blida city) we recorded lower receptivity and fertility rates (58.47 and 55.6% respectively) [8,11]. On the local Kabyle population, we observed lower receptivity and fertility values of 57.1 and 49.1% [7]. Fertility varied according to the genetic type [12]. This may be related to the strain or population format.

The prolificacy of the local population studied was found to be similar or even greater than that recorded by Ouyed [12] on the purebred (Californian) rabbit, which is 6.1 with 5.3 born alive. On the hypharm strain, [7] report a value of 11.8 total born. Unlike birth prolificacy, rabbits from the Aurès region are characterized by low weaning prolificacy (4.8), similar to that of other local populations from different regions. This low prolificacy at weaning is linked to mortality during the birth-weaning phase.

The rabbits of this population are characterized by a relatively low milk production (on average 2003.5g for the period 0-21 days). This would partly explain the low weight of the young rabbits in this population at weaning (396.5g). The evolution of the quantities of milk produced per rabbit and during the period 0-21 days of lactation presented in the form of a curve shows a similarity to the curve described by [9]. The quantities of milk produced per day increase throughout the lactation period.

Conclusion

This first characterization study of the local Auresian population, maintained in a closed population, made it possible to define its main characteristics, namely an adult weight of females of 3350g, a high fertility of 79%, a modest birth prolificacy of 6.9 aggravated by a high stillbirth probably linked to inadequate housing conditions. All the results will help define the objectives that we want to achieve for genetic improvement.

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