

EVALUATION OF PRODUCTIVE INDICATORS IN HALF-BREED RABBITS FED WITH LOCAL PRODUCTS IN CUBA

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ABSTRACT

An experiment was carried out at the Experimental Station of Pastures and Forages “Indio Hatuey”, with the objective of studying the productive performance of half-breed rabbits with a feeding system based on the use of local products. A total of 30 clinically healthy does with a weight higher than 3.4 kg were used. Feeding was composed by mulberry (*Morus alba*) forage *ad libitum*, sugarcane, sweet potato (*Ipomea batata*) creeping stems and domestic feed. From the individual records of the does, the following indicators were determined: average of born-alive offspring per parturition, weaned offspring per parturition, mortality per stages during lactation, average weight at birth, 20 days after being born and at weaning (45 days), average daily gain (adg) per stages and during the whole lactation. The average of young rabbits born alive per parturition was 7, while the average of weaned young rabbits was 5.2 with a weight of 784 g/animal. Average daily gain during lactation was 18 g. Mortality rate was 25.7 %, most of which took place during the first lactation stage (0-20 days) with 20.7 %. The results show that with the use of local resources of moderate nutritional quality, satisfactory productive results are obtained in half-breed rabbits.

Key words: productive indicators, half-breed rabbits, local products.

INTRODUCTION

One of the main problems faced by rabbit producers in the tropics is the lack of a constant source of high nutritional quality feedstuffs during the whole year and at a reasonable price that allows them to obtain adequate productive and economic profits (BAUTISTA *et al.*, 2002).

However, although there are several research institutions, in Cuba and other countries, devoted to find new feeding alternatives, there is little information about the use of available local resources in rabbit nutrition. That is why the objective of this work was to study the productive performance of half-breed rabbits with a feeding system based on the use of local products.

MATERIAL AND METHODS

The work was carried out at the Experimental Station of Pastures and Forages “Indio Hatuey” of Perico municipality, Matanzas province, between September, 2003 and February, 2004. A total of 30 clinically healthy half-breed does, 10-18 months old, which were between the second and fourth parturition and had an average weight higher than 3.4 kg, were used.

Housing: the animals were individually housed in galvanized wire cages, 75 cm long and 75 cm wide, provided with feed and water clay troughs. The shed had in fiber cement roof, wire mesh walls and cement floors with 50 cm deep pits under the cages, where earthworms are fed the rabbit excreta. The sides of the shed (at the level of the cages) were covered with woven nylon blankets to protect the animals from the direct incidence of wind.

Feeding: the does were fed a diet based on mulberry (*Morus alba*) forage *ad libitum* which was supplied in the morning (7:30-8:00 am) and the afternoon (5:30-6:00 pm), chopped sugarcane (*Saccharum officinarum*) (400 g per doe), sweet potato (*Ipomea batata*) creeping stem (500 g per doe), and domestic feed (70 g per doe). Table 1 shows the nutritional composition of each of the feedstuffs supplied during the study.

Table 1. Nutritional composition of the feedstuffs supplied during the evaluation period.

Feedstuffs	Dry matter (%)	Crude protein (g)	Crude fiber (%)	Calcium (g)	Phosphorus (g)
Mulberry (<i>Morus alba</i>)	26.1	15.0	14.1	2.7	0.2
Sugarcane (<i>Saccharum officinarum</i>)	26.0	5.8	24.0	0.6	0.1
Creeping stem (<i>Ipomea batata</i>)	18.0	16.0	30.0	2.6	0.4
Domestic feed	89.0	11.0	2.9	2.3	1.0

Domestic feed: non-industrial concentrate elaborated from local grains.

Animal management: a management system was used in which the does were presented to the bucks from 20 days after the parturition for which the does were transferred to the cages of the bucks, after heat detection by means of inspecting the external genitalia and checking vulva swelling and color change of the mucous membrane according to the methodology described by PONCE DE LEÓN (1994).

The nests were placed 27 days after the service. They contained bermuda grass hay for avoiding moisture. Immediately after the parturition, the young rabbits were counted and individually weighed, which was repeated 20 and 45 days after the parturition. Mortality rate of the offspring was quantified in each lactation stage and abrupt weaning was performed 45 days after parturition.

The young rabbits were dewormed when they were 20 and 45 days old with an homeopathic (Cina 30 ch-Teucrium 200 ch) at a rate of 10 drops per liter of drinking water during 5 days. Likewise the does were dewormed 20 days after the birth of the young rabbits and after weaning, with the same dose and over the same period of time.

Data processing: from the individual records of the does the following data were controlled: identification, service date, pregnancy diagnosis, parturition date, offspring born alive and weaned young rabbits per doe. The data were introduced to a Microsoft Excel calculation sheet in order to facilitate information processing, with which the following indicators were calculated: average of young rabbits born alive per parturition, weaned young rabbits per parturition, mortality rate per stage during lactation, average weight at birth, 20 days after birth and at the weaning time (45 days), average daily gain (adg) per stages and during the whole lactation.

RESULTS AND DISCUSSION

Figure 1 shows the total of parturitions and abortions during the evaluation period. As may be observed, there were 60 parturitions and 4 abortions, which represent 93.75 and 6.25 % of the total of pregnancies, respectively. The cause of abortions may have been the *ad libitum* intake of fresh mulberry forage, which, according to GARCÍA (2003) shows high concentrations of coumarin and other anti-nutritional factors that affect pregnancy maintenance in the pregnant does.

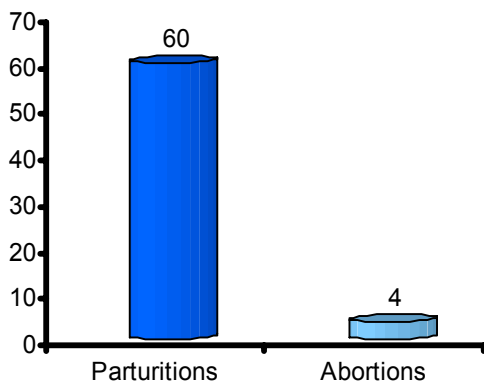


Figure 1. Total of parturitions during the period.

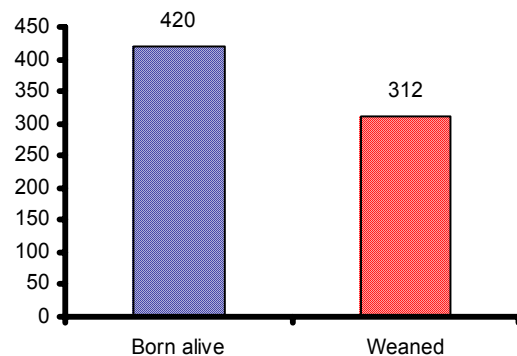


Figure 2. Total born alive and weaned offspring during the evaluation period.

Figure 2 shows the total of born-alive and weaned (45 days) young rabbits during the period. In this case, it is noteworthy that from 410 born-alive young rabbits, 312 were weaned, which represents 74.3 % of survival during lactation, higher than the percentage found by REYNALDO *et al.* (2002) in a traditional system based on commercial concentrate, but weaning 35 days after birth.

Figure 3 shows the average of born alive and weaned offspring per parturition. It is noteworthy that using half-breed animals under these management and feeding conditions an average of 7 young rabbits were born alive per parturition, a result higher than the one found by CÁNDIDA *et al.* (2002) in a traditional reproduction system, using

half-breed does and feeding based on commercial concentrate (pellets), where 5.64 rabbits born alive per parturition were obtained. Besides, these results were similar to those reported by PASCUAL *et al.* (2002) in first parturition does of the New Zealand x California cross with feeding based on concentrate with 96 % alfalfa.

In the case of the performance of weaned offspring per parturition, there was an average of 5.2 during the whole evaluation period, a result similar to the one found by REYNALDO *et al.* (2002) using a diet based on commercial concentrate and a traditional reproduction system, and also similar to what was reported by GARCÍA (2002) in does of the Chinchilla breed.

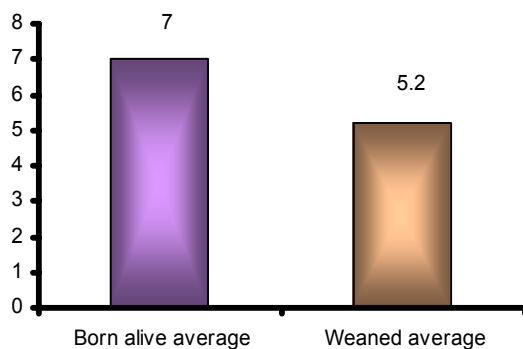


Figure 3. Average of born-alive and offspring per parturition.

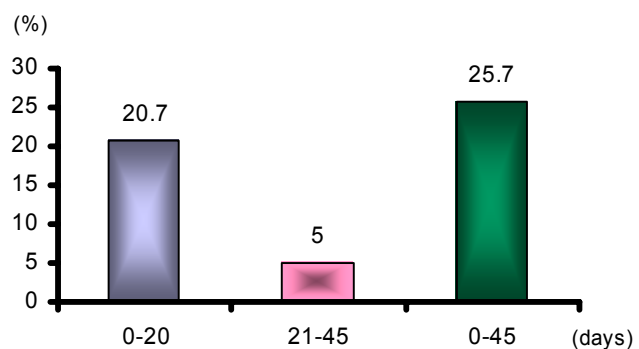


Figure 4. Mortality rate in the offspring in the different stages analyzed during lactation.

Mortality rate in the offspring during the different lactation stages is shown in figure 4. The highest mortality percentage was found during the first lactation stage (0-20 days), with 20,7 % of deaths during this period, which coincides with what was found by SZENDRŐ (1989) who qualifies this stage as the most critical during lactation. This was mainly because in this first stage the weakest and smallest young rabbits of the litter died, besides some died due to crushing which is not present among rabbits between 21 and 45 days old.

In the second stage of lactation (between 21 and 45 days old) mortality percentage was only 5 %, the main cause being in this case the diarrheas brought about by the feedstuffs, perhaps because of the intake of fresh mulberry forage, which has good palatability, high protein concentration and high fiber digestibility (GONZÁLEZ *et al.*, 2002 and DIGO *et al.*, 2002), all of which may have propitiated the development of enteric processes in the young animals. In order to reduce these digestive problems in the young rabbits and the reproductive problems in the does, it is convenient to use this forage restrictively and not *ad libitum*.

Average weight of the offspring at birth, 20 days after birth and at weaning time is shown in figure 5. It is remarkable that the young rabbits were born weighing 64 g, which is relatively high taking into account the average weight of the does (3.4 kg). These results were higher than the ones reported by CÁNDIDA *et al.* (2002) in half-breed does in

traditional system, fed with commercial concentrate, who found a weight at birth of 57.6 g per young rabbit.

Twenty days after birth the young rabbits weighed 324 g, which represents an increase of 260 g in the first 20 days of life of the animals; while at weaning they weighed 874 g, a value lower than the one found by CÁNDIDA *et al.* (2002) with a feeding system based on commercial concentrate (1033.5 kg).

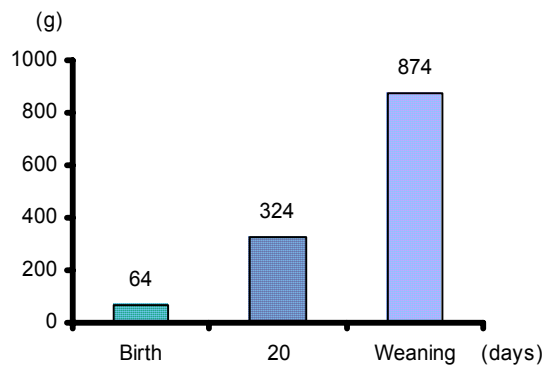


Figure 5. Average weight of the offspring in the different stages analyzed during lactation.

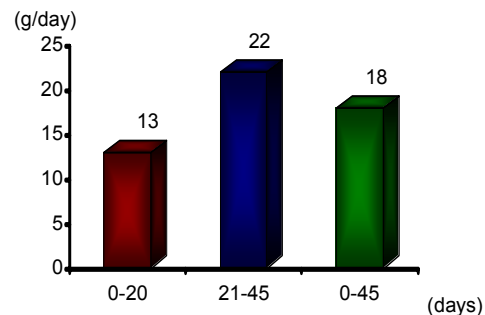


Figure 6. Average daily gain of the young rabbits in each lactation stage.

Figure 6 shows the daily gain of the young rabbits. It may be observed that during the first 20 days the adg was 13 g/day. Between 21 and 45 days of age, the adg increased as compared to the previous stage and was 22 g/day.

During the whole lactation stage, average daily gain was 18 g/day, similar to what was reported by REYNALDO *et al.* (2002) who obtained gains of 18.3 g/day in young rabbits weaned 35 days after birth. On the other hand, these results were lower than those reported by CÁNDIDA *et al.* (2002) in half-breed animals weaned 42 days after birth (23.2 g/day).

CONCLUSIONS

The results prove that, in spite of the problems caused by mulberry forage when fed *ad libitum*, with the use of local resources, encouraging productive values are reached in half-breed rabbits obtaining 7 live young rabbits per parturition and weaning more than 5 with a weight of 874 g when they are 45 days old, which allows weight gains of 18 g/day during the lactation stage.

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