

TECHNICAL NOTE: RABBIT MEAT PRODUCTION UNDER A SMALL SCALE PRODUCTION SYSTEM AS A SOURCE OF ANIMAL PROTEIN IN A RURAL AREA OF MEXICO.

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ABSTRACT: The aim of this study was to obtain information on rabbit meat consumption habits and rabbit production in Xocotlan, a rural community in Mexico. In the first part of the study, 20 families were requested to describe the rabbit production situation in the community, before 1989 and during 1995. Results indicated that before 1989, the percent of rabbit breeders was 70% of the population while during 1995 a decline to 45% was noticed. This fact can be explained by the outbreak of the Viral Hemorrhagic Disease in 1989. The percentage of the breeders that raised one to five does before 1989 was 64% and decreased to 55% in 1995. Seventy two percent of the breeders before 1989 assigned their production to self-consumption while in 1995 this percentage increased to 89%. Moreover, the breeders that ate rabbit meat one to two times per month before 1989 was 79% while in 1995 this percent reduced to 67%. In the second part of the study, a rabbit production program was performed with nine families, five from Xocotlan and four from Purificación. The results showed that one family from Xocotlan got a litter size at birth of 9.5 ± 1.7 kits, while two families did not get any results due to abnormal behaviour of the does. In general, the breeders from Xocotlan obtained higher performance than those from Purificación. The range of rabbit meat consumption per capita per month was 310 to 644 g and the highest meat consumption was recorded by the Xocotlan families.

Key words: rabbit production, meat consumption, community.

INTRODUCTION

Development of rabbit production in Mexico has been limited at both extensive and intensive levels, as indicated by low rabbit meat production in addition to the limited consumption per capita (Colin and Lebas, 1996, Clavel *et al.*, 2004). The factors that explain this situation are the minor economic importance of the domestic rabbit, compared to cattle and poultry, and the small size and dispersion of production units across the Mexican territory. Most rabbitries in Mexico belong to small scale family breeders. Furthermore, limited rabbit production is also attributed to the lack of support from governmental organizations, the poor sanitary policies to avoid the outbreak of epizootics, little interest from the universities in performing research with this species and the lack of genetically superior animals.

Good quality data and information are needed for prospective studies and development programs. Quality, technological and economical data and information about rabbit production systems in Mexico are scarce. The purpose of this study was to characterize small rabbit production units in the

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period 1989-1995 and evaluate a rabbit meat production program using families from two rural communities.

MATERIAL AND METHODS

The study was performed in the community of Xocotlan, Texcoco, Mexico. Texcoco is located at 19° 21' -19° 33' N and 98° 38' - 98° 56' W, and 2253 m above sea level. Climatic conditions include an annual average temperature of 15.9°C and rainfall of 691 mm (García, 1981). There were 329 families in the community in 1989, with an increase of 60 families in the year 1995. Twenty families were selected according to the following criteria: (a) performance of family livestock activity; and (b) interest by the community in rabbit meat production and consumption. The study was divided into two phases; the first phase had as a goal to give a description of the rabbit production situation in 1989, in which an outbreak of viral hemorrhagic disease (VHD) appeared. As a result all of the rabbit population in the Mexico valley and other surrounding areas was slaughtered by the sanitary authorities. A survey using a random sample of 20 families, represented 5.14% of the total population, was conducted to investigate rabbit meat production and consumption habits (Marques and Castillo, 1990). The sample was selected using a random number table (SAS, 1988). A questionnaire was designed to obtain information including, socioeconomic, production, nutritional, health and reproductive aspects, as well as commercialization, facilities and equipment for rabbit production. Data were analyzed using the PROC UNIVARIATE, PROC FREQ procedures of SAS software (SAS, 1988).

The second phase was designed to describe the rabbit production situation after eradication of the VDH in 1995 and evaluate a small scale rabbit meat production program. In total nine families were selected; five from Xocotlan and four from Purificacion. The nine families had a one day workshop in which they learned the main management aspects of rabbit production. The nine participants built shelters for the rabbits and three does and one buck, New Zealand White breed (2.7 to 3.1 kg B.W., 3 months old) were distributed to each family. Animals were fed basically with kitchen leftovers and alfalfa; the latter depending on availability. The duration of the experiment was seven months, allowing the animals to breed and have offspring. Records were taken on the offspring until they reached a live weight of 2 kg. Production data and information of the nine small rabbit production units were obtained using specific formats and with collaboration of the producer on a weekly basis. The variables observed were: total number of parturitions, litter size born, number born alive, number still born, mortality at weaning, number of weanling rabbits and rabbit meat consumption. Data were analyzed using the PROC UNIVARIATE, PROC FREQ procedures of SAS software (SAS, 1988).

RESULTS

Rabbit production and meat consumption in Xocotlan before 1989 and during 1995 are presented in Table 1. It can be seen that before 1989, 70% of the population was engaged in this activity. In 1995 there was a considerable reduction to only 45%, which represents 230 and 175 breeders in 1989 and 1995, respectively.

This reduction in the number of breeders can be explained by the outbreak of VDH. The reasons why the breeders did not resume rabbit production were loss of interest, lack of economic profit because of the outbreak of the disease and the belief that the disease was not going to be eradicated.

The distribution of number of does indicated that before 1989, 64% of the breeders had one to five does and in 1995 this percentage was only 56%. In both periods the production was basically for home consumption. The percentage of families that consumed rabbit meat one to two times per month was 78.6% in 1989 and 66.6% in 1995. However, 33.4% of the families consumed rabbit meat

Table 1: Rabbit production situation in the community of Xocotlan, Texcoco, México.

	Before 1989	1995
Rabbit Producers (% of population)	70	45
No. of producers	230	175
Estimated no. of does	1224	896
Units size (% of producers.):		
1-5 does	64.3	55.6
6-10 does	28.6	33.3
11-20 does	7.1	11.1
Type of feed (% of producers):		
Commercial	3.0	2.0
Leftovers and other	97.0	98.0
Production destination (%):		
Home-consumption	72.3	88.9
Sale	27.7	11.1
Rabbit meat consumption per month (%)		
1 time/month	50.0	22.2
2 time/month	28.6	44.4
3 time/month	7.1	11.2
4 time/month	14.3	22.2

three to four times in 1995, and 21.4% in 1989. As a result, people were eating rabbit meat more times per month in 1995. Animal diet was based mainly on kitchen leftovers, corn, wheat, bread, fruit, alfalfa, and only a low percentage received commercial feed. There was no technical assistance given by any governmental office.

Animal performance from the Xocotlan community is presented in Table 2. Two breeders had the lowest litter size at birth, and there were no weaned rabbits. This result can be explained because the does avoided any contact with the newborn by taking them out of the nest, in some cases the does had aggressive behaviour. As a result, the kits died of cold and lack of feed. It is possible that this behaviour was due to the feeding regime of the does, the place where the nests were located in terms of humidity and the weight of new born rabbits which sometimes was very small. The breeders were also unreliable in taking care of the animals. Three breeders got the highest litter size with 9.5 ± 1.7 per parturition, another breeder had the lowest still born percentage (9.4%). Other reproductive traits of

Table 2: Descriptive statistics of rabbit breeding performance with families in Xocotlan.

Family	Total kits born (n)	Total kits born alive (n)	Still born (%)	Mortality at weaning (%)
1	6.4 ± 1.1	3.0 ± 4.1	53.1	100.0
2	6.6 ± 1.9	3.4 ± 4.6	18.2	100.0
3	8.0 ± 2.2	7.0 ± 3.5	12.5	68.6
4	9.5 ± 1.7	8.5 ± 1.0	10.5	20.6
5	7.0 ± 1.1	5.8 ± 2.2	9.4	13.8

Table 3: Reproductive and productive performance of breeding with the animals of the families in Xocotlan.

	Mean	Standard error
Total number of parturitions	24.0	
Litter size at birth (n)	7.2	0.53
Number of kits born alive	5.4	0.98
Percentage of kits still born	25.7	
Percentage mortality from birth to weaning	51.5	
Number of kits weaned	63.0	
Total number of kits born (n)	173.0	
Interval between parturitions (days)	66.4	1.18
Conception rate (%)	53.3	
Gestation (days)	32.5	0.41

the does such as interval between parturitions, conception rate, litter born percentage and weaned are shown in Table 3.

Table 4 presents the breeding performance in Purificación. The highest number of total rabbit born was 7.0 ± 1.7 per parturition, which was lower than the one in Xocotlan with 9.5 ± 7.7 rabbits per parturition. A common trait in both communities is that one family from each community did not have any reproductive activity because of lack of management or health problems. In general, the breeding behaviour of the does in Purificación was apparently lower, as presented in Table 5, where it was found that the mean litter size at birth was 5.9 in Purificación versus 7.2 rabbits in the Xocotlan community. The same trend was found for kits born alive and for number of kits weaned. The Xocotlan community had better apparently results in the parturition interval, conception rate and litter born percentage.

Rabbit meat consumption began four months after the beginning of the program. Slaughter was carried out when rabbits reached 2 kg live weight and this was achieved at an average of 97 ± 6 days of age. These results agreed with those found by Lukefahr and Cheeke (1991 a,b), were under a small scale production system, the animals reach 2 kg of live weight at 4 months of age, essentially twice the time required under optimal productive conditions. Table 6 presents rabbit meat consumption. Consumption per capita per month from Xocotlan was 601 ± 50.95 g average over the study period. In comparison, in Purificación the meat consumption per capita per month was 370 ± 43.93 g. The families that had a better meat production were those who followed the recommendations by the technician in terms of care, feeding and general management. In general the families from Xocotlan had acceptable rabbit meat consumption, considering the relatively low investment.

Table 4: Descriptive statistics of rabbit breeding performance with the animals of the families in Purificación.

Family	Total kits born (n)	Total kits born alive (n)	Still born (%)	Mortality at weaning (%)
6	0	0	0	0
7	5.5 ± 2.1	4.2 ± 3.3	22.7	17.6
8	7.0 ± 1.8	5.0 ± 3.5	29.5	20.0
9	5.2 ± 3.2	3.7 ± 4.3	28.5	26.6

Table 5: Reproductive and productive performance of breeding with animals of the families in Purificacion.

	Mean	Standard error
Total number of parturitions	12.0	
Litter size at birth (n)	5.9	0.88
Number of kits born alive	4.3	1.30
Percentage of kits still born	26.7	
Percentage mortality from born to weaning	78.8	
Number of kits weaned	41.0	
Total number of kits born (n)	71.0	
Interval between parturitions (days)	68.9	1.65
Conception rate (%)	44.4	
Gestation (days)	31.4	0.65

CONCLUSIONS

Xocotlan was an important rabbit production community in 1989 and has the potential to become important again. The low performance observed in the families from Purificacion may be due to the lack of experience, possible suggestions about how their production could be improved including, more workshops to elucidate the benefits of rabbit production. Small scale rabbit meat production in rural areas can be an alternative to satisfy, to some extent, the need for animal protein for these families, especially as far as children are concerned.

Table Table 6: Rabbit meat consumption per capita per month in the families in Xocotlan and Purificacion.

Families in Xocotlan	g	Families in Purificacion	g
1	0	6	0
2	0	7	310.0
3	530.0	8	414.0
4	631.0	9	386.0
5	644.0		

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