

## **USE OF SOLAR AND SOCIAL PERCEPTION OF DOMESTIC RABBIT (*Oryctolagus cuniculus*) IN TWO RURAL COMMUNITIES OF THE STATE OF YUCATAN, MEXICO**

**Cruz - Bacab, L.<sup>1</sup>, Sandoval - Castro, C.<sup>1</sup>, Pantoja – Nuñez, G.<sup>2</sup>**

<sup>1</sup>Universidad Autónoma de Yucatán – Campus de Ciencias Biológicas y Agropecuarias , Mexico

<sup>2</sup> Instituto Tecnológico de Sonora – Depto. De Ciencias Agronómicas y Veterinarias, Mexico

Corresponding author: veterina@www.uady.mx

### **ABSTRACT**

The necessity for efficient alternatives in animal production in rural areas make it necessary to know the current use of the home garden and the potential for inclusion of new species in this production unit. This paper discusses the current use of home gardens in two rural communities of Yucatan, Mexico (Ucu and Santa Elena), and surveys knowledge of the domestic rabbit (*Oryctolagus cuniculus*) and its potential inclusion in home gardens. Two-hundred twenty-seven surveys were obtained in Ucu and 98 in Santa Elena. The results show a greater proportion of activities related to agriculture and animal husbandry in Santa Elena than in Ucu ( $P < 0.05$ ). Similarly, greater interest in raising rabbits was found in Santa Elena as compared to Ucu ( $P < 0.05$ ).

**Keywords:** Yucatan, rabbit, rural inclusion

### **INTRODUCTION**

Traditional production systems such as the solar or home garden have been maintained throughout history, and have contributed to the survival of rural populations. Their continuity is explained by their ability to adapt to environmental and socioeconomic changes within societies (Gliessman, 1999, Gonzalez et al 2007). The home garden is a low-risk agricultural system that allows families to cushion the impacts of periods of shortage due to its continuous production of crops for consumption or trade. In Mexico, the home garden as a productive system has a large distribution and acts as a mainstay in the cultural identity of the rural populations (Allison, 1983; Gispert 1993; According to Beltrán 2005; Ellis and Porter 2007; Gonzalez, et al. 2007; Moctezuma, 2010). Changes that occur in the lifestyle of families, particularly in their diets, promote changes in the function of the home garden (orientation, size, components) and even, testing the sustainability of the land and its contribution to the permanence of rural communities over time. This makes necessary the search for efficient animal species in the use of local resources for production, without competing with human population nutrition. The aim of this study was to characterize both the use of the home garden in two rural communities of Yucatan, and the opportunities for the inclusion of the domestic rabbit as a productive component of the home garden.

### **MATERIALS AND METHODS**

#### **Study site**

The study was conducted in two communities in the state of Yucatan, Ucu in the northwest and Santa Elena in the southern part of the state. Ucu Township, which has an area of 92.89 km<sup>2</sup>, is bordered by Progreso in the north, Uman in the south, Hunucma to the west, and by Mérida to the east. Ucu is located 14.71 km away from the metropolitan city of Merida. The town of Santa Elena occupies an area of 694.90 km<sup>2</sup>, and is bordered by Muna in the north, south Ticul to the east, Halachó to the west, and by Oxkutzcab and the state of Campeche in the south.

## Sample Size

The unit of study determined for data collection was the family and their use of the solar. The solar is understood as the physical space, adjacent to the homestead where the family performs both cultivation of crops and livestock, and socialization. The sample size was established by calculating the estimated proportions in each population using the formula proposed by Batthacharyya and Johnson (1977), which is based on the number of families reported in the national census in population and housing 2010 INEGI (907 and 942 respectively in Ucu and Santa Elena). Based on these data, the sample size for both communities was determined to be 90.

## Data Collection

Rigid questionnaires were divided into four sections: I) Occupational profile of the head of household (primary occupation of head of household). II) Profile of the use of the home garden (characterization and use of home gardens, as well as plant and animal resources). III) Characterization of animal production (current breeding of animals and interest in the introduction of additional species to the solar). IV) Description of the current knowledge of domestic rabbits, and characterization of their current use (knowledge, and previous experience with rabbit breeding, previous consumption of rabbit meat, interest in rabbit breeding).

## Statistical analysis

The results were determined using inferential statistics. The proportion of families (%) had a confidence interval (CI) of 95% toward including the variable of interest in each target population. Contrast hypothesis testing for independent samples using a 2 x 2 contingency table was used to calculate the coefficient of contingency (C). All analyses were performed using the Statgraphics Centurion XVI (2010 StatPoint ® Technologies, Inc.) statistical package.

## RESULTS AND DISCUSSION

**Table 1.** Home garden activities related to crops, animal husbandry, and the use of local resources in Ucu and Santa Elena, Yucatan.

Activity	Ucú			Santa Elena			P-value
	Frequency	%	CI (95 %)	Frequency	%	CI (95 %)	
Crops	136	60.00a	±5.53	84.7	86.43b	±6.45	<0.0001
Animal Husbandry	155	68.20 a	±5.25	80.6	82.24b	±7.20	0.0095
Additional Species *	106	46.69 a	±5.63	68.4	69.80b	±8.64	<0.0001

\* Interest in raising rabbits.

## Utilization of Homegardens: Crops and Livestock

The *home garden* is an important social to the family, where the man-plant is part of the set of relationships that give meaning and specificity to the system. In this regard, it was noted that both communities used the home gardens for cultivation and animal husbandry. However, the proportion of families who benefit from these activities was higher in the case of Santa Elena (see Table 1). The proximity of urban areas provides rural residents with the ability to access salaried jobs, producing migration that can occur on a temporary or permanent basis (Lambin et al., 2001, Gerritsen, 2002). In the communities studied, although differences exist between the uses of home gardens as productive spaces, maintaining the scheme of traditional uses for plants, divided into fruits, and vegetables, both ornamental and medicinal, mirrors what was previously reported and described by Cuanalo (2008). In turn, the animal component accounts for the home garden power by constantly supplying protein at low cost. Domestic birds (chickens, turkeys, and ducks) represent species with greater presence as compared to other species (71% and 52% respectively in Ucu and Santa Elena). These species coincide with those reported by Ake (2002) and Cuanalo (2008) as part of the productive species in other communities in the same geographical area in the state of Yucatan.

**Table 2.** Knowledge of rabbits in the communities of Ucu and Santa Elena, Yucatan.

	Frequency	Ucú %	CI (95%)	Frequency	Sta. Elena %	CI (95 %)	P value
Knowledge of Rabbits	216	95.15 a	±2.43	90.8	92.6a	±4.93	0.3704
Raising Rabbits	86	37.89 a	±5.48	55.1	56.2b	±9.35	0.0021
Consumption of Rabbit Meat	104	45.81a	±5.62	61.2	62.4b	±9.12	0.0060
Interest in Raising Rabbits	135	59.47a	±5.54	75.5	77.0b	±7.93	0.0023

n = 227 for Ucu, n= 98 for Santa Elena Different letters in the same row = significant (P<0.05). Frequency corresponds to those who answered affirmatively to the variables.

#### Knowledge of and Interest in the Domestic Rabbit (*Oryctolagus cuniculus*). Consumption of Meat

The rabbit formed part of the diet of Mesoamerican peoples like the Maya, and according to Segovia et al. (2001) rabbit meat has been one of the best sources of meat in rural areas historically exploited by hunting, a traditional activity which continues today. Although there is no previous information on the consumption of rabbit meat in the rural communities of Yucatan, this study found differences in the proportion of households consuming this meat according to their geographical location with respect to urban areas (P<0.05), as shown in Table 2. The difference in consumption of rabbit meat from the study communities can be related to factors such as: the tradition of hunting, and the image of the rabbit as an animal for consumption. In this sense, hunting, and the identification of the rabbit as a species for consumption is more related to remote communities such as Santa Elena, than to urban centers. Subsistence hunting is a practice associated with other productive activities such as maintaining cornfields, gardens, beekeeping and extracting wood (Terán and Ramussen, 1994; Montiel et al, 1999; Guerra and Naranjo, 2003, Toledo et al, 2008).

Since pre-Hispanic times at least 20 species of terrestrial vertebrates including wild rabbits have been exploited by the Maya of the Yucatan Peninsula (Emery, 2008); they have historically been used for food, commerce, medicine, craft or to reduce the impacts of crop damage (Jorgenson, 1995; Montiel et al, 1999; Quijano - Hernández and Calme, 2002; Naranjo et al, 2004; Barrera - Bassols and Toledo 2005 and Emery, 2008). This explains the higher proportion of families who have eaten rabbit meat in Santa Elena, since it is in this community that a greater proportion of the land in use is dedicated to cultivation compared to Ucu. The lower consumption rate of rabbit meat among the families in Ucu (Table 2), may be the result of the lack of custom in its consumption, a lower degree of utilization of the land and its resources, and tending more toward urbanized lifestyles. This coincides with the fact that for health reasons urban populations tend to eat less meat, particularly red meat (Santos and Booth, 1996, Kiefer et al., 2005). On the other hand, the lower level of consumption of rabbit meat may be influenced by current ideological trends of respect for animals and vegetarianism, called by Serpell (2004) as "emotional and moral reasons." According to Serpell (2004), the rejection of the consumption of rabbit meat is directly associated with owning a pet rabbit, and therefore the rejection of its meat is given for emotional reasons. In general, the act of owning pets since childhood, has resulted in increasing interest in animal welfare and in some cases an increased rejection of the consumption of meat (Serpell, 1993, Miura et al., 2002). In the case of the rabbit this effect is reinforced by the animal's quiet and peaceful nature, which has been personified in stories and cartoons typical of Anglo-Saxon culture, giving it a strong connotation as a pet as opposed to an animal for consumption (Camps, 1996; Camps and De Pedro, 2001).

#### CONCLUSION

Knowledge of and interest in domestic rabbits is related to families that participate in agricultural activities and animal husbandry. Rabbits are known in rural communities through the tradition of hunting and their meat has been traditionally consumed since prehispanic times.

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