Rev. prod. anim., 25 (1): 2013

Woody Plants Eaten by Goats

Jorge Ezequiel Hernández Hernández, Julio César Camacho Ronquillo*, Lorenzo Carreón Luna*, Oscar Villarreal Espino-Barros*, David Galeno Hernández** and Redimio Manuel Pedraza Olivera****

*** Faculty of Veterinarian Medicine and Animal Care, BUAP, Tecamachalco, Puebla, México**

**** Student of the Faculty of Veterinarian Medicine and Animal Care, BUAP, Tecamachalco, Puebla, México**

***** Center for the Study of Animal Production and Development (CEDEPA), Faculty of Agricultural Sciences, University of Camagüey**

ovichiv_05@yahoo.com

ABSTRACT

Fifteen domestic goat raising units from Tehuaxtla and Maninalcings communities in Mixteca poblana, México, were studied to find out which woody plants parts were mainly grazed by goats. Five marked goats were sampled and watched while grazing. Each plant part was taxonomically collected and classified. A descriptive statistical analysis was performed to determine the number of mouthfuls/time/plant species and mouthfuls/time/plant part. A simple variance analysis (ANOVA) was also performed. Differences among mean values were determined by Duncan's test. Leaves, flowers, and unripened fruits were the parts most grazed by goats. With regard to woody components, legumes reached a higher percent (75 %), particularly their leaves (86 %).

Key Words: *fraction, arborescent shrubs, feeding, goats*

INTRODUCTION

Plants are the key to life on earth, without them many living organisms would disappear, as higher forms of life depend on plants directly or indirectly for food (Hodgson e Illius, 1996).

The use of woody plants in agricultural production systems where there is rain shortage and lack of import capacity is essential for goat feeding and production. All components of legumes (leaves, flowers, fruit and pods) are valuable for small ruminant nutrition (Hernández, 1986 y Hernández, 2006).

Due to upper lip motility and pressing tongue, goats have the special ability to capture very small leaves, even from thorny plants and very short pastures (Franco *et al*., 2005).

Likewise, goats can take bitter tastes easier, a reason why in some parts of the world they prefer to graze on woody parts of plants. In Mixteca Poblana, México there is arborescent, shrubby potential as forage; however, the most commonly grazed woody parts are still unknown in the region. As a result, the aim of this research is to know the woody parts most commonly grazed in Mexican Mixteca Poblana.

MATERIALS AND METHODS

This work was carried out in the municipality of Piaxtla, within the communities of Tehuaxtla and Maninalcingo, from Mixteca Poblana, located between 17° 59' 00'' and 18°12' 30'' northern latitude; 98° 10' 54'' and 98°21' 36'' eastern longitude. The precipitation rates vary from 350 to 800 mm (INEGI, 2000). The ecosystem is characterized by thorny deciduous xerophyte lower jungle, spiky shrubbery and arborescent-shrubby vegetation. There are also some forest areas with ever-green oaks and pastures. The weather is sub humid, with rainfalls in the summer, and semi dry and very warm in the dry season. The mean temperature is 23 °C .

Five goats were used per family production unit (FPU), for plant trimming and identification of the parts eaten (taxonomic herbal collection). A clipboard, a guide shepherd (native identification of the plant), garden shears and photo camera, were used. The observation method was used during grazing (8:00 a.m. to 12:00 p.m.), to determine the plant (20-25 cm branch) and eaten part (leave, flower and fruit). Each part was separated with paper for collection and taxonomic classification, at the herbarium of the School of Biology of the Meritable Autonomous University of Puebla (BUAP). The studies took place in the dry and rainy seasons (February to October, 2006). Descriptive statistics was used to analyze the parts of the eaten plant, the woody component (number of mouthfuls/time/plant part), and value as forage

given in units of family production (FPU). Simple variance analysis (ANOVA) was performed, and the mean differences were determined by Duncan test (1955). Software SPSS 10.0 for Windows was used.

RESULTS AND DISCUSSION

The part of the plants eaten by the caprine accounted for 35 % for leaves, flowers and unripened fruit; 23 % was reached for leaves, flowers and pods; whereas for the remaining parts of the plants the percentages decreased (see figure).

Needless to say, in the seven groups of woody parts from the plants, the results indicate 86% of preferences for the leaves ($P < 0.05$), possibly due to the technological state of perennial woody plants. Eight out of the forty arborescent-shrubby trees were the ones most frequently grazed by the animals (Table 1). The highest consumption corresponded to legumes, an important stock of proteins (Table 1). Finally, all the grazed parts (mouthfuls) of the plants (Table 2) showed significance for ($P < 0.05$), except for *Acacia pennatula* and *Ceiba parvifolia*.

Carrera and Cano (1969) and Hernández *et al*. (2005) concluded that the goat tends to eat arborescence species and plant shoots, whereas graminaceae, though abundant, are eaten in limited amounts. On the contrary, a research carried out in a semiarid area from Loma de León experimental fields, Venezuela, concluded that graminaceae were the plants goat consumed most (Martínez *et al*., 1972).

Santos (2001) stated that to study the grazing or trimming preference caprine it is important to consider the trimming sites within a land area, forage species, parts of the plant and mouthfuls. Other factors to be regarded as well are the topography, plant size, durability and kind of forest it belongs too (Dumant and Gordon, 2003) (Hernández, 2006).

CONCLUSIONS

The most frequently grazed plant parts in the Mixteca Poblana are leaves, flowers and unripened fruits.

The woody component was mainly legumes, with the highest percentages on leaves.

Recibido: 3-9-2012
Aceptado: 3-10-2012

REFERENCES

CARRERA, C. y CANO BLAKE, J. (1969). *Plantas aprovechadas por el ganado caprino en una zona de matorral desértico y su análisis proximal*. XI Informe de investigación del ITESM, Monterrey, México.

DUMONT, B y GORDÓN, L. (2003). Diet Selection and Intake Within Sites and Across Landscapes: Matching Herbivore Nutrition to Ecosystem Biodiversity. En L. Mannetje; L. Ramírez-Avilés; C. Sandoval Castro; J.C. Ku-Vera (eds.) *Proceedings of the VI Internacional Symposium on the Nutrition of Hervibores*, Universidad Autónoma de Yucatán. Mérida, México.

DUNCAN, D. B. (1955). *Multiple Range and Multiple F Test Brometric*, 11:1.

FRANCO F.; GÓMEZ, G.; MENDOZA, G.; BARCENA, R.; RICALDE, R.; PLATA, F. y HERNÁNDEZ, J. (2005). Influence of Plant Cover on Dietary Selection by Goats in the Mixteca Region of Oaxaca, México. *J. Appl. Anim. Res.*, *27*, 95-100.

HODGSON, J. y ILLIUS, A. W. (1996). *The Ecology and Management of Grazing Systems*. London, England: Ed. CAB International.

HERNÁNDEZ, I. A. (1986). Ramoneo de las cabras en un bosque seco tropical: especies consumidas y su valor nutricional. *Rev. Fac. Agron., 7* (1), 64-71.

HERNÁNDEZ, J. E.; FRANCO, F. J.; CONTRERAS, J. L.; PEDRAZA, R. M.; ZAMÍTIZ, G. J. y HERRERA, J. G. (2005). *Identificación de las principales plantas forrajeras de tipo arbóreo y arbustivo consumidas por caprinos en la Mixteca poblana*. Memorias del XXIX Congreso Nacional de Buiatría, 11 al 13 de agosto, Puebla, México.

HERNÁNDEZ, J. (2006). *Valoración de la caprinocultura en la Mixteca poblana: socioeconomía y recursos arbóreo-arbustivos*. Tesis de Doctorado, Universidad de Camagüey, Cuba.

INEGI (2000). *Síntesis geográfica del estado de Puebla*. México.

MARTÍNEZ, J.; DURAND, G.; CASTILLO, J. y GARCÍA, 0. (1972). Preferencia y análisis proximal en plantas consumidas por el ganado caprino en el campo experimental Loma de León. *Prog. Nal. lnv. Ovinos y Caprinos*, informativo, (2). Venezuela: MAC.

SANTOS, S. (2001). *Caracterização dos recursos forrageiros nativos da sub-região da Nhecolandia, Pantanal, Mato Grosso do Sul, Brasil*. Tese Doutorado em Nutrição e Produção Animal. Botucatu, SP, Universidade Estadual Paulista, Brasil.

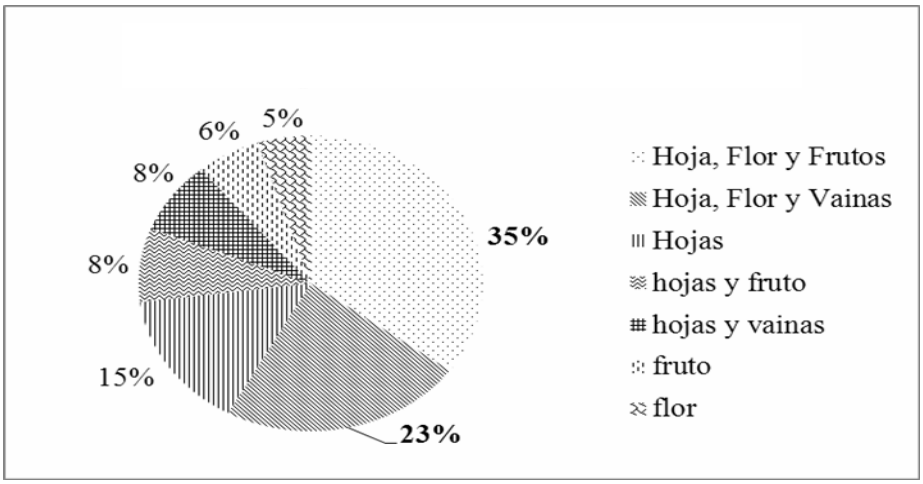

Fig. 1. Percentages of plant parts grazed by goats from the Mixteca Poblana

Table 1. Preference of goats for plants and plant parts

Vulgar Name	Scientific Name	Family	Part Grazed	Plant Kind
Barba de chivo	*Pithecellobium acatlense*	*Leguminosae*	Leaf, pod	Arborescent
Cubata blanca	*Acacia pennatula*	*Leguminosae*	Pod, leaf	Shrubby
Huamuchil	*Pithecellobium* dulce	*Leguminosae*	Leaf, pod, peel	Arborescent
Palo de Brasil	*Haemotoxylum brasiletto*	*Leguminosae*	Leaf, flower	Arborescent
Pochote de secas	*Ceiba parvifolia*	*Bombacaceae*	Fruit	Arborescent
Rompebotas	*Senna wislizenni*. var. *Prenglei*	*Leguminosae*	Leaf	Shrubby
Tehuistle	*Acacia bilimekii McBride* var. *robusta*	*Leguminosae*	Leaf, pod, peel	Shrubby
Tlaxistle negro	*Amelanchir denticulata*	*Rosaceae*	Leaf, peel	Arborescent

Table 2. Mouthfuls/Time of grazed plant part by FPU goats

Plants	Indicators				
	Plant Parts			ES	Significance
	Flower	Fruit	Leave		
Palo de Brasil	6.0[a]	7.0[b]	34.2[a]	3.37	*
Barba de chivo	0.0[c]	9.5[b]	39.0[a]	3.84	*
Cubata blanca	0.0	10.6	0.0	2.18	NS
Huamuchil	0.0[b]	21.5[b]	34.2[a]	3.61	*
Pochote de secas	0.0	8.8	0.0	2.05	NS
Rompebotas	0.0[b]	0.0[b]	28.0[a]	3.12	*
Tehuistle	0.0[c]	16.2[b]	31.3[a]	3.71	*
Tlaxistle negro	0.0[c]	6.38[b]	30.3[a]	3.53	*

Unequal values indicate significant differences for ($P < 0.05$), Duncan (1955)