

## *Research Note*

### **DESCRIPTIVE ANALYSIS OF THE SMALL RUMINANT MEAT OFFERING IN PUERTO RICO<sup>1</sup>**

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In Puerto Rico small ruminants (SR), such as sheep and goats, are raised mainly for meat production under extensive conditions, grazing native tropical grasses (NTG) without supplementation. During the last decade there has been a decrease in local production of small ruminant meat (SRM), whereas the demand for sheep (lamb/mutton) and goat (kid goat/chevon) meat has increased. This higher demand might be associated with an increase in various ethnic populations, as well as the health and gourmet food preferences of certain consumer segments. One of the problems affecting the SR industry in Puerto Rico is the lack of detailed information on demand, consumer preferences, niche markets, and other aspects of the meat that affect the synchrony between market preferences and product supply. Furthermore, there has been no systematic study concerning frequency of the offer of small ruminant meats for retail sale on the island. Knowledge of these factors could assist in designing an adequate program for feeding, managing and selecting animals to improve the quantity and quality of local SRM. The objective of this study was to perform a descriptive analysis of the types of SRM offered at the retail level in the seven agricultural regions (AR) of Puerto Rico. The target population for three years (2007, 2008, and 2009) consisted of supermarkets located in different municipalities of Puerto Rico, but without any stratification among ARs. For the fourth and final year (2010), the target population consisted of supermarkets located in the seven ARs. Due to the fact that locations of SRM production within ARs are very heterogeneous with regard to area, number of municipalities, and human population, seven subpopulations (strata) were identified for each AR. This stratification was done in order to improve the representativeness of the sample by reducing sampling error and to allow comparisons of sub-populations to be performed with equal 'power'. The supermarkets surveyed included both established chains (multiple locations around the island or in certain ARs) and local businesses (with locations in only one municipality).

The instrument used for collecting the information was a questionnaire designed to permit a descriptive analysis. The survey was conducted by interviewing the manager or person in charge of the meat department in each supermarket. The questionnaire consisted of eight questions, four of which were multiple-choice type and four were open-ended answer questions. Information was requested as to the species of SR (sheep, goat or both) that the meat offered for sale was from, whether whole carcasses or special cuts were offered, and the origin of the meat (local or imported). Additionally,

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respondents were asked from whom the meat was bought and the purchase price paid to the producer/distributor, as well as the price for the consumer. Since the intention of this survey was to perform only a descriptive analysis of the SRM offer at the retail level in Puerto Rico, questionnaires were given to students enrolled in the Small Ruminant Production course for years 2007, 2008, and 2009. Students personally performed the interviews in five supermarkets in their home municipality, including both chain and local supermarkets. Students specified the name and location of the supermarket to avoid duplication of data. During the first three years, the number of observations was different among years, municipalities and ARs represented. For year 2010 a sample size of 150 supermarkets was selected to ensure that the survey included enough observations in each AR, and that the distribution of observations in the seven ARs was proportional to the size of the population in each region (Table 1).

Data were analyzed to determine frequency and percentage of supermarkets offering SRM for retail sale in Puerto Rico by year. Similarly, information on the offer of SRM by supermarket type, species of SR, and origin of the meat was tabulated using a STATA program (STATA 9.2, 2010). In 2009, a high proportion (94%) of the supermarkets surveyed were offering SRM, but in the following year (2008) it decreased to 79% (Table 2). Then a pattern of a slight increase to 82% and a return to 79% was observed for 2009 and 2010, respectively. A similar pattern can be observed in the amount of SRM imports reported for those years (Department of Agriculture of Puerto Rico, 2008). The higher offer of SRM in 2007 compared to the following years represented an extension of the peak in consumption reported for SRM in 2005-2006 (Department of Agriculture of Puerto Rico; Agricultural Census 2007).

During each of the four years studied, the percentage of supermarkets surveyed offering SRM was 79% or higher, suggesting that there is a strong consumer demand for these products in Puerto Rico. In 2010, the total number of supermarkets selling SRM per AR was highest, by a wide margin, in the San Juan region (47%). Thus nearly one-half of the supermarkets selling SRM was estimated to belong to this AR which is composed of municipalities of the metropolitan area where one-third of the island's population lives. Furthermore, the population of this area is diverse and, in general, has a higher purchasing capability than the other regions. Also present is a well-established gourmet sector, rarely found in the rest of the island. The estimated percentages of the other ARs were Caguas, 17%; Mayagüez and Ponce, 13% each; Arecibo, 7%; Lares, 4%; and Orocovis 3%. The proportion of total sellers of SRM in Puerto Rico represented by the two types of supermarkets (local and chains) favored the chain establishments in

TABLE 1.—*Number of supermarkets surveyed among seven ARs in the years 2007, 2008, 2009, and 2010.*

Agricultural Region	Year			
	2007	2008	2009	2010
San Juan	39	10	28	63
Arecibo	0	4	12	11
Mayagüez	22	27	24	20
Ponce	19	15	5	19
Caguas	0	0	15	25
Orocovis	0	0	3	5
Lares	3	5	0	7
Total	83	61	87	150

TABLE 2.—Percentage of supermarkets offering small ruminant meat during the years 2007 through 2010.

Frequency	Year			
	2007	2008	2009	2010
Not offered	5	13	16	32
Offered	78	48	71	118
Total	83	61	87	150
Percentage	94	79	82	79

all four years of the study, with values ranging from 54 to 66%, and showing an upward trend (Table 3).

Most of the supermarkets that sold SRM offered only goat meat; a smaller number offered only sheep meat, and a few offered meat from both species (Table 4). These findings are consistent with the higher imports of goat meat during recent years, mainly from Australia. Goat meat is considerably lower in price than sheep meat (Department of Agriculture of Puerto Rico, 2008). Most of the supermarkets selling sheep meat mainly offered special cuts of lamb. This product is expensive and is only purchased by specific gourmet food sectors. Therefore, it is offered much less frequently than goat meat. Additionally, a considerable part of the population of Puerto Rico believes that sheep meat is tough, which reduces its acceptance and consumption. Most of the survey respondents were not able to specify if the offering of sheep meat was mutton or lamb, nor if that of goat meat was chevon or kid.

Of the supermarkets surveyed, most offered SRM of imported origin only; a smaller proportion offered local meat only, and a still smaller proportion offered meat from both origins (Table 5). This is consistent with the higher sales of SRM during recent years in contrast to declining local production shown in official statistics. This trend can be attributed to lower prices for sheep and goat meats from the United States and Australia, which commonly cost about half the price of the locally produced SRM. The higher price of the local product is attributed to the high cost of raising the animals and processing their meat as compared with other competing countries.

Most of the respondents declined to offer information regarding the amount of meat that the supermarkets bought annually, the price paid or the name of the distributor/supplier. Nevertheless, respondents said that imported goat meat was mainly from Australia, whereas sheep and lamb meat was mainly from the United States. The prominence of imported SRM follows logically from its much lower price (Foreign Trade Statistics. U.S. Department of Commerce, 2004). The higher cost of local production of SRM places it at a competitive disadvantage relative to meats imported from abroad. Some respondents specified that imported goat meat was supplied in boxes as quarter carcasses whereas sheep meat was mainly supplied as special cuts.

TABLE 3.—Percentage of total supermarkets selling small ruminant meat represented by each type of supermarket for years 2007 through 2010.

Market	2007	2008	2009	2010
Local	46	42	35	34
Chain	54	58	65	66

TABLE 4.—Percentage of total supermarkets selling small ruminant meat that offered meat of each species for the years 2007 through 2010.

Meat	2007	2008	2009	2010
Sheep	5	2	11	7
Goat	79	81	62	72
Both	15	17	27	22

TABLE 5.—Percentage of total supermarket selling small ruminant meat that offered local or imported meat, or both for years 2007 through 2010.

Meat	2007	2008	2009	2010
Local	9	10	3	20
Imported	87	77	90	72
Both	4	13	7	8

Most of the sellers described sales of the product as steady at a medium level most of the year with increases during certain holidays due to ethnic preferences. Another important observation was that often the label did not match the species that was offered for sale. In the interviews, some sellers confided that they label the packages as sheep or goat meat depending on consumer demand, even though the meat available is from only one of those species.

Because there are no quality or yield grades to classify the local meat, most of the product offered in the supermarkets surveyed was cut into cubic pieces (stew or “fricassee”) from the entire carcass. This practice, combined with the lack of distinction between sheep and goat meat, results in a product of inconsistent quality and is detrimental to the interests of local producers.

Small ruminant meat has a ready market in Puerto Rico and raising this livestock could become an economically viable enterprise. However, the supply of local meat is poor. The lack of a grading system to standardize the quality of local meat and the lack of distinction between sheep and goat meat result in a product of inconsistent quality being offered for sale. Studies of consumer preferences, niche markets, and demand elasticity should be performed to improve marketing strategies. All of these efforts should be accompanied by consumer education regarding the positive nutritive attributes of locally produced SRM. In summary, over the four years studied (2007-2010), the percentage of supermarkets surveyed that offered SRM for sale remained at 79% or higher, indicating that the SRM industry has the benefit of a well-established market. The frequency of offer is highest in the AR of San Juan and most supermarkets offer goat meat only. Sellers of SRM can seldom specify if the goat meat they sell is chevon or kid, or if the sheep meat is mutton or lamb. The level of offer can be characterized as medium, but demand increases during certain holidays due to specific ethnic preferences.

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