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A survey of Mexican retail chain stores for fresh U.S. pork

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ABSTRACT

An overview of fresh US pork in the Mexican market was achieved by surveying fresh US pork packages (n = 342) for sale in five Mexican cities. Data on cut, primal/sub-primal from which the cut was sourced, subcutaneous and seam fat thicknesses, marbling scores, and presence of bone were collated. The most prevalent identifiable retail cuts were milanesa (thin slice of pork, breaded or non-breaded) and trozos (diced pork) derived primarily from the leg and accounting for 68% of the total US pork on sale. Over 90% of the retail cuts were trimmed to 3.2 mm or less of external fat and the average marbling score was 2.26. Differences in distribution and fat measures were observed with chain, location and socio-economic status of clientele indicating potential for a targeted marketing approach in Mexico.

1. Introduction

Pork is a traditional source of protein in popular Mexican cuisine. Over the last decade, the average per capita consumption of pork in Mexico increased from 13.9 kg in 2003 to 16.8 kg in 2014 (U.S. Meat Export Federation-Mexico, unpublished results) with the national annual demand reaching approximately 2 million tons (Gobierno de la República de México, 2015). Concomitantly, pork production in Mexico has steadily increased, but is insufficient to meet domestic demand. The ratio of consumption to production has increased from 1.22 to 1.38 in the decade to 2013, appearing to have leveled off at 1.35 in 2014 (U.S. Meat Export Federation-Mexico, unpublished results). The discrepancy between supply and demand is met through pork imports of which the USA is Mexico's most important trade partner, not in the least due to geographical proximity, provisions of the North American Free Trade Agreement (NAFTA), the high production efficiency of the U.S. pork supply and the availability of high demand cuts for the Mexican market. The processing industry and large retail chains are the principal buyers of U.S. pork in Mexico (Díaz-Carreño, Mejía-Reyes, & del Moral-Barrera, 2006). While the retailing sector in Mexico is highly fragmented and small independent businesses play an important role, the small corner grocery stores and open air markets are slowly being replaced by large grocery stores and supermarkets. Today, 67% of all food products in Mexico are reported to be purchased through supermarket chains (Agriculture and Agri-Food Canada, 2014).

The per capita consumption of fresh pork has increased in Mexico, but is hindered by perceptions of safety and nutrition concerns, such as parasites and high fat content (Rocha-López & Padilla-Vera, 2006). Although a preference of Mexican consumers for lean pork has been observed (Ngapo, Martin, & Dransfield, 2007a; Rubio, Méndez, & Huerta-Leidenz, 2007), studies on the levels of fat and marbling in pork in the Mexican retail market are not reported. Huerta-Leidenz and Ledesma-Solano (2010) suggested that Mexican retailers have developed merchandising strategies for both pork and beef of US origin based on the type of cut (sub-primal and derived retail cuts), the retailing cutting style (portion size and thickness) and overall leanness to meet consumer preferences. Such strategies are likely impacted by extrinsic factors, including supermarket chain, geographical location and characteristics of the targeted clientele. However, no studies reporting the influence of these extrinsic factors on pork merchandising in Mexico are found in the literature.

The objectives of this study were therefore a) to achieve an overview of fresh US pork on sale in the five Mexican cities where most of the pork imported from the US is sold, and b) to examine type, retail cutting style, subcutaneous and seam fat levels, and marbling of pork cuts of US origin

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and determine variations by city, geographical region, supermarket chain, and reported socio-economic status of the targeted clientele.

2. Materials and methods

2.1. Data collection

Preliminary assessments were undertaken in grocery stores in Mexico City from January to April, 2008 (Huerta-Leidenz & Ledesma-Solano, 2010) to understand the handling of wholesale US pork cuts and how cuts are presented to the consumer, as described for beef in Huerta-Leidenz, Ruíz-Flores, Maldonado-Siman, Valdéz, and Belk (2014). Ground pork was not included in the list of cutting styles since the origin of the product is not identifiable. Using meat merchandising guides of Sonora Agropecuaria S.A. de C.V. (SASA) for local pork cuts (SASAPORK, undated), regulations on national pork cuts nomenclature from the Normas Mexicanas (NMX-FF-081-2003, 2003) and experienced retail supervisors of the USMEF, Mexican pork cuts were aligned with North American Meat Processors Association (NAMP) cuts (NAMP, 2011) as best possible. Tables 1 and 2 present the wholesale pork cuts and their retail cutting styles surveyed.

Upon completion of the preliminary assessments, a survey was carried out in grocery stores in five Mexican cities between April 4 and August 8, 2008. The five cities comprised Mexico City in the Federal District and its surrounding area (number of retail packages, n = 177), Querétaro, Querétaro (n = 20), León, Guanajuato (n = 14), Guadalajara, Jalisco (n = 49), and Monterrey, Nuevo León (n = 82). These five cities are reported to account for 59.7% of total food store sales in 2012 (Asociación Nacional de Tiendas de Autoservicio y Departamentales, ANTAD, unpublished data) and fall in the three most economically important regions in Mexico according to the Instituto Nacional de Estadística y Geografía (INEGI, 2012) representing the largest markets for imported US pork. The majority of the stores surveyed were supermarkets and hypermarkets belonging to large retail chains in Mexico, but also included wholesale club-style stores, meat boutiques and traditional grocery stores where US meats were sold. The retail chains comprised Soriana (Mexico City, Guadalajara, Monterrey, Querétaro, and León), Chedraui and Mega (Mexico City, Guadalajara, Querétaro and León), Comercial Mexicana (Mexico City, Guadalajara and León), Superama (Mexico City) and Walmart (Monterrey). Three to six supermarket chains per city were surveyed.

Surveyors were USMEF personnel with one to three years of experience in supervising US meat merchandising practices. The surveyors were trained in-store by a meat scientist as described for beef in Huerta-Leidenz et al. (2014).

2.2. Statistical analyses

Means and standard deviations were generated using SAS (SAS, 2014). Equality of frequencies were conducted only to determine differences between the socio-economic status of clientele of certain locations by chi-square ($\chi 2$) test using the GENMOD procedure of SAS 9.3 (SAS, 2014) with an alpha level of 0.05. Risk ratios were calculated using epidemiology-based analyses since they indicate measures of association rather than cause and effect relationships (Dohoo, Martin, & Stryhn, 2003). The risk ratio is a measure of association rather than a measure of statistical significance, the latter of which gives no estimate as to the magnitude of a difference and is highly dependent on sample size (Dohoo et al., 2003). In epidemiology these measures typically evaluate the risk of a disease occurring in the portion of a population exposed to a factor relative to the risk in the unexposed portion. Cumulative incidence gives a proportion (p) that provides a measure of risk, and a relative risk (or risk ratio) is computed by taking the ratio of two proportions, p1/p2. In the current study, the risk ratio was determined as the risk of finding a retail cut, primal source or marbling score in a given city, socio-economic status or supermarket chain relative to the risk of not finding the cut, source or score in the given extrinsic factor. Using risk ratio methodology for the analysis of survey data that included non-respondents was deemed appropriate by Rubin (1987) and recently this methodology has been applied to data from the North American Beef Tenderness Survey 2011–2012 to determine the risk of "tough" beef steaks at retail (Howard et al., unpublished). Limited sample sizes in certain portions of the current survey population mean that frequency data could be misleading and the use of risk ratios allows differences to be evaluated by comparing proportions thereby allowing for determination of differences between large and small sample sizes. Nevertheless, in order to achieve a sufficiently large sample size for the risk ratio analyses to be valid, some variables were combined for comparison and only select variables were used. Furthermore, only the retail cuts and primal/sub-primal sources with more than 25 samples on sale were used for analyses. Probabilities (P-values) and confidence intervals (CI) at the 95% level were calculated. Noting that the null value of the confidence interval for the relative risk is one, if the CI for the relative risk included the null value of 1, then there was insufficient evidence to conclude that the groups were statistically significantly different.

Table 1
Commercial names (alternate name), U.S. equivalent name and NAMP codes for wholesale pork cuts in Mexico City.

Primal cut[a]		Subprimal cut[a]		NAMP
Mexico	USA	Mexico	USA	Code[b]
Paleta (espaldilla), cabeza de lomo de paleta, con hueso	Shoulder, Boston butt, bone-in			406
		Cabeza de lomo, recortada de grasa, sin hueso de paleta, deshuesada	Shoulder butt, cellar trimmed, boneless	407
		Barriga (tocino fresco)	Belly	408
		Costillar	Spareribs	416
Paleta (espaldilla), picnic (brazuelo)	Shoulder, picnic			405
		Maciza "cojin", deshuesada	Cushion, boneless	405B
		Chamorros	Shoulder hocks	417
Pierna (jamon fresco), chamorro corto	Leg (fresh ham), short shank			401A
		Chamorro trasero	Hind shank	401D
		Contracara (pulpa blanca)	Outside	402D
		Pulpa negra	Inside	402F
		Punta de sirloin (pulpa bola)	Tip	402H
Lomo (chuleta natural/entrecot)	Loin, bone-in			410
		Extremo del aguayón, con hueso	Sirloin end, bone-in	410A
		Extremo del costillar, con hueso	Rib end, bone-in	410B
		Ojo de lomo (caña de lomo)	Loin eye	413C
		Filete	Tenderloin	415

[a] Commercial names according to USDA (2014).
[b] NAMP (2011).