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Composition and quality of Mexican and imported retail beef in Mexico

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Abstract

Randomly selected New York steaks from domestic and imported beef were purchased in three major Mexican cities, comparing Mexican beef (from northern, central, and southern regions of the country) and American beef (USDA-Choice and ungraded No Roll). The meat was analyzed for chemical composition, Warner-Bratzler shear force (WBSF), cooking loss, color and consumer acceptability. All sources of Mexican beef and No Roll US beef had similar chemical composition. USDA-Choice beef had a higher fat content and a lower moisture and total collagen content. Mexican beef from the northern region and USDA-Choice beef had lower WBSF and redness values than the other beef sources. Overall desirability was high regarding all Mexican beef sources, and USDA-Choice beef. No Roll US beef had the lowest overall desirability score. Results indicate Mexican beef is in an advantageous position when competing with imports in the current open market.

Keywords: Beef quality; Chemical composition; Consumer acceptability

1. Introduction

Several production and biological factors, such as differences in management, nutrition, age and genetic background among others, are considered responsible for the large variation in beef quality. In Mexico, beef cattle production is centered in three main geographical regions, well differentiated by prevailing climate, feeding system, and the exploited breeds, among other characteristics. In most of the northern part of the country, the land is arid and cattle are fattened on concentrates. Production in arid zones is strongly oriented towards the export of calves to the US. Therefore, specialized breeds like Angus, Hereford, and Charolais are predominant (Sánchez, Gómez, Avalos, Iruegas, & Roseta, 1999). On the other hand, production in central and southern regions is largely based on pasture and the *Bos indicus* (Indobrasil, Brahman, Guzerat, Gyr, among others) are the principal breeds being exploited (Villegas, Bolaños, & Olguín, 2001). In spite of this, it has not been established whether the different sources of Mexican beef differ in chemical composition, quality and consumer acceptability. Increasingly, after the approval of the North American Free Treaty Agreement (NAFTA), increasing quantities of imported beef, mostly originated in the US, are available at the retail level. Mexican beef cattle producers claim the largest part of imported beef is of poor quality and represents a hindrance for the development of the Mexican beef

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industry, which has demonstrated poor growth in the past few years.

Under these circumstances, it is vital for the beef industry to establish a benchmark for the composition and quality of retail beef. Accordingly, it is worth considering the differences in chemical composition and quality traits of meat at consumer level since they can both influence the consumer's decision to purchase beef. The purpose of this investigation is to present empirical data regarding chemical composition, quality traits and consumer acceptability of both Mexican and imported retail beef samples.

2. Materials and methods

The study was conducted from November 2002 through January 2003 in three Mexican cities (Monterrey, Mexico City, and Villahermosa). These cities were selected because they permit the sampling of retail beef from the three main beef cattle producing regions (northern, central, and southern regions, respectively), and also represent some of the largest metropolitan areas (INEGI, 2003), important distribution points for beef.

2.1. Sampling

Prior to sampling, a supermarket inventory was obtained from the National Retailers Association of Mexico (ANTAD, 2001). The surveyed supermarkets were randomly selected within cities. Since imported beef was not available in all stores, in some cases it was necessary to sample certain stores repeatedly. However, these stores were visited in different days. Each city was visited once. Mexico City and Villahermosa were surveyed in October and November 2002, respectively, while Monterrey was visited in January 2003. Samples of packaged (film-wrapped) refrigerated New York steaks of approximately 1 inch thick (up to three per shop in the same visit) were purchased from a total of 80 different supermarkets and transported – refrigerated – to the National Autonomic University of Mexico for analysis. Meat samples of Mexican, USDA-Choice, and No Roll US beef were purchased, depending on the availability of the relevant sources of beef in the shops. The aging period of the meat at the point of sale was unknown. Overall, 90 samples of Mexican beef (30 from Monterrey, 40 from Mexico City and 20 from Villahermosa), 36 samples of USDA-Choice beef and 54 samples of No Roll US beef were analyzed in the study. Table 1 shows detailed information on the

Table 1
Surveyed retailers, number of samples taken per retail chain and type of beef available in the stores at purchase

Geographical region/city	Retail chains			Type of beef available at purchase			
	Commercial name	Existing units[a]	Sampled units	Number of samples taken[b]	Mexican	USDA-Choice[c]	No Roll[d]
North/Monterrey	HEB	5	5	26	x	x	
	WalMart	5	2	4		x	x
	Carrefour	2	1	2	x		
	Soriana	7	7	10	x		
	Gigante	24	10	12	x		
	Others[e]	5	5	6	x	x	
	Subtotal	48	30	60			
Center/México City	WalMart	62	20	40	x	x	x
	Gigante	25	10	16	x		
	Commercial Mexicana	29	10	18	x		
	Carrefour	9	2	6	x		
	Subtotal	125	42	80			
South/Villahermosa	WalMart	2	2	17			x
	Soriana	2	2	8	x		
	Chedraui	2	2	9	x		
	Carrefour	1	1	3	x		
	Grijalva	1	1	3		x	
	Subtotal	8	8	40			
	Total	181	80	180			

[a] *Source of data*: National Retailers Association of Mexico, ANTAD (2001).
[b] No more than three samples per store were taken in the same visit .
[c] Beef labeled as USDA-Choice at the point of sale.
[d] US beef with no quality grade specified on the label at the point of sale.
[e] Retail stores specialized on beef.