ANALYSIS OF POTENTIAL FACTORS AFFECTING BEEF CONSUMPTION IN FIVE STATES OF MEXICO

By

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Bachelor of Science

Oklahoma State University

Stillwater, Oklahoma

2001

Submitted to the Faculty of the
Graduate College of the
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
MASTER OF SCIENCE
December, 2003

ANALYSIS OF POTENTIAL FACTORS

AFFECTING BEEF CONSUMPTION

IN FIVE STATES OF MEXICO

Thesis Approved:

Thesis Adviser

Dean of the Graduate College

ACKNOWLEDGMENTS

Pursuing my master's degree in International Studies has been one of the most rewarding missions in my educational process. Writing a thesis has been one of the most challenging. To all the people who have supported me during the last two years, I owe this project to your encouragement and belief that I could do it.

To Dr. Derrell Peel, my advisor and committee chair, thanks for your certainty that we could do a master's thesis in International Studies. More than just donating your time and funds to a graduate student who was not even in your department, you provided an idea, resources, patience, and humor to a project that was at times a challenge for both of us. Thanks for understanding my strange work hours, always having time for a briefing, and for showing me Mexico. You have sparked a lifelong interest in a fascinating country.

Dr. Kelsey, thank you for your continued support and patience on this project. I have so much respect for your professionalism and research abilities, and I am honored to have you on my committee. Thanks for always taking the time to chat.

Dr. Ray, I have so much enjoyed working with you over the last five years. You are always enjoyable to be around, compassionate and understanding, and a wealth of knowledge on international beef operations. Thank you for serving on my committee.

To Dr. Maureen Nemecek and Dr. Wilkinson, thank you for your dedication to the SIS program and for supporting students pursuing the thesis option.

Dwayne (Dr. Cartmell) and Shelly (Dr. Sitton) in agricultural communications, thank you for the opportunity to work with you for a year as a teaching assistant, and for your continued support of my educational pursuits and career goals.

To Kay Ellis of the Office of University Research Services, thank you for providing my graduate assistantship and the experience working with university research this past year, as well as many nights and weekends use of office space to complete this project.

To all of my outstanding professors in my graduate and undergraduate work, thank you for providing me with an education I am proud of, knowledge to base my future successes upon, and a pride in Oklahoma State University.

My inspiration for pursuing a master's degree and my role model behind true academic pursuit was my dear friend Travis Choat, who was always there to listen to my complaints and cheer me on my accomplishments. Thanks for always being my friend, and for making me cookies.

To Laurie Hueneke—"The Loo"—thank you for being my "bestest" friend throughout these past two years. Not only were you my sidekick in classwork, studying, graduate association leadership, and social activities, but you were my inspiration to stick to my goals, learn the skills of yoga and shooting pool, and be my own person.

Thanks to "Paul Down the Hall," for proving moral support and conversation during the late nights we were pushing deadlines to finish up our theses.

To all my Mexican friends, thank you for sharing your culture with me. You have taught me so much, not just how to eat *chiliquiles* and how to speak "Mexican," but you've shown me that language, culture and distance are no obstacle to friendship.

To all of my fellow graduate students in agricultural communications, agricultural education, animal science, and the SIS program, thank you for your understanding of the whole "thesis process," and for your continued encouragement.

To all my special "girls" who have been my best friends during my five years in Stillwater: Abby, Araceli, Angelika, Becky, Carrie, Heather, Jamie, Jennifer, Jeanie, Jodn, Katrena, Laneha, Laura, and Ming, thank you. You all have a very special place in my memories.

Wade, Diana, Emma, Joe, Sally, Rena, Arthur, Martha, Bradley, Beth, Wes and Lou, thank you for being "my family" this past year. I will miss you all very much.

Thanks to all my family and friends back in Montana for continuing to let me know I was missed back home, and for always reminding me where I come from.

To my sister and brothers: Kari, Taylor, Jace and John Henry, thanks for always being just a phone call away, and a reminder that there is a lot of work needing done back home, so its time to get out of school!

I would especially like to thank my parents for their unwavering support and encouragement throughout my entire life. Thanks to Dad for always telling me, "I knew you could do it," and to Mom for telling me "It'll all be okay."

Most of all, I thank the Lord for blessing me abundantly. I am not reluctant to admit I have lived a rich and rewarding life thus far. I pray my future will follow His plans for me, and that I can share with others the blessings He has given to me.

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INTRODUCTION

"The culture stops where the grilling begins."

— Unknown

Background and Setting

It has been said "The culture stops where the grilling begins." More than being just an offhand expression noting the separateness between the North and South regions of Mexico, this statement contains an important underlying message that there are distinct differences among the various areas of Mexico. The cultures, ethnicities, and traditions of these regions all directly impact their populations' consumption of beef, which, overall, impacts the entire beef and cattle industry.

Beyond just the North and the South, Mexico is comprised of many distinct cultural and demographic regions, representing a wide diversity of languages, traditions, customs, economic profiles, education levels, age distributions, family sizes and access to products. These differences may be associated with differing levels of beef consumption, as well as type of beef consumed. Research (Peel & Hayes, 2000) has shown that tastes and preferences of Mexican consumers greatly affect the cattle and beef industries as a whole.

Importance of the Cattle and Beef Industries

The cattle industry exists primarily in Mexico to provide beef for human consumption. With the exceptions of dairy cattle, which provide milk, and the small percentage of rodeo calves used for sport, the purpose of this industry is food animal production.

Beef is the end product of the cattle industry; therefore, the purpose and success of the cattle industry are determined by factors influencing the beef industry.

According to Peel (2003), "Beef demand growth is the major driver of a sweeping set of changes affecting domestic Mexican cattle and beef production and international trade patterns."

The North American Free Trade Agreement (NAFTA) of 1994 established a trend of merging international cattle and beef markets. These trade patterns become more important as Mexico continues to develop trade agreements with other nations and becomes more competitive in the global beef industry.

Trade with the U.S. is particularly important to Mexico, primarily since the creation of NAFTA. Mexico is currently situated as the number one importer of U.S. beef (U.S. Meat Export Federation, 2003), and in turn is a leading exporter of cattle to the U.S.

This trade interaction of cattle and beef has led to concerns with both Mexico and the United States (Peel, 2003). Mexico is currently importing around 30 percent of their domestic beef consumed. Meanwhile, despite an apparent insufficiency in domestic beef production, they continue to export large amounts of cattle to the United States.

The discovery of factors that influence beef consumption in Mexico is a critical element in understanding the larger scope of the balance of international trade.

Determination of motives for consumption of beef, including income levels, tastes and preferences and population differences, will lead to better understanding of the Mexican people, as well as interaction between the beef and cattle industries—not just within Mexico, but within the global nation as well.

Definitions of Beef and Meat

Beef, as defined in this study, is the protein product derived from bovine, or cattle, carcasses. Muscle cuts are most commonly utilized, however in many cases in Mexico, visceral tissues and organs are consumed as delicacies.

Meat, in this study, refers to all animal-based proteins. Those mentioned in this research include pork, or meat from pigs or hogs; poultry, or meat from chicken, turkey, or other domesticated birds; lamb, or meat from young sheep; *cabrito*, meat from young goats; and seafood, coming from fish and other marine animals.

The human body requires proteins for survival. While these nutrients are also found in plants, animal-based derivatives offer a more complete nutritional package (Beardsworth & Keil, 1997), and are found in many societies to be more desirable. Populations of people often eat one group of proteins more than others, but the determination of which ones is dependent upon many factors. This study will assume that most commonly, the substitution of one protein will result in the elimination of another.

Statement of the Problem

Peel and Granillo (2001) created a linear programming model to represent the Mexican cattle and beef industry, with the objective function being to minimize the costs

of beef production in the Mexican industry. This model takes into account a wide range of inputs, including forage type and production levels; quantity, type and location of cow-calf, stocker, and slaughter animal production; types of finishing (grass-fed versus feedlot); production of meat by type and location; type and location of slaughter facilities; imports and exports of cattle and meat; and costs of inputs.

Much of the data for this *Ganaderia Mexican* (GANAMEX) model comes from direct sources, such as official data and publications, scientific literature, and industry information. However, due to the limited availability of data for many of the inputs, some parameters in the model are determined as averages or judgments based on data (Peel, 2001), and are not confirmed specifically by data sources.

A specific area of the model that is found lacking in controlled data, is quantity of beef consumption by type and location (Peel & Granillo, 2001). Figures for this section of the model are currently based on informal observations, readings, conversation, and intuition from the researcher's time spent in Mexico, as there are currently no concrete figures describing the beef consumption of people in different regions of Mexico.

At the current time, there is little data clearly demonstrating regions of similar beef consumption patterns in Mexico. In order to more accurately model the Mexican cattle and beef industry, information on the differing tastes and preferences of similar areas of Mexican is needed (Peel & Granillo, 2001).

Purpose of the Study

The data provided in the following chart and table was compiled by the *Procuraduria Federal del Consumidor* (PROFECO), and published in the May/June

2002 edition of *Los Porcicultores y Su Entorno*, a Mexican trade magazine for the pork industry.

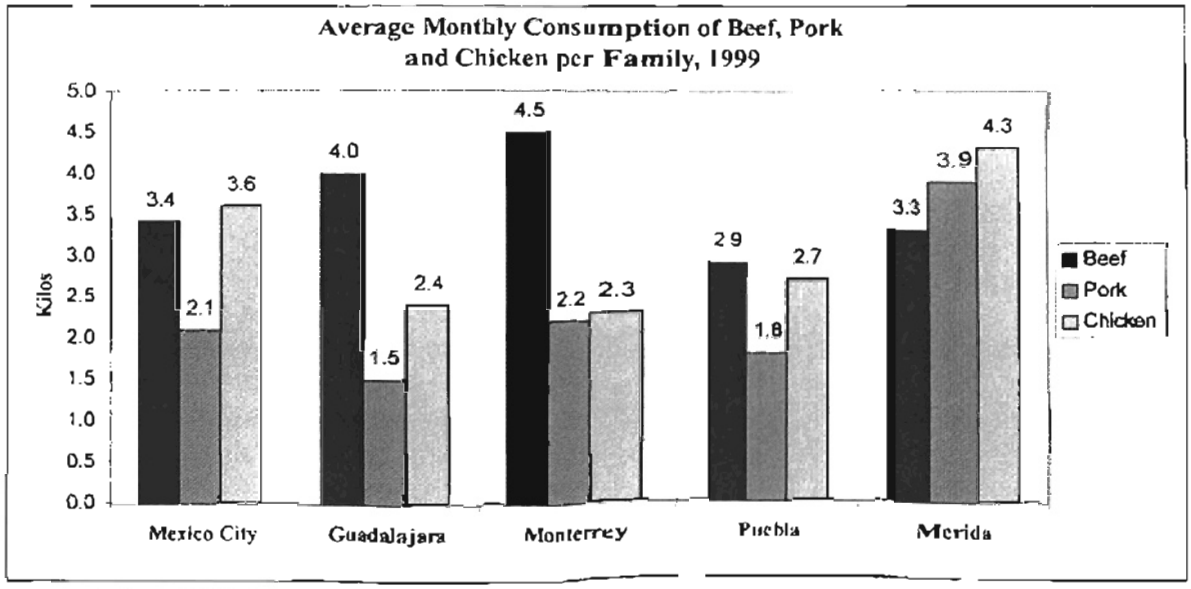
This information showed varying levels of consumption of different types of meat among five major cities in Mexico. This data prompted two research questions:

1. What areas or regions tend to consume more beef than others?
2. Why factors cause these areas to consumer more beef than others?

The first question is can be potentially answered through government documentation[1], as data for five states was provided in the *Porcicultores* article. However, this data, if in existence, does little to answer the second question.

The objective of this research was thus to answer the second question, and determine potential factors that might lead to differing levels of beef consumption.

Figure 1.



Source: Beltran (2002, May/June), Indicadores del consumo de la Carne de Cerdo. *Porcicultores*, pp. 110.

[1] During a visit to the Mexico City office of the U.S. Meat Export Federation in April 2003, officials were asked if they were aware of the existence of data on levels of meat consumption in various cities in Mexico. The data was either not available or not able to be found at the time.

TABLE 1

Average Monthly Consumption of Beef, Pork and Chicken per Family, 1999 (Kilograms)

	Beef	Pork	Chicken	Total
Mexico City	3.4	2.1	3.6	9.1
Guadalajara	4.0	1.5	2.4	7.9
Monterrey	4.5	2.2	2.3	9.0
Puebla	2.9	1.8	2.7	7.4
Merida	3.3	3.9	4.3	11.5
Total	14.8	7.6	11.0	

Source: Beltran (2002, May/June), Indicadores del consumo de la Carne de Cerdo. *Porcicultores*, pp. 110.

The objective included identifying variables that affect beef consumption across five varying states of Mexico, and highlighting differences in these variables among states. The five states studied were selected based on the information in the *Porcicultores* article. These states display not only differences in beef consumption, but they also show a wide variation in geographic location, as shown in the following map of Mexico.

Figure 2.

Adapted from WorldAtlas.com at http://www.worldatlas.com/webimage/countrys/namerica/mxstates.htm

Significance of the Study

Alone, this research will describe the diverse populations of five states of Mexico, leading to improved understanding of this nation and its food consumption patterns. Furthermore, it will serve as a baseline guide of potential characteristics that impact the beef industry of Mexico. Factors of importance identified in this study will provide a basis for further research and the aggregation of states into regions of consumption. This will ultimately result in a quantitative figure assigned to each defined region, balancing that region against the national average. This data will be utilized in the GANAMEX model and used to predict the cost of beef production in the individual regions and the entire nation.

As consumption is the end of the beef production chain, information on variables affecting consumption will help describe the motives behind production type and quantity in the different states and regions of Mexico.

By understanding differences in motives of production, as well as in the diverse populations of the varying states, businesspersons are better able to understand the Mexican beef consumer and the workings of the Mexican beef and cattle industry. The industry of Mexico, the U.S.'s primary trade partner in the beef and cattle sector, ultimately affects our own national cattle and beef industries, and improved knowledge of our neighboring country can only be a positive addition to trade relations.

CHAPTER II

LITERATURE REVIEW

Demand Concepts

The concepts of demand and quantity demanded are essential to any study of economics. Quantity demanded refers to a change in amount of a commodity that a consumer is willing to buy at a particular price. As the price increases, the consumer is less willing to purchase more of the product; as the price decreases, they are willing to purchase more of it.

However, differing from quantity demanded is demand. Demand is defined as the willingness and ability to purchase a given quantity of a good at a given price, and is an inverse relationship between quantity and price. According to Schrimper (2001), demand is dependent upon three main factors: 1) changes in income; 2) changes in the price of some other good; and 3) changes in tastes and preferences.

When economists refer to a change in demand, it is in reference to the entire demand schedule moving to the left or right, implying a different set of quantities of a certain commodity consumers are willing to purchase at a correlating set of prices, not a change upon a certain linear price-quantity curve. This relationship between these factors and the demand of a product is known as an individual demand curve.

Schrimper (2001) said, "For purposes of market analysis however, it is necessary to aggregate individual demand curves to consider the total market demand for a commodity. An aggregate demand curve is a horizontal summation of the individual demand curves that exist for a particular market."

Therefore, any factors that lead to a shift in individual demand curves will in turn affect the aggregate demand curve. However, according to Schrimper (2001) an additional factor in shifting aggregate demand curves is how many individuals are in a particular market at a given time, or essentially a change in population. Furthermore, not only a change in size of the population is significant, but also a change in the composition of the population, including factors such as different age or ethnic groups, which will typically affect consumption of different types of products.

Therefore, the demand for beef products in Mexico is dependent upon many factors, in addition to price of beef. These can be classified as:

1. Changes in income
2. Changes in the price of related goods
3. Changes in tastes and preferences
4. Changes in population size and composition.

This study will examine changes in income, changes in tastes and preferences, and changes in population size and composition. Changes in the price of other goods, although it is a vital component in the overall study of the Mexican beef and cattle industry, will not be analyzed in this work.

All factors play an important role in analyzing demand and consumption. All can be studied independently; however, none can be used exclusively to create a conclusive description of reality, as shown in the following reviews.

Wallendorf and Reilly (1983) noted that most studies comparing consumption levels between two different cultural groups lack controls for factors other than cultural differences. They said cultural differences might not be the sole reason behind

consumption behavior differences; instead demographic differences such as income, education, age distribution, family size, or product availability play key roles in consumption patterns and need accounted for.

Likewise, Guseman, McIntosh and Sapp in their paper "Traditional and Nontraditional Explanations of Food Consumption: The Case of Beef" (1986), refer to the need to study more than just income factors.

They said, "In the selection of food for consumption, some sort of evaluation occurs," and "It is clear that consumption behavior is dependent on more than income and supply factors" (Guseman et al., 1986).

They examine three facets of beef consumption: 1) microeconomic variables, including per capita income, change in amount of income spent on food, and current intake of other protein substitutes and fruits and vegetables; 2) social structure variables, including age, sex, educational attainment, and location of production; and 3) consumer sentiment, including views on health concerns, social acceptance, and dieting.

Changes in Income

A change in income is an economic factor shown to create changes in consumer patterns, including food consumption and in this case, consumption of beef.

The study of Guseman et al. (1986) found an increase in the percentage of income spent for food to have a positive correlation to beef consumption.

Schrimper (2001) said, "Increases in U.S. per capita income over time have definitely influenced the type and quality of individual food products and marketing services purchased and consumed."

This is a generally accepted economic principle—as incomes increase, consumers tend to purchase more of and a greater variety of food. At low income levels, people spend a greater percentage of their income on food. Any increase in income will likely result in a change in food from plant-based proteins to animal-based proteins. Additional increases in spending power will result in purchase of higher quality food. Therefore, as income levels increase, expenditures will increase likewise. Even when the saturation point of quantity of food purchased is reached, expenditures will continue to increase as more expensive, higher quality food is purchased. This principle applies to the Mexican economy as well, and appears to have for a long time.

Accounts from nineteenth century Mexico described patterns of beef consumption among the wealthy and poor.

"Fanny Calderon de la Barca described plates filled with meat, fish, and fowl served indiscriminately at every meal. She recorded that the wealthy ate meat for virtually every meal and in astonishing quantities, more than in any other country in the world" (Pilcher, 1998).

In today's Mexico, differences in consumption of meat between the wealthy and the poorer are evident.

"There are rich and poor *panuchos* [a crisp tortilla snack]—those with meat and lettuce piled high, and simple bean-filled tortillas for those one-peso days" (Zaslavsky, 1995).

Joel Haggard, former vice president of International Programs for the U.S. Meat Export Federation said "Meat consumption in Mexico is very dependent upon growth in real income" (U.S. Meat Export Federation, 1993).

Hoddinott and Skoufias (n.d.), in a study of how increased income levels affect nutrition and hunger levels worldwide, examined the effects of a welfare program in Mexico, the *Programa de Educacion, Salud y Alimentacion* (PROGRESA). The program, started in 1997, provides cash transfers to poor households to encourage children's enrollment in school, health clinic attendance, nutritional supplements, and health and nutrition educational programs. In their study, they found that before PROGRESA implementation, poor households showed great monotony in diets, with approximately 75 percent of daily calories coming from grains. Over one year's time, households receiving PROGRESA supplements showed a mean increase of 7.8 percent more calories per person daily than non-PROGRESA households. More noteworthy was the observation of the increase in percent of calories coming from fruits, vegetables, and meat and animal proteins. This was consistent with the views of PROGESA participants that the program was enabling them to eat better (Hoddinott & Skoufias, n.d.).

Beardsworth and Keil (1997) noted the differences in meat consumption—primarily of beef, pork, poultry and seafood—between developed and developing countries, which tend to have differences in levels of disposable income available for food (Regmi, Deepak, Seale, Bernstein, n.d.).

"In the former [developed countries], on average, individuals derive 30.8 percent of their daily calories from animal products and 13.1 percent from meat specifically. In developing countries, these figures are only 8.9 percent and 4.3 percent respectively," said Beardsworth and Keil (1997).

This positive correlation between gross domestic product and livestock-derived proteins per capita leads to an association of eating meat to wealth.

Rural versus Urban

Although distinguishing a population by its rural and urban sectors is typically a description of population composition, in the case of Mexico it is intrinsically linked to income patterns, and also falls logically under the category of "Changes in Income." Differences in eating patterns among the rural and urban dwellers depend mostly upon wealth, and rural residents tend as a whole to be less wealthy.

The World Bank (2002) examined poverty in rural areas of Latin America and the Caribbean regions, including Mexico. They found that of the total population in the region, approximately 34.6 percent was classified as "poor." Of the total urban population, 11.1 percent were designated as "extreme poor," and 27.5 percent as "poor." Conversely, of the total rural population 31.0 percent was classified as "extreme poor," and 55.6 as "poor."

According to Lichfield (2000), the larger land ownership tends to be in the northern states of Mexico, and the amount of rural population is lower. However, it is in the South where small landowners, mostly *ejidatarios*, are more common.

The most extreme cases of poverty in Mexico are found in these *ejidatario* rural populations, that were noted by sociologist Rodolfo Stavenhagen as having "Mexico's poorest and most exploited rural workers" (Federal Research Division of the U.S. Library of Congress, 2003). Many of the *ejidatarios*, rural peasants who farm land that was redistributed to them after the Mexican revolution from wealthy *hacienda* landlords, work marginal communal plots with other *ejidatarios*. In many cases, production from the average two to five hectares per *ejidatario* are not enough to meet the subsistence needs of his family, and what they do grow consists mostly of corn or beans.

This is confirmed in a study by DeWalt (1983) of the Temascalicingo region of Mexico, a distinctively rural area. Here, she said, "Much of the maize and other crops are used by the households who produce them."

A typical day's food for a rural Mexican is described by Quint, Rayment and Madigan (n.d.).

> "Rising before dawn, peasant women prepare the tortillas and strong black coffee for *desayuno* (breakfast). When the men return from the fields by late morning, *almuerzo* (second breakfast) is waiting for them, which consists of more tortillas and black coffee with *frijoles* (beans) and perhaps *biscochos* (sweet buns). *La comida* (lunch) is then had around 2 p.m. This includes more tortillas and frijoles with perhaps a *sopa* (soup) and maybe a little meat and *salsa de jitomate* (tomato sauce). The drink usually drank with *la comida* is a *cerveza* (beer). *La cena* (dinner) would be served into the late evening. *La cena* is a small meal likely to consist of *tortillas, frijoles*, coffee and perhaps fruit" (Quint et al., n.d.).

For city dwellers, the fare is more varied and healthy. Breakfast includes fresh fruit, sweet rolls, fried eggs, and coffee or hot chocolate for kids. Lunch or supper may include soup, dry soup, or pasta, meat dishes, vegetables, beans, a salad, tortillas and salsa, and a fruit salad (Quint et al., n.d.).

The diet of a poor city dweller differs little from that of a rural peasant. Tortillas are the base for most meals, and meat or *chorizo* sausages are a special treat (Quint et al., n.d.).

Work by Zaslavsky (1995) backs up this information. She said, "Fresh food is not cheap in Mexico; you'll discover this when shopping in markets or eating in restaurants. Very poor families throughout the country still get by on rice, beans, and tortillas on a daily basis."

Changes in Tastes and Preferences

Economic analysis often focuses on two aspects of consumers: ability to purchase certain goods, and willingness to purchase these goods. Changes in income often determine ability to purchase items. Willingness and desire to purchase them however, are impacted by consumers individual tastes and preferences. Factors that shape these tastes and preferences cannot be overlooked in considering demand of a population.

"My single most important message to U.S. exporters is that you have to meet your customers. You have to get to know them and understand their needs. That is the key to long-term success in doing business in Mexico," said U.S. Meat Export Federation, Western Hemisphere Director, Homero Recio, (U.S. Meat Export Federation, 1993).

Peel and Hayes (2000) also highlight the importance of consumer partiality. They said, "From the results presented, it is appropriate to say that the future of the Mexican beef cattle industry depends greatly on the tastes and preferences of the Mexican consumers."

Tastes and preferences may be impacted to a degree by income. However, other factors such as education and the presences of international tourists, restaurants, and

supermarkets have a deep impact. These factors provide new choices to consumers, altering their perception of products and their desire for different products.

According to the U.S. Meat Export Federation Mexico report (1993), "In a preference study of upscale Mexican consumers, affluent consumers prefer the taste and quality of U.S. beef to that of Mexican beef, especially top sirloin, and they are willing to pay for it."

Level of Education and Social Status

As consumers become more educated, their perceptions of foods in terms of social acceptance, food safety, and health and diet issues change.

According to Schrimper (2001), "Considerable evidence exists that an increasing proportion of consumers make food purchasing and consumption decisions in terms of perceived implications about how healthful or safe certain foods might be."

Guseman et al. (1986) observed this same factor and found health and safety attitudes toward beef, as well as frequency of dieting, showed a negative correlation to consumption of beef.

Beardsworth and Keil (1997) discuss the speculation that although consumption of meat may rise as income levels and spending power increase, they may then level out as "a wider choice of substitutes and alternatives become available." Additionally, as income levels tend to increase with level of education, the more affluent may become subject to increased information on health and social issues, possibly affecting their choices in meat consumption to improve health or avoid disease. They do point out that most probably, only in a culture where food supplies are secure and offer a wide variety

of choice and satisfaction, will people become more sensitive to issues surrounding meat consumption.

Beardsworth and Keil (1997) discuss underlying reasons for the importance of meat in the diet—high nutritional value and great social status. They mention the human bodies' need for high-energy, high-protein and low bulk foods, such as meat. They noted meat and animal-derived proteins provide all eight essential amino acids required by the human body in one "readily assimilated package," which no plant can claim. They also noted the esteem regarding meat as a food, compared to plant foods, held by many cultures worldwide. They also noted the differences in meat consumption and significance of it as a dietary staple between men and women. In Western culture eating meat is associated with a masculine stereotype and male dominance, and is seen as a sign of virility and male physical strength. They state that differences in consumption of meat between men and women are relatively less significant in times of surplus than in times of shortage. If meat is thus defined as a symbol of masculinity, vegetables comparatively are seen as "women's foods," and tend to suggest monotony, dullness and inactivity. They observe that men who become vegetarians may be seen as weaker and traitors to traditional masculinity.

Beardsworth and Keil (1997) also discuss the influence of the male of the household on the female's food preparation choices. A survey of wives in Texas suggested that women are more likely to be influenced by the attitudes and beliefs of their husbands concerning food, and to a lesser extent by their friends' outlook on food preparation and choices, than they are by their own opinions and health concerns.

Tourism

According to the USDA GAIN Report on the Hotel, Restaurant and Institutional (HRI) Food sector of Mexico (2000), the nation is ranked as the seventh largest tourist destination in the world, with visitors from the United States constituting more than 90 percent of total international tourism.

The USDA sees several main trends as affecting growth in the HRI sector in Mexico. They include:

1) Changing tastes
2) More women in the work force, and
3) Investment in the hotel/restaurant industry.

As total spending by Mexican citizens and international tourists has increased, so has revenue to hotels and restaurants nationwide. Tastes and preferences have also been altered. According to the USDA, Mexican's tastes are becoming more Americanized, and U.S.-style restaurants have grown in popularity in Mexico.

Moore (1999, March) in the article "Cheeseburgers in Paradise," mentioned the Puerto Mio hotel in Zihuatanejo, a small tourist city on the coast of Guerrero, where their American-style hamburger is popular with locals and tourists alike. He said, "Why does a hotel have such a good burger; well the secret is the meat, and rumor has it, theirs is Texas Beef, say no more."

Restaurants

Restaurants often reflect and highlight regional cuisine of an area, but they also provide access to specialized tastes and cuisines of other areas, cultures and nationalities.

In the case of Mexico, the infiltration of American restaurant chains has altered consumer tastes and preferences and changed the type of beef consumed by Mexicans. Restaurants have also threatened traditional home preparation of food, as eating out has become more common. According to the USDA (2000), data from the National Association of Retail and Department Stores (ANTAD) shows the average times Mexicans eat out per month has increased by 67 percent since 1995.

Restaurants in Mexico are grouped into two divisions: 1) the organized sector, which includes chains and large establishments; and 2) the traditional sector, which is composed of smaller, family-owned restaurants.

According to the USDA, there are nearly 70 registered restaurants chains in Mexico, which are broken down into three categories: 1) fast food chains, 2) economical sit-down restaurants, and 3) international theme restaurants.

Information from the USDA shows the leading companies in each category are as follows:

TABLE II

LEADING RESTAURANT CHAINS IN MEXICO, 2000

Fast Food			Family Style			Tourist/International/Theme		
1.	McDonalds	150	1.	VIP's	156	1.	Anderson's	62
2.	KFC	128	2.	Sanborns	136	2.	Chili's	13
3.	Pizza Hut	91	3.	Wings	50	3.	TGI Fridays	6
4.	Burger King	85	4.	El Porton	26	4.	Hard Rock Café	5
5.	Arby's	9	5.	Fonda de Santa Clara	4	5.	Planet Hollywood	3
6.	Domino's Pizza	278	6.	Toks Restaurant	35	6.	All Star Café	2
7.	Benedetti's Pizza	65				7.	Rainforest Café	4
8.	Broaster Fried Chicken	117				8.	Hooters	3
9.	Church's Chicken	22				9.	Italianos	8
10.	Las Flautas	6						

Source: USDA (2000).

The majority of popular restaurant chains in Mexico are American-based, which is reflected in their menu and food sources. In chain store restaurants, major group owners control imports of food, especially bulk imports from countries like the United States, and almost all chains begin business relying solely on imports from their home distribution center. They tend to have uniform purchasing practices and serve higher percentages of imported products. Over time, this percentage decreases as they begin to purchase more locally. For example, the KFC and Domino's chains five years ago imported 80 percent of their food products, but now that number is only 30 percent. Restaurants in the traditional sector have always purchased most of their products locally, and rely little on imported food.

Much of the growth in the HRI sector comes from increased investment from foreign hotels and restaurant chains, which serve higher quality imported food products demanded by their international clientele. According to the USDA (2000), imported products in high demand in the hotel restaurant industry include U.S. meats such as Angus, Rib Eye, New York Strip, and Prime Rib.

In Mexico, the popularity of American culture transfers to American food, and there is a belief by Mexicans that imported U.S. products are superior even though they tend to be more expensive.

Emergence of Supermarkets

The U.S. Meat Export Federation estimates that supermarkets account for 27 percent of total meat sales in Mexico, with three-fourths of them located in the nation's three largest cities: Mexico City, Guadalajara, and Monterrey. The hotel and restaurant

sector accounts for 21 percent of total meat demand; the institutional sector accounts for 2 percent; and local grocery and specialty stores and public markets sell the remaining half (U.S. Meat Export Federation, 1993).

Supermarkets have become a more common place for housewives, who are mostly in charge of food purchases in Mexico (Warrix, n.d.), to do their shopping. Many supermarkets are American-based, such as Mexico's largest chain, Wal-Mart, and COSTCO, Sam's Club, and HEB.

As supermarkets have quickly become a dominant factor in shaping Mexican consumer decisions, they have also ignited a grassroots cause to reestablish old traditions and ensure the continuation of cultural foods.

An article by the Associated Press (2002) discussed a fear of globalization and culture-transfer displacing Mexican family farms, along with deeply ingrained Mexican food customs. As "more sophisticated processing, marketing and retailing of American foods has taken Mexico by storm" (Associated Press, 2002), Mexicans are seeking to preserve their historic food staples and cooking methods.

While much of the country has embraced this globalization in their food culture, resistance is still show through policy and in more subtle way, such as housewives who "... shun the packaged, machine-made tortillas sold at modern supermarkets and instead go to the sidewalks outside the stores and buy handmade blue-corn tortillas from Indian women crouched next to baskets" (Associated Press, 2002).

Changes in Population Size and Composition

According to Schrimper (2001), "There are many ways in which changing characteristics of the population other than just the total number of people can affect the retail food market."

Changes in ethnic diversity will affect overall demand as different ethnic groups have differing tastes and preferences. Changes in geographic distribution of the population are important as food distribution networks must adjust to new locations of consumers.

A population transformation due to changes in birth or death rate, net immigration rates, and areas of immigration descent will involve different changes in products purchased. Varying age of the population will present changes in consumption patterns and product purchases associated with age, as will a difference in size of households. For example, smaller households will be more interested in purchasing smaller food packages.

In their study, Guseman et al. (1986) found data agreeing with the impact of demographics. Women as well as older respondents consumed less beef than other proteins, while younger participants showed no decreases in intake. However, they found those raised in rural areas showed higher levels of beef consumption than those raised in urban areas, suggesting that place of origin and eating habits learned at an early age may create lifetime food habits. They also found level of education did not affect consumption. Both of these ideas contradict other information describing Mexico's situation, however the study of Guseman et al. (1986) was conducted in the United

States. Its importance is solely to show that there are differences in consumption levels that correlate with differences in population demographics.

Household Size

Beardsworth and Keil (1997) define family as a nuclear group composed of parents and children—different than a household, which is a group of people sharing accommodation and, to varying degrees, pooling their resources.

They noted, "While food consumption patterns can be seen as highlighting the boundaries of the nuclear family, food and eating can also act as linkages between the nuclear family and the extended family and, indeed, between the nuclear family and the wider community" (Beardsworth and Keil, 1997). They suggested that food customs can be seen as a language that symbolizes patterns of social relationships.

Robichaux (1997) discussed the structure of the family, both nuclear and extended, and the development cycle of members of families coexisting under one roof. His work stated many groups in the Mesoamerican area show "a distinct pattern involving an interrelated system of postmarital residence, domestic development cycle, and inheritance of the dwelling" (Robichaux, 1997), meaning young married couples usually tend to live with the parents of one of them for a short time—in Mexico, typically with the husband's family. From there, they move into a house of their own, and eventually inherit the parent's house and possibly the land.

Robichaux uses the example of families living in the city of Acxotla de Monte, Tlaxcala. They follow the traditional pattern of living virilocally, with the family of the husband, for a time until they have saved enough money to build their own dwelling. The

replacement phase follows as the married couple has children, who eventually marry and one or more of them brings his spouse to live with the extended family. When the parents pass away, they leave their house and often land to the children.

In the case of Tlaxcala, the common occurrence is for the newly married couple to live in the same house as the parents, but to build their own kitchen and have their own consumption budget. This appears to be the desired method, aside from circumstances where part of the extended unit is not economically self-sufficient and depend upon a shared budget.

Population Age

The population of Mexico is very young, according to the USDA (2000). Over half are under the age of 25, and are very discerning in their food tastes and preferences, with the potential to become even more so.

Ethnic Diversity, Culture and Traditions

Hays (1999) said, "Further research concerning the demands of the Mexican consumers for beef products in the future would be beneficial to U.S. producers and processing companies. This would enable these entities to develop products that are better suited for the Mexican consumer. But for a complete demand analysis of the Mexican consumers, it is necessary to weigh very heavily the culture and traditions of the Mexican people."

It is clearly essential to consider differences in ethnic diversity, culture and traditions among different groups in Mexico. Many sources consider the impact of the wide variety of races and backgrounds of the people of Mexico.

"You can still find ancient Aztec or Mayan markets in Mexico- -in the same locations they occupied thousands of years ago.... Today, though, you will also find items that reflect the Spanish influence. In the sixteenth century, the Spaniards introduced cattle, sheep, pigs, chickens, wheat, rice, citrus, nuts, melons, onions, olives, and new herbs and spices to the Western hemisphere. Hispanic producers gave a new life to Mexican cuisine and immediate excitement to the culinary culture. Mexican food became truly *mestizo*—a mixture of Indian and Spanish" (Zaslavsky, 1995).

According to a fact sheet from the Ohio State University Extension (Warrix, n.d.), "The Mexican diet of today is rich in a variety of foods and dishes that represent a blend of pre-Columbian, Spanish, French, and more recently, American culture. The typical Mexican diet contains an adequate amount of protein in the forms of beans, eggs, fish and shellfish, and a variety of meats, including beef, pork, poultry and goat."

Paananen, in his article "Ole for Hispanic Fare!" (1988), said, "Hispanic foods reflect the impact of invasions and racial mixture. In Mexico, the cuisine is basically a blend of Indian and Spanish."

Paananen noted that although more tender cuts of beef and chicken are now available, in the past it was typical for meat to be stewed or boiled for long periods of time to tenderize it; therefore today many stewing recipes are still popular staples in Mexico.

In many of the strongly traditional ethnic groups of Mexico, food is not just important for nourishment. It is a reflection of their beliefs, customs, religion, and rituals and defines who they are. DeWalt (1983) said that in rural Mexico, like as in many other rural settings, food plays in important and honored role in ritual. Wallendorf and Reilly (1983) said, "One set of behavior patterns strongly connected to cultural style is that concerning foods," and, "Cultural style is particularly linked to the types of food consumed and the frequency with which they are consumed."

Kennedy (1978) said, "Food has always played an important role in the ceremonial and ritual life of the pre-Hispanic cultures of Mexico—the Olmec, Maya, and Aztec—whose great traditions were either merged among themselves, lost, or took on new syncratic forms with the Spanish conquests. Though transformed and embellished in the convents during the Colonial period, with products and knowledge brought over from the Old World, the age-old culinary traditions, in their purest forms, have lingered on, still to be found among the 'little folk traditions' in regional Mexico."

The fact that these different cultural blends impact the consumption of various foods is a key link in the study of Mexican beef consumption.

In the National Provisioner, the National Food Laboratories (2001) said, in reference to differences among cultures, some groups commonly utilize the entire animal, while others only use specific parts for various recipes. They noted that the meat industry should utilize knowledge from the grassroots level to discover time-honored traditional recipes and ingredients. The National Food Laboratories observed that sources of information for finding these cultural differences include ethnic cookbooks.

Women Involved in Economic Activity

Beardsworth and Keil (1997) discuss the findings of a study of Italian-American families in Philadelphia that describes the "older style" family structure, which has slowly been replaced as societies move towards more women working outside the home and gaining equal status with men. In this more traditional setting, the women are seen as maintaining responsibility for domestic and social life, and even those engaged in full- or part-time employment are viewed as having simply jobs—not careers.

These perceptions and expectations of women in the home and those employed outside the home impact types of food purchased, prepared and consumed.

Schrimper (2000) said, "Perhaps one of the most dramatic factors that has affected the demand for marketing services and different kinds of retail food products is the increasing number of females that work outside the home."

When women work outside the home, they have less time or desire to prepare meals at home, which causes a change in the amount of food eaten at home versus away from home. Additionally, this factor not only impacts composition of population, but also can affect income levels, as a family with two working parents will tend to have a higher income level.

According to the USDA GAIN Report (2000) on the HRI sector of Mexico, more women are working—the national average showed 39.4 percent of women were in the workforce in 1998, a three percent increase from 1996. As women enter the workforce, they tend to eat out more at restaurants with their families, as opposed to preparing meals at home.

Geographic Location

"Sooner or later, visitors to Mexico who display the slightest curiosity about the country are inevitably told: 'Ah, well, you know, of course, that there are two Mexicos" (Lichfield, 2000).

The North and the South are commonly considered the two distinct regions of Mexico, with many "sub-categories" of other geographic regions. According to INEGI (2000), the country's heterogeneous zones make it one of the most complex countries in the world, with its contrasting topographic characteristics and natural resources. While geographic location is not the sole determinant of characteristics of economic and social well being, it is an important indicator of attributes of the state.

"The different topographical conformations [of Mexico] play an important role in the country's economic and social activities, since they influence climatic conditions, types of soils, and vegetation, which in turn affect agricultural, livestock, forestry, industrial activities and human settlements" (INEGI, 2000).

Often, however, it is the southern states that fall to the lower end of the economic spectrum. Lichfield (2000) said, "Today the South—above all the seven southeastern states of Guerrero, Oaxaca, Chiapas, Campeche, Tabasco, Veracruz and Quintana Roo—has more poverty, a bigger and more spread-out rural population, higher illiteracy levels, more indigenous people, more non-Spanish speakers, faster population growth, worse infrastructure, lower agricultural productivity, less industry and more hurricanes."

Although cultural differences and ethnic background play an important role in differing consumption patterns, there may be differences even among groups from similar

ethnic backgrounds that are located in different geographical locations. These differences in turn affect meat consumption.

The National Food Laboratories (2001) said, "Types and cuts of meat consumed vary by region, even among people of similar ethnic classifications. Sub-segments of the Hispanic market can be regionalized geographically."

This ethnic differentiation in varying geographical locations is shown in a study that compared similar and non-similar ethnic groups in non-similar locations. Wallendorf and Reilly (1983) compared food consumption levels between Mexican-Americans living in Tucson, Arizona; Anglos living in Tucson, Arizona; and Mexicans living in Mexico City—all members of comparable income-level groups. They found volume of beef consumed by Mexican-Americans more than 63 times higher than the amount consumed by Mexicans. This study not only shows differences in ethnic background (between Anglos and Mexicans living in Tucson), but also geographical differences between Mexicans in Mexico City and Mexican-Americans in Tucson (who are assumed to have similar ethnic backgrounds).

Summary

Changes in income, changes in tastes and preferences, and changes in population size and composition clearly impact consumption levels of beef. These differences all contribute to the diversity of Mexico, and the diversity of beef consumption in the states.

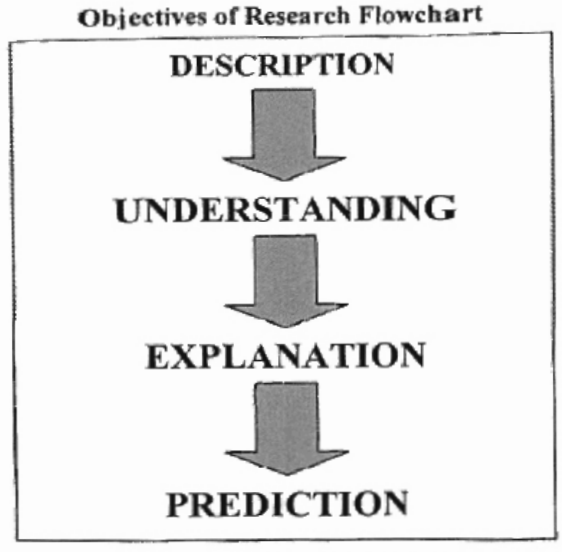
CHAPTER III

METHODOLOGY

Research Design

According to Papps and Henderson (1977), the purpose of scientific models is to fulfill four functions: description, understanding, explanation, and prediction.

Figure 3.



Source: Based on Papps and Henderson, 1977, p. 114

The design of this project is a descriptive analysis of factors that potentially affect beef consumption. This research was intended to be solely an explorative and descriptive study, and fulfills the first two objectives of description and understanding, utilizing three different methodologies. They include:

1. Secondary Data Analysis
2. Content Analysis
3. Case Study

Secondary Data Analysis

The purpose of the secondary data analysis is to use descriptive statistics to compare and accentuate differences in five states of Mexico, using variables that reflect social and economic well being.

According to Papps and Henderson (1977), descriptive statistics are concerned with the classification and description of data, and can be ends in themselves.

The secondary data analysis consists of data primarily gathered from the *Anuario de Estadisticas por Entidad* Federativa, of the *Instituto Nacional de Estadistica, Geografia e Informatica* (INEGI, 2000). INEGI is a government census bureau of Mexico that collects state-level data in categories including the following:

1. Agriculture, Livestock, Forestry and Fishing
2. Commerce
3. Communication and Transportation
4. Culture and Recreation
5. Economics
6. Education
7. Employment and Salaries
8. Financial and Monetary Indicators
9. Geographic Aspects
10. Health and Social Security
11. Housing Development and Structure
12. Industry
13. Demographic Aspects
14. Public Finances
15. Security and Public Order
16. Selected Indicators by State
17. Tourism

Variables

Within each of these categories, sets of state-level statistics were available describing the populations and living patterns of Mexico. Based on the review of literature, variables most likely to impact beef consumption were selected and analyzed through basic descriptive statistics, including averages and ranking.

These selected variables include:

1. Total Population: Urban and Rural and Density
2. Total Population: State and Largest City, and Density
3. *Ejidatario* Population
4. Total Population by Age Groups
5. Crude Fertility Rates
6. Index of Masculinity
7. Altitude of Capital Cities
8. Percent of National Area
9. Location of Principal Peaks
10. Physiographic Regions
11. Principal Types of Climate
12. Range of Temperature and Precipitation
13. Surface Structure of Principal Natural Regions
14. Housing Characteristics by Number of Occupants
15. Housing Characteristics by Availability of Drainage, Electricity and Water
16. Population 15-Years and Older by Condition of Literacy
17. Selected Indicators of Education
18. Number of Tourists: National and International
19. Availability of Lodging by Category
20. Economic Participation Rate by Sex
21. General Minimum Salaries per Month
22. Economically Active Population
23. Economic Activity by Sector: Agriculture, Industry and Services
24. Percent of Population Speaking Ethnic Language
25. Services Available Housing with Ethnic Language Speaker Head of Household

These variables were analyzed for the five selected states of the Federal District, Jalisco, Nuevo Leon, Puebla and Yucatan, using descriptive statistics to compare the states to the national average and to each other.

Content Analysis

The content analysis section of this research was a review of regional cookbooks from Mexico.

The Colorado State University English Center (2001) defines content analysis as coding text into categories consisting of a word, phrases, or other classification that the researcher can define and focus on. An advantage of the content analysis methodology is it can be applied to any narrative or piece of recorded communication.

Cookbooks containing regional recipes as well as articulate descriptions of the regions of origin were reviewed. General observations were made of the proportion of total recipes containing different types of meat, including beef, pork, poultry and seafood.

Case Study on Supermarkets

The case study of Mexican supermarkets is included as a special section, highlighting the impact of the emerging supermarket sector on beef consumption. Wright et al. (2001) state two uses of the case study are to tell a story and to use as a tool for evaluation. Both uses of the case study methodology fit the needs of describing the supermarket sector of Mexico.

Creswell (1994) defines a case study as research where the investigator explores a sole entity or phenomenon, then collects information during a determined time period.

The event in this case study was the emergence of supermarkets in Mexico. Data collection involves compiling a list of the top ten supermarkets in the nation and their primary locations, collected for the time period of 2003.

According to Lailai (n.d.), typical assumptions of a case study are that it is used in exploratory stages and for descriptive purposes, both which fit the purposes of this research.

Positive/ Normative Analysis

A *normative* model recommends certain characteristics; *positive* models just simplify the original (Papps & Henderson, 1977).

"In principle, positive analysis is concerned with what *is* and tries to establish the relationships that exist in the real world. Positive statements can therefore be tested by the observation of the real world. Normative analysis is concerned with what should be and cannot be tested by an appeal to the facts" (Papps & Henderson, 1977).

Creation of description, explanation, understanding and prediction, and thus the creation of constructive knowledge are dependent upon a combination of positive and normative models. This research shall attempt to describe what is, and therefore takes a positivist approach in providing description and understanding.

The GANAMEX model developed by Peel possesses normative qualities, as it is a method of determining what should be. The positive information obtained from this research will be utilized in the normative model of GANAMEX to create explanation and prediction. A good normative model cannot be correct without a solid positive base; therefore this work is a component of enhancing the GANAMEX model.

Subject Selection

Population and Sample

This study utilized statewide data, with a sample population of five states out of the 32 states of Mexico.

Information produced by the *Procuraduría Federal del Consumidor* (PROFECO), a consumer information institution of the Mexican federal government, was published in the article "Indicadores del Consumo de la Carne de Cerdo," in *Porcicultores* magazine, May/June 2002. Part of the information presented showed varying levels of meat consumption of pork, poultry and beef in five large cities in Mexico.

Based upon this information, purposive sampling means were used to designate the following five cities and thus their respective states for examination.

1. Mexico City (Federal District)
2. Guadalajara, Jalisco
3. Monterrey, Nuevo Leon
4. Puebla, Puebla
5. Merida, Yucatan

Purposive sampling is a type of non-probability sampling, using human selection to achieve what randomization would do in a proportional cluster sample. In this case specific, stratified purposeful sampling is used, which according to Patton (1990), exemplifies characteristics of certain selected subgroups of interest and facilitates comparisons.

These selected cities not only showed a variance in consumption levels of three different types of meat in the five cities, as shown by information in the article in *Porcicultores*, but they also display a variety of geographical location. Based upon the

proof of differences in beef consumption in these five areas, these samples prompted further study of the reasons for differences in consumption levels of meat, in this case particularly of beef.

Data Collection Procedures

The information used in this research came from secondary data. The secondary data analysis utilized statistics from the INEGI, a national census providing state-level data on multiple categories. Basic statistical descriptions were utilized, including averages and ranking.

For the content analysis, cookbooks were examined to determine general proportions of meat dishes utilizing beef, pork and poultry in relation to each other, for each of the fives selected states.

The case study of the supermarket sector used information from government documents, as well as a list of data collected through an informal interview.

Limitations

According to Papps & Henderson (1977), social scientists are usually more interested in inferential statistics, which aid in explanation and prediction. However, the information provided through this study highlights the important aspects necessary to design additional studies in which to gather inferential data.

As the overall scope of this project was very broad, the information gained will not necessarily be portrayed as scientific, numeric data, but viewed more as qualitative data contributing to an overall picture of the Mexican consumer. As there is at this time

little data available in this field, this study will provide baseline information for others to add proof to or negate.

Limitations of General Economic Analysis

Economics is a social science that attempts to understand human behavior. Much economic work is based on quantitative analysis. However, qualitative work done beforehand is used to determine the basis for quantitative research. Both are critical aspects of economic research.

Papps and Henderson (1977) discuss two common criticisms of economic analysis. First, there is not a "normal" in reality—all people are different and gross assumptions cannot be made. However, economic theory is based upon broad patterns of human behavior, and the more this information is aggregated, the less it applies to an individual. Thus part of the challenge of economic analysis is determining the appropriate level of aggregation, or disaggregation, where the information becomes useful, but does not loose its reflection of reality.

The GANAMEX model requires purely quantitative, numeric data to balance each determined region of similar beef consumption in Mexico against the others. In creating regions of similarity, aggregation is necessary. This study will aid in determining to what degree aggregation of similar states, and the disaggregation of Mexico as a whole, is neccesary.

The second criticism of Papps and Henderson (1977) is that humans are not just economic beings, but operate on factors in addition to maximization of utility. Quantitative economic analysis tends to determine these levels of utility maximization.

Qualitative data is thus important to understanding the additional factors beyond utility maximization.

Limitations of Descriptive Analysis

The author of a description is in a compromising situation. He or she wishes to describe only those factors which are necessary to the overall purpose of the model, yet in doing so, invariably leaves out other details which contribute to the overall truth and reality of the situation.

The omission of these additional details is known as distortion, and the reasons for and the effects of distortion are dependent upon the type of omission.

Papps and Henderson (1977) classify distortion into two categories: voluntary and involuntary, with further breakdowns as follows:

A. Voluntary
    1. Simplification
    2. Lack of interest
    3. Information assumed to be available elsewhere in a more convenient form
    4. Misleading the audience
B. Involuntary
    1. Limitations of the medium
    2. Limitations in perception

Types A.4 and B.2 are the only two types of distortion to cause concern, as they intentionally mislead the audience. However, in this study, neither shall purposefully be used, and the extent of limitations in this descriptive analysis shall be limited to types A.1, A.2, A.3, and B.1.

Type A.1 is of special note, as simplification is essential in any economic model. Reality is grossly complex, and to include all variables in an analysis would be

impossible and purposeless even if achievable. However, additional variables tend to add accuracy to a descriptive model. A balance must be found between an increase in accuracy and a decrease in value due to complexity.

A further limitation of descriptive analysis, which involves classifying and categorizing, is the downfall of depending upon existing mindsets to organize data. According to Papps and Henderson (1977), "The responsible scientist should be aware of the possibility of the existence of classifications other than those that he is currently using, and he should be prepared to consider alternative ways of looking at his subject."

Limitations of Secondary Data Analysis

The variables analyzed in the secondary data analysis were chosen rationally based upon information in the review of literature. Papps and Henderson (1977) note a problem in this approach. They note that as humans, we cannot grasp reality directly, but are dependent upon our perception of it and the background that determines our perception of it. Therefore, the variables that we choose to test are selected according to the limitations of our perceptions (Papps and Henderson, 1977).

A further limitation of this type of descriptive analysis is that it is very basic, and, according to Papps and Henderson, "... such elementary processes are not usually described as statistical models." However, their value in description and summarizing quantitative data are considered useful within the domain of this research.

Limitations of Content Analysis

A limitation of the case study methodology in this research is that it is conducted with the purpose of general observation, and lacks true classification and quantitative categorization of factors. General findings were observed from narrative data, and described using broad summaries.

Limitations of Purposive Sampling

A limitation of purposive sampling, due to its non-random nature, is the inability to generalize the findings back to the population. This study is based on the purposive sampling of five cities and their corresponding states. A critical limitation of selecting only five cities and their respective states is risk of excluding other essential states that may be the basis for a regional grouping. Only five states were selected, but it is not known for sure if these states, whether similar or different, represent the full range of diversity of states. Perhaps in reality, there are six or more distinct regions in Mexico. In this case, this study would overlook important regions and their distinct qualities. At this point, however, there are no defined regions, so there is currently no way to determine the number of states to study.

Assumptions of Study

The majority of the data used for analysis in this research is dated prior to 2000. Although this is not the most accurate portrayal of the current situation in Mexico, this information is gathered in a census every ten years and this is the most recent information available.

Additionally, a drawback of using secondary data is the need to take for granted that the information is accurate and correct. However, this is beyond the capabilities of the researcher, and secondary data must be assumed correct.

Finally, there are many differences among variables even at state levels, which are described in this analysis. State-level breakdown is the most precise information available now. It is also the most usable, as it is impossible to conduct analysis for every city even if the data was available. Therefore, we must assume statewide averages present a satisfactory portrayal of the true population of the state.

Summary

In regard to common predictive economic research, Papps and Henderson (1977) said, "When the results of research appear, they are often presented as a reliable predictive model," and "A model that increases our understanding but does not yield predictions is only a prototype."

However, they add that although from an economist's point of view the only practical results from research are those from a predictive model, the stages of description and understanding are just as vital in the process of creating acceptable predictive models. Thus, the steps of description and understanding should be taken as important in model building, and as crucial elements.

This research shall attempt to provide information regarding description and understanding, in order to provide the groundwork for further explanation and prediction using more complicated economic modeling. The description shall come from analysis of

different state-level statistics. The understanding shall grow from information linking these variables to beef consumption.

"No model can be built without classification, and the descriptive process is an important way in which categories are formed and later modified to fit the situation in which we are interested" (Papps and Henderson, 1977).

CHAPTER IV

FINDINGS

The findings of this study correspond with the three types of methodology used, which include: 1) secondary data analysis, 2) content analysis, and 3) case study.

Secondary Data Analysis: Statistical Evidence

The majority of the statistical information in the following chapter was based on data collected by *Instituto Nacional de Estadistica Geografia e Informatica* (INEGI) (2000). Data from other sources is stated as so.

Population

Rural versus Urban and Density

Urban areas are defined by the INEGI as localities of more than 2,500 people. Rural areas are localities of 1-2,499 people. Density is people/km^2, and rank is the state's status out of 32 states, including the Federal District.

When looking at the population density of Mexico as a nation, there appear two distinct groups: the Federal District, and all other states. The population density of the Federal District for 2000 was 5,643 people/km^2. The population density of the remaining 33 states are far below that of the Federal District, and range from 611 in the state of Mexico, down to six in Baja California Sur.

With a population of more than 8.6 million, the Federal District alone contains 8.82 percent of the nations population.[1] While there are other densely populated metropolitan areas in Mexico, the fact that the Federal District is smaller in area than any other state, is the center of commercialization in the nation, and is arguably part of the largest metropolitan cluster in the world, make it a far outlier in density. Virtually 100 percent of the population of the Federal District live in urban dwellings.

Jalisco has a population of 85 percent urban, and 15 percent rural. The average density of the state is 80 people/km^2, ranking 12th highest in the nation. However, the largest city in the state is Guadalajara, the second largest city in the nation, with a population of almost 3.5 million. With 55 percent of the state's population in one city, the average density outside of the city drops to 36 people/km^2, making it appear more rural.

The state of Nuevo Leon has a population of 93 percent urban and 7 percent rural, ranking second highest in urban population. Its average density of 59 people/km^2 ranks 15th highest in the nation. However, Monterrey, the third largest city in the nation, accounts for 79 percent of the entire state's population. Without this population, the density of the state drops down to only 12 people/km^2.

Puebla is a contrast in some ways. It has a much higher rural population compared to the other states, at 32 percent rural, yet it's average density of 149 people/km^2 ranks 7th highest in the nation. However, only 31 percent of the state's population live in Puebla, the fourth largest city in the nation. The remainder of the population is distributed evenly across the state, and density outside of the city drops to 103 people/km^2.

[1] The entire Federal District is composed of what is commonly known as Mexico City. However, the metropolitan area of the city expands beyond the borders of the Federal District, into the states of Mexico and Morelos, and in its entirety, has a population of approximately 16.7 million (1995 data), to account for almost 30 percent of the nations population.

Yucatan has a population of 81 percent urban and 19 percent rural, with an average density of 38 people/km^2, ranking it 19th most dense in Mexico. However, outside of the 47 percent of the population that live in the nations 11th largest city, the average density drops to 20 people/km^2.

TABLE IV

POPULATION: URBAN AND RURAL, 2000

	Total	Urban (%)	Rural (%)	National rank, Rural (%)
Total	97,483,412	75	25	
Federal District	8,605,239	100	0	32
Jalisco	6,322,002	85	15	24
Nuevo Leon	3,834,141	93	07	31
Puebla	1,561,558	68	32	15
Yucatan	1,658,210	81	19	20

Source: INEGI (2000), and calculated from INEGI (2000).

TABLE V

POPULATION: STATE AND LARGEST CITY, AND DENSITY, 2000

	Total Population*	National rank, City size	Population in largest city (%)	Density	National rank, density	Density without largest city**
Federal District	8,605,239	—	NA	5,643	1	NA
Mexico City	15,047,685	1	NA	—	—	—
Jalisco	6,322,002	—	—	80	12	36
Guadalajara	3,461,819	2	55	—	-	—
Nuevo Leon	3,834,141	—	—	59	15	12
Monterrey	3,022,268	3	79	—	—	—
Puebla	1,561,558	—	—	149	7	103
Puebla	1,561,558	4	31	—	—	—
Yucatan	1,658,210	—	—	38	19	20
Merida	779,648	11	47	—	—	—

Source: Calculated from INEGI (2000).

**Total Population* for states is from 2000; city data was only available for 1995. For purposes of comparison in this analysis, the difference is insignificant.

***Density without largest city* is calculated using the entire area of the state, as the area of the city itself is insignificant in comparison to the entire state for these purposes.

Ejidatarios

Ejidatarios, the rural peasant workers who farm the land that was reappropriated to them after the Mexican Revolution, vary by percentages among the states. The Federal District has a small number of classified *ejidatarios*, but also has a very limited rural population, and this data is essentially of no purpose.

Yucatan clearly ranks highest among the other four states, with 39.9 percent of its rural population being *ejidatarios*. Jalisco, Nuevo Leon and Puebla are closely matched in percentage of rural *ejidatarios*.

TABLE VI

EJIDATARIOS AS PERCENT OF RURAL POPULATION, 1990 AND 1991

	Ejidatarios (1991)*	Total Rural Population (1990)**	Percent Ejidatarios
Federal District	—	—	—
Jalisco	131,526	962,257	13.7
Nuevo Leon	34,263	248,079	13.8
Puebla	182,073	1,473,322	12.4
Yucatan	116,068	291,322	39.9

Source: * INEGI (1991), VII Censo Ejidal.
** INEGI (2000).
Data from two separate years were used as same-year data was not available, and an estimated comparison was desired.

Population by Age Groups

Mexico has a very young population, with the national average age at 20 years old. Two-year averages for the years 1990 and 1995, broken into 5-year age groups, show the nation as a whole has an obvious downward curve. With the exception of the 0-4 year age group, the trend shows a drop in population with each increasing age increment.

The Federal District tends to show a slight variation from this pattern, with equal numbers of those ages 0-14 years, a jump in numbers of those 15-19 years, the greatest

percentage of the population between 20-25 years, and a steady decline downward from there. Average age is greater than the national average, at 24 years.

Nuevo Leon shows a slight variation, with the greatest percentage of the population being between the ages of 15-19, and a greater percentage of those ages 20-25 than 0-14. This slightly older population is reflected in the average state age of 21.5.

Jalisco, Puebla and Yucatan show similar population age patterns to that of the national average, with the greatest percentage of the population between 5-9 years, the most between 0-14 years and a steady decline in numbers thereafter. Average state ages are 20, 19 and 21 respectively.

Fertility Rates

Crude fertility rates are defined in "The Mexico Handbook" (Pick & Butler, 1994) as the ratio of births per year to the population, multiplied by 1,000. Puebla clearly has the highest fertility rate of the five states, ranking 4th in the nation. Jalisco ranks approximately in the mid-range of the nation, at 17th, and Yucatan follows ranking a low 25th. The Federal District and Nuevo Leon are paired at the bottom, with the lowest fertility rates in the nation—the Federal District being 31st and Nuevo Leon 32nd.

TABLE VI.

CRUDE FERTILITY RATES, 1990

	Crude fertility rate	National rank
Total	32.73	
Federal District	28.39	31
Jalisco	32.63	17
Nuevo Leon	26.32	32
Puebla	37.95	4
Yucatan	29.99	25

Source: Pick & Butler (1994), *The Mexico Handbook*, p. 97.

Index of Masculinity

The masculinity index shows the percentage of men compared to women, nationally and by state. Of the five states, the Federal District falls most below the national average of 94.69, at 90.76, showing the greatest amounts of women compared to men. The highest is Nuevo Leon at 98.65.

TABLE VII.

TOTAL POPULATION, MEN, WOMEN AND MASCULINITY INDEX

	Total	Men	Women	Index of Masculinity
Nation	**97,361,711**	**47,354,386**	**50,007,325**	**94.69**
Federal District	8,5 91,309	4,087,523	4,503,786	90.76
Jalisco	6,321,278	3,057,820	3,263,458	93.70
Nuevo Leon	3,826,240	1,900,158	1,926,082	98.65
Puebla	5,070,346	2,435,584	2,634,762	92.44
Yucatan	6,901,111	3,338,141	3,562,970	93.69

Source: INEGI (2000), *Resultados preliminaries de los Estados Unidos Mexicanos.*

Geographic Aspects

The nation of Mexico claims diversity in geography among its many distinct aspects. INEGI (2000) has broken the nation into 15 physiographic areas, based on the topographical and relief aspects of the land.

They include:

1. Baja California Peninsula
2. Sonoran Plateau
3. West Sierra Madre
4. Northern Sierras and Plateaux
5. East Sierra Madre
6. Great Plateaux of North America
7. Pacific Coast Plateux
8. North Gulf Plateux
9. Central Plateau
10. New-Volcanic Axis
11. Yucatan Peninsula
12. South Sierra Madre
13. South Gulf Plateau
14. Sierra of Chiapas and Guatemala
15. Central American Tropical Forest

The Federal District of Mexico composes only a small portion, 0.1 percent, of total land mass of Mexico, yet its importance lies in its immense population, rapidly growing population and the fact that it is the center of distribution, commerce and transportation in the nation.

The Federal District is a landlocked mountainous region in the south central part of the nation, and at 2,240 meters above sea level, contains within its boundaries two of the nations thirty highest peaks. It lies within the mountainous region of the New-Volcanic Axis, and the climate of the area is temperate, and matches the national average temperature of 10-18 degrees Celsius. Total rainfall for the area is more than double the national average of 300-600 mm/year, at 600-2,000 mm/year.

The western state of Jalisco is one of the many coastal states of Mexico, with 351 kilometers of its border on the Pacific Ocean. Jalisco composes 4 percent of the total land area of Mexico, and is noticeably different in the number of physiographic regions it takes in: the West Sierra Madre reaches down into the northern tip of the country, the Central Plateau touches on the eastern-most tip, the New-Volcanic Axis fills the majority of the central part of the state, and the South Sierra Madre reaches up along the western coastline. Jalisco's unique shape encompasses two of the highest fifteen peaks in the nation. Approximately 40 percent of the state is temperate climate, 40 percent dry tropics,

and 20 percent semiarid. Temperatures range from –10 to 26 degrees Celsius, and average rainfall is between 300-2,000 mm/year.

Nuevo Leon is a landlocked northern state, barely bordering the United States and comprising 3.3 percent of the nation's land mass. The capital, Monterrey, sits at an altitude of only 540 meters, but the country is still home to four of the nations thirty highest mountain peaks. Nuevo Leon displays a wide variety of physiographic regions, encompassing the regions of the East Sierra Madre on its western and southern borders, and the Great Plateaux of North America along the eastern boundary, with the North Gulf Plateau reaching up into the central part of the state. Eighty-seven percent of the state is arid and semi-arid climate, with only 12.7 percent being temperate. Rainfall averages between 300 and 1,000 mm/year, and temperature ranges from 10 and 26 degrees Celsius.

Puebla, a small south central state comprising only 1.7 percent of national territory, lies in the mountainous regions of the East Sierra Madre, the New-Volcanic Axis, and the South Sierra Madre. It's capital city, Puebla, lies at 2,160 meters, and the state claims four of the five highest mountain peaks in the nation. Puebla's climate is 47 percent temperate, 32 percent wet and dry tropics, and 20 percent semiarid, and average rainfall is between 300 and 4,000 mm/year. Temperatures range from 10 to 26 degrees Celsius.

The state of Yucatan, on the easternmost tip of the Yucatan Peninsula, is a tropical state composing 2 percent of the land area of Mexico, with 340 miles of border along the Gulf of Mexico and Caribbean Sea. It's capital, Merida, is only 10 meters above sea level, and the entire state falls into the heterogeneous physiographic region of

the Yucatan Peninsula. The state is almost completely dry tropics, with a small percentage of wet tropics, yet the average rainfall is between 600 and 2,000 mm/year. Temperatures range from –22 to 26 degrees Celsius.

Urbanization and Living

Housing by Number of Occupants

The national average of housing with 4-6 occupants is 49 percent, with the five states falling closely around this average. The differences come in the percentages of houses with fewer or more occupants.

The Federal District sets itself apart from the other four states by having the greatest percentage, 39 percent, of houses with 1-3 occupants, higher than the national average at 32 percent, and the least percentage of housing with ≥7 occupants. This spread between the percentage of housing with 1-3 occupants and ≥7 occupants is greatest at 28 percent.

The remaining four states follow this pattern of having a higher percentage of housing with 1-3 occupants than those with ≥7, with the 4-6 category falling close to the national average of 50 percent. However, the range of the four other states differs. Jalisco falls close to the national average, and the Yucatan is similar. However, Puebla has a much closer balance between the 1-3 and ≥7 categories, with a lower than national average percentage of houses with 1-3 occupants, and more in the ≥7 category. Nuevo Leon more closely mirrors that of the Federal District, with a greater percentage of homes with 1-3 occupants, and less homes with ≥7 occupants.

TABLE IX

PERCENT OF HOUSING BY NUMBER OF OCCUPANTS, 1995

	1-3	4-6	≥7	Difference in 1-3 and 7+
Nation	32	49	18	14
Distrito Federal	39	50	11	28
Jalisco	32	47	21	11
Nuevo Leon	33	54	13	20
Puebla	29	47	24	05
Yucatan	33	47	19	14

Source: INEGI (2000), and calculated from INEGI (2000).

Characteristics of Housing

Housing units were classified as having or not having drainage, electricity, and plumbing by percentage.

The Federal District lies high above the national average of 63.6 percent, with 93.8 percent of its housing units equipped with drainage. Jalisco and Nuevo Leon both are above the national average, with 81.2 percent and 80.9 percent, respectively.

TABLE X

CHARACTERISTICS OF HOUSING, 1990

	Sewerage	+/- Nation	Electricity	+/- Nation	Running Water	+/- Nation
Nation	**63.6**	-	**87.5**	-	**79.4**	-
Distrito Federal	93.8	30.2	99.3	11.8	96.3	16.9
Jalisco	81.2	17.6	92.5	5.0	86.5	7.1
Nuevo Leon	80.9	17.3	96.2	8.7	92.9	13.5
Puebla	48.4	-15.2	84.5	-3.0	71.2	-8.2
Yucatan	46.2	-17.4	90.4	2.9	71.5	-7.9

Source: INEGI (2000), and calculated from INEGI (2000).

TABLE XI

CHARACTERISTICS OF HOUSING, 1997

	Sewerage	+/- Nation	Electricity	+/- Nation	Running Water	+/- Nation
Nation	**78.2**	-	**94.5**	-	**88.1**	-
Distrito Federal	99.4	21.2	99.8	5.3	99.2	11.1
Jalisco	92.8	14.6	96.1	1.6	94.7	6.6
Nuevo Leon	92.1	13.9	98.3	3.8	96.5	8.4
Puebla	63.5	-14.7	94.1	-0.4	78.2	-9.9
Yucatan	55.9	-22.3	95.2	0.7	87.2	-0.9

Source: INEGI (2000), and calculated from INEGI (2000).

TABLE XII

PERCENTAGE CHANGE IN CHARACTERISTICS OF HOUSING, 1990-1997

	Sewerage	Electricity	Running Water
Nation	+14.6	+7.0	+8.7
Distrito Federal	+5.6	+0.5	+2.9
Jalisco	+11.6	+3.6	+8.2
Nuevo Leon	+11.2	+5.8	+3.6
Puebla	+15.1	+9.6	+7.0
Yucatan	+9.7	+4.8	+15.7

Source: Calculated from INEGI (2000).

Education

Illiteracy Rate

Illiteracy rate is the percentage of people who cannot read, with the literacy rate being the residual percentage.

The average rate of illiteracy across Mexico is 10.6 percent with men averaging 8 percent and women having a higher rate at 12.9 percent illiterate.

Within the five states, there appear three distinct groupings: the Federal District and Nuevo Leon have lower rates than the national average in all areas; Jalisco is below the national average but ranks in the middle of the group, and Puebla and Yucatan are both above the national illiteracy rate in all categories.

When ranked, the Federal District and Nuevo Leon have the two highest rates of total literacy in the nation; however, the Federal District drops to fourth place in literacy rates among women, and Nuevo Leon drops to second place. Puebla and Yucatan both are in the top ten highest rates of illiteracy in the nation in all three categories, with a larger spread between illiteracy rates of men and women. Puebla especially has a wide gap when compared to the rest of the states, with 12.1 percent of men and 21 percent of

women illiterate. Jalisco falls in the middle in all three areas, both in rank and percentage, but has a smaller gap than most when comparing rates of men to women.

When looking at the gap between men and women of all states in the nation, generally as the literacy rate gets higher, the gap between sexes becomes smaller.

TABLE XIII
ILLITERACY RATE, 1990-1997

	Total	Men	Women	Gap Between Men and Women
Nation	10.6	8.0	12.9	4.9
Distrito Federal	3.6	1.9	5.0	3.1
Jalisco	7.2	6.6	7.8	1.2
Nuevo Leon	3.9	3.2	4.4	1.2
Puebla	16.8	12.1	21.0	8.9
Yucatan	14.3	11.2	17.2	6.0

Source: INEGI (2000), and calculated from INEGI (2000).

Selected Indicators of Education

The national average of children aged 6-14 years, who are not attending school is 8.2 percent. The Federal District falls far below this average, with only 3.6 percent not attending. In Nuevo Leon, a state usually close in statistical averages to the Federal District, the percentage is 12.6, above the national average, and higher than any of the five selected areas. In contrast, Yucatan is the only state besides the Federal District to fall below the national average, with only 6.9 percent of children not attending school.

The national percentage of the population 15 years and older, who are without instruction and have not completed elementary school is 28.2 percent. All states except Puebla fall below this national average, but the Federal District clearly has the highest rate of elementary school completion, closely matched with Yucatan. Nuevo Leon ranks in the middle among the five areas, and Jalisco and Puebla maintain the highest percentage of population who haven't completed elementary school.

The national percentage of the population 15 years and older who have completed post-elementary school is 51.8 percent, with the Federal District again ranking above national average at 71.7 percent. Nuevo Leon, in contrast to the figures for the previous two categories, ranks second among the five and also below national average, with a 65.5 percent post-elementary school completion. Jalisco maintains close to the national average, and Puebla and Yucatan fall below.

TABLE XIV

INDICATORS ON POPULATION EDUCATION CHARACTERISTICS, 2000

		Population 15 Years and Older	
	Population Aged 6 to 14 Years Not Attending School (%)	Without Instruction and Haven't Concluded Elementary School (%)	With Post-Elementary School (%)
Nation	**8.2**	**28.2**	**51.8**
Distrito Federal	3.6	12.1	71.7
Jalisco	8.6	26.5	51.1
Nuevo Leon	12.6	16.3	65.5
Puebla	10.4	34.9	43.0
Yucatan	6.9	12.3	46.0

Source: INEGI (2000).

Tourism

Tourism: National and International

When looking at tourism in Mexico, there are two separate groups of tourists with different habits and requests: national—Mexicans who travel within their country; and international -foreign residents in Mexico for vacation or business.

The two top states for total number of tourists for the average of years 1995, 1997 and 1998 are the Federal District and Jalisco, which also rank first and second, respectively, for national tourists. However, international tourists during this three-year time average visited the southern state of Quintana Roo most, followed second by the Federal District, Baja California and then Jalisco.

Yucatan, while ranked only 27th among national tourists, is eighth most popular with internationals, and Puebla drops from 13th among nationals to 20th among internationals.

TABLE XV
TOURISM: TOTAL, NATIONAL AND INTERNATIONAL FOR 1995, 1997 AND 1998 AVERAGE

	Rank of States		
	Total	National	International
Distrito Federal	1	1	3
Jalisco	2	2	5
Nuevo Leon	16	14	8
Puebla	15	13	15
Yucatan	21	27	20

Source: INEGI (2000), and calculated from INEGI (2000).

Hotels

Hotels in Mexico are ranked similar to those in the United States, with a "star" system, from five stars down to one star.

The Federal District and Jalisco rank in the top in almost every category, and Yucatan falls into the lower half in every category. Nuevo Leon also tends to rank in the bottom half of hotels available, except for the 5-Star category, where it is ranked 7th. Puebla's rank falls around the middle consistently.

Number of hotels for each state seems to follow the same general pattern as tourism, with the Federal District leading, Jalisco following, Nuevo Leon and Puebla in the middle, and Yucatan near the bottom two-thirds of states. However, Nuevo Leon tends to rank consistently lower than Puebla in hotels, yet is closer to it in number of tourists.

TABLE XVI

RANK BY NUMBER OF HOTELS BY CLASSIFICATION, 1990, 1995 AND 1997 AVERAGE

	Rank of States						
	Total	5-Star	4-Star	3-Star	2-Star	1-Star	No Rating
Distrito Federal	3	3	1	2	2	1	5
Jalisco	2	2	2	3	6	2	9
Nuevo Leon	30	7	22	28	23	11	32
Puebla	14	17	21	13	11	17	15
Yucatan	23	25	16	25	21	31	24

Source: INEGI (2000), and calculated from INEGI (2000).

Employment

Women Involved in Economic Activity

Women involved in economic participation, or those working outside the home earning income, average 29.9 percent in Mexico. The national average for men involved in economic participation is 70.3 percent, with a difference of 40.4 percent.

In the Federal District, the economic participation rate is 71.4 percent for men, with women topping the nation in terms of women employed, at 39.7 percent. The gap between percentage of men and women employed is also the closest in the nation, at 31.7 points.

Jalisco ranks 7th in the nation in terms of women employed outside the home, at 33.8 percent, with a spread of 39.4 points. Of the five areas, Nuevo Leon follows with 32.3 percent of women participating in income earning, ranked 10 in the nation with a gap of 40.4 points.

Yucatan, with 30.9 percent of its female population working, ranks 14th in the nation, above Puebla with only 27.6 percent, ranked 21st. The gap between men and women employed in Yucatan and Puebla are 44.3 points and 41.9 points respectively.

TABLE XVII
ECONOMIC PARTICIPATION RATE, 2000

	Men (%)	Women (%)	Difference Between Men and Women
Nation	70.3	29.9	40.4
Distrito Federal	71.4	39.7	31.7
Jalisco	73.2	33.8	39.4
Nuevo Leon	72.7	32.3	40.4
Puebla	71.9	27.6	44.3
Yucatan	72.8	30.9	41.9

Source: INEGI (2000), and calculated from INEGI (2000).

Minimum Wage

Annual minimum salaries in Mexico tend to be higher in metropolitan areas. As of February 2000, the Federal District was set at $1,137 pesos per month; Jalisco was at $981, with Guadalajara at $1,053. Nuevo Leon's statewide minimum salary was $981, with the city of Monterrey being $1,053. The statewide minimum rate for both Puebla and Yucatan was $981.

TABLE XVIII
GENERAL MINIMUM SALARIES PER MONTH, FEBRUARY 2000

	Mexican Pesos/Month
Distrito Federal	$1,137
Jalisco	$981
Guadalajara	$1,053
Nuevo Leon	$981
Monterrey	$1,053
Puebla	$981
Yucatan	$981

Source: INEGI (2000), and calculated from INEGI (2000).

Unemployment

Of the total population, those over 12-years-old who are able and willing to be employed are considered the economically active population.

In the Federal District, 58.9 percent of the population is considered economically active, ranking 11th in the nation, with a 2.9 percent unemployment rate. Jalisco claims a 58.3 percent economically active population, but has the 21st lowest unemployment rate at 2.8 percent. The state of Nuevo Leon has a 57.5 percent economically active population, but has the highest unemployment rate in the nation at 4.1 percent.

Puebla and Yucatan rank among the top in the nation and above all five in the group in terms of both total economically active population—Puebla is 2nd and Yucatan is 4th, and lowest unemployment rates—Puebla ranks 2nd and Yucatan is 3rd.

TABLE XIX

ECONOMICALLY ACTIVE POPULATION, 1997

	Total	Unemployed
Nation	57.6	2.6
Distrito Federal	58.9	2.9
Jalisco	58.3	2.8
Nuevo Leon	57.5	4.1
Puebla	65.8	1.0
Yucatan	62.1	1.0

Source: INEGI (2000), and calculated from INEGI (2000).

Economic Activity by Sector

The national average for employment by form of economic activity divides the nation's economically active population into groups of approximately half commerce, transportation, government and other services; one-fourth agriculture, livestock, hunting and fishing; and one-fourth mining, petroleum and gas extraction, manufacturing, electricity, water and construction.

The Federal District lies far from this national average, ranking first in the nation with approximately three-quarters of employment in services, with virtually no agricultural employment.

Jalisco follows the national average closer, but with more resources applied to industrial jobs than agriculture.

Nuevo Leon patterns the Federal District, with a greater amount of employment in services and a small amount in agriculture.

Puebla ranks fifth in the nation in agricultural employment, with 40.4 percent of its workers in this area, but ranks low, 28th, in the nation in terms of services employment.

Yucatan follows the national average most closely with its division of labor, and falls in the middle in national ranking in all three categories.

TABLE XX

ECONOMIC ACTIVITY BY SECTOR, 1995

	AGRICULTURE	INDUSTRY	SERVICES
	Agriculture, Livestock, Hunting and Fishing (%)	Mining, Petroleum and Gas Extraction, Manufacturing, Electricity, Water and Construction (%)	Commerce, Transportation, Government and Other Services (%)
Nation	**22.5**	**24.4**	**52.8**
Distrito Federal	0.4	22.1	76.9
Jalisco	15.9	29.0	54.8
Nuevo Leon	5.4	32.3	61.7
Puebla	40.4	21.8	37.7
Yucatan	26.2	24.5	49.2

Source: INEGI (2000), and calculated from INEGI (2000).

Ethnic Groups

Ethnic Languages

Besides Spanish, Mexico's official language, there are a fifteen ethnic languages classified by the INEGI (2000) spoken in Mexico, with 6.8 percent of the total population over 5-years speaking them.

The Federal District has a lower percentage of ethnic speakers at 1.3 percent, and Jalisco and Nuevo Leon rank 5th and 6th in the nation in terms of least amount of ethnic speakers. However, Puebla ranks 7th in the nation with 13 percent, and Yucatan with 39.7 percent ranks first in the category of ethnic speakers.

Of the households residents whose householder or spouse speak an ethnic language, Yucatan again ranks first with 61.5 percent.

Of the total population 5-years and older who speak an ethnic language, there is only a small difference between total men, 49.4 percent, and total women, 50.6 percent.

TABLE XXI
ETHNIC LANGUAGE SPEAKERS, 1995

	Population Aged 5-Years and Older Who Speak Ethnic Language (%)	Household Residents Whose Householder or Spouse Speak Ethnic Language (%)
Nation	6.8	9.9
Distrito Federal	1.3	2.6
Jalisco	0.4	0.6
Nuevo Leon	0.2	0.3
Puebla	13.0	18.8
Yucatan	39.7	61.5

Source: INEGI (2000).

Services Available

Of three major service categories: sewerage, running water and electricity, the households of ethnic language speakers fall behind the general population in availability. Only 20.7 percent of ethnic speaker households have all three services, with the remaining categories of two services, three services and no services falling into approximately one-quarter of the native speaking households each.

TABLE XXII

PRIVATE DWELLING SERVICES AVAILABLE, 1990

	Total Population (%)	Ethnic Language Speakers (%)
Availability of sewerage, running water and electricity	60.1	20.7
Two services available	18.5	24.8
Running water and sewerage	0.9	1.3
Running water and electricity	15.3	21.7
Sewerage and electricity	2.3	1.8
One service available	13.3	28.1
Running water	3.1	8.5
Sewerage	0.4	0.7
Electricity	9.8	18.9
No services available	7.8	25.5

Source: INEGI (2000).

"It is difficult to talk about any one cuisine of Mexico because Mexico's cuisines are as varied and intriguing as its geography and culture. Climate, geography, location near the sea or mountains and exposure to different influences have given the cuisines of Mexico its definite character and regional differences."

– Gabriela Brana

A History of *Carne*

Meat has been an important part of the diet of Mexicans, long before they were known as Mexicans, and long before the introduction of the Spanish. Antelope, sloth, and very large rabbits provided food for the ancient tribes of the country. When many of these species became extinct by 7200 B.C. due to climatic changes, the natives became dependent upon a mainly vegetarian diet. That is, until the invasion of the Europeans brought domestic animals that served not only for food, but also eventually replaced manpower as a workforce.

By 1493, Columbus had introduced horses, cattle, goats, sheep, chickens and pigs to the New World. The native people were often shocked, scared and in denial of the animals. A Franciscan friar noted, "The first appearance of cattle often sent astonished villagers fleeing into the mountains" (Pilcher, 1998). Throughout the colonial period, the acceptance of the animals by the Indians was slow, and many complained of the damages to their corn fields caused by the overabundance of wild cattle that overran the

countryside. Eventually they accepted the animals, and acquired a taste for beef, but they "often preferred to buy if from Spaniards rather than raise the troublesome animals themselves" (Pilcher, 1998).

In time meat came to be a prized provision, often available only to the elite. Elaborate and intriguing ways to prepare it set the foundation for a culinary culture that pervades even today. Cookbooks from the nineteenth-century "reveal an enormous variety of seasonings and dressings for meat" (Pilcher, 1998). The women of the time took great pride in creating ornate and succulent meals with a variety of native spices adding zest to the meat sources of beef, pork, poultry and seafood.

With the creation of new flavors came new methods of preparing meat, most of which did not meet the approval of outsiders from Europe and United States. They considered the Mexican cuts of meat as butchered in a "slovenly and judicious manner (Pilcher, 1998), and the meat dishes as greatly overcooked. The Mexicans prepared meat to suit the preferences of their own people, who "abhorred the dripping, rare fillets served in Europe and cut their meat in thin strips, pounding and marinating to tenderize them" (Pilcher, 1998).

Thus was born a flavor reminiscent of native customs, influenced by European food sources, designed through centuries of creativity and experiment, and as varied as the people of Mexico, who have come to claim it as an essential part of their national identity.

Regional Flavor

The use of cookbooks as a whole gives a representative picture of what types of food are prepared in different regions. Although not an exact science, content analysis of the literature of ingredients and cooking methods reveals much about the regional varieties of Mexico.

Zaslavsky, in her book "A Cook's Tour of Mexico" (1995), emphasized the diverse culture and regions of the country by dividing her cookbook into regional sections, so one can "get a good idea of how flavors and dishes are unique to certain areas of the country," (Zaslavsky, 1995).

Brana, an accomplished chef with her own bed and breakfast in the city of Ixtapa, Guerrero, recognized the importance of the diversity of the nation's food culture also. Based on her experiences, she divided the country into five distinct regions, grouped by the culinary culture of the area and types of ingredients used in cooking.

Brana describes the "Cuisine of Simplicity," which includes the states of Baja California, Sonora, Chihuahua, Sinaloa, Durango, Coahuila, Nuevo Leon, and Tamaulipas; the "Cuisine of Surprises," which consists of Aguascalientes, Colima, Guanajuato, Jalisco, Michoacan, Nayarit, Queretaro, San Luis Potosi, and Zacatecas; the "Cuisine of Imagination," containing the state of Mexico, Mexico City, and Morelos; the "Baroque Cuisine," found in the states of Veracruz, Puebla, Tlaxcala, Hidalgo, Guerrero, and Oaxaca; and the "Cuisine of Spices and Aromas," incorporating Tabasco, Chiapas, Campeche, Yucatan, and Quintana Roo (Brana, 2001, February).

Within each region, it is the natives and the locals who best represent the flavor of the area.

"homemade" food as one can find, were traditionally located in old garages or front rooms of the home, where the woman of the household would sell meals to local workers to earn money.

"There's nothing quite like a fonda outside of Mexico, so be sure to visit fonda sections at markets to see what locals are preparing with regional products," advised Zaslavsky (1995).

Mexico City Cuisine

Mexico City, the state of Mexico, and Morelos make up the region Brana labels the "Cuisine of Imagination." Here, she said, "The constant throughout the years has been the extraordinary diversity of ingredients available."

"Regional cuisine is born out of the limitation of supplies, out of the absence rather than the abundance of products," Brana said. But, as Mexico City has long served as the political and commercial foundation of the nation, so with that comes a little piece of every region of the nation, including culture, ethnicity, and of course, cuisine.

Here one can find food specialties from any region of the country, mixed with rich international touches of Spanish, French, Arabian, Chinese and Greek culinary influences.

"Mexico City is a microcosm of the country. Products from every region are trucked, trained, and jetted to its markets: tropical fruits, cocoa, and chiles from Chiapas, Tabasco, and Yucatan; seafood, vanilla, and coffee from Veracruz; mangoes, seafood,

and tequila from Jalisco; pork, coconuts, avocados, and exotic wild mushrooms from Michoacan. It's all here and yours for the asking" (Zaslavsky, 1995).

The Mexico Tourism Board described Mexico City as "one of the main gastronomic capitals of the world," and said, "The only limit to cooking in Mexico City is personal taste."

Popular restaurants in the vast and diverse downtown serve dishes ranging from traditional family recipes such as *filete de carne*, beef filet with onion, potato and chile, to the ancient preparation of meatballs in chrysanthemum petals, to squash blossom soup. Restaurant styles range from intimate, personal cafes to grand, world-class restaurants where "gastronomy has taken on ritualistic dimensions" (Mexico Tourism Board, 2003, *Mexico City cuisine*). However, it is in the abundant open-air markets and sidewalk *fondas* where the true essence and variety of Mexico City is found.

Fondas, Mexico's traditional "fast-food" outlets common to every market, offer a meal-on-the go of fresh, handmade tortilla, with fillings from almost any animal imagined. *Carnitas* (pork pieces), *barbacoa*, and fried *charales* (tiny fish), are deep-fat fried, griddled, grilled, or ground cooked, and folded into tortillas for a daily breakfast, lunch or snack. An especially popular filling is beef innards, especially *carne de cabeza*, or meat from the head of a beef.

The markets themselves display the produce utilized everyday by housewives and working women, from the basic, daily supplies such as tortillas, to the produce of a typical, busy market in Mexico City described by Zaslavsky (1995).

"Gourmet meats such as lamb, kid, rabbit, and suckling pig are available every day, not just for holidays. Poultry tables include stewing hens, capons, tiny chickens, and

different types of duck, quail, pigeon, and pheasant. *Los gueros*, a smoked-meat counter with a constant line in front, sells lean, smoked pork loins, sliced hams, salamis, wursts, and various chorizos from Mexico and South America."

In the highlands around Mexico City, connoisseurs of meat know the distinct difference between *barbacoa, mixiotes,* and *birria*. These traditionally "weekend-only" meat specialties are commonly sold in roadside stands on Sundays.

Barbacoa is traditionally meat from a lamb or goat kid, wrapped in leaves of an agave plant that produces mezcal, and slow-cooked in the ground for hours. In some places *barbacoa* is taken to mean barbequed goat specifically (Moore, 1999). Other times, it is just in reference to the actual preparation of the meat—wrapped in leaves or some other material, and slow-cooked in a pit.

Mixiotes are smaller, individual-sized pieces of meat, also wrapped in maguey leaves and cooked in the ground. *Birria* differs in that the meat is marinated overnight in a chili sauce, then steam-roasted, usually in an oven.

In different regions of Mexico, preparation is different for *barbacoa* and *mixiotes*. In Oaxaca, avocado leaves replace the maguey, and in Yucatan, banana leaves are preferred (Zaslavsky, 1995).

Jalisco Cuisine

The state of Jalisco lies in Brana's "Cuisine of Surprises." Here a variety of ingredients and notable products, such as tequila, a drink enjoyed worldwide and named after the town northwest of Guadalajara where it originated, and the famous seafood of

the coastline, play a part in Jaliscan cuisine, influence by Tarascan, Spanish, and French cultures.

"Because of the variety of climate, landform and elevation, nearly every type of fruit and vegetable grows somewhere in Jalisco" said Zaslavsky.

With their variety of local production come a variety of regional food dishes, made from an equal array of meat sources.

"Jaliscans love their meat dishes," said Zaslavsky. Some of the most popular include *carne asada*, *birria*, and *pozole verde*.

"Without a doubt *carne asada* is the most popular dish served in Guadalajara, and probably all of northern Mexico, from Tiajuana to Tampico" (Zaslavsky, 1995). "Carne asada is always a thin, grilled or griddled beefsteak with a dish of soupy beans, guacamole, and either a cheese quesadilla, enchilada, scoop of chilaquiles, or French fries alongside, depending on the cook's whim."

While beef is a staple of Jaliscan diets, other meats vie for popularity.

Birria, a dish of slow-roasted meat, usually lamb or goat meat served in a thick sauce, is "Western Jalisco and Michoacan's answer to Central Mexico and Oaxaca's *Barbacoa*," said Zaslavsky.

Traditionally, *birria* meat is always wrapped in or surrounded with maguey leaves, from the plant used to make tequila, before being slow-cooked in a pit in the ground. Today some cooks forego this step, Zaslavsky (1995) noted after watching a local woman prepare the dish for a picnic, but they still compensate with similar flavorings.

"Being rather modern, Lupita doesn't bother with a pit lined with magüe leaves as her parents did. But, [she] makes up for their absence by including a good shot of firewater, either tequila or mezcal" (Zaslavsky, 1995).

Pozole verde is most famous to Guerrero, which lies farther south along the Pacific coast, but is also common in Jalisco. Thursday is unofficially "*Pozole Day*," and few locals disrupt this tradition.

"Since moving to Mexico, my husband, Brian, and I have fallen into the ritual of going out to dinner on Thursday night for pozole, a regional dish," said Kokolias (2002), a native of New York who also lives in Ixtapa, Guerrero.

"Pozole is a thick rich soup made from pork or chicken and hominy, and is both delicious and cheap. Thursday is the designated day (*jueves pozolero*) to enjoy pozole in Zihuatanejo as well as throughout the entire state of Guerrero, although no one can remember why. And no one would dream of ordering it on any other day of the week either, even if it were on the menu. The exception to this is the unsuspecting visitor who ends up in a touristy restaurant filled with other Americans where the waiters speak English, instead of in one of the *pozolerias* that line the alleyway off one of the main streets where the locals eat."

According to Zaslavsky, this dish is traditionally a workingman's low-cost dish, made with pork and hominy kernels, but now including more meat because, as she said, "People enjoy more meat in their *pozole* these days" (Zaslavsky, 1995).

The state's coastline contributes to the immense popularity of *mariscos y pescos*, or seafood. Along the coasts of Jalisco, and south into Guerrero, Colima, and Oaxaca "shrimp dishes outnumber everything else on the fonda signs," said Zaslavsky (1995).

Jalisco is also home to the nation's largest lake, where *charales*, or lake whitefish, the most famous food of Lake Chapala, are caught and served.

Nuevo Leon Cuisine

The cuisine of Nuevo Leon is distinctly *norteno*, and much like other aspects of the state, is a blend of Spanish and American, merged to create its own unique style.

Nuevo Leon, along with its northern counterparts, is grouped by Brana (2001, February) into the region of the "Cuisine of Simplicity." These states lie in a region of grass fields and dry ranchlands—suited to producing beef and dairy cattle, as well as semi-arid expanses—perfect for citrus orchards. She notes the importance of the export industry on these border states, and the influence of Americanization on their tastes and preferences.

Nuevo Leon borders the agriculture-based state of Coahuila, where large cattle ranches and farms attract few tourists, but influence the region with their production of beef. To the east lies Tamaulipas, the state that gave the world "fajitas." Many traditional Mexican dishes such as this have been adopted, slightly Americanized, and offered in mass in Monterrey (Mexican Trade Commission Montreal, n.d.).

According to the Mexico Tourism Board (2003, *Nuevo Leon*), "Cooking is an important part of the local culture, and is based primarily on meat dishes. Classic examples include delicious roast kid, charcoal grilled ribs, Zaraza meat, braised kid and traditional beef jerky with scrambled egg, accompanied by wheat tortillas and traditional sauces such as pico de gallo, la bandera and la fresadilla."

The city of Monterrey claims a blend of American, International and Mexican dining options, but is dominated by American chains such as Applebee's, Fuddrucker's, and the Outback Steakhouse (Valley Morning Sun, n.d.). There is still a good range of restaurants serving national and regional food, catering to hearty meat eaters, with the regional specialty being roast kid (Business Traveler Center, n.d.).

El Tio restaurant in Monterrey, noted for its traditional, regional foods, is most famous for its thick steaks and roasted kid.

"Grilled steaks, and again, cabrito, are the mainstays—Monterrey is not really a vegetable and salad city," (Business Traveler Center, n.d.).

In the North, men play a more active role in food preparation. Laura B. de Caraza (2003), author of books on Mexican food culture and gastronomy, said "It can be affirmed that the male—not female -cook played a major role in the origins of northern and, of course, Nuevo Leon gastronomy. The involvement of women slowly increased over a long period of time."

She also noted, "It is true that meat is an essential foodstuff, but having men cooking at the grill at parties and social gatherings is also a tradition among cattle breeders. These men are accomplished cooks and they happily serve meat dishes to the womenfolk, who are happy to have such a great cook at home" (Caraza, 2003).

Puebla Cuisine

What Brana (2001, March) referred to as the "Baroque Cuisine" is found in the state of Puebla, along with neighboring Tlaxcala, Hidalgo, Guerrero, and Oaxaca. From the coastal beaches, to the country's highest mountain peaks, and from the primitive,

indigenous tribes to the modern tourist mobs, a complex variety of foods is found. Two locations primarily affected the history of this area's cuisine: Veracruz, where Hernan Cortez first landed and brought the New World influences; and Acapulco, Guerrero, the ancient place of contact with the Orient. In this region, Brana maintains, is where the *mestiza,* or "of mixed origins," Mexican cuisine was born.

Cooking is considered just "another of Puebla's art forms," and the food is described as a "a blend of Spanish and Oriental flavors, spices, condiments and ingredients enriched with maize, turkey, chili and tomato and the skill of the local cooks who continue to create and have developed an exquisite new Mexican cuisine" (Mexico Tourism Board, 2003, *Puebla cuisine*).

The city of Puebla is known for creating *mole*, a sauce made from over twenty ingredients from three continents (Puebla Cuisine, 2003). Arguably the state's most popular dish is *mole poblano*, with *poblano* referring to the people of Puebla. This special recipe is usually made with chicken or other poultry.

Other famous recipes of the area include *tinga poblana*, shredded pork with tomatoes and chiles; *manchamanteles*, made with either chicken or pork; chicken breast with various sauces; enchiladas with either chicken or shredded pork and dried fruit; and pumpkin seed sauce with either chicken or pork.

A traditional, regional recipe from Puebla- -*carne a la poblana*, or grilled beef, served with *chalupas*, refried beans, and sautéed chili strips –is popular at restaurants in Mexico City.

Despite their creativity with spicing meat, the majority of the recipes in the book "A Cook's Tour of Mexico" from the Puebla region are vegetable based, and of those that

do use meat, few call for beef as a main ingredient. Lamb is listed in a select few dishes, and beans provide the protein base for many recipes, but pork and chicken are the most common.

When describing the *fondas*, or local food markets in Puebla, Zaslavsky (1995) noted that "Soups and stews made of vegetables are popular, especially in the morning."

Where meat is sold though, the friendly tradition of the state is seen. In a butcher shop in the city of Cholula, Puebla, where Zaslavsky visited, she found a "... very clean, refrigerated stall that offers top-quality fresh beef and pork. The friendly butchers enjoy North American customers who request different cuts, and they try their hardest to please" (Zaslavsky, 1995).

Yucatan Cuisine

"Yucatan, home to the Mayan ruins of Chichen Itza and Uxmal, plus charming colonial Merida, has a cuisine all its own—much more Caribbean-influenced than Mexican" (Zaslavsky, 1995).

Yucatan is included in Brana's region of "Cuisine of Spices and Aromas," along with Tabasco, Chiapas, Campeche, and Quintana Roo. Brana describes the food of this region, and particularly of Yucatan, as "distinguished by its originality and wisdom."

Within these southernmost states lie the lands of the ancient Mayan culture, where today the descendants of the native tribes still speak the same language and prepare food very similar to what their ancestors did one thousand years ago. Traditionally, seafood and wild game, including deer and turkeys, provided the staple foods for the ancient

peoples. Today, the wild game is gone, but the people still "prepare and savor other foods of their ancestors" (Zaslavsky, 1995).

Ancient traditions run deep here, yet the influence of the New World did not go unnoticed, especially in food preparation. The main food product adopted from the Spanish was pork, which is still overwhelmingly popular today and used in many main dishes.

The spices and flavors from the nearby Caribbean also played an important role in shaping the flavor of Yucatan cooking.

"Merida's, and Yucatan's, food is completely different from that in the rest of Mexico. It's a cuisine unto itself, influenced more by the Caribbean islands than by other states in the country," said Zaslavsky (1995).

In Yucatan, chicken and poultry are also common in many main dishes. The majority of the recipes from Merida, Yucatan, in the book "A Cook's Guide to Mexico" include chicken or eggs as their protein source. The traditional Christmas Eve dinner of this region is *escabeche Oriental*, or "vinegared chicken with flavors of the Yucatan"– here the Oriental refers to eastern Yucatan, not East Asia.

"Everyone eats the same meal this night—chicken if you're poor, turkey if you're rich," said Zaslavsky (1995).

Recipes that offer a choice of meats always suggest pork if not chicken. Grilled, marinated pork steak, *poc-chuc*, is what Zaslavsky refers to as "the region's answer to the north's *carne asada*." It is on most menus throughout the entire Yucatan Peninsula, with the most popular area for this specialty in the center of the state of Yucatan.

The most famous dish of the Yucatan is *cochinita pibil*, or oven-cooked, pit-style pork, similar to Jalisco's *birria* or Oaxaca's *barbacoa*, and can always be found in weekend-only stands along the roadways of the state.

"The flavor of Yucatan's cuisine and its enormous variety of dishes have made it famous. In addition to satisfying the taste buds, Yucatan's traditional food charms the ear with its fanciful Mayan names: *papadzules*, *salbutes*, and *cochinita pibil*" (Mexico Tourism Board, 2003, *Yucatan cuisine*).

Common Meat Dishes of Mexico

Pilcher (1998) describes the meat of different regions of Mexico—some specifically established in a lone region. Others originated in a certain area, but have become popular throughout other states.

TABLE XXIII

COMMON MEAT DISHES OF MEXICO

Birria	Steamed or barbecued meat, often goat, a regional dish of Jalisco
Cabrito al pastor	Barbecued kid, a regional specialty of Monterrey, Nuevo Leon
Carne asada	Grilled meat, a common dish of northern Mexico
Carnero	Mutton
Carnitas	Bits of fried meat, often pork
Chorizo	Sausage spiced with chili peppers; the most renowned come from Toluca, Mexico
Cochinita pibil	Pit-barbecued pig, a specialty of Yucatan
Fonda	Restaurant
Gordita	"Little fatty," fried corn masa snack resembling a small round pita bread that is filled with meat and other stuffings
Mancha-mantel	"Table-cloth stainer," a sweet and sour dish of meat, fruit and chili peppers
Picadello	Chopped meat stuffing made with candied fruits and used for chiles en nogada
Pozole	Hominy stew with pork, served throughout the Pacific coast region
Puchero	Spanish stew
Tamal	Cake made of corn masa stuffed with meats, vegetables, or chiles, wrapped in a corn husk or banana leaf, and steamed
Torta compuesta	Sandwich made with cold cuts or hot pork or chicken along with beans, cheese, avocado, and pickled chiles, on a bolillo

Pilcher (1998), Que vivan los tamales! pp. 203-206.

Case Study: The Supermarket Sector of Mexico

The supermarket sector of the food retail industry in Mexico is growing dynamically in importance—not only to the new wave of consumers who are demanding different products, but also to the owners and operators of traditional food distributorships and stores in the country.

In 1993, there were 700 supermarkets in Mexico—in 1997, there were 3,850 with new stores continuing to open each week (USDA, 2001).

In the midst of this dynamic structural change, smaller, more traditional markets are struggling to maintain their position in Mexican commerce, while foreign influences and domestic preferences drive the growth of the "Americanized" supermarket concept.

A report by the USDA, Foreign Agricultural Service, "The Mexican Market for the Retail Food Sector" (2001) breaks retail food sectors into three divisions:

1. Super Stores, Supermarkets, Hyper Markets or Super Centers, Club and Warehouse Outlets
2. Convenience Stores, Gas Marts and Kiosks
3. Traditional Markets, "Mom and Pop" Small Independent Grocery Stores, and Wet Markets.

Placed at opposite ends in the spectrum of food retail, it's the supermarkets versus traditional markets in Mexico, with one group fighting for emergence and one fighting for survival.

Price and New Products

Mexico is a very agricultural country, and is self-supportive in providing food for it's population. It has a strong food processing industry that supplies most of its population's needs. Of the top 500 companies in the nation, the largest sub-sector is food-processing companies, containing 55 of the 500 firms. Some of these firms are Grupo Industrial Bimbo, producer of bread products; Bachoco, a producer of eggs and poultry products; and Grupo Bafar, a processor of red meats.

Despite their general food self-sufficiency, Mexican consumers tend to enjoy American products, and associate American labels with high quality and value. The younger population especially has adapted to a more international perspective and they tend to be consumers of more imported food purchases.

However, imported products range from 15 percent to 40 percent more expensive to Mexican consumers, and Mexican consumers are very price conscious. Only about 22 percent of the Mexican population can afford imported food products.

A strong advantage therefore of international importers is not always price advantage, but instead product advantage. Many multinational firms are active in importing products that are not produced in Mexico in addition to providing recognized staple food sources.

According to the USDA (2001), "Although the Mexican food processing industry is competitive, in general, it does not produce some consumer ready products which are consequently imported, mainly from the United States."

Changes in Distribution

The emergence of supermarkets in Mexico is thus changing the kinds of products demanded by Mexican households, and is also causing changes in preference of quality, consistency, packaging, and handling (USDA, 2001).

Traditionally, food products in Mexico enter a retail system via the *Central de Abasto*, or central distributorship, of the city. From here, local shops purchase their supplies for the day or week, and sell it at retail levels.

With the new concept of supermarkets and chain stores however, many of the larger retail companies (Cifra, Gigante, Soriana, Carrefour, CasaLey) have developed contacts with suppliers or foreign importers and have direct relationships with them. This direct marketing is a popular trend that will probably grow in importance between Mexican retailers and importers, and is a key element to the success of chain supermarkets, which prosper on efficiencies of scale and direct procurement.

This new style of food distributorship is putting additional strain on the infrastructure of the country, as truck fleets, wholesale markets, packers and shippers, and farmers all try to realign their production and business to the new pace. In addition, wholesalers' position in food distribution is rapidly declining, but due to overall vigorous consumption growth, may not be severely harmed.

A weakness of the current Mexican food system is its lack of standards and unitization for food products. As exports of Mexican products increase, along with the emergence of chain supermarkets and expectations of quality and consistency, stricter standards are beginning to develop in the food industry. SECOFI, the Mexican Ministry of Commerce that interacts with agricultural marketing from the producer to the

consumer, is putting pressure on ANTAD, the Mexican supermarket trade association, to develop industry-wide standards for produce grades, cartons, and packaging.

Location and Development of Supermarkets

According to the USDA (2001), "Retail outlets are usually located in most major cities across Mexico, as well as some of the smaller cities. Within the cities, they can be found downtown or on the outskirts of the city. There is no specific location pattern."

Factors that drive the establishment of new supermarkets include a large number of products and services in one location, better prices, discounts, convenience of services and the new food products consumers can find.

According to Gustavo Castaño of the U.S. Meat Export Federation in Mexico City (Personal communication, May 2003), criteria for establishment of new supermarkets are based on the questions of:

1. Are there other supermarkets around?
2. What is the population around the zone?
3. Is there a wet market nearby?
4. Is it a new habitation zone?

Customer Profile

According to the USDA (2001), supermarkets have had a presence in Mexico for many years, but before the 1980's, were rare and catered mostly to the upper-income class and foreign residents. For this reason, supermarkets gained the image of upscale,

high-price establishments, and it wasn't until recently, with efforts to serve the lower-income classes also, that their popularity has inflated.

There is still no defined "typical customer" of supermarkets in Mexico. The younger, more internationally-minded consumers tend to accept the idea of supermarkets more readily, but clients come from all socioeconomic levels (USDA, 2001).

"Only in the case of membership clubs do consumers tend to be a more homogenous representation of the upper income population, including the category of foreign residents" (USDA, 2001).

Many retailers have adopted the concept of *bodegas*, or warehouses such as Sam's Club, which are no-frills outlets that offer the lowest prices and cater to the lower-income classes.

A unique aspect of shopping at a Mexican supermarket is the *fiesta* atmosphere—the evolution of a trip to the grocery store as a fun-filled, family excursion—that has come to be demanded from customers in Mexico. The traditional concepts of trying something before purchase, discussing benefits of one product over another, and personal salesmanship have not been entirely abandoned in Mexico, and are evidenced in product demonstrators and the expected free samples prevalent in super stores. In a Wal-Mart in Mexico City, on any day of the week, more than 40 registered demonstrators fill the store.

According to Moreno (2003) of the Houston Chronicle, in many Latin American countries shopping is a woman's job, but not in Mexican supermarkets. The entire family goes together, often for three or four hours. The women taste a plethora of food samples and products, while demonstrators show electronic and sports equipment to men.

Children are often equipped with their own shopping carts to gather free samples of candy, toys and balloons.

This tradition of taste-testing originated with the Aztecs, who founded outdoor markets to sell wares and agricultural products (Morena, 2003), and due to competition between chain stores, has evolved from just sampling to a level of family entertainment that smaller stores cannot match.

Criticisms of the Supermarket Concept

In stark contrast to the traditional method of shopping in Mexico, supermarkets introduced the concept of independent shopping. They are sometimes called *tiendas de autoservicio*—literally self-service stores. This new system can bring anonymity to consumers, which erases the social interaction and enjoyment of making daily or weekly food purchases. For this reason, the concept of supermarkets is criticized by many traditional consumers, especially those who have just moved to an urban area from a rural area and find this style of purchasing very intimidating (USDA, 2001).

There is strong competition between supermarkets and traditional markets in Mexico, with the goal of supermarkets being to attract traditional shoppers to their stores with lower produce prices but offering other goods at regular or higher prices (USDA, 2001). Due to their advantage in providing lower-priced, necessary daily produce, supermarkets have gradually eroded the market share of the local *tianguis* and wet markets.

Traditional Markets and "Mom and Pop" Grocers

Despite the rapid influx of supermarkets in Mexico, most Mexicans still shop at bazaar-style booths or stalls from a municipal market (41 percent), or from neighborhood street markets, called *tianguis* (20 percent), (USDA, 2001).

These traditional "wet markets" in Mexico, as well as the local "Mom and Pop" grocery stores, tend to offer more traditional food product, and less imported products and Americanized food. Many tend to be specialized shops, such as the local *carniceria*, selling only meat products, or the *panaderia*, selling only bread.

This style of shopping is highly regarded in Mexico for its personal-level transactions.

"Unlike supermarkets, these are not self-service operations: the consumer asks for a kilo of tomatoes and the proprietor selects and weights the product. The customer and proprietor often know each other, so there is an social element to the exchange" (USDA, 2000).

Also known as *abarrotes* and *ultramarines*, these small stores often have little refrigeration. Their business is reliant on local customers, due to proximity and loyalty drawn from personal relationships between the owner and his customer. There are more than 400,000 of this type of establishment throughout Mexico, and they are common in smaller towns and less developed regions.

Top Ten Supermarket Chains

Information gained from personal communication with Gustavo Castaño (2003) of the U.S. Meat Export Federation office in Mexico City describes the top ten supermarket chains in Mexico.

TABLE XXIII.

TOP TEN SUPERMARKET CHAINS IN MEXICO, 2000

1 Walmex (Wal-Mart of Mexico)	Located all over the country with an average of 6-7 stores at the main cities such as Guadalajara, Monterrey and Mexico, and 1-2 at most important cities, such as state capitals	53 outlets
2 Comercial Mexicana	Largest in terms of numbers of outlets; most important areas of interest are Tijuana, Bajio Zone (Queretaro, San Luis Potosi, Nuevo Leon, etc.) and Mexico City)	234 outlets: Mexico City= 75
3 Soriana	Mexican owned company; was #1 in revenue last year over Wal-Mart, operates out of Saltillo, Coahuila; located mostly in the North part of the country: Nuevo Leon, Saltillo, Chihuahua, Sonora, etc.	105 outlets
4 Gigante	Mexican owned company	120 outlets: Mexico City= 45 Guadalajara= 35 Tijuana, Queretaro and Bajio Zone= Rest
5 Chedraui	Located in the South, especially in the states of Veracruz, Chiapas, Quintana Roo, etc.	46 outlets
6 San Francisco de Asis	Close competitor of Chedraui; located in the states of Yucatan, Veracruz and Quintana Roo	46 outlets
7 VH	Leader in the state of Sonora, medium side regional supermarket chain	45 outlets
8 Arteli	Local supermarket chain in Tampico, Tamaulipas	25 outlets
9 Smart	In the state of Chihuahua, specifically La Ciudad de Juarez	25 outlets
10 Futurama	Small side supermarket chain with 25 outlets located in Chihuahua	25 outlets

Source: Personal communication with the U.S. MEF office in Mexico City, D. F., May 2003.

With the exception of Chedraui and San Francisco de Asis—which are concentrated in Veracruz, Yucatan, Quintana Roo and Chiapas—the top ten supermarket chains are located primarily in the northern states and in Mexico City.

The largest chain, Walmex, is concentrated in the large cities, including the three largest in Mexico: Mexico City, Monterrey, and Guadalajara. Comercial Mexicana is clustered in the northern states, but has the greatest amount of locations in Mexico City.

Soriana is centered in Saltillo, Coahuila, but has outlets in other border states. Gigante is focused on the *Baja Zone* of northern Mexico also, but with the most locations in Mexico City. VH, Arteli, Smart and Futurama are all headquartered in the northern border states of Sonora, Tamaulipas, and Chihuahua.

This distinct pattern of major supermarkets developing in the northern states and larger cities has an impact on the style and level of food consumption of the areas. The emergence of supermarkets is an indicator of Americanization, and is evidenced through the largest chains being based near the border, and, as in the case of Walmex, being U.S.-based companies that have expanded into Mexico. Although they have adapted to Mexican culture and needs, they still tend to offer a large variety of American-style products that have seen an increase in popularity in the areas where they are available.

CHAPTER V

CONCLUSIONS AND IMPLICATIONS

Conclusions

Conclusions: Secondary Data Analysis

The literature review implied certain factors of social and economic well being might lead to changes in beef consumption. Based upon these inferences, a list of potential factors of social and economic well being were selected from the complete list of variables analyzed in the secondary data analysis, and deemed most important in gauging changes in beef consumption. These selected potential factors of change and their presumed relation to beef consumption of a population are described below.

Rural Population

There are differences in consumption patterns between rural and urban residents, mostly due to differences in income levels. Rural residents as a whole are poorer than urban dwellers and, along with urban poor, eat a much simpler and less nutritious diet based on corn and beans. Wealthier urban dwellers consume more beef and other types of meat due to higher income levels and accessibility to lower priced product, such as that in supermarkets. In the North, states have a smaller percent rural population, as landowners possess larger parcels of land.

Average Age

Younger adults are more likely to be open to change and more accepting of new food consumption patterns. They are more likely to prefer American-style products over traditional food commodities.

Geographic Location

Geographic location and climate influence the types of food consumed. This is due in part to location of production, and also to regional tastes and preferences. In general, people in the North prefer more beef, those along the coastlines consume more seafood, and the population of the South tends to eat more pork and chicken.

Housing by Number of Occupants

In Mexico, customary tradition is for extended families to live together in one household. However, this practice is slowly changing among the younger urban population. Lower income families tend to live together out of necessity, as their incomes are combined to support the group, with housing amenities shared by all. Populations with fewer occupants per household are more progressive and willing to break from tradition.

Characteristics of Housing

Development of housing, including access to electricity, sewerage, and running water, is a reflection of the economic well being of the household. Populations with a greater percentage of housing with these characteristics are more progressive and have

higher levels of income. Populations with higher percentages of housing development will likely have greater economic freedom to consume foods of their choice, including beef.

Illiteracy Rate

Literacy and illiteracy rates are an indicator of the education and advancement of a population. A populace with a lower rate of illiteracy will tend to have higher levels of income, greater ability to buy a variety of food products, and be more willing to do so. This increase in education is also likely to shape attitudes toward beef concerning nutrition, diet, health and quality of product.

Selected Indicators of Education

As with illiteracy rate, selected indicators of education depict access to educational and imply increased levels of income. A population with higher selected indicators of education will be more likely to purchase more costly meat, including beef.

International Tourists

The majority of international tourists to Mexico come from the United States. These international tourists tend to consume more costly food products, in particular American-style beef. States and cities with high levels of international tourism will have greater access to American-style beef. Although the native population may not be as likely to afford or desire consumption, these products are available and do impact populations that have a high level of international tourism.

5-Star Hotels

Five-Star hotels serve wealthy tourists who are more willing to spend money on a greater variety of food. An increase in American-style beef cuts in these upper-scale hotels creates access to this style of food. Like the potential factor of international tourism, the presence of 5-Star hotels may not indicate greater consumption levels within the native population, but greater access to beef and American-style products does impact awareness.

Women in Economic Participation

Women who work outside the home are more likely to eat out in restaurants with their family than prepare a home-cooked meal. They also tend to buy more processed and "ready-to-eat" style food from grocery stores, rather than purchase traditional commodities. As beef has always been a traditional commodity purchased in *carnicerias*, and requires timely preparation, economically involved women purchase and prepare less beef than non-economically involved women. Families with two parents working will have higher levels of income also.

Minimum Wage for Area

Minimum wage is related to income levels; income levels impact food consumption patterns. Minimum wage in relation to price index is most important. However, a comparison of minimum wage rates of a region to that of other regions is an indicator of comparative economic well being. States with higher comparative minimum

wage rates will have greater freedom to purchase higher cost food products, including beef.

Unemployment Rate

Unemployment is also related to income levels. Unemployed members of a population have less ability to purchase more expensive food, and will tend to buy cheaper grain-based foods as opposed to meat.

Economic Activity by Sector

Workers with government and service-based jobs have higher income levels than blue-collar workers involved in industry and agriculture. Agriculture workers are more rural and thus have lower income levels and different eating habits. Government and services worker are more likely to have the ability and willingness to consume beef.

Ethnic Language Speakers

A larger percentage of the ethnic language speaking population lacks access to water, electricity and sewer systems, compared to non-ethnic language speaking populations. This is a reflection of income levels and development, which suggests lower access to and ability to purchase higher priced items such as beef.

Conclusions: Content Analysis

The regions of cuisine defined by both Brana and Zaslavsky are consistent in many ways with the findings of the secondary data analysis. Brana and Zaslavsky both

mention the Federal District has a wide variety of gastronomical influences—which is expected based upon the remarkable variations of its population. The Federal District's higher levels of economic and social well being match the implications of the content analysis that the population of this area has access to, as well as the ability and willingness to purchase, a variety of food products including beef.

Jalisco is a state with a wide variety of meat consumption. Beef is common, but so are pork and seafood, according to the cookbook study. In many ways its typical levels of economic and social well being match the typical but varied fare of its population. It is home to its own distinct flavor that tends to permeate this state and also spread farther south down the coastline.

In Nuevo Leon, beef is popular not only for its taste but also for its social implications. Meat is prevalent and important to this state, with *cabrito* (goat meat) being another regional specialty. This state is strong in its traditions of meat, and has the matching economic well being to provide for this.

Recipes from Puebla indicate a shortage of meat in main dishes, with vegetables used more commonly as a staple. This follows the levels of economic and social well being of the state, which show more poverty and less ability to purchase meat.

The Yucatan differentiates itself from the other states, with pork and poultry being more common in the recipes of this region. This region has a distinct flavor documented in cookbooks, with a heavy Caribbean influence separating it from mainland Mexico.

Conclusions: Case Study

The supermarket sector of Mexico is both a result of and a generator of change. The emergence of supermarkets is predominantly in the Northern states and also in large cities, where higher standards of living, education, housing characteristics, and women in the work force are predominant, and where the population has a smaller agricultural-based work force. These factors are key in the initial decision to build supermarkets in these locations.

The dispersion and location of these supermarkets mirrors the results of the secondary data collection—primarily with the cases of the Federal District and Nuevo Leon. They rank highest in variables of social and economic well being, and also have the greatest presence of supermarkets of the five states.

Separate from a result of change, supermarkets themselves have generated immense changes in Mexico. American-based chains such as Walmex and HEB have been a driving force in the globalization of food trends in Mexico, and have also introduced American-style food, preservation and packaging. The products these stores offer, as well as their cultural impact on style of shopping, have created a new approach to consumerism.

The emergence of these chains has changed the traditional Mexican system of purchasing food products from specialized, individual stores. The old method has dropped in appeal to many consumers, when compared to shopping at a supermarket that offers an entire week's supply of vegetables, grains and meat products conveniently in one location. The younger, more affluent population has led the way in accepting these

super stores, while the older, more traditional group have remained more true to time-honored *carnicerias* and *tortillarias*.

The concept of supermarkets is not prevalent throughout Mexico for several reasons. First, not all populations or states have access to supermarkets. Development tends to be largely in the Northern border states and in large metropolitan areas—eight of the top ten supermarket chains in Mexico are based in Northern states.

Second, food is more expensive in many supermarkets. Although fresh produce is often cheaper, other supplies and ingredients may be higher priced than at local markets. Additionally, most imported American products are 15 percent to 40 percent more expensive.

Third, to the older, traditional consumers, there exists an aversion to the concept of supermarkets. Customers dislike the absence of personal-level transactions, and prefer to maintain their loyalties to local markets and merchants.

The impact of supermarkets upon beef consumption is compelling. With the attraction of one-stop food shopping, customers of supermarkets are less likely to additionally visit local markets for traditional commodity purchases. A working woman who buys all her food for the week at the local Gigante will not likely go to the *carniceria* to purchase meat when it is available and conveniently packaged in the supermarket with all her other items.

Meat purchases at supermarkets indicate a change in style of meat purchased. Americanized "heat-and-eat" products, including beef dishes, are readily available, and have a great attraction for Mexican consumers. They are more likely to buy prepackaged, smaller-serving meat options, as opposed to larger cuts typical of a *carniceria*.

Supermarkets do not show a bias in type of meat available, whether it is beef, pork, poultry, or other. However, the large-distributorship nature of supermarkets and their links to efficient transportation systems increase the variety of foods available.

Implications

State Descriptions

The list of selected important factors of economic and social well being, which are potential factors affecting beef consumption, was compiled for each state (Tables XXIV-XXVIII). This list of principal factors was incorporated into the findings of the content analysis of regional cuisine and the case study on supermarkets. This combined information was then reviewed to create a profile of each of the five states. These profiles include descriptions of the state's population, as well as its likelihood to consume beef.

Mexico City—The Melting Pot of Mexico

In contrast to the overcrowded space, polluted air, and constant noise of the world's most densely populated city is the progressive undercurrent of the Federal District. What could be described as Mexico's "melting pot" is a metropolitan region that has seen an influx of migrants from every region of the country, bringing with them a mixture of ways of living, and aspirations of a better life. Here is found a little bit of everything: races, backgrounds, traditions, education levels, employment, family structure, and, of course, foods.

The Federal District itself, known simply as *D.F. (day-EFEE)* to Mexicans, composes only the core of the large, urban area of Mexico City, which has sprawled into

the neighboring states of Mexico and Morelos, and has served as the nation's capital officially and unofficially since the ancient reign of the Aztec ruler, Moctezuma.

Growth of the city's population is rated at 2 percent per year (Go2, 2003), and has overwhelmed the city's attempts to provide services to the approximate 20 million in the metropolitan area. Some of these national immigrants come to find a more progressive lifestyle, and some come simply to escape the poverty of rural areas.

Perhaps it is the fact that the majority of the city's government headquarters, its foreign delegations, and its core of business and commerce lie mainly within the Federal District itself of Mexico City, along with the fact that the most wealthy and upper class district, the Zona Rosa, is located in this core, that raises the levels of so many factors of social well being in D.F.

The Federal District, despite many struggles to provide for its rapidly growing population, claims the highest rates of success in many areas. Almost 100 percent of all housing units in the city have electricity, sewerage, and running water. The illiteracy rate is only 3.6 percent –the lowest in the nation and far below that of the national average. It has a high percentage of the population aged 6-14 years attending school, and only 12.1 percent of its population has not completed elementary school –much lower than the national average and of the other selected regions. D.F. also claims the most highly educated population, with 71.7 percent having post-elementary school education.

The percentages of each sector of economic activity within the Federal District reflect the conclusions of this research that those involved in commerce, transportation, government and other services have a higher standard of living than those involved in agriculture and industrial employment. A small, unsignificant sector of the population is

involved in agriculture, with the majority, 76.9 percent—the highest in the nation—involved in the government and service sector. With the factors that reflect higher income levels: improved living units, fewer family member in each household, higher education levels, and higher minimum wage levels, the population will more likely consume a greater variety of foods, including beef.

Additionally, the Federal District is an international haven, ranking third in the nation in attracting international tourists. These tourists are most likely a different set than those who flock to the popular beach resorts. Visitors to the Federal District come on business as well as vacation, bringing with them international ideas. Its claim as a global hub has created an international mindset in the nations capital, and the people tend to be more welcoming to new ideas and international trends.

While there is assumably a great amount of poverty and hardship in a city this size and with such unprovided for growth, the Federal District clearly rises above all national averages in many categories. This reflects a higher overall standard of living and access to greater ammenities, including food choices. This is reflected in a study of descriptions of the foods of Mexico City, showing variety is the theme, and meat is readily available and consumed in greater proportions than other areas.

Jalisco—A Pretty Average State

The western coastal state of Jalisco is home to some of Mexico's greatest traditions: tequila and mariachi. And, just as a bit of Jalisco exists everywhere in Mexico, Jalisco in turn accurately reflects Mexico as a whole. Although it's wide variety of

characteristics span the range, it still has a touch of everything to provide a general description of the country. In many ways, it is Mexico's average state.

It is one of the 17 coastal states of Mexico, with 351 kilometers of its border on the Pacific Ocean. Jalisco composes 4 percent of the total land area of the nation, making it the 7th largest state, with a distinctive border that extends along the Pacific Ocean then reaches inland to branch into three prongs, shaped by the influence of mountain ranges and plateaus. The southern tip of the Sierra Madre Occidental mountain range reaches down into the northern prong of the state, the Neo-Volcanic Axis that spreads across the central part of the country dominates the middle region of Jalisco, the eastern region lies in the Central Plateau, and the peaks of the South Sierra Madre mountains intermingle with the hot, tropical plains along the coast.

The mountainous capital city of Guadalajara sits at 1,540 meters above sea level, and the state claims two of the nations fifteen highest peaks. Approximately 40 percent of the state is of temperate climate, 40 percent dry tropics, and 20 percent semiarid. Temperatures range from –10 to 26 degrees Celsius, and average rainfall is between 300-2,000 mm/year. A wide variety of fruits and vegetables are grown in the state, and the emmense production of corn and wheat from the central plateau make it known as the "granary of Mexico" (Zaslavsky, 1995). Rice and wheat are grown in the south; and the mountains yield timber and minerals (especially iron, silver, some gold, and precious stones). The raising of livestock and the production of food products are also important.

Jalisco tends to follow a general pattern of following the national average in most categories, and almost consistently ranks in the middle compared to the other four states examined.

Density of the state is 80 people/km^2. However, outside of the nation's second largest city, Guadalajara, it has a density of only 36 people/km^2, closer to the national average of 50 people/km^2. The percent of population that is rural is 15 percent, lower than the national average of 25 percent, but still placing median of the five states.

The state's average age matches the national average at 20 years old, and characteristics of housing coincide almost exactly with the national levels. Average number of occupants per household resembles national data, with a slightly larger percentage in the 7+ category. Education levels in Jalisco also match national averages, but the illiteracy rate is lower in the state; in each case Jalisco ranks third of the five states. Jalisco has a slightly larger than national average percent employed in government and services as well as in industry, and a lower rate of agricultural employment, but a higher rate of women employed.

One outlier of Jalisco's characteristics is tourism. The state is the fifth most popular location for international tourists, and possesses the 2nd most 5-Star hotels in the country. Jalisco also has a lower than average percentage of ethnic language speakers.

With its consistency in national averages and median placing of the five states, it is assumable that Jalisco may have an average consumption of beef also.

Nuevo Leon—King of Beef

In the north. Mexicans take great pride in their beef. It is a symbol of status of wealthy landowners of *haciendas* and *estancieros*, and a fare enjoyed by the city folk too.

The Northern state of Nuevo Leon is technically a border state with the U.S., but only for a short, 12-mile portion of its northern-most political boundary. On its northeastern edge, however, a small strip of land belonging to the state of Tamaulipas is all that separates it from Texas, and an influx of U.S. culture and economics still heavily permeates the state.

Nuevo Leon is one of the most industrialized states in the nation, with highways and routes of communication and transportation linking it to Mexico City and the neighboring U.S. The capital, Monterrey, is a financial center for the state and the northeast region of Mexico. Iron and steel, glass, textiles, and petrochemicals are produced in great amounts in the state, and factories and U.S. *maquiladoras* play in important role in the economy of Nuevo Leon. It's highly experienced and skilled work force, not only in blue-collar fields, but also in services and technical phases of industry such as computer systems, attract industry. Institutions of higher education in the state produce some of Mexico's top-level professionals (Mexican Trade Commission Montreal, n.d.).

Aside from the culture of enjoying their meat are factors of evaluation in Nuevo Leon that may lead to their means to consume such quantities of meat.

When comparing the five states in factors of analysis, it became apparent that Mexico City rose to the top in most categories, but was closely followed by Nuevo Leon.

Together, there was a very small but consistent gap between the two, which were paired steadily at the top of the spectrum.

Nuevo Leon, despite its seemingly rural traditions, has a very small percentage of its population living in rural areas, only 7 percent, compared to the national average of 25 percent, and ranking fourth among the five states examined. Much of the state is comprised of dry, desert-like climate, and controlled by large haciendas that produce the popular beef. The majority of the population is located in the capital, Monterrey, where industrial production here boosts the state to be the leader in industrial production in Mexico. Population density outside of the capital is only 12 people/km^2, displaying a great concentration within Monterrey.

The state shows a fairly normal distribution of percentages of households by number of occupants, and is fairly consistent with the other states in percentages of households having one to three occupants, and four to six occupants. However, they do show slightly lower than national average of households with seven or more occupants, again ranking fourth among the states in percentage of large households.

In terms of characteristics of housing, Nuevo Leon is far above the national average in percentage of homes with sewerage, electricity and running water, and is almost matched with the Federal District, again outranking the states of Jalisco, Puebla and Yucatan.

Interestingly, Nuevo Leon drops below average in percentage of children aged 6-14 attending school, but is still above average in those who have completed elementary school and those with a post-elementary school education. Their illiteracy rate is far

below the national average, at only 3.9 percent, close to the Federal District's and far below that of the other three states.

The state is not a popular tourist attraction, ranking only 8th in the nation for international tourists, which it does attract more than national tourists however. It still outranks the states of Puebla and Yucatan, possibly due to its location near the U.S. border and the tourists it catches traveling through to the more popular destinations, and ranks 7th in the nation in number of 5-Star hotels.

Nuevo Leon does rank above the national average in terms of percentage of women involved in economic activity, however, so do all five of the states with the exception of Puebla, which is slightly below national average. The minimum wage for the state is similar to that of the other five, with a higher minimum wage in the urban area of Monterrey. Despite its standing on the top end of most categories, Nuevo Leon surprisingly has the highest unemployment rate of the five states, at 4.1 percent.

Sectors of economic activity are what set Nuevo Leon apart from the others. It has the second lowest agricultural sector, far below that of Jalisco, Puebla and Yucatan, but the highest percentage employed in industry and the second highest in government and services.

The state has a very small percentage of ethnic language speakers, not surprising due to its northern location, whereas the majority of ethnic language speaking states tend to be in the South.

Overall, Nuevo Leon is one of the more progressive states, not only of the five studied, but in the nation. Its downfalls in some areas are countered by high rankings in other areas, bringing it up the the ranks of the Federal District in many ways. This higher

level of economic well-being, paired with the culture and resources of the area, and the simple fact that is it a traditional northern state, portray a state with high levels of beef consumption.

Puebla—The Traditional Agriculturalist

Shadows of the beginning of the Mexico we know today are still evident in the small, mountainous state of Puebla—only hours from Mexico City, but in many ways, worlds away. Farmers with mule or ox-drawn plows decorate the fields, in site of the famous smoking mountain, *Popocatepetl*, an Indian warrior, and his legendary stone maiden, *Iztaccihuatl*. This state of varied climate boasts forests and fertile cropland, and a variety of natural water resources in rivers, springs, lakes and reservoirs.

Puebla is one of the most Spanish-influenced states in the nation, with its gilded churches and convents, open plaza colonial structures, and Talavera tiles, but it still displays traces of the infusion of other cultures since it's establishment by the Spaniards in 1531.

Despite its rich culture and history, Puebla today struggles to meet national averages in categories of economic and social well-being, and has several significant factors that rank below national average and at the bottom of the five states examined.

Puebla has the greatest percentage of rural population of the Federal District, Jalisco, Nuevo Leon, and Yucatan. Interestingly though, it is only the 15th most rural in the nation, and its average density, even outside of its largest city, is still the greatest with the exception of the Federal District. This tends to show a much more evenly distributed population across the state than the other four.

Puebla does have indicators that tend to infer greater poverty among its population. Percentages of housing in the state that have sewerage and running water are far below national average, although those with electricity are near national levels. It has a greater percentage of households with seven or more occupants, and fewer with one to three occupants; ranking above and below, respectively, the national averages and the other state percentages for these categories.

In education ratings, Puebla is near the bottom of the five states. The illiteracy rate of the state is far above national levels, and the highest of the five states. It has the second highest percentage of children 6-14 years not attending school, the highest percent of its population of the five states who haven't finished elementary school, and the lowest percentage with post-elementary schooling.

Puebla is not a major tourist attraction—it ranks in the middle of the nation in terms of international tourists and quantity of 5-Star hotels.

The state has a lower than normal percent of its women employed outside the home; however, minimum wage rates are consistent with the nation and other states reviewed. Puebla's most distinguishing factor is its agricultural sector—40.4 percent of the working population is involved in agriculture, the most of the five states, while it conversely ranks lowest in employment in industry and services.

The state also has a high percentage of ethnic language speakers compared to the other states, at 13 percent, and far above the national average.

As a whole, Puebla tends to rank near the bottom of the scale in many factors of evaluation. These factors tend to lead to higher levels of poverty in the state, and in turn, lower levels of nutrient variety, especially animal proteins. Studies of the cuisine of the

nation show a great amount of vegetables consumed, with indicators that meat, if eaten, tends to be pork or chicken. These suggestions fall in line with the statistical evidence of the state, placing it below national averages in consumption of beef and towards the bottom of the ranking among the five states.

Yucatan—A State of Contrasts

Yucatan is described as "the legendary land of the Maya" (Mexico Tourism Board, *Yucatan*, 2003). The handcrafts of the present Mayan tribal members sold at roadside stands across the state shadow a history of thousands of years, as do the religious rites and traditions of this ancient people. Ruins of pyramids and other archaeological formations dot the landside of a people whose Mexico is different from that of anyone else in the nation.

Of all the states of Mexico, Yucatan could most be described as set-apart from the nation. Positioned on the southeastern-most tip of the nation, on the peninsula it is named after, its only connection to "main Mexico" is through the state of Campeche. Not only in geographical terms, however, is Yucatan independent. In many ways, the native population of the state has retained more of its ancient heritage than the rest of the nation, creating its own distinct culture that has furthermore been influenced greatly by its neighboring Caribbean Islands.

Yucatan is truly a state of contrasts. In many ways, data portrays an expected picture of greater poverty than the rest of the nation. In ranking the five states in factors of evaluation, Yucatan regularly pairs with Puebla, closer to the bottom of the status.

It is a southern state, which tends to categorize it in a lower economic placing. It has the largest percentage of ethnic language speakers in the nation, 39.7 percent, who, statistics show, tend to have lower access to improved housing characteristics such as sewerage, electricity and plumbing. It has a higher illiteracy rate than the nation, and a lower percentage of its population who have post-elementary schooling. Like Puebla, it is clearly not a tourist state, although it has a large beachfront, ranking at only 20th in the nation for international tourists and 25th in number of 5-Star hotels.

However, when compared to national averages, Yucatan is in line with the national average on homes with electricity and running water, although it does rank lower in sewerage. It has approximately the same percentages of its population in agriculture, industry and services as the national average, and the same percentage of women employed. Minimum wage is in line with the national average, and it has more children aged 6-14 attending school than the nation, and a lower percentage who haven't completed elementary school. Of the five states, it has the second most rural population, but at 19 percent is still below the national average.

Thus, with the somewhat paradoxical state of Yucatan, consumption of beef is not easily speculated upon. A study of typical cuisine of the area describes a population with little beef consumption, but who enjoy pork and chicken, which are more readily available. Yucatan is clearly a region where further study could reveal much about the aspects that determine consumption levels of beef.

Porcicultores Data Comparison

In the overall study of the five states of the Federal District, Jalisco, Nuevo Leon, Puebla and Yucatan, exploratory groupings and rankings emerged. Mexico City and Nuevo Leon tended to consistently rise to the top of the group, in terms of positive factors of social and economic well being. Jalisco almost consistently placed in the middle, and Puebla and Yucatan, with few exceptions, fell to the bottom of the ranking.

When comparing these conclusions to the data from *Porcicultores*, the same ranking holds somewhat true, but with an unexpected result shown for the state of Yucatan. In overall meat consumption, Yucatan consumes a total amount of 11.5 lbs. per family per month of all three meats, outranking the other four states by a substantial margin.

Following Yucatan, the Federal District and Nuevo Leon fall into an expected pairing of 9.1 lbs. and 9.0 lbs. total meat consumed; Jalisco follows with a total consumption of 7.9 lbs.; and Puebla ranks last with 7.4 lbs. of meat consumed per family per month.

When comparing different types of meat within each city, the Federal District shows a lesser amount of pork consumed, with chicken ranking slightly higher than beef. In Jalisco, the assertion that *carne asada* is popular even this far south is proven accurate. In Guadalajara, the consumption of beef monthly per family is almost double that of chicken, and almost triple that of pork. An interesting addition to this data would be the amount of seafood consumed in comparison to the other three proteins. In Monterrey, Nuevo Leon, conclusions from the literature clearly match data from *Porcicultores*. Beef consumption is almost double chicken and pork, and is the highest among the five cities.

Puebla holds true to predictions from the literature and statistics. It has the lowest total consumption of all three meats compared to the other cities, but surprisingly with total beef consumed greater than either chicken or pork.

Merida, Yucatan, is clearly the greatest surprise. This "state of contrasts" shows that economic indicators do not accurately predict consumption in this particular case. Presumptions that the population of the Yucatan tends to eat greater amounts of poultry and pork lend true, with chicken and pork consumed in greater amounts than beef, although not in strikingly different amounts. Reasoning for these inaccuracies involve further research in different areas.

Creation of Regions of Similar Beef Consumption

This study conducted exploratory research in creating defined regions of beef consumption in Mexico, and laid the groundwork for future aggregation. Research clearly demonstrated there are many variables that potentially affect beef consumption. The amount of variables is further complicated by extreme differences among the states of Mexico.

This study examined five geographically and demographically diverse states, including the northern border state of Nuevo Leon, the dry tropics of native Yucatan, the world's largest city in the Federal District, the poorer colonial state of Puebla, and the distinct western state of Jalisco.

Among themselves, these five states show enough diversity in factors of social and economic well being, cuisine traditions, and supermarket development to distinguish

themselves as five separate categories. However, certain groupings do emerge, proving potential for future regional aggregation.

The Federal District and Nuevo Leon continually rise to the top of the rank of the five states in factors of social and economic well being. Literature describing the areas cites both as having higher levels of government and services workers, with Nuevo Leon also being a national leader in industry. The Federal District and Nuevo Leon were also the most closely matched of the five in development of supermarkets, with other northern states and large cites such as Guadalajara also showing a prevalence of supermarkets.

These similarities are not consistent, however, in the evaluation of regional cuisines. The strong *carne* tradition of Nuevo Leon and its high propensity to consume meat and particularly beef separates it from Mexico City, where a wide diversity of foods and meats are consumed. Data from *Porcicultores* confirms this, showing Monterrey outdoing the Federal District in beef consumption. Beef consumption in Nuevo Leon most likely matches that of other northern states, predominantly Coahuila, Chihuahua, and Sonora.

The Federal District is distinct from the rest of the nation, and is difficult to categorize with other states. However, the surrounding state of Mexico appears closest to matching the aspects of the Federal District, in terms of social and economic well being and geographic location. A portion of Morelos closest to the urban area may also be considered in a potential Federal District group.

Jalisco, with its consistency in matching national averages, seems to stand alone from the five states in terms of factors of economic and social well being. It is neither near the top pair of the Federal District and Nuevo Leon, nor near the bottom with Puebla

and Yucatan. However, when gauging the cuisine of this state, it appears to display the wide range of meats that the Federal District does. Based on the cookbook description, the prevalence of beef appears to be closer to that of Nuevo Leon, and this popularity of beef is backed up by *Porcicultores* data. However, general inferences from cookbooks and narratives group Jalisco with the states south of it, primarily Colima, Michoacan, and Guerrero.

Considering that Guadalajara is the nations second largest city, and it contains a large percentage of Jalisco's population, could suggest that this state would match the Federal District in terms of meat consumption, if the remaining rural population of the state is not weighed as heavily.

Puebla and Yucatan match considerably in factors of economic and social well being. However, their differences emerged once cookbooks and recipes were examined. Puebla showed a greater propensity to consume more vegetables and less meat, whereas Yucatan displayed higher consumption of pork and poultry. None of the top ten supermarket chains are based in Puebla (although they may still have stores in the city of Puebla itself), compared to Yucatan, where two of the top ten chains are prevalent. Puebla would most likely be grouped with the states of Tlaxcala, Veracruz, and possibly parts of Oaxaca and Morelos. Like them, Puebla shows inclinations of poverty, and matches these states in geographical location also.

Yucatan, although very distinct in itself, would most likely be grouped with the other states on the Yucatan Peninsula: Quintana Roo and Campeche, and possibly with Tabasco and Chiapas, based on geographic location and percentage of ethnic language

speakers. If focusing on the percentage of ethnic language speakers in the state, Oaxaca could be put into this grouping as well.

Geographic location and proximity to other states clearly has an impact on the similarities of beef consumption within the states of Mexico. However, as evidenced by the case of Puebla and the Federal District, although states may be close geographically, they may still have distinct patterns of beef consumption, and other factors are crucial in aggregation of states.

Mexico clearly does not have one homogenous region of beef consumption—there is no true "national average" for this country. It is more complex than this. Regional aggregation of states is important when emphasizing differences. This research does not define what these regions of beef consumption in Mexico are, but instead explains what is not.

Areas of Further Research

Ethnic Tribes and Natives

The data provided information on the percentage of ethnic language speakers in each state, indicating the presence of native tribal members or their descendants. However, INEGI alone classifies native languages into fifteen different categories, with the presence of numerous more representing a plethora of different nationalities, tribes, and communities—all with potentially diverse eating habits.

An example circumstances that could skew results is the following: Perhaps the natives of Yucatan, a group strong in their Mayan heritage that remains distinct from the rest of the nation, raise more pigs, chickens and cows as a food source, which therefore

leads to their higher consumption levels of meat. Perhaps the native of Puebla are farmers, and grow the majority of their food as corn or beans and have few meat animals for consumption.

These specific differences in ethnic backgrounds and traditions are the next step in identifying how factors of culture and ethnicity leading to consumption patterns.

Major Cities

Perhaps a factor of this study that may skew the conclusions is the fact that of the five states examined, four include Mexico's four largest metropolitan areas: Mexico City, Monterrey, Guadalajara, and Puebla; and the fifth has the eleventh largest city, Merida. Despite efforts to examine the population outside of just these cities, the general data examined is statewide level, and inherently takes into account the large urban populations in its averages. Perhaps Nuevo Leon is more agricultural outside of Monterrey than described here; or possibly the entire state of Jalisco has fewer women in economic activity than depicted, once Guadalajara is not considered.

It is beyond the confines of this study to break down data for these five states, much less the entire nation, that would accurately describe each distinct area within each state. However, as at the time there is a deficiency of even statewide data to lead to conclusions on beef consumption, this research is a step forward in gaining more detailed information.

Agricultural Production

An aspect not examined in this study was agricultural production. Although it may seem essential to a study on beef consumption, production itself does not lend true to consumption levels, due to reasons such as transportation and pricing. For this reason, this study attempted to look at other factors that may lie behind consumption patterns. Once these have been reviewed, connections to and impacts of agricultural production can be brought into the equation and evaluated. Thus, impacts of amounts of personal food products grown and raised for family consumption are not considered, although they do impact state variations to an unknown extent.

Call for Further Research

The inferences of this research are descriptive conclusions based on the data available. They provide an understanding of the variations in populations and states within Mexico, and set a foundation upon which further research will begin to define more specific areas of beef consumption in this nation. Continued research is needed in this area to further understand the cattle and beef industry of Mexico, as well as the diversity of the many unique areas of this country.

TABLE XXV.

FACTORS OF ANALYSIS FOR THE FEDERAL DISTRICT

Factor of analysis	National	Federal District
Rural population (% of total)	.25	.00
Average age	20 years old	24 years old
Geographic location	—	South Central
Housing by number of occupants (% of total households)		
1-3 people/household	.32	.39
4-6 people/household	.49	.50
≥7 people/household	.18	.11
Characteristics of housing (% of total housing units, 1997)		
Sewerage	78.2	99.4
Electricity	94.5	99.8
Running water	88.1	99.2
Illiteracy rate	10.6	3.6
Selected indicators of education		
Population aged 6-14 years not attending school	8.2	3.6
Without instruction and haven't concluded elementary school	28.2	12.1
With post-elementary school	51.8	71.7
International tourists (rank in nation for average total of years 1995, 1997 and 1998)	—	3rd
5-Star hotels (rank in nation for number of hotels)	-	3rd
Women in economic activity (% of total women over 12 years who are able)	29.9	39.7
Minimum wage for area (monthly salary)	—	$1. 137
Economic activity by sector		
Agriculture	22.5	0.4
Industry	24.4	22.1
Services	52.8	76.9
Ethnic language speakers (% of population 5-years and older who speak ethnic language)	6.8	1.3

Source: INEGI (2000), and calculated from INEGI (2000).

TABLE XXVI.

FACTORS OF ANALYSIS FOR JALISCO

Factor of analysis	National	Jalisco
Rural population (% of total)	.25	.15
Average age	20 years old	20 years old
Geographic location	—	Southwest
Housing by number of occupants (% of total households)		
1-3 people/household	.32	.32
4-6 people/household	.49	.47
≥7 people/household	.18	.21
Characteristics of housing (% of total housing units, 1997)		
Sewerage	78.2	92.8
Electricity	94.5	96.1
Running water	88.1	94.7
Illiteracy rate	10.6	7.2
Selected indicators of education		
Population aged 6-14 years not attending school	8.2	8.6
Without instruction and haven't concluded elementary school	28.2	26.5
With post-elementary school	51.8	51.1
International tourists (rank in nation for average total of years 1995, 1997 and 1998)	—	5th
5-Star hotels (rank in nation for number of hotels)	—	2nd
Women in economic activity (% of total women over 12 years who are able)	29.9	33.8
Minimum wage for area (monthly salary)	—	$981
Guadalajara	—	$1,053
Economic activity by sector		
Agriculture	22.5	15.9
Industry	24.4	29.0
Services	52.8	54.8
Ethnic language speakers (% of population 5-years and older who speak ethnic language)	6.8	0.4

Source: INEGI (2000), and calculated from INEGI (2000).

TABLE XXVII.

FACTORS OF ANALYSIS FOR NUEVO LEON

Factor of analysis	National	Nuevo Leon
Rural population (% of total)	.25	.07
Average age	20 years old	21.5
Geographic location	—	Northeast
Housing by number of occupants (% of total households)		
1-3 people/household	.32	.33
4-6 people/household	.49	.54
≥7 people/household	.18	.13
Characteristics of housing (% of total housing units, 1997)		
Sewerage	78.2	92.1
Electricity	94.5	98.3
Running water	88.1	96.5
Illiteracy rate	10.6	3.9
Selected indicators of education		
Population aged 6-14 years not attending school	8.2	12.6
Without instruction and haven't concluded elementary school	28.2	16.3
With post-elementary school	51.8	65.5
International tourists (rank in nation for average total of years 1995, 1997 and 1998)	—	8th
5-Star hotels (rank in nation for number of hotels)	—	7th
Women in economic activity (% of total women over 12 years who are able)	29.9	32.3
Minimum wage for area (monthly salary)	—	$981
Monterrey		$1,053
Economic activity by sector		
Agriculture	22.5	5.4
Industry	24.4	32.3
Services	52.8	61.7
Ethnic language speakers (% of population 5-years and older who speak ethnic language)	6.8	0.2

Source: INEGI (2000), and calculated from INEGI (2000).

TABLE XXVIII.

FACTORS OF ANALYSIS FOR PUEBLA

Factor of analysis	National	Puebla
Rural population (% of total)	.25	.32
Average age	20 years old	19
Geographic location	—	South Central
Housing by number of occupants (% of total households)		
1-3 people/household	.32	.29
4-6 people/household	.49	.47
≥7 people/household	.18	.24
Characteristics of housing (% of total housing units, 1997)		
Sewerage	78.2	63.5
Electricity	94.5	94.1
Running water	88.1	78.2
Illiteracy rate	10.6	16.8
Selected indicators of education		
Population aged 6-14 years not attending school	8.2	10.4
Without instruction and haven't concluded elementary school	28.2	34.9
With post-elementary school	51.8	43.0
International tourists (rank in nation for average total of years 1995, 1997 and 1998)	—	15th
5-Star hotels (rank in nation for number of hotels)	—	17th
Women in economic activity (% of total women over 12 years who are able)	29.9	27.6
Minimum wage for area (monthly salary)	—	$981
Economic activity by sector		
Agriculture	22.5	40.4
Industry	24.4	21.8
Services	52.8	37.7
Ethnic language speakers (% of population 5-years and older who speak ethnic language)	6.8	13.0

Source: INEGI (2000), and calculated from INEGI (2000).

TABLE XXIX.

FACTORS OF ANALYSIS FOR YUCATAN

Factor of analysis	National	Yucatan
Rural population (% of total)	.25	.19
Average age	20 years old	21 years old
Geographic location	--	Southeast
Housing by number of occupants (% of total households)		
1-3 people/household	.32	.33
4-6 people/household	.49	.47
≥7 people/household	.18	.19
Characteristics of housing (% of total housing units, 1997)		
Sewerage	78.2	55.9
Electricity	94.5	95.2
Running water	88.1	87.2
Illiteracy rate	10.6	14.3
Selected indicators of education		
Population aged 6-14 years not attending school	8.2	6.9
Without instruction and haven't concluded elementary school	28.2	12.3
With post-elementary school	51.8	46.0
International tourists (rank in nation for average total of years 1995, 1997 and 1998)	(32 states)	20th
5-Star hotels (rank in nation for number of hotels)	(32 states)	25th
Women in economic activity (% of total women over 12 years who are able)	29.9	30.9
Minimum wage for area (monthly salary)	-	$981
Economic activity by sector		
Agriculture	22.5	26.2
Industry	24.4	24.5
Services	52.8	49.2
Ethnic language speakers (% of population 5-years and older who speak ethnic language)	6.8	39.7

Source: INEGI (2000), and calculated from INEGI (2000).

SELECTED BIBLIOGRAPHY

Beardsworth, A., & Keil, T. (1997). *Sociology on the menu: An invitation to the study of food and sociology*. London: Routledge.

Beltran, Hugo. (2002, May/June). Indicadores del consumo de la carne de cerdo. *Los Porcicultores y Su Entorno*, 5, No. 27, 103-112.

Brana, G. (2001, February). The taste of Mexico: Cuisines of Mexico. *Another Day in Paradise*. Retrieved April 12, 2003, from http://www.zihua-ixtapa.com/~anotherday/index.htm

Brana, G. (2001, March). The taste of Mexico: Cuisines of Mexico. *Another Day in Paradise*. Retrieved April 12, 2003, from http://www.zihua-ixtapa.com/~anotherday/index.htm

Business Traveler Center. (2003). *City guides: Monterrey*. Retrieved July 15, 2003, from http://www.btonline.com/cityGuides.php?cityID=92

Caraza, L.B. de. (2003). *Nuevo Leon cuisine*. Mexican Tourism Board. Retrieved July 7, 2003, from http://www.visitmexico.com/destinations/r_nor/s_nle/d_mty/?lexp=d_laura_barrenechea_d4&bio=0

Colorado State University Department of English. (2001). *An Introduction to Content Analysis*. Writing @ CSU: Writing Guide. Retrieved July 25, 2003, from http://writing.colostate.edu/references/research/content/pop2a.cfm

Creswell, J.W. (1994). *Research Design: Qualitative and Quantitative Approaches*. London: Sage Publications.

DeWalt, K.M. (1983). *Nutritional strategies and agricultural change in a Mexican community*. Ann Arbor, Michigan: UMI Research Press.

Federal Research Division of the U.S. Library of Congress. (2003). *Mexico: Rural society*. (Country Studies U.S.). Retrieved July 8, 2003, from http://countrystudies.us/mexico/58.htm

Go2®, S.A. de C.V. (2003). *Let's Go2Mexico!: Welcome to Mexico City!* Retrieved July 5, 2003, from http://www.go2mexicocity.com/

Guseman, P.K., McIntosh, W.A., & Sapp, S. G. (1986). Traditional and nontraditional explanations of food consumption: The case of beef. *Southern Rural Sociology, 4*, 67-82.

Hayes, L.D. (1999). *An evaluation of the Mexican beef cattle industry*. Unpublished master's thesis, Oklahoma State University, Stillwater.

Hoddinott, J. & Skoufias, E. (n.d.). *The impact of PROGRESA on food consumption.* (FCND Briefs, Discussion Paper 150). Washington, D.C.: International Food Policy Research Institute.

Instituto Nacional De Estadistica, Geografia e Informatica. (1991). *VII Censo Ejidal.*

Instituto Nacional De Estadistica, Geografia e Informatica. (2000). *Anuario de Estadisticas por Entidad Federativa, Edicion 2000.*

Instituto Nacional De Estadistica, Geografia e Informatica. (2000). Physiography, Main Characteristics. Retrieved July 15, 2003, from http://www.inegi.gob.mx/difusion/ingles/fmapa.html

Instituto Nacional De Estadistica, Geografia e Informatica. (2000). *XII Censo General de Poblacion y Vivienda 2000: Resultados Preliminares.*

Kennedy, D. (1978). *Recipes from the regional cooks of Mexico.* New York: Harper & Row.

Kokolias, K. (2002, April). Pozole night. *Another Day in Paradise.* Retrieved April 12, 2003, from http://www.zihua-ixtapa.com/~anotherday/index.htm

Lailai, L. (n.d.). Case Study as a Research Design: Seminar on Research Methodology. Retrieved July 30, 2003, from http://www.lead.org.cn/leadcn/national/curriculum/year1/docs/c9-casestdy.ppt

Lichfield, G. (2000, October 28). Survey Mexico: North is north and south is south. *The Economist*, 357, M9-M11.

Mexico Trade Commission Montreal. (n.d.) Nuevo Leon. *Mexican Textile and Apparel Showroom.* Retrieved June 15, 2003, from http://www.mexicanshowroom.com/state/nuevo.html

Mexico Tourism Board. (2003). *Mexico City cuisine.* Retrieved July 7, 2003, from http://www.visitmexico.com/destinations/r_cen/s_dfd/d_mex/restaurants/

Mexico Tourism Board. (2003). *Northeast Mexico: States of Coahuila, Nuevo Leon, and Tamaulipas.* Retrieved July 7, 2003, from http://www.visitmexico.com/db_downloads/northeastern_mexico_g/northeast.pdf

Mexico Tourism Board. (2003). *Nuevo Leon.* Retrieved July 7, 2003, from http://www.visitmexico.com/destinations/r_nor/s_nle/

Mexico Tourism Board. (2003). *Puebla.* Retrieved July 7, 2003, from http://www.visitmexico.com/destinations/r_cen/s_pue/d_pub/

Mexico Tourism Board. (2003). *Puebla cuisine*. Retrieved July 7, 2003, from http://www.visitmexico.com/destinations/r_cen/s_pue/d_pub/restaurants/

Mexico Tourism Board. (2003). *Yucatan*. Retrieved July 7, 2003, from http://www.visitmexico.com/destinations/r_yuc/s_yuc/

Mexico Tourism Board. (2003). *Yucatan cuisine*. Retrieved July 7, 2003, from http://www.visitmexico.com/destinations/r_yuc/s_yuc/d_mid/restaurants/

Moore, K.L. (1999, November). The secret spots-Dona Licha's. *Another Day in Paradise*. Retrieved May 23, 2003, from http://www.zihua-ixtapa.com/~anotherday/index.htm

Moore, K.L. (1999, March). Cheeseburgers in paradise. *Another Day in Paradise*. Retrieved May 23, 2003, from http://www.zihua-ixtapa.com/~anotherday/index.htm

Moreno, J. (2003, May 18). In Mexico, grocery shopping is fun-filled outing for families: Free samples part of the fiesta. *Houston Chronicle*. Retrieved May 20, 2003, from http://mexico-info.com/leadstories/chron/fiesta.htm

National Food Laboratory, Inc. (2001, November). Cuisine that is out of this world. *The National Provisioner*. Retrieved January 30, 2003, from http://www.thenfl.com/news/national.asp

Paananen, E. (1988, September). Ole for Hispanic Fare! *The World and I Magazine, Vol 3*, 336. Retrieved January 20, 2003, from http://www.worldandi.com/public/1988/september/lf4.cfm

Papps, I., & Henderson, W. (1977). *Models and economic theory*. Philadelphia: W.B. Saunders Company.

Patton, M. Q. (1990). *Qualitative evaluation and research methods* (2nd ed.). Newbury Park, CA: Sage Publications.

Peel, D. S. (1982). *Estimation of economic and hydrologic impacts of water management policies in the Yellowstone River Basin*. Unpublished master's thesis, Montana State University, Bozeman.

Peel, D.S. (2001). *Mexican income, consumption and beef demand summary*. Unpublished manuscript, Oklahoma State University, Stillwater, and visiting researcher, INIFAP—Fundación Produce, Chihuahua, Mexico.

Peel, D.S. (2003, February). *Implications of Mexican beef demand change on cattle and beef production in Mexico and U.S.-Mexican cattle and beef trade*. Paper

presented at the meeting of the Southern Agricultural Economics Association annual meeting, Mobile, AL.

Peel, D. S., & Granillo, E. S. (2001). *Ganadería Mexicana (GANAMEX): An Economic model of the Mexican cattle and beef industry.* Unpublished manuscript, Oklahoma State University, Stillwater, and visiting researcher, INIFAP—Fundación Produce, Chihuahua, Mexico.

Peel, D.S., & Hayes, L.D. (2000, May). *Future Mexican beef production and U.S./Mexican beef and cattle trade.* Paper presented at the Global Agricultural Trade in the New Millennium, New Orleans, LA.

Pick, J.B., & Butler, E.W. (1994). *The Mexico handbook.* Boulder, Colorado: Westview Press.

Pilcher, J.M. (1998). *Que vivan los tamales!: Food and the making of Mexican identity.* Albuquerque, New Mexico: University of New Mexico Press.

Pyrczak, Fred. (2001). *Making sense of statistics: A conceptual overview* (2nd ed.). Los Angeles, CA: Pyrczak Publishing.

Quint, R., Rayment, N., & Madigan, T. (n.d.) *Mexican cookery.* Retrieved July 10, 2003, from http://www.schools.ash.org.au/thscompst/Mexico/Mexico1.html

Regmi, A., Deepak, M.S., Seale, J.L. Jr., & Bernstein, J. (n.d.) *Cross-country analysis of food consumption patterns: Changing structure of global food consumption and trade.* (USDA, Economic Research Service, WRS-01-1.) Retrieved July 8, 2003, from http://www.ers.usda.gov/publications/wrs011/wrs011d.pdf

Robichaux, D. L. (1997). Residence rules and ultimogeniture in Tlaxcala and Mesoamerica. *Ethnology, 36*(2), 149-171.

Schrimper, Ronald A. (2001). *Economics of agricultural markets.* Upper Saddle River, New Jersey: Prentice Hall.

Shields, D.A. (Ed.). (1997, July). The influence of income on global food spending. *Agricultural Outlook.* Washington, D.C.: USDA, Economic Research Service, Market and Trade Economics Division. Retrieved February 10, 2003, from http://www.ers.usda.gov/publications/agoutlook/jul1997/ao242e.pdf

Shields, D.A. (Ed.). (1998, August). Mexican supermarkets spur new produce distribution system. *Agricultural Outlook.* Washington, D.C.: USDA, Economic Research Service, Market and Trade Economics Division. Retrieved March 7, 2003, from http://www.ers.usda.gov/publications/agoutlook/aug1998/ao253d.pdf

U.S. Department of Agriculture. (2000, December 29). *Mexico HRI food service sector: Hotel, restaurant and institutional food service sector*. (GAIN Report: Global Agricultural Information Network, #MX0189). Washington, D.C.: USDA, Foreign Agricultural Service.

U.S. Department of Agriculture. (2001, June 19). *Mexico retail food sector: The Mexican market for the retail food sector*. (GAIN Report: Global Agricultural Information Network, #MX0026). Washington, D.C.: USDA, Foreign Agricultural Service.

U.S. Meat Export Federation. (1993). *Mexico: Market report*. Denver, CO: U.S. Meat Export Federation.

U.S. Meat Export Federation. (2003). International Markets: Mexico. Denver, CO. Retrieved July 30, 2003, from http://www.usmef.org/TradeLibrary/Markets /Mexico/Mexico.htm

Valley Morning Star. (n.d.) *Rio Sun: Dining*. Retrieved July 15, 2003, from http://www.riosun.com/dining/#american

Wallendorf, M. & Reilly, M.D. (1983, December). Ethnic migration, assimilation, and consumption. *The Journal of Consumer Research, 10*,(3), 292-302.

Warrix, M. (n.d.). *Cultural diversity: Eating in American Mexican-American*. Ohio State University Extension Fact Sheet, Family and Consumer Sciences [HYG-5255-95]. The Ohio State University: Columbus, Ohio.

Wright, T., et al. (2001, March 30-31). Case Studies Working Group Summary. ULSF/CE Consultation. Retrieved July 30, 2003, from http://www.ulsf.org /programs_conferences_mar2001casestudy.html

World Bank Rural Development Family. (2002, July). *Reaching the rural poor: A rural development strategy for the Latin America and Caribbean region*. [Appendixes 1-5]. Washington, D.C.: The International Bank for Reconstruction and Development, Rural Development Department. Retrieved July 14, 2003, from http://lnweb18.worldbank.org/ESSD/essdext.nsf/11DocByUnid/025DCA61119889A285256BEA00613313/$FILE/LAC_strategy_web2.pdf

Zaslavsky, N. (1995). *A cook's tour of Mexico*. New York: St. Martin's Press.

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