

**Dietary Patterns and Acculturation
Among Latinos of Mexican Descent**

*by Eunice Romero-Gwynn
and
Douglas Gwynn*

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Table of Contents

Introduction	1
Description of Study	1
Dietary Acculturation	2
Tortillas	2
Rice and Pasta	2
Bread and Pastries	2
Beans	2
Vegetables and Fruits	3
Dairy Foods	3
Meat and Eggs	3
Fats	4
Sugars and Sweets	4
Meal Patterns	5
Snacks	6
Selected Health Conditions	6
Conclusions and Recommendations	7
Study's Limitations	7
References	7
Appendix A	8

Dietary Patterns and Acculturation Among Latinos of Mexican Descent

Introduction

Contrary to common belief, Latinos living in the United States comprise a heterogeneous population with diverse cultural backgrounds. The last U.S. Population Census identified the geographic origin of the 22.4 million Latinos as follows: 63% Mexican, 12% Puerto Rican, 12% Central and South American, 5% Cuban, and 8% an unidentified country.¹ While Spanish is the common language to most Latinos, other cultural characteristics, particularly food practices, are unique to specific countries and even specific regions within a country. Often the same food is consumed in many countries, but the preparation methods and integration of foods into the meal pattern vary from one country to another. For example, while beans are consumed in most Latin American countries, refried beans are consumed mostly in Mexico.

The native populations of Latin America have made significant contributions to the world food supply. For example, peanuts and potatoes domesticated in the Andes of Peru became part of the diet for people in Europe, Asia, North America, and Africa. Corn, beans, tomatoes, squash, and cocoa, domesticated in Central Mexico, are consumed in most of the countries of the world.^{2,3} In Mexico, the Spanish *conquistadors* were amazed by the diversity of foods and food preparations consumed by the Aztecs.⁴

Contemporary diets in Latin American countries reflect, to different degrees, indigenous foods domesticated by native populations as well as dietary practices introduced from Europe and, to a lesser extent, from other continents. While indigenous foods (i.e., corn and beans) have a strong presence in the diet of Mexico and Central America, these are limited in the southern countries of Latin America such as Argentina, Chile, and Uruguay. In these countries, where European immigration was not only diverse but large in proportion to the native population, the diet reflects Italian, Spanish, French, and German influences. In Brazil, Cuba, Puerto Rico, and other Caribbean countries, African dietary practices enriched the native and European dietary heritage. More recently, food processing technologies adopted from the United States have increasingly introduced a new dimension to current Latin American diets.

Canned, dried, packaged, frozen and other forms of processed foods have become part of the food supply in supermarkets in urban areas.

The diet of Latinos living in the United States is influenced by the dietary traditions of individual countries, availability of native foods in U.S. food stores, and new dietary practices adopted in the United States. Length of residency of Latinos in the United States also affects dietary acculturation.^{5,6}

This paper describes dietary patterns and selected health conditions among people of Mexican descent in California. Sources of information include literature searches and data from a study conducted among women of Mexican descent living in five California counties.

Description of the Study

Our study was designed to investigate the degree of retention and/or abandonment of traditional Mexican dietary practices and adoption of new ones in the United States. Participants in this study included 165 Mexican-born women who had migrated as adults to the United States. These women will be referred to as immigrants. A second group consisted of 101 first generation Mexican-American women born and reared in the United States. Both parents of these women were immigrants from Mexico. Women included in this study were low-income. The average age of the participants was 34, and the average education was seven years. Since this study's approach was more cultural than nutrient oriented, we assessed the patterns of food consumption (frequencies) rather than the number and amount of nutrients provided by the diet. Frequency of food consumption in Mexico (before immigration), after immigration, and frequency of food consumption among Mexican-Americans was assessed. Over 160 traditional Mexican foods and foods of the "typical" U.S. diet were included in the research instrument. Prevalence of obesity and diabetes as well as participants' awareness of preventive measures were assessed among the two groups of women studied.

Dietary Acculturation

Some anthropologists define acculturation as the exchange of cultural features that results when groups come into continuous contact; elements of both cultures change but each group remains distinct.⁷ Immigration of Mexican women resulted in different levels of dietary acculturation. While many of the dietary changes were healthful, many others could have negative effects on the health of the individuals studied. Consumption of traditional foods and dishes decreased and adoption of new practices increased with length of residency in the United States. Dietary changes reported here refer only to the core diet, or foods consumed from two to seven days per week. To simplify, foods are reported in categories. (See glossary of foods in Appendix A).

Tortillas

Corn tortillas and other corn-based foods have been part of the Mexican diet for centuries. The consumption of corn tortillas among the women studied has remained relatively stable over time. Ninety-eight percent (98%) of the immigrants included corn tortillas in their core diet both while living in Mexico and after immigration to the United States. Slightly less (84%) of the Mexican-Americans included corn tortillas in their core diet. Flour tortillas which are popular in the United States, are almost unknown in the Mexican states which our study's participants came from. However, flour tortillas emerged as a new food for most participants after immigration to the United States. While only 14% of the immigrants reported consumption of flour tortillas while in Mexico, 35% consumed these tortillas after immigration; 53% of the Mexican-Americans consumed flour tortillas in the core diet. According to some of the participants, flour tortillas are more convenient to carry in bag lunches than corn tortillas which break and "leak" easily when cold. Some traditional tortilla-based foods (*tostadas* and *chilaquiles*) decreased and almost disappeared from the core diet in the United States

Rice and Pasta

Adopted into the Mexican diet during colonial times, rice remains an important part of the contemporary Mexican diet. Its consumption by women participating in our study has not decreased significantly. However, changes have been made in the way

rice is prepared. The consumption of rice prepared with vegetables (i.e., *sopa seca de arroz*) decreased in the United States. Plain boiled rice increased from 9% in Mexico to 32% after migration to the United States. The same figure (32%) was reported by Mexican-Americans. The declining consumption of *sopa seca de arroz* is a negative change, as this dish is a major source of vegetables in the Mexican diet. Pasta consumption (*fideos* and other pasta) decreased even more than rice and beans. While 68% of the immigrants reported consuming pasta in Mexico, consumption decreased to 36% in the United States. Pasta appeared in the core diet of only 17% of the Mexican-Americans. Decreased pasta consumption is a negative dietary change as traditional pasta dishes are a source of vegetables and like rice, pasta is an inexpensive source of complex carbohydrates.

Bread and Pastries

Introduced by the Spaniards and later reinforced by the French, bread is widely consumed in Mexico. Most common breads are *pan dulce* (sweet bread) and a white French type roll (*birote* or *bolillo*); sliced bread is less common. Consumption of "pan dulce" decreased from 84% in Mexico to 29% after immigration to the United States. Only 15% of the Mexican-Americans consumed this bread in the core diet. Limited availability of *pan dulce* in American food markets may explain its sharp decline in the diet. Consumption of white sliced bread was 15% in Mexico, 66% after immigration and 84% among Mexican-Americans. Consumption of cookies also increased. While 25% consumed cookies in Mexico, this increased to 61% after immigration, 52% of the Mexican-Americans ate cookies as part of their core diet. Contrary to popular belief, American pastries such as doughnuts, cakes, and pies were consumed by less than 10% of the women studied.

Beans

Essential to the traditional Mexican diet, consumption of beans has decreased in the United States. Consumption of boiled beans (*frijoles de la olla*) was 84% in Mexico, 71% after immigration, and 42% among Mexican-Americans. A similar decrease was observed for refried beans. While the decreased consumption of refried beans can contribute to decrease fat intake, boiled beans are fat-free, and are an inexpensive source of protein, iron, and fiber.

Vegetables and Fruits

Traditionally, vegetables have been used mainly as ingredients in soups, rice, pasta, meat, and tortilla-based preparations. Salads and vegetables as side dishes were less common in the traditional Mexican diet. Fruits were consumed fresh, in fruit salads, juices, and fruit-based beverages. Eighty percent of the immigrants consumed vegetables and fruits from two to seven days per week in Mexico; consumption increased to 92% in the United States, and was about the same among Mexican-Americans. As with other basic foods, many of the traditional vegetable and fruit preparations decreased, and some disappeared from the core diet. While traditional dishes were absent or very limited in the diet, the consumption of vegetable salad, which was very low in Mexico (13%), increased to 51% after immigration and to 74% among Mexican-Americans. Similar increases were observed for cooked vegetables as side dishes. The increased consumption of vegetable salad and cooked vegetables as side dishes can not be viewed as an entirely healthful change, as these changes also resulted in the consumption of fat-rich salad dressing, mayonnaise, and margarine or butter. Furthermore, the vegetables used in salads such as lettuce and celery are low in nutrients. The consumption of fruit salad, and *aguas frescas de frutas* (fruit-based beverages), significantly decreased. While 62% of the immigrants consumed *aguas frescas* in Mexico, only 41% of them consumed these drinks after immigration. Only 17% of the Mexican-Americans consumed these traditional drinks. Sugar-rich soft drinks and sodas have replaced traditional fruit-based beverages. Diet drinks had a very limited acceptance among the two groups of women studied

Dairy Foods

Unknown previous to Spanish colonization, milk, cheese, and other dairy foods are now widely consumed in Mexico. Cheese is extensively used in tortilla-based dishes and as a topping for most traditional food preparations. Consumption of dairy foods among our study participants was relatively high; 85% of the immigrants consumed cheese in Mexico and 91% consumed it in the United States. Contrary to common misconceptions about lactose intolerance among Mexicans, most participants in our study consume milk daily. Seventy-eight percent of the immigrants consumed milk daily in Mexico, and increasing to 85% in the United States. A slightly higher number of Mexican-Americans (88%) consumed milk daily. However, while milk was used in Mexico in preparations

such as *arroz con leche*, *atole* and *cafe con leche*. In the United States, most milk was consumed in a new food: ready-to-eat breakfast cereals. These cereals were consumed only by 8% of the immigrants in Mexico, but increased to 78% after immigration and to 72% among Mexican-Americans. Even though ready-to-eat breakfast cereals are enriched with iron and vitamins, most are high in calories and are much more expensive than traditional Mexican breakfast foods such as *atole*, *licuado* or *batido*. The type of milk preferred by immigrants was whole milk; Mexican-Americans were more likely to choose low-fat milk than fat-rich milk. Preference for whole milk may reflect the fact that in Mexican towns and rural areas, milk fat was often removed and water added to the milk to increase the milk's volume, therefore increasing the seller's profit. Immigrants should be informed about the good quality of low-fat milk, as it is enriched with milk solids, and is therefore high in proteins, calcium and other nutrients. Ice cream (*nieve*) consumption increased from 24% in Mexico to 39% after immigration, and to 49% among Mexican-Americans.

Meat and Eggs

Meat (beef, poultry, pork, and fish) was consumed in Mexico almost daily by 97% of the sample. Its consumption remained high after immigration (91%) and was equally high among Mexican-Americans (92%). As with many other foods, there were significant changes in the way meats were consumed. Several of the traditional meat preparations (which contain vegetables) decreased drastically in the United States. However, frequency of consumption of grilled meat and ham increased. The decrease/abandonment of traditional meat-vegetable preparations may result in a decrease in the consumption of chilies, carrots, and purslane, and other traditional nutritious vegetables. Consumption of eggs declined from 82% in Mexico to 68% after immigration to the United States. Only 59% of the Mexican-Americans included eggs in their core diet. This decline may reflect an increased awareness about the cholesterol content of eggs. However, the decrease in egg consumption may also decrease the consumption of vegetables, as eggs are almost always prepared with tomatoes and other vegetables in Mexico. Furthermore, eggs are a good source of Vitamin A and iron. These nutrients are often very low in the diet of children, and pregnant lactating women. A positive change was the decreased use of raw eggs in the milk-fruit beverage *licuado* or *batido* as raw eggs are often contaminated with salmonella.

Fats

The most significant dietary changes were observed in the consumption of fat sources. Use of lard decreased from 67% in Mexico to 28% after immigration. Only 12% of the Mexican-Americans used lard. Similarly, consumption of Mexican dairy cream (*crema*) showed a significant decrease; from 48% in Mexico to 14% after immigration. Only 1% of the Mexican-Americans consumed *crema*. While these two traditional fat sources decreased, several less traditional fats increased significantly. Cooking oil, for example, increased from 36% in Mexico to 80% after immigration and to 82% among Mexican-Americans. Similar increases were found for margarine, salad dressing, mayonnaise, and sour cream. The increased consumption of sources of fat appears to be due to the greater availability of these foods in American grocery stores, increased consumption of familiar foods which were expensive in Mexico (i.e., mayonnaise, margarine, cooking oil), new ways of consuming traditional foods and the adoption of new foods

(i.e., vegetable salad served with salad dressing and sandwiches flavored with mayonnaise).

Sugars and Sweets

Introduced to Mexico by the Spaniards, refined and unrefined sugar (*piloncillo*) has been used by Mexicans in sweetening cold and hot drinks and in preparing sweets breads and some desserts. However, use of sugar in general is not extensive. With immigration, the consumption of sources of sugars increased with the consumption of commercial soft drinks, cookies, ice cream, and other sugar-rich foods.

In summary, there were numerous changes in the diet of the women studied. While several traditional foods were retained in the diet, many were rarely or never consumed in the United States. Many new foods were adopted. Table 1 highlights foods that were decreased or increased by over 20% of the participants.

Table 1: Dietary Acculturation Trend

Foods decreased and increased in the core diet (2-7 day/week)

Food	Before Immigration %	After Immigration %	Hispanic %
Decreased:			
Meat, any type	97	91	92
Boiled beans	84	71	42
Eggs	82	68	59
Refried beans	81	71	58
Pan dulce	84	29	-
Pasta	68	36	-
Lard	67	28	-
Aguas frescas	62	41	-
Tostadas	39	20	-
Crema	48	-	-
Atole	40	-	-
Increased:			
Cheese	85	91	91
Milk	78	85	88
Cooking oil	36	80	82
Cookies	25	61	52
Ice cream	24	39	49
Breakfast cereals	-	78	72
Sliced bread	-	66	84
Margarine	-	60	78
Mayonnaise	-	46	64
Salad dressing	-	26	59
Flour tortilla	-	35	53
Soft drinks/sodas	-	29	49
Boiled/steamed rice	-	32	32
Sour cream	-	48	31

- = Consumed by less than 20% of the participants.

Food consumption by over 20% of the participants before immigration, after immigration and by Mexican-Americans.

Meal Patterns

The Mexican meal pattern is unique to Mexico, not only in the types of foods consumed but in the meal scheduling. Practices such as the mid-morning meal *almuerzo*, the absence of a noon meal, the mid-afternoon heavy meal *comida*, and the light dinner *cena* are not shared with other Latin American countries or the United States. A description of each meal followed by data obtained from our study participants is included below. Table 2 shows the frequency of consumption of foods at each meal on the day previous to the interview (24-hour recall).

Table 2: % Foods Consumed by Over 20% of the Participants at Each Meal on the Day Previous to the Interview

	<i>Immigrants</i>	<i>Hispanic</i>
Breakfast (<i>desayuno</i>)	68	65
Eggs	44	-
Tortillas	37	-
Coffee with milk	30	-
Bread	25	-
Cold milk	-	77
Ready-to-eat breakfast cereals	-	53
Mid-morning <i>almuerzo</i>	55	66
Tortillas	71	40
Eggs	60	52
Orange juice	39	33
Refried beans	38	-
Sandwiches	-	28
Mid-afternoon <i>comida</i>	86	47
Tortillas	70	54
Rice	50	-
Meat (any kind)	38	50
Boiled beans (de la olla)	33	23
<i>Aguas frescas</i>	26	23
<i>Cocido</i>	23	-
Cooked vegetables (side dish)	-	50
Fruit juice	-	27
Evening <i>cena</i>	70	95
Cold milk	52	32
Ready-to-eat cereal	42	-
<i>Pan dulce</i> (Mexican sweet bread)	34	-
Tortillas	-	64
Meat (any type)	-	42
Beans	-	32
Vegetables, cooked	-	42
Soup	-	26
Vegetable salad	-	22

- = Consumed by less than 20% of the participants.

Desayuno

This is a light breakfast often consisting of coffee or *atole* and bread or tortilla. *Licuerdo* or *batido* can also be consumed at breakfast. Our study in California showed that 68% of the immigrants and 65% of the Mexican-Americans ate *desayuno*. Foods consumed at breakfast by over 20% of the immigrants were eggs, tortillas, coffee with milk, and bread. Cold milk and ready-to-eat breakfast cereals were the most common breakfast foods for Mexican-Americans. Cold milk with cereals are rarely consumed by adults in Mexico as they are often considered “children foods.” Similarly, milk is more likely to be consumed in hot beverages than in cold beverage. The consumption of cold milk and ready-to-eat breakfast cereals by Mexican-Americans can be viewed as indicators of dietary acculturation.

Almuerzo

The term *almuerzo*, as used in Mexico, should not be mistaken for its English translation of lunch. For Mexicans, *almuerzo* is a heavy breakfast eaten between 9 a.m. and 11 a.m. *Almuerzo* was consumed by 55% of the immigrants and by 66% of the Mexican-Americans. Main foods consumed at this meal by over 20% of the immigrants were in order: eggs, tortillas, orange juice, and refried beans. Mexican-Americans consumed in order: eggs, tortillas, orange juice, and sandwiches. Indicators of dietary acculturation in this meal among Mexican-Americans is the consumption of sandwiches and the absence of refried beans.

Comida

This meal is the heaviest meal of the day. It is eaten between 2 p.m. and 5 p.m.; it can include soup, cooked rice or pasta, beans, meat, vegetables, and tortillas. This healthful practice of eating the heaviest meal in the afternoon is, to a large extent, retained after immigration; 86% of the immigrants consumed this afternoon meal in the United States. However, only 47% of the Mexican-Americans had this meal in the mid-afternoon. The rest ate a heavy dinner at night.

Foods consumed at this meal by over 20% of the immigrants were, in order: tortillas, rice, meats of any type, boiled beans *frijoles de la olla*, or fruit-based beverages *aguas frescas*, and *cocido*. For Mexican-Americans they were in order: tortillas,

meat of any type, cooked vegetables, fruit juice, boiled beans, and *aguas frescas*. Markers of dietary acculturation in this meal, for Mexican-Americans, were the absence of rice and *cocido* and the presence of cooked vegetables (as a side-dish).

Cena

In Mexico, this is a light night meal often consisting of a hot beverage and bread. *Cena* was consumed by 70% of the immigrants and 95% of the Mexican-Americans. Consistent with traditional practices, the immigrants tended to eat lightly at this meal. Foods eaten by immigrants were in order: ready-to-eat breakfast cereal, cold milk, and sweet bread (*pan dulce*). It is interesting to note that while this meal was light, a non-traditional food, breakfast cereals, was the most commonly consumed at this meal. Traditional *atole*, chocolate and coffee with milk appear to be replaced by ready-to-eat breakfast cereals. This may be due to the fact that many of the immigrant women participated in the Women and Infant Children (WIC) program, where these foods are given at no cost. Foods consumed by over 20% of the Mexican-Americans were in order: tortillas, meats, beans, soups, and vegetable salad.

Snacks

It appears that the traditional Mexican meal pattern is not favorable to snacking. When snacks are eaten, it is likely to be fruits or tortilla-based *antojitos*. However, snacking increases with immigration to the United States. Snacking after *cena* was practiced by 15% of the immigrants and by twice as many (31%) of the Mexican-Americans. Foods mentioned by immigrants were: *golosinas* (term used to denote foods such as cookies and candies), sandwiches, and chips. Among Mexican-Americans, vegetables, chips, and ice cream were the foods most commonly eaten.

Information on meal patterns suggest that while a large number of immigrants tend to preserve the traditional meal patterns, many others have changed their traditional meal schedules as well as the type of foods consumed at each meal. Of concern is the tendency toward consuming the largest meal at night instead of the afternoon, and the increased consumption of snacks.

Selected Health Conditions

Obesity and Non-Insulin Dependent Diabetes (NIDD) are much more prevalent among Latinos living in the United States than non-Hispanic whites. However, there are differences in the prevalence of these conditions among the different Latino groups. The Hispanic Health and Nutrition Examination Survey (HHANES) documented a higher prevalence of obesity and diabetes among people of Mexican and Puerto Rican descent than among Cuban-Americans.⁸

Central obesity (accumulation of fat tissue in the abdominal cavity and upper part of the body) is the most common type of obesity among Latinos. This obesity is a major health risk as it is more likely to be associated with diabetes and cardiovascular diseases than obesity characterized by a large deposition of fat in the lower part of the body.⁹

Women participating in our California study were asked their perception of their body weight, as well as the number of people diagnosed with diabetes in their families. Diagnosed diabetes in at least one member of the family (spouses, children, grandparents, aunts, and uncles) was reported by 20% of the immigrant and 25% of the Mexican-American participants. Reported diabetes was significantly associated with an index of dietary acculturation. The lower the consumption of traditional foods, the greater the reported prevalence of diabetes in the family ($r = -0.20$ $P < 0.01$). As many as 73% of the immigrants and 87% of the Mexican-Americans responded "don't know" when asked what could be done to prevent or control diabetes. Measures stated by immigrants were first to avoid sugars (20%) and second to avoid fats (7%). Mexican-Americans mentioned limiting foods rich in fats (7%), dieting (4%) and avoiding sugars (2%). It is important to note that respondents were unaware of the important role that low physical activity, high fat in the diet, being overweight, and high intake of calories, have in increasing the onset of diabetes.

Thirty-four percent of the immigrant and 45% of the Mexican-American women reported being overweight or obese. These figures (based on self-perception) are close to the 39% prevalence for the total sample of women of Mexican descent (both Mexican-born and Mexican-American) examined in the HHANES study.⁸ In our study self-reported over-

weight/obesity was associated with the number of years living in the United States ($r = 0.14$ $P = 0.04$) and with an index of dietary acculturation ($r = 0.27$ $P = 0.00$). Thirty-nine percent of the immigrants and 41% of the Mexican-American women who reported obesity have attempted to control their weight. Participants mentioned the following factors as being important in the prevention of obesity: decreasing total food intake, increasing physical activity, consuming a balanced diet, and limiting fats.

Conclusions and Recommendations

Different levels of dietary acculturation were identified among the two groups of women of Mexican descent studied. These reflect a decline in the consumption of traditional foods, new ways of utilizing traditional foods and, above all, the adoption of new foods. Overall, there were some healthful and some significantly less healthful dietary changes. Healthful changes included a moderate increase in the consumption of vegetables and fruits, and a large decrease in the consumption of lard and Mexican cream. While the consumption of vegetables (salads and cooked vegetables) increased, the use of fat in the form of salad dressing and mayonnaise increased. Other sources of fat which increased significantly in the diet include: cooking oil, margarine, and American sour cream. Other less healthful changes included a decline in the consumption of traditional fruit-based beverages in favor of high-sugar foods such as sodas, and increased consumption of ready-to-eat breakfast cereals, many of which are high in sugars. Inexpensive sources of complex carbohydrates such as beans, *atole* and pasta decreased as a result of acculturation in the United States. In addition, changes in the meal patterns — in particular the tendency toward consuming the heaviest meal at night instead of the mid-afternoon — was an

unhealthy change. In addition to the possible impact on the health of the group studied, those dietary changes may also affect the economy of the family as low-priced foods are replaced by more expensive items.

Self-reported obesity and diabetes was high among immigrants and even higher among Mexican-Americans. These data are consistent with findings by other researchers who have utilized clinical assessment of the health conditions among Latinos of Mexican descent. Our data suggest that many of the dietary changes may have a negative impact on the health of the groups studied. Health and nutrition professionals are advised to take into account the different cultural dietary traditions, identify and support healthful dietary practices (traditional as well as new ones), and discourage the adoption of less healthful dietary practices. Awareness regarding the importance of physical activity in preventing obesity and NIDD is of particular importance among the groups studied.

Study's Limitations

As with most dietary studies, our study relied on information recalled by participants. While precise quantities of foods consumed (i.e., servings of foods) was not assessed, it is likely that the frequency in which foods were consumed may not be as precise, particularly regarding food consumed previous to immigration to the United States. Thus, readers are advised to view our study's results as trends, patterns, and tendencies. While the associations of dietary acculturation with obesity and diabetes are significant, these are only correlations and may not represent a direct cause-effect relationship. Larger studies exploring further the role of dietary acculturation in diabetes and obesity are strongly recommended.

References

1. Hispanic Policy Development Project. *The Hispanic Almanac*, Edition Two. Lebanon, Penn.: Sowers Printing Co., 1990.
2. Viola H.J. and C. Margolies. *Seeds of change. Five hundred years since Columbus*. Washington D.C.: Smithsonian Institute Press, 1991.
3. Tannahill R. *Foods in History*. New York: Crown Publishers Inc. 1988.
4. Bernal D. *The Conquest of New Spain*. London: Penguin, 1963.
5. Romero-Gwynn E., D. Gwynn, and B. Turner, et al. "Dietary Change Among Latinos of Mexican Descent." *California Agriculture* 1992; 46:10-12.
6. Romero-Gwynn E., D. Gwynn, and L. Grivetti, et al. "Dietary Acculturation Among Latinos of Mexican Descent." *Nutrition Today* 1993; 28:6-12.
7. Kottak C.P. *Cultural Anthropology*. New York: McGraw-Hill Inc. 1994.
8. NCHHS. "Prevalence of Overweight for Hispanics-United States, 1982-1984." *MMWR* 1989; 38:841-843.
9. Reichley K.B., W.H. Mueller, and C.L. Harris, et al. "Centralized Obesity and Cardiovascular Disease Risk in Mexican-Americans." *American Journal of Epidemiology* 1987;125:373-85.

Appendix A. Glossary of Selected Foods and Dishes

Aguas frescas de frutas: Homemade beverages prepared with water and sliced or blended fruits, and sometimes vegetables such as lettuce, carrots, and cucumber.

Arroz con leche: A rice dessert prepared by cooking the rice in milk and sweetening it with sugar and spicing it with cinnamon.

Atole: A gruel thickened with *masa*, corn starch, ground rice or oats and sweetened with sugar. Sometimes fruit, such as pineapple is added for flavor. *Atole* is consumed at breakfast or at *cena* night meal.

Cafe con leche (coffee with milk): Black coffee added to hot milk. Consumed at breakfast and at *cena*, often with a sweet roll, or *pan dulce*.

Caldo: Thin soup prepared with vegetables, chicken, or other meat.

Chilaquiles: A casserole-type dish made of tortillas cut in small pieces, fried, and covered with chile and tomato sauce, eggs, or other ingredients. Cream and/or cheese is often used as topping.

Chile (hot pepper): There are a large variety of chiles, which vary in size and degree of hotness. Fresh or dried chiles are used extensively to season table salsas, cooked sauces, meats, soups and many other dishes. Chiles are sources of Vitamin A and Vitamin C.

Chorizo or longaniza (pork sausage): Spiced, coarsely ground pork sausage used in scrambled eggs and other dishes. *Chorizo* is often used as filling for tacos. While this term is used in this context in Mexico and most other Latin American countries, in Puerto Rico it refers to a blood sausage that is highly spiced.

Cocido: A soup of meat and vegetables.

Crema (Mexican dairy cream): *Crema* is commonly used to garnish beans, eggs and many other dishes. A low-fat alternative that can be suggested is prepared by mixing one cup of plain yogurt with one to two spoons of sour cream.

Enchiladas: Tortillas dipped in a chile sauce, deep fried, and filled with cheese or chicken. Baked enchiladas are low-fat alternatives to fried enchiladas.

Fideo: Vermicelli pasta is usually consumed in soups. *Sopa de fideo* (vermicelli soup) is usually prepared by frying the *fideo* and cooking it with tomatoes, carrots, and other vegetables.

Frijoles de la olla: Beans cooked in water and spiced with onions, garlic, and salt. This fat-free bean dish should be encouraged, as it is a healthful inexpensive source of protein, fiber, starch, and other nutrients.

Frijoles refritos (refried beans): Cooked, mashed beans fried in lard. Chicken or beef *caldo* or milk can be suggested to moisten beans instead of lard.

Licuada or batido: A cold beverage prepared with fruit and milk, blended and sweetened with sugar. Some people may add raw eggs. *Licuada* or *batido* is a good way to encourage milk consumption among people who may not enjoy plain milk. However, the use of raw egg should be discouraged.

Manteca (lard): Widely used in Mexican cooking. The substitution of oil for *manteca* should be encouraged.

Pan dulce: A sweet roll usually eaten with coffee or chocolate for breakfast and/or dinner. A variety of *pan dulce* is available in Mexican markets and some American supermarkets. *Pan dulce* is usually lower in sugar and fat than regular American pastries.

Salsa: This term should not always be translated to sauce. Mexican salsas are tomato and chile based garnishes used at the table. In other Latin American countries, salsas are sauces often rich in fat used as dressing for meats and other dishes.

Sopa: This term should not always be translated to soup. In Mexico, the term *sopa seca* is used to denote cooked rice and cooked pasta. The term *sopa aguada* (watery soup) is used to denote regular soups. In most other Latin American countries *sopa* is used for soup.

Taco: Tortilla wrapped around a filling and is usually fried. Tacos can also be prepared at the table using warm tortillas and fillings of meat and other foods.

Tortillas: Thin, unleavened pancake of dried and ground corn or wheat flour. Flour tortillas are consumed in the Northern states of Mexico, but are not common in other parts of Mexico.

Tostada: Fried and crisp tortilla topped with refried beans, shredded beef or chicken, and shredded vegetables and cream.