

**LIGA HEALTH EDUCATION - NUTRITIONAL ISSUES IN MEXICO**  
**LIGA INTERNATIONAL**  
**THE FLYING DOCTORS OF MERCY**

The basis of the traditional diet is corn (maize) and beans, with the addition of meat, animal products, local fruits, and vegetables. The use of **processed foods** is contributing to the rapidly increasing prevalence of obesity and diet-related chronic diseases such as diabetes.

**Common foods of Mexico**

Avocado	Greens, locally grown
Bananas	Guavas
Beans	Limes
Beef	Mangoes
Cacti	Melons
Calabaza (pumpkin)	Onions
Carrots	Oranges
Chicken	Papayas
Chile peppers	Pineapple
Con leche (coffee, milk, cinnamon, and sugar)	Plantains
Corn	Pork
Eggs	Queso del pais, a mild white cheese
Fish	Tomatillos
	Tomatoes
	Tortillas, corn and flour
	Tunas (prickly pears from cacti)

The traditional diet of Mexico is based on corn and beans, but coupled with locally available fruits, vegetables, meat and dairy products, the diet can be nutritious. Poverty limits access to an adequate variety of quality foods, resulting in malnutrition. The increasing use of processed foods is contributing to obesity, diabetes, and other chronic conditions.

Maize is ground, treated with lime and then pressed into tortillas. Maize is used in tacos, tamales, and a thin gruel called atole. The complementary staple in the region is beans (frijoles), most commonly black or pinto beans. Rice is also widely used. Major changes in the traditional diet occurred when the Spaniards and others introduced the region to wheat bread, dairy products, and sugar. Wheat is consumed in the form of white rolls or sweet rolls, or as a flour-based tortilla.

The consumption of meat and animal products is limited due to their cost. Beef, pork, chicken, fish, and eggs are all used. Traditional cheeses are prepared locally throughout the region as queso del pais, a mild, soft, white cheese, and milk is used in cafe´ con leche.

The region around El Fuerte is a rich source of a variety of fruits and vegetables. Best known among these are the chile peppers, tomatoes, and tomatillos that are used in salsas. Other

commonly used vegetables include avocado, calabaza (pumpkin), carrots, plantains, onions, locally grown greens, and cacti. Fruits are seasonal but include guavas, papayas, mangoes, melons, pineapples, bananas, oranges, and limes, as well as less-known local fruits such as nances, mamey, and tunas (prickly pears from cacti). Traditional drinks (frescos, chichas, or liquados) are made with fruit, water, and sugar.

## **Methods of Cooking**

The traditional preparation of maize involves boiling and soaking dried maize in a lime-water solution and then grinding it to form a soft dough called masa. Soaking in lime softens the maize and is an **important source of calcium** in the diet. The masa is shaped and cooked on a flat metal or clay surface over an open fire. In some areas, lard or margarine, milk, cheese, and/or baking powder may be added to the tortilla during preparation. Beans are generally boiled with seasonings such as onion, garlic, and sometimes tomato or chile peppers. They are served either in a soupy liquid or are “refried” with lard or oil into a drier, and higher fat preparation.

Meat, poultry, and fish are prepared in local variations of thin soup (caldo or sopa), or thicker soups or stews (cocido) with vegetables.

Tamales are made with corn (or corn and rice) dough that is stuffed with chicken and vegetables. The tamales are steamed after being wrapped in banana leaves. Tacos are generally made with meat, chicken, or fish grilled or fried with seasoning and served on tortillas; enchiladas are filled tortillas dipped in a chile-based sauce and fried; and tostadas are fried tortillas topped with refried beans or meat, and sometimes with vegetables and cream. Chiles rellenos are made with the large and sweet chile poblano and filled with ground meat. Examples of specialty dishes include ceviche, raw marinated fish or seafood made along the coast throughout Mexico.

## **Benefits**

The staple diet of the region—corn and beans, supplemented with meat, dairy products, and local fruit and vegetables—is nutritionally complete and well suited to a healthful lifestyle. The proper combination of tortilla and beans provides an excellent complement of amino acids, thus supplying the necessary amount of complex protein. The process of liming the maize makes the calcium and the niacin in the tortilla more bioavailable, and this food is a major source of these nutrients. In addition, the traditional preparation of tortillas with a hand mill and grinding stones appears to add iron and zinc to the tortilla. Beans are excellent sources of B vitamins, magnesium, folate, and fiber. The tomato and chile-based salsas, along with several of the tropical fruits such as limes and oranges are important sources of vitamin C, and the variety of vegetables and yellow fruits such as papaya, melon, and mango provide excellent sources of carotenoids, which are precursors of vitamin A.

## **Risks**

Unfortunately, limited financial access to this variety of foods for many people in Mexico means that the diet often **does not include sufficient levels of vitamins and minerals**. For low-income groups, lack of access to **animal products** contributes to deficiencies in iron, zinc, vitamin A, and other nutrients. When animal products are included, there has been a tendency to choose high-fat products such as **sausage and fried pork rinds (chicharron)**. The use of **lard and a preference for fried foods** also contributes to high intakes of saturated fat and cholesterol among subsets of the population.

## **Changes in Dietary Practices**

**Infiltration of American culture** has created a tendency to consume less tortilla, beans, soups, stews, gruels, and fruit-based drinks, with greater use of meat, sweetened ready-to-eat breakfast cereals, soft drinks, candy, cakes, ice cream, snack chips, and salad dressings.

Over the course of four weeks 453 (N = 453) surveys were collected. Foods that made up the core Mexican diet were identified using the frequency of each food item consumption. For the purpose of this poster the researcher is only reporting the results for 18-24 year olds as 69% (n = 312) of the respondents fit into this age bracket.

The frequency of consumption scale was set at 1 = multiple times per day, **2 = daily**, 3 = most days, 4 = more than one time per week, 5 = once in a while, and 6 = almost never.

Based on this scale, the most frequently consumed items were:

Milk = 2	Fruit-based water = 2
Beef or Pork = 3	Chicken = 3
Cheese = 3	Corn Tortillas = 2
Rice = 3	Cereal = 2
Noodles = 2	Fresh fruit = 2
Fresh vegetables = 2	Oil = 2
Peppers = 2	Red Salsa = 2

## **Common Foods:**

Milk/Milk Products - milk (cow, goat), evaporated milk, cheese (fresh unripened, soft aged, and semi-hard or hard aged)

Meat/Poultry/Fish - beef, goat, pork, chicken, turkey, shrimp, red snapper, other firm-fleshed fish

Eggs/Legumes - chicken eggs, black beans, chickpeas, kidney beans, pinto beans

Cereals/Grains - corn, wheat, rice

Fruits - bananas, cactus fruit, carambola, casimiroa, cherimoya, coconut, custard apple, guanábana, guava, lemons, limes, mamey, mangoes, melon, oranges, papaya, passion fruit, pineapple, strawberries, sugar cane, sweet sop, zapote

Vegetables - avocados, cactus, chili peppers, corn, green pumpkin, jicama, lettuce, onions, peas, plantains, potatoes, squashes (chayote, pumpkin, summer), squash blossoms, sweet potatoes, tomatillos, tomatoes, yams, yucca (cassava)

Seasonings - anise, achiote (annatto), chiles, cilantro, cinnamon, cocoa coriander, cumin, epazote, garlic, hoja santa, mace, onions, vanilla

Nuts/Seeds - pine nuts, pumpkin seeds (pepitas), sesame seeds

Beverages - aguas naturales, atole, coffee (café con leche), hot chocolate, soft drinks

Fats/Oils - butter, lard

Sweeteners - sugar, marzipan, panocha (raw brown cane sugar)

### **Meal Patterns:**

The typical meal pattern is four to five meals daily: breakfast, coffee break, lunch, late afternoon snack, and dinner. Meals are mainly eaten at home and served family-style.

Breakfast is quick and consists of **sweet bread or pastry and fresh fruit** served with café con leche. The **late morning coffee break** is similar to brunch and includes heartier fare often including **tortillas, eggs, meat, beans, bread, and fruit with coffee or hot chocolate**. Lunch is the largest meal of the day, traditionally featuring several courses, which might include a **soup, seasoned rice, a main course, beans, salad, and dessert**. Following lunch, a rest (siesta) is taken if time permits. The afternoon snack consists of **sweets (sweet rolls, cakes, cookies) served with coffee, hot chocolate, or atole**.

Dinner is light and usually consists of leftovers or may be skipped altogether. Recently, Mexicans have shifted to **eating a lighter lunch and a more substantial dinner**. **Snacking** is popular in urban areas. **Street vendors, cafés, cantinas and open-air markets** provide a wide variety of foods.

### **Coca-Cola for water**

**People go for more energy-intense foods.** These are often high in sugar or fat. People drink **Coca Cola as if it was water in order to have the energy to carry on - and so many of the foods are rich in carbs, are full of cheese or are fried."**

According to a National Institute of Public Health report by Juan Rivera et al., **Mexico consumes more gallons of sugary beverages than any other in the world - 60 gallons per person per year. And leading the supply is Coca-Cola.**

For **Mexico, Coca-Cola's second largest market behind the United States**, the multinational corporation is in the middle of a **five year, \$5 billion investment plan** to increase production and sales. Since 2006, Coca-Cola has more than doubled the size of its product portfolio with 60 brands and 400 products, spending more than \$500 million per year on advertisements.

Most disturbing of Coca-Cola's presence is its stronghold on the water supply. The company admits, **"The Coca-Cola Company is a hydration company. Without water, we have no business,"** and this is most clear in its search for water in Mexico's war-torn Chiapas state.

In Chiapas, a state home to one of the country's deepest aquifers, local environmentalists claim that Coca-Cola "has pressured local government officials into using preferential zoning laws to allow the privatization of water resources," as written by Chiapas-based Centre for Economic and Political Investigations of Community Action (CIEPAC). CIEPAC accuses the national government and its president, former president of Coca-Cola Mexico, Vincente Fox, of allowing the company concessions to exploit public water resources.

Writing on behalf of Collective Support, Solidarity and Action (CASA), Monica Wooters notes, **"Some 12 million people in Mexico have no access to piped water and 32 million have no access to proper sewage. This resource monopolization simultaneously creates a scarce water supply and a conveniently abundant Coke supply."** She adds, **"Mexico is now the number two consumer of bottled water in the world, a large percentage of which is sold by Coca-Cola, ironically enough."**

A 2012 case study on Mexican children sponsored by the University of California-San Francisco contends that, "Increased risk for obesity and abdominal obesity were associated with factors indicative of lower and higher [socioeconomic status] including watching TV in English, increased video game playing and perceived food insecurity." Of the 8,299 sampled advertisements in Mexican television, 22 percent were food-related and 50 percent were geared toward children. **Moreover, during the times that children watch the most television, Ramírez et al. found that "50 percent of all [food-related advertisements] were potato and corn chips, desserts and cakes, juices, sweetened cereals, candies, cookies, sweetened beverages and fast foods."**

The American fast food industry continues to widen its reach across Latin America. The director of policy and programs at the International Association for the Study of Obesity in London, believes the **fairly recent influx of fast food in the region to be similar to the introduction of smallpox and measles by European conquistadors 300 years ago.** To evidence this, the **average man in Mexico has gained 15 pounds** while the **average woman has gained 19 pounds since the introduction of the first U.S. fast-food chain** in 1985. The rates of death from cardiovascular diseases in Mexico and Brazil surpassed those in the United State in 2008. Most affected by Mexico's "nutritional shift" are the poor. According to Mexico's National Nutrition Institute, **"In the poor classes we have obese parents and malnourished children. The worst thing is the children are becoming programmed for obesity. It's a very serious epidemic."**

In the United States, the National Center for Health Statistics determined that minorities - African Americans and Hispanics - hold the **highest rates of obesity and overweight.** Posted on her Food & Health blog, R.D. Timi Gustafon writes, "The Hispanic population is the fastest-growing ethnic group in the U.S., and Hispanics of Mexican origin account for the largest portion."

Rapidly changing dietary habits have created a nation in danger of eating themselves to death. Mexican schoolchildren are now some of the fattest in the world, with **one in three classified as overweight or obese - a 27 percent rise in 12 years**, according to the latest National Survey of Health and Nutrition. Their parents also score high on global ranking tables - weighing in second behind only the United States.

Among adults, a staggering **73 percent of women are overweight or obese**; men are only marginally thinner, with **69 percent "abnormally" sized**. The National Survey reveals what is obvious to even an untrained eye: people of a "normal" or healthy weight are becoming a rare breed in this food-obsessed country.

Mexico's biggest killers are now **cardiovascular diseases - including heart failure, myocardial infarctions (heart attacks) and strokes - and diabetes**. Together these accounted for 150,000 deaths in 2012, according to World Health Organisation figures.

Yet only 40 years ago, the main causes of death here were **malnutrition and infectious diseases**. The speed at which Mexicans have made the change from a diet dominated by maize and beans to one that bursts at the seams with **processed fats and sugars** poses one of the greatest challenges to public health officials.

### **Fried food and soda**

There are about **21 million clinically obese adults in Mexico - that's a 38 percent rise since 2000**. Diabetes rates doubled in this period - one of the most rapid growths seen anywhere in the world. "My daughters are always asking for refrescos, but I try to lead by example so the whole family only drinks water or fresh juices. The streets are full of fatty foods because Mexicans don't want to eat vegetables any more."

The pavements are saturated with vendors selling calorific snacks: **deep-fried pork skin, beef tacos, doughnuts, ice cream, quesadillas filled with cheese, hot dogs, hamburgers, with freshly made potato crisps, and deep-fried plantain** - sometimes the only vegetables in sight. Mexicans drink more "refrescos" than any other country. **Seven out of ten children in rural communities have a sugary drink with breakfast**, according to the campaign group Power of the Consumer.

Research presented at an American Heart Association conference in March found that **sugary drinks accounted for 22,000 deaths in Mexico every year** - the highest rate in the world. The television, billboards and markets are awash with advertisements, in Spanish and indigenous languages, for **processed snacks and sugary drinks** by companies such as **Nestle, Pepsi, Coca Cola and Bimbo**. Children are bombarded with advertisements, with few regulations to restrict marketing.

### 'Public health emergency'

Research by Professor Barry Popkin, a global obesity expert from the University of North Carolina, was the first to show Mexicans drink more sugary drinks than any other nation.

"Marketing of sugary beverages is the most important factor that we have found [in Mexico]," Popkin said. "Calories from beverages doubled between 1999 and 2006.

2. snacking is way up - again, probably a demand created by marketing.
3. the huge growth of convenience stores and modern mega-food markets.

In Mexico, **6.4 million - or one in 10 - adults is diagnosed with diabetes, the sixth-highest rate in the world.** Another **3.6 million people are thought to have the disease, but are unaware.** Health Minister Mercedes Juan Lopez recently described the massive rise incidence as a "true public health emergency". A genetic predisposition means Mexicans are more prone to diabetes than Caucasians. Even among those who are diagnosed, figures from the national survey suggest **three-quarters have poorly controlled blood sugar levels,** placing them at a much higher risk of long-term disabling and fatal complications. Already it is the **biggest-single cause of blindness in adults and a major cause of amputations,** said the Mexican Diabetes Federation. Dr Stan De Loach, an American diabetologist, has been treating adults and children in Mexico for more than 40 years. "Diabetes and obesity are the country's biggest silent deadly diseases but most people are so addicted to carbohydrates that they aren't willing to do anything about it until the complications set in, and then it's too late."

### Government response

The government has introduced a range of measures to try and curb the tsunami of fat. Last year it introduced the so-called **"sin taxes" on sugary drinks,** and in 2011 published guidelines to **restrict junk food being sold in schools** - though a proposed list of banned products was successfully opposed by the food and drinks industry. As part of a new national exercise campaign, the government enlisted revered wrestling stars to try to get kids active: Lucha Libre against Obesity. Currently, 60 percent of 10- to 14-year-olds perform no sport at all.

The direct and indirect cost is expected to double from \$6.5bn now to \$13.7bn in 2017, according to department of health figures. Recent initiatives fail to tackle the fundamental causes, said Alejandro Calvillo, director of Power of the Consumer.

**"Formula milk, instant soups and sugary sodas** have replaced breast-feeding, maize, beans and water, and **children become addicted to sugar from a very early age.** Kids in rural areas of Chiapas and Guerro are malnourished but overweight," Calvillo said. Nutritional Health Alliance wants **restrictions on the marketing of junk foods, improved food labelling, clean drinking water fountains in public places, support for local, fresh produce, and national campaigns to promote breast-feeding and filtered tap water.**

"When 70 percent of people are overweight or obese, then it is not only about bad personal choices. Their environment is developing this epidemic, and so government policies need to change this environment," Calvillo said. Despite the obesity epidemic, malnutrition still kills about **9,000 people annually, mainly young children in poor rural states.**

The two biggest challenges facing the nation's battle against the bulge are: "Getting major government action in the face of very organized food industry lobbying, and Mexicans' preference for extreme sweetness."

Every little bit of education helps.

Thanks for joining our efforts.

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