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STUDY OF A CONTEMPORARY DIET IN ONE HOUSEHOLD IN THE YUCATAN

A Capstone Experience/Thesis Project

Presented in Partial Fulfillment of the Requirements for

the Degree Bachelor of Science with

Honors College Graduate Distinction at Western Kentucky University

By

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Western Kentucky University
2014

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ABSTRACT

The history of the Yucatan has played a major role in the development of the food system of the area and the nutritional status of the population. Originating from an agricultural based diet, which forms the foundation of the traditional Yucatan diet, there has been a recent shift away from whole and natural foods to a more processed and convenient food supply due to the influx of American products and culture. Coinciding with the influx of these unhealthy foods, there has also been a rise in the health problems of the Mexican population such as heart disease and diabetes, both of which are diseases related to nutrition.

Through an evaluation of the history of the Yucatan, the traditional foods consumed in the Yucatan, the lifestyle and the health status of the Yucatan population, and through an analysis of a 3 day food diary from a contemporary Yucatan household, it is concluded that the traditional Yucatan diet provides all of the essential macronutrients in their recommended amounts. However, with a more detailed analysis, the Yucatan diet is also lacking or exceeding the Dietary Recommended Intake (DRI) of specific nutrients such as calcium, iron, fiber and sodium.

Keywords: diet, nutrition, Yucatan, Mexico

Dedicated to mom and dad,
and the beautiful city and people of Mérida, Mexico

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And upmost, I would like to thank my Lord and Savior for blessing me with the incredible opportunity to experience life outside of my comfort zone in Mérida, Mexico. Without Him I would not have anything but because of His grace and never-ending love I have lived a blessed life and anything that I have or that I have done belongs to Him. I hope to glorify Him in all that I do. Thank you Jesus.

VITA

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CHAPTER 1

HISTORY OF THE YUCATAN

Location and Climate

Located on the eastern half of Mexico and bordered by the Gulf of Mexico to the north, lies the Mexican state of Yucatan. Yucatan is one of the thirty-one states that comprise Mexico. On the east, Yucatan is bordered by Quintana-Roo (which is popular for its touristic cities such as Cancun and Playa del Carmen) and on the west, Yucatan is bordered by the popular port state of Campeche. The size of Yucatan is comparable to about half the size of the US state of Maine, equaling a total of 16, 749 square miles.¹

The geography of Yucatan is very diverse, ranging from coastal regions in the north with white sandy beaches to small patches of vegetation in the south-western part of the state. But overall, Yucatan is considered a lowland area,¹ with very few surrounding areas of high ground or rolling hills. The lack of hills and mountains allows for limited rainfall. The lack of high land and limited rain are also a cause of dry land which does not support much vegetation. Also, something very unique about Yucatan geography is the fact that the state has no rivers, which makes it unfathomable that ancient civilizations, like the Mayans, thrived there. However, in order to compensate for the lack of rivers, the land is very blessed by the fact that it sits mostly upon limestone, which when eroded by rainfall causes the formation of underground

lakes. These underground lakes are known as “cenotes”, translating to “natural well” in English. The cenotes are basically underground pools of purified water and are some of the most beautiful creations. When the rain water seeps through the ground, the limestone purifies it before the water makes its fall into the cenotes, creating a crystal clear body of freshwater that supports life. Today, the cenotes serve as great tourist attractions as many are open to the public for swimming purposes, and in ancient times served as drinking water and sacrificial offerings for the Mayan cities.² The limestone surface not only gives way to the cenotes but also served as a means of construction for the Mayans.³ Limestone was widely used to build the pyramids, temples, streets and buildings for which the Mayan culture is notorious. For example, the cathedral located in the town center of Mérida was constructed from the limestone foundation of a Mayan temple that was once located in the center of the city.

In regard to climate, Yucatan is hot year round. The average temperature in Yucatan is between 77-81 degrees Fahrenheit¹. The Yucatan is known for having two-types of seasons: a dry season and a wet season. The dry season ranges from November through May and the wet season from June through October.⁴ Luckily, the showers are usually short, but they pack a big punch. According to Nations Encyclopedia, “the average [annual] rainfall in the area is 115 centimeters (45 inches)”.¹ However, because the rainfall only occurs for half of the year with the other half being very hot and dry, it makes farm life difficult and agriculture less productive. During the wet season plant soil is eroded and the nutrients are washed away, and during the dry season the plants tend to die off and become less productive due to the lack of water, which is likely to cause a food shortage leading into the wet season.⁵

The Mayan Civilization

Historians believe that the first humans to reach North America were those who crossed the Bering Strait in about 12,000 BC.⁶ And according to Frommer's,⁶ the earliest "Mexicans" populated Mexico about the same time and based their lives around agriculture and the raising of animals. The migrated community began to develop in all of Mesoamerica—a term used to refer to the region around Mexico and Central America before the Spanish conquest.³

As the Mesoamerican community began to grow and expand, various indigenous groups developed. Each group formed and established their own communities in either one region of Mesoamerica or they scattered themselves in various places through the land. However, as this thesis focuses on, the Mesoamerican region of the Yucatan was civilized by the Mayan indigenous group.

The great Mayans, whose awe-inspiring cities are still standing and whose contributions are still taught in schools today, began as a culture which excelled in agriculture and who based their lives around farming. Known as the Archaic or Pre-Classic Period (7000-2000 BC), the Mayans survived through the development of a hunter-gatherer culture harvesting crops such as maize (corn), beans, squash and cassava (tapioca root)⁷ in both the highland and lowland regions.³

The strong development of agriculture provided security to the Mayans, allowing them to build large cities in central locations. Called the Classic Period and ranging from the years of 250-900 AD, the Mayans consolidated their power throughout Yucatan in

cities like Uxmal and Chichen Itza.^a Also, during this period, according to Mark,⁷ the Mayans began developing in the areas of mathematics, astronomy, engineering, architecture, and the visual arts. They accomplished and developed great things that are still in use today such as the number 0, the development of the wheel, the calendar, creation and the use of metal and rubber, and meticulous and creative architectural designs.⁸ These are the areas of achievement for which the Mayans are mostly known. Nevertheless, in order to support city and educational development, the Mayans of the Classic Period were still reliant upon farming. Located on the outskirts of each Mayan city-state, farmers used slash-and-burn agriculture and the incorporation of irrigation and terracing to provide the Mayans with food.³

The golden age of the Maya empire slowly transferred into the Post-Classic Period (950-1524 AD), which is the period most notably known for the abandonment of the great Mayan cities.⁷ There is no proven or known reason for the abandonment of the great cities, though many scholars credit overpopulation and overuse of land and resources as their decline, claiming that “by the time the Spanish invaders arrived, however, most Maya were living in agricultural villages, their great cities buried under a layers of rainforest green”.³ Interestingly, just as the Mayans grew and developed from a foundational basis of agriculture they eventually returned to their agricultural roots, making agriculture an important part of Yucatan history.

^a I had the great privilege of touring both of these landmarks, and I can tell you that these cities are breathtaking. It was and still is incomprehensible to me how these very antique civilizations and people were so developed, smart and passionate about life. What they developed and built in a time so long-ago without even a hint of technology stands as testament to the intellect and passion of the Mayans.

The Colonization of the Yucatan

The Yucatan was not discovered by Europeans until the year of 1517, when the Spanish conquistador Francisco Hernández de Córdoba arrived on the Peninsula.² It was during his interaction with the indigenous people where the peninsula got its name. When Córdoba made land, he also made contact with the natives of the region. Córdoba wanted to know where he was but when he asked the natives, he received a response in a language which he did not understand. According to legend the natives said “tetic dtan. Ma t natic a dtan” (“you speak very rapidly; we don’t understand your language”), but Córdoba thought they had responded to his question with the answer of Yucatan, so that is the name he gave to the region.²

Córdoba did not stay in the Peninsula very long, allowing the natives to have a few more years of peace before the Spanish returned in 1527. This time, however, the Europeans wanted to stay. Francisco de Montejo, a Spanish conquistador, fiercely started an expedition with the goal of conquering the Yucatan. However, in 1527 on his first try, he was unsuccessful as he encountered a rowdy bunch of natives who forcefully fought for their land, sending Montejo back to Spain.¹ As history would soon tell, Montejo was not a man to easily give up. In 1530, he returned back to the peninsula. But this time he was not alone as a conquistador, he brought with him his son, Francisco de Montejo y León. But two proved not to be strong enough to conquer the indigenous people, so once again Montejo was unsuccessful in his attempt to subdue the native population.² However, 10 years after his first attempt to conquer the land, Montejo returned to the

peninsula with the same purpose as before. On his third attempt, Montejo was finally successful in his battle. It did not take the Spanish much time to begin building cities and imposing their way of life upon the natives and the land. In 1540 and 1542 Montejo had already built the still-standing cities of Campeche and Mérida, respectfully.² Even today, there is a long street which runs through all of Mérida called *Paseo de Montejo*, or Montejo Avenue in English.

Once the Spanish had conquered the peninsula they began establishing many missions in hopes of converting the natives to the Catholic faith. Going to a much further extent in the name of Catholicism, a Franciscan monk by the name of Fray Diego De Landa ordered that all Mayan codices (books) and figurines be destroyed. Only a few Mayan artifacts of that cultural extent remain.¹ Not only did the newcomers try to change and destroy the Indigenous Mayan culture, but the Spanish also brought diseases and oppression which began to destroy the native population as well, shrinking “their population from an estimated 5 million in 1500 to 3.5 million a century later”.¹

Throughout the years since the original conquest of the Peninsula, there have been many Mayan uprisings against the Hispanic population and the implemented government. One such uprising in 1761, led by Jancito Canek, resulted in the deaths of thousands of Mayans, but more-widely known are the revolts led by the Mayan people against the “Hispanic population in political and economic control” in 1847, commonly known as the Caste War.² The Mayans were revolting against the oppression and inequality imposed upon them by the white race that had gained all political and social power. When the war eventually ended in 1904, nothing seemed to have changed besides the population size of both of the fighting parties. However, the Mayans had developed a

“reputation of being fierce and difficult-to-conquer warriors,” something that still holds true today as the Maya still plays an important part in the culture, life and politics of Yucatan.

CHAPTER 2

OVERVIEW OF THE TRADITIONAL YUCATAN DIET

History of the Yucatan Diet: How it came to be

As discussed, the Mayans are traditionally known for their academic achievements. But what most people don't realize is that the Mayans have also made significant gastronomical contributions, altering the world's eating habits.

The food of the peninsula today is a mix of ancient Mayan traditions and European influences, including a mix of Middle Eastern ingredients. Yucatan food is drastically different than the food from other parts of Mexico. Just as civilization in the Yucatan developed at a different rate and a different time than the rest of Mexico, Yucatan cuisine developed in isolation from the rest of Mexico.^b

The culinary history of the Yucatan began around 700 BC with the ancient Mayas. Reliance upon the milpa or mixed crop method allowed for the harvesting of various foods at the same time. Milpa is a type of agricultural practice, common in the Yucatan, where corn, various types of beans, and squash are grown and harvested through the slash-and-burn method and the incorporation of mulch.⁹ With this agriculture

^b My house mother (the woman who I lived with while I was in Mérida) repeatedly declared that “Yucatan food is so rich and so delicious. It's very different than the food in other parts of Mexico, and it tastes much better.”

practice, the same crops could be continuously planted and grown in the same soil without depleting the nutrients from the soil.¹⁰ This type of agriculture easily facilitated a diet rich in vegetables and spices. The Mayans cooked with and consumed foods such as “corn, beans, chiles, tomatoes, and squash”.⁶ Some other important foods in their diet included sweet potatoes, agave cactus, cassava, and amaranth with a reliance on insects, sometimes fish, and domesticated turkeys as their main sources of protein. Overall, it is estimated that the Mayans consumed a diet of only 1,200 calories, which today would be considered malnutrition. However, because of their small stature and frame size (and after visiting some traditional Mayan communities and meeting authentic Mayans, I can tell you that they are very small when compared to Hispanics of mixed Mayan and European descent and they were extremely small compared to our American group) I do believe that their low caloric intake would have been appropriate for them.

Corn was an important source of nutrition in the traditional Mayan diet. So important that the Mayans even had corn gods and myths telling that humans came from a mix of blood from a god and masa, which is a dough made from corn.¹⁰ Corn was also important in some Mayan rituals as a baby’s umbilical cord was cut over an ear of corn and a piece of masa was placed in the mouth of the dead.¹¹ Not only was corn easy to cultivate but its cultivation produced enough food and nutrition for a Mayan family of four when the grounds were only tended for two days out of the week. This Mayan staple is still an important element in the Yucatan diet of today.

Also important to the Mayan diet (and still important elements in the peninsula’s diet today) were fruits such as papaya, mamay, oranges, dragonfruit and plums. These fruits are easy to cultivate in the Yucatan’s tropical climate. Also, honey and protein

sources from turkey and fish (in the more coastal areas) are common ingredients in Yucatan cuisine.

The Mayans lived off of their own crops and agriculture for many years. But the later Mayans of the Yucatan, obtained “salt, cocoa....honey, salted fish, and smoked venison” from trading with the Aztecs, an indigenous group from Central Mexico.¹⁰ These different spices and foods added variety and different nutritional components to the Yucatan diet.

Once the Yucatan was discovered by the Spanish and the Europeans, the traditional diet of the Mayans slowly changed into the Yucatan diet of today. Just as trade with the Aztecs brought different foods to the Yucatan, trade with the Europeans brought different foods to the peninsula as well. The integration of European foods into the Mayan diet (like achiote, sour orange, Edam cheese, peas and a variety of different meats) allowed for the development of a very distinct cuisine that characterizes the diet of the Yucatan today.¹²

Traditional Yucatan Ingredients

(List of ingredients compiled from Frommer’s Food & Drink in Yucatan Peninsula¹² and from my personal experience in the Yucatan)

- Avocado- served mainly as a topping to soups, spread on bread of a *torta* (similar to a sub sandwich) with meat dishes or as guacamole
- Black Beans- served with everything; mainly used as a side dish but incorporated in a variety of main entrees; are served in various ways from cooked to refried to a condensed soup

- Chiles- used to spice up Yucatan dishes and used as an ingredient in many salsas
- Chocolate- cultivated in the Yucatan from cacao beans; mostly used as a savory ingredient in the traditional entrée of *mole*; not typically used as a traditional sweet ingredient
- Corn- used in everything; staple food that is used as a main source of nutrition
- Papaya- served at breakfast every morning and sold on every street corner; most popular, cheap and cultivated fruit in the Yucatan
- Tomatoes- used to make salsas and served plain on small salads, *tortas*, and on the side of many main entrees
- Vanilla- grown wild and used as a flavoring in many drinks and as an ingredient in *flan* (a typical Yucatan dessert)
- Rice- served as a side with many meals, usually seen paired with black beans and used as the main ingredient in *horchata* (a popular drink made from water that was used to wash rice and mixed with a combination of cinnamon and sugar)
- Limes and Lemons- used to add flavor to many traditional dishes; always served alongside any dish
- Honey- used as a sweetener in many drinks and as a topping to *hotcakes* (breakfast food very similar to pancakes)

Traditional Yucatan Dishes

(List of dishes compiled from Frommer's Food & Drink in Yucatan Peninsula,¹² article titled *Yucatan Cuisine* from Yucatan Today,¹³ and my personal experience in the Yucatan)

- Tacos- very different from the tacos served in the United States; soft corn or flour tortilla (never fried) and stuffed with meat of your choice (usually turkey or chicken) and topped with pickled onions; sold in taquerias on the street and in every city; various types of tacos with different toppings and meats
- Tamales- corn *masa* (dough made by the mixture of corn meal and water) filled with meat (usually pork, or chicken, or turkey) and spices and wrapped in corn husks and steamed
- Empanadas- corn *masa* filled with meat and spices and fried
- Panuchos- dish very specific to the Yucatan; a fried corn tortilla filled with refried beans, and topped with shredded meat of your choice (turkey or chicken), pickled onions, lettuce, tomato, and avocado
- Salbutes- same as panuchos (described above) but without the filling of refried beans
- Pollo Pibil- chicken marinated in a mixture of achiote, sour orange juice, peppercorns, garlic, cumin, and salt. Meat mixture is then wrapped with corn *masa* and then wrapped in banana leaves and baked (traditionally Pollo Pibil was baked underground). This dish is a very significant meal served for Day of the Dead, a Mexican holiday that celebrates the lives of those who have died. I had the honor of being in Mexico during this celebration and everywhere I went I was served

Pollo Pibil. My house mom also had all of her relatives over to make this dish and we were served leftovers for weeks.

- Lime Soup- soup made with a broth of lime juice and water with shredded chicken, fried tortilla strips, onion and avocado; popular soup served in every restaurant and in the homes of those in the Yucatan.
- Poc Chuc- typical Yucatan pork dish; thin slices of grilled pork that had been marinated in sour orange juice, topped with pickled onions and served with a tangy sauce
- Papadzules- soft corn tortillas rolled around chopped hard boiled eggs and covered in a pumpkin seed sauce
- Frijol con Puerco- chunks of cooked pork served with black beans and rice; traditionally garnished with radish, cilantro, and onion. This dish is usually served on Mondays and it was one of my favorite meals.
- Mole Poblano- a chicken or pork dish covered in a specialty sauce called *mole*. *Mole* consists of a unique mixture of many ingredients such as many different chilies, Mexican chocolate, peanuts, garlic, different spices such as cinnamon and pepper, different seeds like pumpkin, coriander and sesame. Poblano refers to the city of Puebla, a town just southeast of Mexico City where mole was first conceived.
- Chilaquiles- fried corn tortillas cut into strips or triangles laid out in a baking dish and topped with tomato sauce and layered again to form a casserole. Shredded chicken and cheese can be added. This dish was made and served as my last meal in the Yucatan, as my host mom called it “our departing dish.”

CHAPTER 3

THE YUCATAN OF TODAY

Population

The population the Yucatan has been steadily increasing over the past decade. In the year 2000, the population was 1,658,210 and as of 2010, the population had reached 1,955,577. The majority of those who live in the Yucatan reside in the state capital of Mérida (population of 830,732) as well as a few other large cities such as the historic city of Valladolid (74,217) and the port/beach city of Progreso (53,958).¹⁴

Also, the population of the state includes many indigenous people. The indigenous people come from the Mayan indigenous group and Yucatan is able to boast that it has the largest percentage of native language speakers compared with the rest of the Mexican states, one of the many things that make the Yucatan culture very unique.²

Economy

The currency in the Yucatan, as well as the rest of Mexico, is the peso. As of October 7th, 2014, 1 US dollar is equal to 13.42 Mexican pesos.¹⁵ However, the exchange rate is always fluctuating. From personal observation, the rate

usually only fluctuates up or down by a maximum of 1 peso. In the beginning of my trip, I was overwhelmed when I saw the prices of any and all items. For example, I remember going into my first authentic Mexican restaurant and saw that an average entrée cost about \$79 pesos. Initially, this price registered in my mind as \$79 dollars. I was blown away! However, after getting acclimated to the peso, I realized that \$79 pesos was only about \$6 dollars, which is actually a fairly cheap meal when compared to an entrée at any US restaurant. Overall, the majority of items were much cheaper in Yucatan when compared to the prices in the US.

According to USA Today, the main means of profit for the Yucatan is tourism.¹⁶ With its specific location in a tropical area and having a coast, Yucatan boasts many resorts and natural attractions that bring in many tourists every year. It was interesting to see how the big historic cities such as Mérida, Izamal, Valladolid, and Celestun were much more developed and economically thriving compared to the smaller and much more impoverished cities and communities that were located in less tourist areas. Just traveling around the state made it very easy to see how tourism plays such a major role in the Yucatan economy.

Also important to the Yucatan economy is service based companies, trade activities, finance and insurance, manufacturing, transportation and communications, agriculture and livestock, construction, and mining.² As Mexico becomes more developed, and because the Yucatan is a tourist hotspot, service companies are expanding rapidly. For example, there are many hotels, airports, restaurants, repair and maintenance shops, and beauty salons in the Yucatan. Also, in terms of agriculture, Mexico is one of the biggest organic agriculture countries in Latin America, exporting about 134 million

USD each year from products such as coffee, corn, beans, various vegetables, medicinal plants, honey, and many fruits.¹⁷

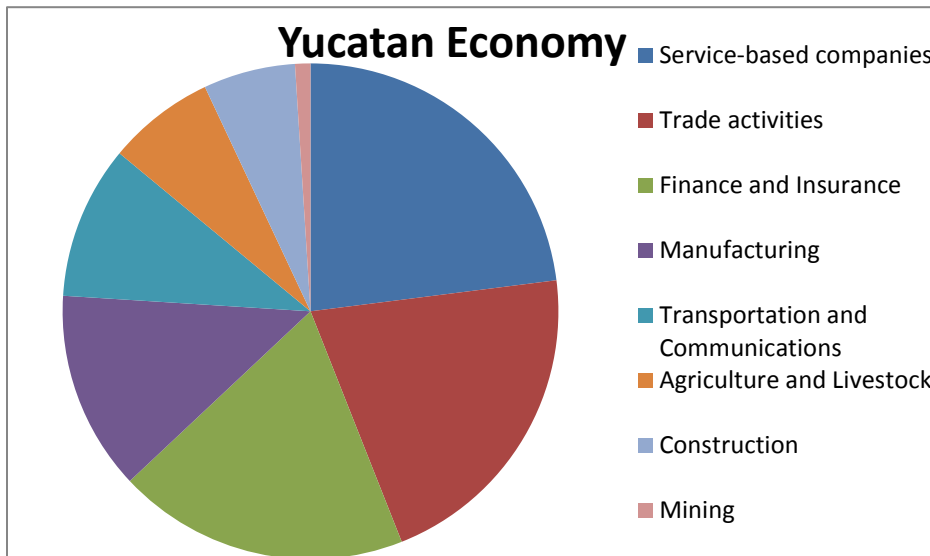


Figure 3.1 Yucatan Economy

Lifestyle

If I had to choose one word to describe the lifestyle of those in the Yucatan, I would choose the word *relaxed*. Life in the Yucatan is very relaxed, where the people work only to make money so that they can afford to live the way they want. Those in the Yucatan make time to cook and they make sure they also have time to enjoy their food, taking 2-3 hour lunch breaks. They also make time for friends, spending hours at city cafes sipping coffee and talking about the latest telenovela (soap opera) drama. But most importantly, those in the Yucatan make time for family. Most households are multi-generational consisting of grandparents, parents, and children. And even if family has moved away (such as siblings or children), they generally have weekly gatherings that last all day and are full of laughter, storytelling, and sometimes tears. Also, with Yucatan

being a coastal state, the residents spend their weekends on the beach basking in the sun and spending time with loved ones. Those with more finances generally own a beach house that is used for holidays and long weekends or a big celebration. This relaxed type of lifestyle is found in the more wealthy parts of the Yucatan. In the more poverty stricken areas, life is a little less relaxed as the families spend their days working out in the sun on a *milpa* or spend hours preparing food and cleaning and taking care of the house. However, those in poverty still cherish time spent with the family and work is not one of their top priorities.

Health

The following health statistics were reported by the World Health Organization (WHO).¹⁸ The data are for the country of Mexico and not for Yucatan specifically. However, if there is more specific research that has been collected for the Yucatan, that information will be denoted. Also, I will provide my own commentary if I see a discrepancy in the data based on my observations while I was in Yucatan.

i. General Health Facts

Collected from the WHO,¹⁸ all data is from 2012.

- Gross national income per capita 16,450
- Life expectancy at birth m/f 73/79
- Probability of dying under 5 (per 1,000 live births) 16
- Probability of dying between 15 and 60 years m/f (per 1,000) 177/90
- Total expenditure on healthcare per capita 1,062
- Total expenditure on health as % of GDP 6.2

ii. Nutrition Information

- Child (>5 years) Anthropometry
 - 2.8% underweight
 - 13.6% stunting
 - 1.6% wasting
 - 9% overweight
 - 23.7% anemia (Hemoglobin <110 g/L)
 - 28.6% subclinical vitamin A deficiency
- Adult Female Malnutrition based on Body Mass Index (BMI)

The BMI is a nutritional tool to assess a person's body fat percentage based on their height and weight.

- 1.4% BMI <18.5 kg/m² (underweight)
- 71.9% BMI ≥25 kg/m² (overweight)
- 34.5% BMI ≥ 30 kg/m² (obese)

These percentages are indicating the prevalence of women who are malnourished in each BMI category (underweight, overweight or obese), excluding those of normal BMI. For example, 1.4% of Mexican women who are underweight are malnourished. Malnourished is defined as someone who is not consuming adequate proteins, carbohydrates, fats, vitamins and/or minerals. To elaborate, someone could be consuming excessive calories, making them overweight, but their calories only consist of breads and beans, thus making them malnourished in fats and many vitamins and minerals that would support optimal health.

- Pregnancy/Breastfeeding Statistics
 - 17.9% women 15-19 years who are pregnant with their first child
 - 20.3% exclusive breastfeeding under 6 months
 - 12 weeks maternity leave
- Nutrition Consumption
 - 96% population use improved drinking water sources (water that is protected from outside contamination through its natural state or through active intervention to make the water pure)
 - <5% population below minimum level of dietary energy consumption
 - 91% households consuming iodized salt
- Obesity
 - As of 2013 70% of Yucatan teens are obese and with the steadily rising obesity rates in the Yucatan, obesity has been declared an epidemic.¹⁹
 - Mexico has now surpassed the United States as the most obese country in the western hemisphere. As of 2013, the obesity rate in Mexico had reached 32.8% for the Mexican adult population. Experts are saying that the rise in the obesity rates in Mexico is due to the increase of wealth and an urban population which correlates with a more sedentary lifestyle. However on the other hand, for the more poverty stricken families and communities there has been an increase in the consumption of sugary drinks and highly processed and packaged foods. These types of foods are now cheaper in Mexico

than fresh fruits and vegetables, which were once the foundation of the traditional Mexican diet. According to Abelardo Avila, a physician with Mexico's National Nutrition Institute, "The same people who are malnourished are the ones who are becoming obese. In the poor classes we have obese parents and malnourished children. The worse thing is the children are being programmed for obesity. It's a very serious epidemic."²⁰

Food

One of the things that I noticed during my time in Yucatan was the fact that there is a huge difference in the types of food consumed. On one hand, there is an abundance of traditional Yucatan foods where everything is homemade and the ingredients are all natural and mimic the Yucatan food from years ago. But on the other hand, there is an abundance of packaged foods filled with sugar and artificial ingredients that mimics the American culture of today. This is a very evident difference and one that cannot be denied.

Walking down the streets of Yucatan are vendors cooking and selling traditional Yucatan foods such as empanadas, tamales and fresh fruits like papaya. At night, there are many food carts selling tacos wrapped in homemade corn tortillas or fresh salsa or *elote*, which is a Yucatan specialty of fresh corn mixed with mayonnaise, cheese, and hot spices. And in many Yucatan homes the meals are prepared daily from simple ingredients like corn masa, fresh meats, rice, beans, and local fruits and vegetables. All of these traditional foods are cooked daily and rather fresh and healthy for the most part.

However, these simple ingredients which are a staple to the Yucatan diet are becoming more expensive and the lower classes cannot afford to make this type of food on a daily basis and they honestly don't have enough time to prepare healthy homemade meals every day. This brings us to the big problem.

Just as it is easy to find traditional food being sold on any street corner, it is also easy to find a convenient store or fast food American restaurant on every street as well. These convenient stores offer a wide range of cookies, cakes, pastries, candies and soft drinks and were always filled with a large crowd of locals. And while the traditional Yucatan food is fresh and simple and healthy it is also more expensive when compared to the store-bought, packaged foods and sugary drinks. For example, a package of 12 cookies would only cost about \$1.50 and an apple at one of these stores would cost at least \$3.^c While these packaged and processed foods contain a lot of energy (calories) for a small amount of money, they are also causing a detrimental effect on the Yucatan population. For example, diabetes, a nutrition related disease, which effects 10 million Mexicans is the second leading cause of death in the Mexican population closely following the top cause of death which is heart disease, also nutrition related. And according to a study by the Mexican Diabetes Federation the average waist size of Mexican women aged 20-49 has reached 35.9 inches which is about 4 inches more than the "ideal" size.²¹ Diabetes and heart disease are just a few of the problems associated with the newly adopted diet of high sugary and highly processed foods which is becoming the lifestyle in Yucatan.

^c Apples are not local to the Yucatan which does make them more expensive. When shopping for local produce the price for some papaya or jicama would be comparable or even cheaper than a package of cookies, but sadly these local fruits are not sold at the convenience stores.

Personal Interview with Yucatan Dietitian

In Mérida, I had the amazing opportunity to work as a volunteer in a government run health department. This health department, Desarrollo y la Integración de la Familia (DIF) Municipal, provides many services to the Merida community such as support and homes for the elderly, social services, judiciary support, psychological services, and nutrition services. While serving in the DIF, I worked in the department of nutrition which offers nutrition assessments, provides nutrition advice, and gives food to the underprivileged and malnourished that come to their office and qualify for government dispenses. The nutrition office was staffed with 2 qualified nutritionists and 1 student who was completing her nutrition internship at the DIF.

During my time at the DIF, I saw many health and nutrition problems of those in Mérida and I was able to provide them with nutrition advice and support during their consultations. However, I was also able to talk with one of the nutritionists, Andrea Càmara, about her perspective on the nutrition of the Yucatan based on her training and experiences working with Yucatan patients. Below is the interview I conducted with her.

Q: What do you think are the most serious nutrition problems in the Yucatan?

A: The problems are dependent on where the person lives. In a rural zone, where the poor people live, there is a lot of malnutrition. Because of the poverty, the children eat many starches and bread and cookies and they don't drink milk.

These people allow them to eat this type of food because it is cheaper. But, this type of food is made up of many sugars and causes malnutrition. And a malnourished child is more likely to become an obese adult. On the other hand, in the city, the urban zones, there is more obesity. The people with money eat better

than the poor people, but the people with money also eat in excess, which leads to obesity. Also, they drink too many soft drinks. In conclusion, there is much variety between the rural and urban zones.

Q: What do you believe is the biggest cause of malnutrition in the Yucatan?

A: Poverty and food insecurity. 18 of every 100 people in the Yucatan suffer from food insecurity.

Q: Have you seen a change in the food of the Yucatan? If so, what is the change?

A: Before NAFTA (North American Free Trade Agreement) Mexicans ate what they harvested. All was natural and healthy; their diet consisted of fruits and vegetables and meat. But when the NAFTA was signed, Mexico opened themselves up to all types of food. Mexico transformed to a foreign culture. After signing, Mexico began to receive food of bad quality and because the people were poor, Mexicans began to consume a lot of sugary food because they were cheaper. The food soon began to become popular and the Mexican people stopped eating the traditional Yucatan diet. On the other hand, NAFTA allowed for the trade in technology as well (computers, telephones, and videogames). The increase in technology caused a decrease in physical exercise. In conclusion, the change in the food and in the technological products caused an increase in the obesity of Mexico.

Q: What are other health problems in the Yucatan that have a connection with nutrition?

A: Anemia and high cholesterol and other non-communicable diseases such as hypertension, diabetes and renal disease.

CHAPTER 4

ANALYSIS OF MY DIET IN THE YUCATAN

Overview

- While in Yucatan, I had the wonderful opportunity to immerse myself in the Mexican culture, and while embracing the culture, I learned to embrace and love their food as well. Before traveling to Mexico, I was very apprehensive about the food, as I do not like the Mexican food served in the United States. And I was naïve enough to believe that authentic Mexican, and more specifically Yucatan, food was the same. However, I was pleasantly surprised to discover that “American Mexican” and “Authentic Mexican” food are completely different. Yes, rice and beans are some of the most used ingredients and tacos and empanadas are common to every household and restaurant, but in the Yucatan “hard shell tacos” are nonexistent and a side of salsa and tortilla chips is hard to find at any restaurant and a deep fryer is almost never used. All ingredients, especially if the meal was prepared in home, were fresh from the local market and cooked from scratch in an *abuela's* (grandma's) kitchen.
- In this section I will be providing an analysis and nutritional evaluation of some of the foods that I consumed while in the Yucatan in order to provide insight into the nutritional quality of the Yucatan diet. However, in order to be accurate, I will

first provide some basic information about my life and eating patterns while I was there.

1. Where I Ate: While in the Yucatan, I lived with an elderly women in her home. She was in her 70's and had lived in the Yucatan her whole life. With her income and standard of living, she would be considered middle to upper-middle class. Every day, a maid would come and prepare the food for the day and clean the house. The majority of my meals were made fresh every day, in the traditional Yucatan style, and cooked with ingredients from the city market. The nutritional analysis, provided below, were completed on meals that I ate while in the home, making my analysis a little biased toward the traditional and authentic Yucatan foods (compared to the more modern day “Americanized” diet that many of those who live in Yucatan are consuming) and a diet influenced by a middle to upper-middle class income.
2. When I Ate:
 - a. Breakfast: 8:30 am
 - b. Lunch: 1:30 pm
 - c. Dinner: 7:30 pm
3. What I Ate: Eggs, fresh vegetables like tomatoes, onions, and green peppers, poultry, rice, beans, corn and freshly baked breads were common foods that were prepared and eaten on a daily basis within the home. (A more detailed nutritional analysis to follow).

4. How I Felt: While in the Yucatan I had more energy than I normally do, had very few gastrointestinal problems, had clearer skin, stronger and longer nails, improved sleep quality, felt satiated for longer periods of time, and overall had more confidence and felt good about my health and myself. I know many factors play a role in all of these aspects of health, but I also know that food can play a major role in these aspects as well. The food that I was consuming may not have been responsible for all of the changes that my body went through while in Mexico, but I firmly believe that the traditional Yucatan diet is an overall healthy and well-balanced diet that can promote optimal health.

3 Day Food Diary

- A food diary is used to track what someone is eating and provides an overall picture of someone's diet. A food diary is a nutritional tool used to assess the nutritional status of a diet. In this section, I will provide an outline of what I ate for 3 days while in the Yucatan, providing a small glimpse into the dietary and nutritional patterns of the Yucatan diet.
 1. Day 1
 - a. Breakfast: slices of banana, cantaloupe, and papaya covered in natural yogurt and two small hotcakes (similar to pancakes) with local honey and strawberry jam, served with orange juice
 - b. Lunch: small side salad with lettuce, cucumbers and radishes; chilled pasta with pesto flavoring and a sprinkle of cheese and avocado;

baked chicken with potato slices and peas; served with corn tortillas and black beans; small slice of homemade flan

c. Dinner: croissant with sliced ham, butter and cheese

2. Day 2

a. Breakfast: slices of banana, cantaloupe and papaya; scrambled eggs with pieces of ham in them; slices of French bread with picante salsa

b. Lunch: yellow rice, cooked vegetables (plantains, carrots, zucchini and potatoes), baked and shredded chicken, noodles in chicken broth

c. Dinner: sliced and toasted hoagie bread with refried beans and salsa verde on top

3. Day 3

a. Breakfast: slices of banana, papaya and cantaloupe, 2 flour tortillas filled with ham slices and salsa verde

b. Lunch: 2 tostadas and a side of spaghetti

c. Dinner: Pollo Pibil (a traditional Yucatan dish of chicken, orange juice, grapefruit juice and lime juice mixed with some corn flour and covered in banana leaves and baked for long periods of time)

Nutritional Analysis of Food Diary^d

Totals for Day 1	
Calories (kcal)	2,203
Carbohydrates (grams)	285 (~52% of kcal)
Protein (grams)	82 (~14% of kcal)
Fats (grams)	84 (~34% of kcal)

Figure 4.1 Calories and Macronutrients for Day 1

Totals for Day 2	
Calories (kcal)	1,705
Carbohydrates (grams)	241 (~57% of kcal)
Protein (grams)	81 (~19% of kcal)
Fats (grams)	44 (~24% of kcal)

Figure 4.2 Calories and Macronutrients for Day 2

Totals for Day 3	
Calories (kcal)	1,407
Carbohydrates (grams)	178 (~50% of kcal)
Protein (grams)	68 (~19% of kcal)
Fats (grams)	54 (~34% of kcal)

Figure 4.3 Calories and Macronutrients for Day 3

^d Analysis come from MasterCook 14, a recipe/cookbook management system that collects and analyzes various recipes. In this program, I created my own recipes from what I recorded while in Yucatan and from what I gathered from the web and modified to make the recipes as authentic as possible. As a disclaimer, some of the ingredients, portion sizes, and nutritional information could be different than what is actually consumed in Yucatan.

Averages for 3 Day Food Diary	
Calories (kcal)	1,771.67
Carbohydrates (grams)	234.67 (~53% of kcal)
Protein (grams)	77 (~17% of kcal)
Fats (grams)	60.67 (~31% of kcal)

Figure 4.4 Calories and Macronutrient Averages for 3 Day Food Diary

Specific Nutrient Averages		
Nutrient	My Average Consumption	Recommended Consumption^e
Calcium	613.33 mg	1,000 mg
Iron	15.67 mg	18 mg
Fiber	17.33 grams	25 grams
Sodium	3,002 mg	1,500 mg

Figure 4.5 Specific Nutrient Averages

Evaluation of Nutrient Analysis

According to The Dietary Guidelines for Americans, provided by the United States Department of Agriculture (USDA), a healthy diet should consist of about 45-65% carbohydrates, 10-35% protein, and 20-35% fats.²² Based on these recommendations and the nutritional analysis from my 3-day food diary of what I consumed in Yucatan, it can easily be assumed that the Yucatan diet is a healthy diet, providing the consumer with adequate and sufficient macronutrients.

^e Recommendations based on 145 lb., active 20 year old female. Originate from the National Institute of Health's Interactive DRI for Healthcare Professionals.²³

However, with a more detailed analysis it can be concluded that the Yucatan diet is also lacking or exceeding the Dietary Recommended Intake (DRI) of specific nutrients such as calcium, iron, fiber, and sodium. After researching the DRI of these nutrients from the National Institute of Health (NIH)²³ and comparing them with the amounts that I consumed in the Yucatan, it can be theorized that the traditional Yucatan diet is low in calcium, iron, and fiber and high in sodium. A diet low or high in any nutrients puts the consumer at risk of developing acute and chronic medical conditions and does not support optimal growth, development and maintenance of the body. However, due to the small stature of the Yucatan population, it could be possible that natives of the Yucatan do not need as many of the recommended vitamins and minerals; thus the amounts of calcium, iron and fiber that they are consuming from the traditional diet could be enough for them to support necessary growth and health status. Based on my calculations the traditional Yucatan diet may be slightly “off of the mark”, but the dietary changes that are occurring in Mexico due to the increased consumption of processed and convenience foods could be and are likely lacking essential nutrients.

CHAPTER 5

CONCLUSIONS

Based on the nutritional analysis provided by the examination of a 3 day food journal of my personal diet that I consumed in the Yucatan, it can be concluded that my diet provided adequate calories and macronutrients. However, this analysis was based on a more traditional Yucatan diet, one that centered on whole, natural, and local ingredients as consumed by those in the Yucatan area for many years.

However, after performing more research on the health of the Yucatan population and based on my observations of the lifestyle and the “Americanization” of the Yucatan peninsula, it is easy to conclude that the modern day Yucatan diet is not well-balanced and does not promote optimal health as evidenced by the high rates of obesity and high death rates related to heart disease and diabetes. The modern day Yucatan diet centers on convenience and processed foods which are high in added sugars and refined grains. This shift from an agricultural based diet to a processed diet is the cause of the “Americanization” of Mexico, which consists of an economic and social change of Mexico from an independent nation to a nation dependent upon and open to the commercialization of their country. This change has had a great effect on many social, economic and political aspects of the Mexican culture, including a huge effect on the

health status of the country. Many of these detrimental health effects have nutrition related etiologies and could be a direct cause of a change in the diet and food consumption of Yucatan. The “Americanization” of Mexico includes the “Americanization” of the traditional Yucatan diet of commercialized processed foods that are “calorie-dense” and “nutrient-poor” which has resulted in the increase in overweight and obese adults in the Yucatan peninsula.²⁴ According to Archivos Latinoamericanos de Nutrición (Latin-American Archives of Nutrition), “the Maya diet continues to change as a consequence of urbanization and globalization.”²⁸

When reflecting back upon my 3 day food diary and the dietary analysis of what I consumed in the Yucatan, it is clearly evident that the traditional Yucatan diet is different than the modern day “Americanized” diet which has significantly contributed to the increase in the rates of obesity and heart disease.

In conclusion, the traditional Yucatan diet is an overall healthy diet that would provide the recommended amounts of the macronutrients to promote optimal health. There needs to be another dietary shift in order for the Yucatan population to achieve better health; however, this time the shift needs to be away from the “Americanized” diet and back to the basics and the roots of the traditional Yucatan diet.

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APPENDIX

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Nutrition Analysis, Breakfast Day 1

Nutrition per Serving
? x

Calories (kcal): 616

% Calories from Fat: 9

% Cal. from Carbohydrates: 81

% Calories from Protein: 10

Cost: 0.00

Recipes (or Ingredients):

Ingredient	Servings
banana	1
cantaloupe	1
papaya	1
flour	1
suoar	1

Nutrition Facts/Percent Daily Values Per Serving

Total Fat (g):	6	9%	Zinc (mg):	1	10%
Saturated Fat (g):	2	12%	Vitamin C (mg):	97	162%
Monounsaturated (g):	2	8%	Vitamin A (IU):	2007	40%
Polyunsaturated (g):	1	4%	Vitamin A (RE):	305 1/2	31%
Cholesterol (mg):	115	38%	Vitamin B6 (mg):	.5	27%
Sodium (mg):	352	15%	Vitamin B12 (mcg):	.8	13%
Potassium (mg):	949	27%	Thiamin B1 (mg):	.7	47%
Total Carbohydrate (g):	127	42%	Riboflavin B2 (mg):	.7	43%
Dietary Fiber (g):	4	17%	Folacin (mcg):	131	33%
Protein (g):	16	31%	Niacin (mg):	5	25%
Calcium (mg):	334	33%	Caffeine (mg):	0	N/A
Iron (mg):	4	24%	Alcohol (kcal):	6	N/A

Food Exchanges:

Starch/Bread	3	Vegetable	0	Non-Fat Milk	1/2	Other Carbo.	2 1/2
Lean Meat	1/2	Fruit	2	Fat	1/2		

OK
Print
%Daily Value Based On:

Calories

(Recipe for hotcakes provided by Food.com)²⁵

Nutrition Analysis, Lunch Day 1

Nutrition per Serving
? ×

Calories (kcal): 1167

% Calories from Fat: 38

% Cal. from Carbohydrates: 45

% Calories from Protein: 17

Cost: 0.00

Recipes (or Ingredients):

	Servings
lettuce	1
radishes	1
cucumbers	1
pasta	1
pesto sauce	1

Nutrition Facts/Percent Daily Values Per Serving

Total Fat (g):	50	76%	Zinc (mg):	5	36%
Saturated Fat (g):	13	65%	Vitamin C (mg):	33	55%
Monounsaturated (g):	26	116%	Vitamin A (IU):	2257	45%
Polyunsaturated (g):	6	29%	Vitamin A (RE):	409 1/2	41%
Cholesterol (mg):	102	34%	Vitamin B6 (mg):	.8	40%
Sodium (mg):	648	27%	Vitamin B12 (mcg):	1.3	22%
Potassium (mg):	1495	43%	Thiamin B1 (mg):	1.5	101%
Total Carbohydrate (g):	131	44%	Riboflavin B2 (mg):	.9	54%
Dietary Fiber (g):	11	45%	Folacin (mcg):	243	61%
Protein (g):	51	101%	Niacin (mg):	16	81%
Calcium (mg):	662	66%	Caffeine (mg):	0	N/A
Iron (mg):	10	58%	Alcohol (kcal):	0	N/A

Food Exchanges:

Starch/Bread	7 1/2	Vegetable	1/2	Non-Fat Milk	0	Other Carbo.	1
Lean Meat	4	Fruit	0	Fat	7		

OK
Print
%Daily Value Based On:

Calories

Nutrition Analysis, Dinner Day 1

Nutrition per Serving
?
×

Calories (kcal):	420	Recipes (or Ingredients):	Servings
% Calories from Fat:	61	croissant	1
% Cal. from Carbohydrates:	25	ham slice	1
% Calories from Protein:	14	American cheese slice	1
Cost:	0.00	butter	1

Nutrition Facts/Percent Daily Values Per Serving

Total Fat (g):	28	43%	Zinc (mg):	2	11%
Saturated Fat (g):	16	79%	Vitamin C (mg):	trace	0%
Monounsaturated (g):	8	38%	Vitamin A (IU):	912	18%
Polyunsaturated (g):	1	7%	Vitamin A (RE):	224	22%
Cholesterol (mg):	86	29%	Vitamin B6 (mg):	.1	6%
Sodium (mg):	1156	48%	Vitamin B12 (mcg):	.5	8%
Potassium (mg):	181	5%	Thiamin B1 (mg):	.3	23%
Total Carbohydrate (g):	27	9%	Riboflavin B2 (mg):	.3	16%
Dietary Fiber (g):	2	6%	Folacin (mcg):	38	9%
Protein (g):	15	29%	Niacin (mg):	2	10%
Calcium (mg):	198	20%	Caffeine (mg):	0	N/A
Iron (mg):	1	8%	Alcohol (kcal):	0	N/A

Food Exchanges:

Starch/Bread	1 1/2	Vegetable	0	Non-Fat Milk	0	Other Carbo.	0
Lean Meat	1 1/2	Fruit	0	Fat	5		

OK
Print
%Daily Value Based On:

Calories

Nutrition Analysis, Breakfast Day 2

Nutrition per Serving
? x

Calories (kcal): 523

% Calories from Fat: 54

% Cal. from Carbohydrates: 23

% Calories from Protein: 23

Cost: 0.00

Recipes (or Ingredients):

	Servings
banana	1
cantaloupe	1
papaya	1
scrambled eggs	1
ham slices	1

Nutrition Facts/Percent Daily Values Per Serving

Total Fat (g):	31	48%	Zinc (mg):	3	19%
Saturated Fat (g):	10	48%	Vitamin C (mg):	33	56%
Monounsaturated (g):	12	56%	Vitamin A (IU):	2900	58%
Polyunsaturated (g):	5	24%	Vitamin A (RE):	569	57%
Cholesterol (mg):	785	262%	Vitamin B6 (mg):	.7	36%
Sodium (mg):	1024	43%	Vitamin B12 (mcg):	1.9	31%
Potassium (mg):	795	23%	Thiamin B1 (mg):	.4	23%
Total Carbohydrate (g):	30	10%	Riboflavin B2 (mg):	1.1	65%
Dietary Fiber (g):	2	10%	Folacin (mcg):	95	24%
Protein (g):	30	60%	Niacin (mg):	2	11%
Calcium (mg):	181	18%	Caffeine (mg):	0	N/A
Iron (mg):	3	19%	Alcohol (kcal):	0	N/A

Food Exchanges:

Starch/Bread	1/2	Vegetable	0	Non-Fat Milk	0	Other Carbo.	0
Lean Meat	4	Fruit	1	Fat	4		

OK
Print
%Daily Value Based On:

Calories

Nutrition Analysis, Lunch Day 2

Nutrition per Serving
? ×

<p>Calories (kcal): 836</p> <p>% Calories from Fat: 10</p> <p>% Cal. from Carbohydrates: 73</p> <p>% Calories from Protein: 17</p> <p>Cost: 0.00</p>	<p>Recipes (or Ingredients):</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 80%;"></th> <th style="width: 20%; text-align: right;">Servings</th> </tr> </thead> <tbody> <tr><td>yellow onion</td><td style="text-align: right;">1</td></tr> <tr><td>vegetable oil</td><td style="text-align: right;">1</td></tr> <tr><td>garlic clove</td><td style="text-align: right;">1</td></tr> <tr><td>long-grain white rice</td><td style="text-align: right;">1</td></tr> <tr><td>chicken broth</td><td style="text-align: right;">1</td></tr> </tbody> </table>		Servings	yellow onion	1	vegetable oil	1	garlic clove	1	long-grain white rice	1	chicken broth	1
	Servings												
yellow onion	1												
vegetable oil	1												
garlic clove	1												
long-grain white rice	1												
chicken broth	1												

Nutrition Facts/Percent Daily Values Per Serving

Total Fat (g):	9	13%	Zinc (mg):	3	19%
Saturated Fat (g):	2	8%	Vitamin C (mg):	20	34%
Monounsaturated (g):	6	25%	Vitamin A (IU):	4976	100%
Polyunsaturated (g):	2	9%	Vitamin A (RE):	500 1/2	50%
Cholesterol (mg):	34	11%	Vitamin B6 (mg):	.8	40%
Sodium (mg):	2174	91%	Vitamin B12 (mcg):	.6	9%
Potassium (mg):	1160	33%	Thiamin B1 (mg):	1.2	78%
Total Carbohydrate (g):	149	50%	Riboflavin B2 (mg):	.4	21%
Dietary Fiber (g):	5	19%	Folacin (mcg):	360	90%
Protein (g):	36	71%	Niacin (mg):	20	100%
Calcium (mg):	93	9%	Caffeine (mg):	0	N/A
Iron (mg):	9	50%	Alcohol (kcal):	0	N/A

Food Exchanges:

Starch/Bread	9	Vegetable	1	Non-Fat Milk	0	Other Carbo.	0
Lean Meat	2 1/2	Fruit	1/2	Fat	1		

OK
Print
%Daily Value Based On:

Calories

(Recipe for yellow rice from MexicanFood.com)²⁶

Nutrition Analysis, Dinner Day 2

Nutrition per Serving
?
×

<p>Calories (kcal): 346</p> <p>% Calories from Fat: 10</p> <p>% Cal. from Carbohydrates: 73</p> <p>% Calories from Protein: 17</p> <p>Cost: 0.00</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Recipes (or Ingredients):</th> <th style="text-align: right;">Servings</th> </tr> </thead> <tbody> <tr> <td>hoagie roll</td> <td style="text-align: right;">1</td> </tr> <tr> <td>refried beans</td> <td style="text-align: right;">1</td> </tr> <tr> <td>salsa verde</td> <td style="text-align: right;">1</td> </tr> </tbody> </table>	Recipes (or Ingredients):	Servings	hoagie roll	1	refried beans	1	salsa verde	1
Recipes (or Ingredients):	Servings								
hoagie roll	1								
refried beans	1								
salsa verde	1								

Nutrition Facts/Percent Daily Values Per Serving					
Total Fat (g):	4	6%	Zinc (mg):	2	12%
Saturated Fat (g):	1	3%	Vitamin C (mg):	8	13%
Monounsaturated (g):	1	3%	Vitamin A (IU):	0	0%
Polyunsaturated (g):	trace	1%	Vitamin A (RE):	0	0%
Cholesterol (mg):	0	0%	Vitamin B6 (mg):	.1	6%
Sodium (mg):	1011	42%	Vitamin B12 (mcg):	0	0%
Potassium (mg):	497	14%	Thiamin B1 (mg):	.1	4%
Total Carbohydrate (g):	62	21%	Riboflavin B2 (mg):	.1	4%
Dietary Fiber (g):	9	35%	Folacin (mcg):	106	26%
Protein (g):	15	30%	Niacin (mg):	1	3%
Calcium (mg):	58	6%	Caffeine (mg):	0	N/A
Iron (mg):	2	12%	Alcohol (kcal):	0	N/A

Food Exchanges:							
Starch/Bread	4	Vegetable	1/2	Non-Fat Milk	0	Other Carbo.	0
Lean Meat	0	Fruit	0	Fat	1/2		

OK
Print
%Daily Value Based On:

Calories

Nutrition Analysis, Breakfast Day 3

Nutrition per Serving
? ×

Calories (kcal): 377

% Calories from Fat: 30

% Cal. from Carbohydrates: 54

% Calories from Protein: 15

Cost: 0.00

Recipes (or Ingredients):

	Servings
papaya	1
cantaloupe	1
salsa	1
flour tortilla	1
ham slices	1

Nutrition Facts/Percent Daily Values Per Serving

Total Fat (g):	13	19%	Zinc (mg):	1	10%
Saturated Fat (g):	4	19%	Vitamin C (mg):	43	72%
Monounsaturated (g):	6	28%	Vitamin A (IU):	1584	32%
Polyunsaturated (g):	2	8%	Vitamin A (RE):	158 1/2	16%
Cholesterol (mg):	21	7%	Vitamin B6 (mg):	.3	13%
Sodium (mg):	1160	48%	Vitamin B12 (mcg):	.4	6%
Potassium (mg):	511	15%	Thiamin B1 (mg):	.7	45%
Total Carbohydrate (g):	51	17%	Riboflavin B2 (mg):	.3	19%
Dietary Fiber (g):	4	15%	Folacin (mcg):	114	29%
Protein (g):	14	29%	Niacin (mg):	5	24%
Calcium (mg):	115	12%	Caffeine (mg):	0	N/A
Iron (mg):	3	17%	Alcohol (kcal):	0	N/A

Food Exchanges:

Starch/Bread	2 1/2	Vegetable	1/2	Non-Fat Milk	0	Other Carbo.	0
Lean Meat	1	Fruit	1/2	Fat	2		

OK

Print

%Daily Value Based On:

2000

Calories

Nutrition Analysis, Lunch Day 3

Nutrition per Serving
? x

Calories (kcal): 616

% Calories from Fat: 29

% Cal. from Carbohydrates: 53

% Calories from Protein: 18

Cost: 0.00

Recipes (or Ingredients):

		Servings
corn tortilla	1	1
olive oil	1	1
refried beans	1	1
boneless chicken	1	1
avocado	1	1

Nutrition Facts/Percent Daily Values Per Serving

Total Fat (g):	20	31%	Zinc (mg):	3	21%
Saturated Fat (g):	3	15%	Vitamin C (mg):	42	69%
Monounsaturated (g):	13	57%	Vitamin A (IU):	2135	43%
Polyunsaturated (g):	3	13%	Vitamin A (RE):	216	22%
Cholesterol (mg):	33	11%	Vitamin B6 (mg):	.9	43%
Sodium (mg):	962	40%	Vitamin B12 (mcg):	.2	4%
Potassium (mg):	1371	39%	Thiamin B1 (mg):	.7	46%
Total Carbohydrate (g):	84	28%	Riboflavin B2 (mg):	.4	26%
Dietary Fiber (g):	11	44%	Folacin (mcg):	159	40%
Protein (g):	29	57%	Niacin (mg):	13	65%
Calcium (mg):	172	17%	Caffeine (mg):	0	N/A
Iron (mg):	6	32%	Alcohol (kcal):	0	N/A

Food Exchanges:

Starch/Bread	4 1/2	Vegetable	3	Non-Fat Milk	0	Other Carbo.	0
Lean Meat	2	Fruit	0	Fat	3 1/2		

OK
Print
%Daily Value Based On:

Calories

Nutrition Analysis, Dinner Day 3

Nutrition per Serving
?
×

Calories (kcal): 414	Recipes (or Ingredients):	Servings
% Calories from Fat: 41	orange juice	6
% Cal. from Carbohydrates: 37	lime juice	6
% Calories from Protein: 21	grapefruit juice	6
Cost: 0.00	achiote paste	6
	chicken	6

Nutrition Facts/Percent Daily Values Per Serving

Total Fat (g): 21	33%	Zinc (mg): 2	15%
Saturated Fat (g): 6	28%	Vitamin C (mg): 33	55%
Monounsaturated (g): 8	37%	Vitamin A (IU): 1358	27%
Polyunsaturated (g): 5	21%	Vitamin A (RE): 365 1/2	37%
Cholesterol (mg): 117	39%	Vitamin B6 (mg): .6	29%
Sodium (mg): 519	22%	Vitamin B12 (mcg): 1.3	21%
Potassium (mg): 492	14%	Thiamin B1 (mg): .2	13%
Total Carbohydrate (g): 43	14%	Riboflavin B2 (mg): .3	15%
Dietary Fiber (g): 4	18%	Folacin (mcg): 69	17%
Protein (g): 25	49%	Niacin (mg): 9	45%
Calcium (mg): 27	3%	Caffeine (mg): 0	N/A
Iron (mg): 3	14%	Alcohol (kcal): 0	N/A

Food Exchanges:

Starch/Bread	2	Vegetable	0	Non-Fat Milk	0	Other Carbo.	0
Lean Meat	3	Fruit	1/2	Fat	2 1/2		

OK
Print
%Daily Value Based On:

Calories

(Recipe for Pollo Pibil from MexicanRecipes.me with added corn masa to better resemble the food I ate)²⁷