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April 20, 2011

Corn is their Blood, Corn is their Dollars: Analyzing the cultural and economic value of corn
between Mexico and the United States

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Abstract

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By Andrea Lewis

Corn is the pride of Mexico and the blood of the Mexican people. Since prehistoric Mexico, when the Mayans and Incas inhabited Mesoamerica, corn has been an essential crop to everyday life from extensive religious activity to daily nutrition. Today the crop is used in Mexico in many different ways from cuisine to bio fuel. Corn originated in Mexico and because of this, there is great pride in the cultivation of the crop. Farmers in rural areas still perform harvesting rituals to evoke the benevolent spirits of corn gods. The use of corn in many Mexican dishes and the traditional methods that rural farmers still use both show the importance of corn in Mexican culture. However, in the past few decades, Mexico has had to import corn from the United States due to a growing population and demand. Consequently, domestic corn production has suffered since the implementation of the North American Free Trade agreement and Mexico continues to import growing amounts of corn from the United States. With this increase in corn importation, controversy has arisen due to the amount of transgenic corn that has crossed the border from the U.S. into the corn fields of Mexico. Many activists fear that transgenic corn is a threat to native Mexican strands and a threat to Mexican culture. In my thesis, I will answer how important corn is to the Mexican culture today, how NAFTA has changed Mexican views on corn and how an economically changing Mexico will affect the cultural significance of corn. I will answer these important questions by showing the cultural importance and relevance of corn today in Mexico and what measures are being taken to protect domestic corn production. Also, I will show how transgenic corn is threatening Mexico's native corn strands and how changes within the tortilla industry show how a changing Mexican economy is affecting the cultural value of corn.

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“Corn is our mother.”

- **Richard I. Ford**

Introduction

Corn is the golden gift from the gods. Corn is the pride of Mexico. Corn is the blood of Mexican people. Corn is their mother.

Since prehistoric Mexico, corn has been a very important crop in the Mexican culture. Some ten thousand years ago, the ancestors of present day Mesoamerica domesticated the crop and built cities whose culture still resonates today. By the time the Mayans, Aztecs and Incas populated present day Mexico, corn was the staple food item and integral part of Mesoamerican religious life. The Aztecs worshipped corn gods and other earth gods that governed the earth. They also performed rituals that included song, dance, and human sacrifices. The Aztecs also began to revolutionize corn cuisine with the creation of tortillas. Corn became one of the main sources of nutrition for the Aztecs and was an integral part of their religious life.

Corn originated in Mexico, and because of this, there is much pride in the cultivation of the crop. The crop is used in many different ways from cuisine and animal food to ethanol and bio fuel. Modern Mexican cuisine uses corn in numerous dishes. Common Mexican foods such as atole and tamales are both made from corn. Corn used in Mexican cuisine represents the

indigenous side of Mexican culture and the vested interest in the crop.

Rituals to worship corn gods are still practiced by Mexican farmers today. Planting corn is still viewed as a sacred act and many farmers in rural areas pray and fast before they begin the planting season. The Tlamanes, a corn festival, is practiced in Nahua, Mexico and includes dance, music and food. The people of the community ask the gods for a plentiful harvest season and praise the gods for what they have already given to the community. In addition to Tlamanes, various regions across Mexico have corn wrapping rituals and dances to evoke the corn god and earth god spirits.

Although corn is very important culturally in Mexico, the country has imported corn from the United States to feed their growing population since the nineteen forties. The importation of corn from Mexico has created a conflict between the cultural and economic value of corn. During the past few decades, the amount of corn imported, specifically yellow corn, has drastically increased since the implementation of the North American Free Trade Agreement. In addition, transgenic corn has traveled to the corn fields of Mexico which has caused an uproar and controversy over the health of native corn strands. There are many non-governmental groups and agencies who have waged a

war against transgenic corn in Mexico. Also, the Mexican government has begun to support producers of white corn in recent years to maintain the traditional culture of corn. However, due to growing demand, Mexico still has to import corn from the United States.

As more activists and organizations fight for the preservation of Mexico's precious cornfields, several questions arise that I will answer in this thesis. The first question is how important is corn to the culture of Mexico? Secondly, how has NAFTA changed Mexican views on corn? Lastly, how is an economically changing Mexico affecting the cultural significance of corn? I will answer these questions by showing the cultural importance and relevance of corn today in Mexico and what measures are being taken to protect the domestic corn production in the country. Also, I will show how NAFTA has greatly affected Mexican corn production, how the onset of transgenic corn is threatening Mexico's native corn reservoir and how changes within the tortilla industry show how a changing Mexican economy is affecting the cultural value of corn.

Although Mexico is economically advancing and the country is moving towards more neo-liberal strategies that can ultimately harm domestic corn production, the cultural value of corn, which has been created and embodied in the Mexican people

for thousands of years, can't be lost by any cost. Transgenic corn, that has crossed the border through NAFTA trade, threatens and can possibly destroy corn biodiversity in Mexico. The biodiversity of corn mirrors the cultural diversity of Mexican people and corn is a significant part of the Mexican culture. Therefore, there are measures the Mexican government could take to protect the cultural and biological value of corn. One such measure is to subsidize domestic corn production and relevant industries and by investing in the traditional cultivation of corn in Mexico.

Chapter 1: Fundamentals of Corn

Biological properties of Corn

Corn is a domesticated warm weather annual that developed in the Americas. It is a deep-rooted plant that needs constant moisture to develop best. From a single seed, a stalk can grow from two feet to twenty feet pending the growing conditions.¹ The stalk of the corn crop has very distinct tassels that are characterized by their thick terminal spikes. Large smooth leaves that can be more than two feet long are attached to the stem nodes. Side shoots, which may produce seeds, rise at the base of the corn stem and female flowers are attached on an ear near the middle of the stem. Typically, one to three ears develop from the female flowers of corn. The corn plant's flower organs and grain kernels are surrounded by several layers of husks. The stigmas from the flowers, which look like strains of silk, emerge from the ends of the ears and husks. Simultaneously, the pollen from the tassels is released which germinates the stigma. A pollen tube grows down through the silk to the egg of the female flower where the male sperm fertilizes the egg and a kernel develops.²

Corn kernels come in various shapes and sizes. They may be only an eighth inch long or they can be as large as half an inch long. The kernel consists of an outer thin covering, the

¹ Purdue University Center for New Crops and Plant Products, *Corn*, <http://www.hort.purdue.edu/newcrop/crops/corn.html> (Feb. 18, 1999).

² <http://www.hort.purdue.edu/newcrop/crops/corn.html>.

endosperm, and the embryo which is the plant structure that develops into a new plant if the seed is planted and grows.

Origin of Corn

Many theories place the origin of corn in Mesoamerica where the earliest remains of corn were found dating back to 3400 B.C. John L. Stephens and Frederick Catherwood were the first explorers to describe the lost cities of the Mayas to Europeans and Americans.³ The Mayan peoples and their peers not only built the cities that Stephens and Catherwood awe-strickenly described, but created a civilization whose culture still survives throughout Mesoamerica. The ancestors of Mesoamerican culture can be traced back to the Pleistocene Ice Age ten thousand years ago.⁴ During the Archaic period, between five thousand and three thousand years before Christ, the descendants of the earliest Mesoamerican peoples brought about the domestication of corn. Initially, corn cultivation was minimal due to the processes of domestication. However, after several thousand years, corn had become one of the most substantial crops in the Mesoamerican diet.

³ Robert M. Carmack, Janine Gasco, Gary H. Gossen. *The legacy of Mesoamerica, History and culture of a Native American Civilization.* (New Jersey: Pearson Education, 2007), 38.

⁴ Carmack, Gasco, and Gossen, 39.

The earliest forms of corn are from Oaxaca and Tehuacán.⁵ Around 3400 B.C., corn (*Zea mays*) had developed from its wild ancestor teosinite (*Zea mexicana*) through genetic mutation and cultural selection. When corn was combined with beans, it produced a complete protein and this combination of food became the foundation of the Mesoamerican diet. Although Mesoamerica was rich in domesticated plants, it was populated by very few domesticated animals. Only turkeys and dogs were known to be domesticated which Mesoamericans used for food and consequently, corn became the staple food item.

It is theorized that the indigenous ancestors of the Mesoamerican peoples domesticated corn and because of this, there are various folk tales and legends about the origin of corn which are still told in the Mexican culture today. Although there are many legends about the origin of corn in Mexico, the god, Quetzalcóatl, is a common character in most legends. Quetzalcóatl is the god of creations and giver of life.⁶ In the legend of the fifth sun, after the destruction of the last world, the fourth sun, Quetzalcóatl went to Mictlan, the land of the dead and created the current world, the fifth sun. The current world was created with his own blood and he gave life to humanity by giving them corn. After the creation of

⁵ Carmack, Gasco, and Gossen, 43.

⁶ Earl Shorris, *The Life and Times of Mexico* (New York: W.W Norton & Company, 2004), 26.

human beings in the new world, the other gods and Quetzalcóatl realized that his work was not done because the humans needed food to survive. Tlloac, the god of rain, told Quetzalcóatl that the food the humans ate in the other worlds were not sufficient for the fifth sun because these humans were real humans unlike the humans that walked the other four worlds. Consequently, the gods had to find real food for the real human beings. When Quetzalcóatl thought about real food, he saw a small ant that had a kernel of corn. Quetzalcóatl traveled to the world and asked the ant about the corn kernel. The ant didn't say anything but continued walking. Quetzalcóatl then transformed into an ant and followed the ant to a mound that was called the "mountain of corn." Quetzalcóatl then took corn from the mountain and ate it. Afterwards, Quetzalcóatl took the corn and gave it to the human beings and this is how corn originated in Mesoamerica.⁷

One variation of the origin of corn that comes from the people of the Gulf Nahuas and Popolucas does not tell the story of Quetzalcoatl. Their variation tells the story of the plant child known to the Popolucas as Homshuk and Sinitiopiltzin to the Nahuas.⁸ To both regions, the plant child is known as the Corn Master, who is a dwarf three feet tall with hair of

⁷ Bibliotecas Virtuales, *La Leyenda del Maíz*,

<http://www.bibliotecasvirtuales.com/biblioteca/Narrativa/leyendas/laleyendadelmaiz.asp> (Sep. 16, 2008).

⁸ Jacques M. Chevalier, Andrés Sánchez Bain, *The Hot and the Cold: Ills of Humans and Maize in Native Mexico* (Toronto: University of Toronto Press, 2003), 173.

cornsilk. The corn master develops with the corn and when corn ears are small, he is a young boy with golden yellow hair. As the corn matures, he grows older until he is an old man with dry brown hair.⁹ In most Nahua versions of the origin of corn, the story begins with an elderly couple finding two eggs in a field. The pair eats one egg and saves the other from which a boy is born. This boy grows up to become the corn god and goes on a pilgrimage to the burial ground of his father, the place where men are dry, and searches for immortality.¹⁰ The corn god eventually brings corn to the village after his quest to find his real father is completed. For the regions of the gulf Nahuas and Popolucas, this is how corn originated in Mesoamerica.

No matter if the main character is Quetzalcóatl or the Corn god, the legends of how corn originated in Mesoamerican are important to the Mexican culture as Mexico is the center of origin for the crop.

⁹ Chevalier and Bain, 173.

¹⁰ Chevalier and Bain, 174.

**Chapter 2: Corn and Early
Mesoamerican Life**

Corn was an essential element to religious rituals and sacrificial offerings to major gods during the year. Therefore, the crop was central to Mesoamerican religion. Although the crop was very important in the religious lives of the Aztecs and the Mayas, the contents of this section will focus solely on the Aztecs and their early practices.

Corn and Early Mesoamerican life

The gods of the Aztecs can be grouped in three categories, the gods of agricultural fertility and earth, the gods of creation and cosmological cycles and the gods of war and human sacrifice.¹¹ In prehistoric Mexico, the Aztecs worshipped corn gods. Centeotl was the masculine god of corn. In the Tonoalpohualli, a Mesoamerican calendar, Centeotl is the god of the days with the number seven and he is the fourth god of the night.¹² At the beginning of the year, the Aztecs planted corn and danced to worship Centeotl. Women were very important in the worship of Centeotl and each woman took five ears of corn and brought them to the city where the people danced, sung and worshiped. The five ears of corn represented the feminine god of corn, Chicomecóatl, and the women put the ears of corn in a basket where they remained for one year. The corn in the basket

¹¹ John E. Staller, *Maize Cobs and Cultures: History of Zea Mays L* (New York, Springer, 2010), 62.

¹² Kaye Almere Read, *Time and Sacrifice in the Aztec Cosmos* (Indiana: University of Indiana Press, 1998), 45

represented the rest of the corn spirits and were saved until the next harvest.

In addition to Centeotl, Chicomecóatl was the other god that the Aztecs worshipped. Chicomecóatl is the counterpart of Centeotl and corn is their symbol. Chicomecóatl, which means seven serpents, was the feminine god of corn in Aztec culture and was also the goddess of food. She was shown in three forms: as a girl with flowers, a woman who brought death with her arms, and as a mother who used her son as a shield.¹³ During the middle culture of pre-historic Mexico, the Aztec sacrificed a young girl every September to represent Chicomecóatl. In the ceremony, the girl was decapitated and her blood was poured over a figurine of the goddess. This ceremony was very important because it was a form of worship for Chicomecóatl and kept the cosmos in balance as the Aztecs began the planting season. Like the dancing ritual for Centeotl, this ritual was necessary in order to have favor with the gods.

Another important religious ritual that the Aztecs performed revolved around the festival of Toxcatl. The entire ritual was dedicated to, Tezcatlipoca the god of the Smoking Mirror.¹⁴ The Lord of the Smoking Mirror, Tezcatlipoca was associated with the earth's surface and in the east, his color

¹³ El Museo del templo mayor, *Chicomecóatl*, <http://archaeology.asu.edu/tm/pages2/mtm63.htm> (Jan. 14, 1998)

¹⁴ Staller, 63.

was yellow referring to the rising sun and the fruitfulness of corn. Ears of corn, turkey, quail and fish were offered to the god at the temple of Tezcatlipoca where young girls carried out processions dressed in shirts and skirts covered with strings of corn. They wore crowns of corn on their heads and their faces were also adorned with strings of corn. The people participating in the festival wore necklaces made of corn and once they returned to their homes, they ate large plates of corn dough mixed with honey to end the ceremonies.

The color of corn kernels were also very important in the celebration and worshipping of Aztecan gods. A porridge made from purple maize was offered to Camaxtli, the god of hunting during the seventeenth month of the calendar.¹⁵ Blue corn and flour were offered to the waters of the Chinampas in order to have a successful harvest. Corn was also believed to have protective powers. When Aztec warriors were off at war, the women would make tortilla and wine offerings before statues. They would then chant and moan, praying to the gods of war to bring their men back home safely.¹⁶ The funerary rituals for killed warriors also included corn. The ceremony included four days of singing, chanting and drum playing. On the last day, ashes were wiped across the faces of the deceased. The widows

¹⁵ Staller, 63.

¹⁶ Staller, 67.

then had to make offerings for five consecutive days which consisted of breads and cooked corn.¹⁷

Besides rituals, corn held a significant role in everyday life because it was the major source of nutrition. The Aztecs prepared corn in very special and distinct manners. They used corn to make tortillas that is still a very common food in Mexico today. First, they soaked the kernels in lime and ashes. Then they cooked the kernels and smashed them into a type of paste. The paste was then used to create tortillas. Because corn was very important, parents taught their children how to respect the corn gods and children had a strict schedule for eating tortillas. When children were less than six years old, they could only eat half of a tortilla daily. When they turned thirteen, adolescents were then allowed to eat two tortillas a day like adults and it was considered a rite of passage into adulthood.¹⁸ Because corn was the most vital food in the Aztec culture, they cultivated a plethora of corn and had extensive and complicated cornfields. For a great harvest, the Aztecs continuously worshiped the corn gods throughout the harvesting and planting season.

¹⁷ Staller, 67.

¹⁸ Lorena Garcia, *Corn: The Golden Gift from our Ancestors*, http://dnn.epcc.edu/nwlibrary/borderlands/09_corn.htm (Jan. 25, 2011).

The cultural importance of corn began with the Mayans and Aztecs and would carry significance until present day Mexico even when the Spanish arrived and brought horses and wheat during their conquest of the New World. Since that pivotal moment in history, corn would always represent the indigenous culture of Mexico and corn would always hold important cultural significance. The value of corn was vested into Mexico with thousands of years of cultivation, planting, harvesting and rituals. Consequently, its cultural value was not threatened by the introduction of wheat from the Spanish.

Chapter 3: Corn in Mexico Today

Corn in Mexico is used in a variety of different ways. The main use of corn is for nutritional value in hundreds of Mexican dishes. The second most important use of corn in Mexico is for animal feed for pigs, chickens and other animals. Corn is also used for bio fuel for machinery and equipment and as filler for packaging materials.

Food

Corn was very important to the ancient Mesoamericans and continues to be one of the primary foods in modern Mexican dishes. Given the cultural and nutritional importance of corn, there are many different ways to prepare corn and different dishes that can be created using the crop. Tortillas, flat corn cakes, have been the most prevalent food created from corn and were eaten by the Aztec and Maya thousands of years ago. Not only are they easy to eat, they can be cooked ahead of time and stored to be eaten later. Tamales are dough balls made of corn that are steamed in pots. They are often filled with chile, meat and other vegetables. Pozole is a soup made from corn kernels that is usually served for dinner. Atole, a breakfast food, is an oatmeal type mixture made of grounded corn that is usually flavored with fruit and sugar. Corn can also be eaten fresh off the cob flavored with butter or margarine or it can be picked

off the corn and served as a side dish. There are hundreds of more dishes that can be prepared using corn but the presence of the crop in everyday Mexican food is important as it represents the indigenous culture of many Mexicans.

When the Spaniards arrived in Mexico, they introduced many crops and objects to the land including wheat. Because of this, there has been a cultural conflict between corn, which represents the indigenous culture, and wheat, which represents the Spanish culture.¹⁹ This battle is present in Mexican food and can be seen in the production of tortillas. There are corn tortillas as well as wheat tortillas that are produced and sold in Mexico. Although wheat tortillas are more common than those made of corn because they are easier to make, corn tortillas are considered the authentic tortillas because they are created in the same manner that the indigenous people of Mexico created and ate. As a result, corn in Mexican food is a potent symbol of the indigenous culture in Mexico.

Rituals

Rituals to worship corn gods and spirits are still practiced in Mexico. Throughout the country, farmers and

¹⁹Shorris,79.

communities perform numerous corn planting rituals. Planting is viewed as a religious, sacred act and many farmers fast and pray before they begin the act of planting. They also host a sacred ceremony that includes the use of food, drink and incense offerings to prepare their mind for the planting season. Farmers must also perform rituals with other priests in community-wide ceremonies and if these rituals are not performed, there can be major consequences such as a poor harvest.²⁰ Farmers perform corn planting rituals to please the earth that controls growth and prayers are directed towards the center of the field which is considered the heart. During the harvest, corn plants that yield multiple ears from the center of the field are valued. The strongest and best ears become corn guardians that keep the corn from harm during storage. These ears are saved until the next harvest.

The Tlamanes is a ritual that is practiced in the community of Nahua, Mexico. The festival occurs two times a year, in May and in October. The first festival, that takes place before the beginning of the rain season, occurs to ask the gods for a successful harvest and sufficient rain. The second celebration, Tlamanes, is more important and last over two days.²¹ Most of the festival occurs in the corn fields and Tlamanes is a time

²⁰ Christine A. Hastorf and Sissel Johannessen, eds., *Corn and Culture in the Prehistoric New World* (Boulder: Westview Press, 1994), 482.

²¹ México Creativo, *Chilocuil*, <http://www.mexicocreativo.org/chilocuil/> (Sep. 1, 2003).

when the community celebrates together with dance, music and food. During Tlamanes, the people ask the gods for permission to harvest corn. During the celebration, it is common that the people of the community offer their first cobs of corn to the gods as a form of tithing. In some rituals, they cut the cobs to prepare a beverage that they drink to worship the gods and the first fruits of their harvest. There are many rituals and variations of the celebration, Tlamanes, however, all of the festivals and rituals show how important corn still is in the Mexican culture today.

In Mitla, Oaxaca, the wrapping of an ear of corn in cotton is very significant. When an ear of corn is chosen to host the corn spirit at harvest, the ear is dressed, placed on an alter and incensed.²² It is then wrapped in white cotton and taken to the field where the corn will be planted. At the corn planting, which includes a ceremony with song and dance, the ear of corn is wrapped in deerskin and carried to priests to be left in a shrine. After the harvest, the ritual corn is thanked, broken up and distributed. Farmers in Tepotzlan, Mexico still offer prayers in the language, Nahuatl, to corn grains as well as give fiestas to the corn to make the crop happy.

²² Hastor and Johannessen, eds., 495.

The use of corn in many classic Mexican foods and the presence of corn rituals in the fields of Mexico show how important the crop still is in Mexican culture. Although these rituals are not performed in every cornfield, they are practiced by enough farmers who understand and appreciate the importance and value of corn. For thousands of years, Mexican people have been using corn for religious, nutritional and cultural purposes. These values are still present in Mexican culture today despite the onset of a changing and modernizing Mexican economy.

Chapter 4: NAFTA

Corn is culturally important in Mexico and has been since the Mesoamerican period. However, the country has had to import corn from other countries due to its growing population. The import of corn into Mexico has changed drastically since the implementation of the North American Free Trade Agreement.

NAFTA

The North American Free Trade Agreement is a treaty that began on January 1st 1994 between Mexico, the United States and Canada. Under the agreement, all non-tariff barriers between the three countries were eliminated. In addition, many tariffs were eliminated immediately and others were phased out between a span of five to fifteen years. On January 1, 2008, the treaty allowed for an orderly adjustment with full implementation.²³

Since the implementation of NAFTA, all agricultural products are free of tariff protection between Mexico, the United States and Canada. In Mexico however, there were partial tariffs on corn, beans, sugar, poultry meat and milk.²⁴ Mexico

²³ United States Department of Agriculture, *North American Free Trade Agreement*, <http://www.fas.usda.gov/itp/Policy/NAFTA/nafta.asp> (Sep. 2, 2010).

²⁴ Manuel Chávez, Juan M. Rivera, Scott Whiteford, *NAFTA and the Campesinos: the impact of NAFTA on small-scale agricultural producers in Mexico and the prospects for change* (Chicago: University of Scantrom Press, 2008), 1.

has had very little to gain and much to lose from NAFTA. Studies conducted by organizations of producers and academic groups have reached conclusions that NAFTA has jeopardized the domestic production of Mexico's most important foods, including corn and other agricultural products.²⁵ In the year 2002, the World Bank came to a similar conclusion that the rural sector has seen the most drastic structural reform but has seen the most disappointing results. They have experienced stagnant growth, lack of competitiveness in the international market, and an increase in poverty in rural areas.²⁶ The Mexican agricultural sector is in open and total competition with the United States and Mexico has suffered due to disparities in resources and U.S. government subsidization.

Corn is the single most important crop in Mexico. Corn accounted for thirty three percent of the total value agricultural production in country out of two hundred and twenty two goods in 1990.²⁷ Most of the corn production is of the seasonal, rain-dependent type. Eighty-six percent of the total amount of corn produced in Mexico is during the spring-summer cycle, with the harvest season between September and January. Four Mexican states contribute over fifty percent of the corn produced in the country.

²⁵ Chávez, Rivera, Whiteford, 1.

²⁶ Chávez, Rivera, Whiteford, 2.

²⁷ Chávez, Rivera, Whiteford, 89.

The United States is also a main producer of corn within the NAFTA region. The U.S. produces fourteen times as much corn as Mexico.²⁸ On average, the U.S. yields seven tons per hectare compared to between two hectares and four hectares in Mexico depending on the region and time of season. The majority of corn producers in Mexico are small farm holders working on small parcels or communal land. Currently, there are around four million farmers in Mexico who are classified into two groups. One group is considered small agricultural producers with plots of land less than five hectares that yield an average of two tons per hectare. This group represents two-thirds of the total corn producers in Mexico and fifty seven percent of their harvest is used for personal consumption. The remaining farmers have plots over five hectares of land producing a little over three tons per hectare. Around fourteen percent of their harvest is used for personal consumption.²⁹ The disparities in corn production between these two groups are evident. Mexican corn production compared to U.S. corn production is even more drastic.

Mexican corn production has many reasons to restructure and improve. The trade liberalization that NAFTA brought, the decreasing agricultural protection, and the small competitive advantages are examples. It was expected that the small corn

²⁸ Chávez, Rivera, Whiteford, 90.

²⁹ Chávez, Rivera, Whiteford, 90.

producers who plot on less than five hectares would leave the market due to unfavorable circumstances, but total corn production in Mexico has increased from eleven tons in 1988 to eighteen tons in 1999.³⁰ However, the increase in corn production is still not enough for Mexico's growing population and they still have to import corn.

Corn in Mexico received special treatment within the NAFTA agreement. NAFTA grouped products into various categories, depending on the timing needed for the gradual elimination of trade tariffs. The tariffs of some agricultural products were eliminated in five, ten or fifteen years³¹. Corn was one of the very few agricultural products with a long transitional period of fifteen years. According to the NAFTA protocol, Mexico could import two and a half million tons of corn from the United States duty free. The Mexican government could impose import tariffs for any imports of corn that were above this annual duty-free amount. In the NAFTA years, the demand for corn has outgrown the Mexican production, and imports from the United States have consistently exceeded the duty-free threshold. The annual demand for corn in Mexico is at an average of twenty four

³⁰ Chávez, Rivera, Whiteford, 90.

³¹ Chávez, Rivera, Whiteford, 91.

million tons and the country can only produce eighteen million tons per year.³²

Although corn is very important in the Mexican culture, Mexico simply does not produce enough corn to feed its growing population. Consequently, they have to import corn from the United States. Eighty percent of corn consumed in Mexico is produced in Mexico.³³ The other twenty percent is produced in the United States. There are two types of corn imported from the United States, yellow corn and white corn. Yellow corn is mainly used as feed for animals such as birds and pigs. White corn is used in tortilla production as well as other food products for human consumption. Yellow corn is the majority of corn imported from the United States.³⁴ Due to the North American Free Trade Agreement, the importation of yellow corn has increased in the past decade. However, since 2000, the importation of white corn has declined.

There are many reasons for the importation of corn from the United States. First, the production of corn in the U.S. and Mexico are very different due to the disparities and quality of resources in both countries. According to the International Agriculture Dairying in Mexico Seminar, producers in the U.S.

³² Chávez, Rivera, Whiteford, 91.

³³ http://dnn.epcc.edu/nwlibrary/borderlands/09_corn.htm

³⁴ International Agriculture, *Dairying in Mexico Seminar*, <http://www.dairynutrient.wisc.edu/375/page.php?id=332> (Nov. 9, 2005).

have an average of two hundred and seventy hectares of land of which a third is used for the production of corn. In addition, producers in the U.S. have efficient machinery, such as tractors, that aid them in the cultivation of crops. As a result, U.S. producers can produce eight and a half metric tons of corn per hectare. On the other hand, producers in Mexico have on average, five to ten hectares of land.³⁵ Also, many of Mexican producers do not use tractors to cultivate corn and have issues irrigating the land. If the land is irrigated, and the producer has basic machinery, a Mexican producer can produce about five and eight tenths of corn. However, if the land is not irrigated, producers can produce as little as two metric tons of corn. Also, the number of small producers in Mexico has declined in the past decade. The main reason for this decline is the reduction in the amount of agricultural loans given to small producers. Because of this, small producers can't support their businesses because they do not have the necessary resources to produce and cultivate corn.

The difference in the quality of land and machinery together with the decline in small producers has created the bigger need to import corn from the United States. In addition to the disparities in the production of corn between the two

³⁵ <http://www.dairynutrient.wisc.edu/375/page.php?id=332>.

countries, there is a growing demand for corn in Mexico due to a growing population. White corn specifically is in constant demand because it is used to make tortillas, which is a classic Mexican food. Also, the population of Mexico is growing and the demand for food is growing in general.

The North America Free Trade Agreement has changed the quantity of corn imported from the United States to Mexico. The treaty was signed by the governments of the U.S., Canada and Mexico in 1994 to eliminate the barriers of trade between the three countries to promote a healthier and more economically beneficial trade relationship.³⁶ The implementation of NAFTA in 1994 immediately eliminated the barriers between the United States and Mexico. Within ten years of the initial implementation, all barriers between the three countries were eliminated completely with the exception of some agricultural goods, like corn, that were slowly eliminated in fifteen years. On January 1, 2008, all barriers on the importation of corn and other crops were eliminated.

Although the importation of corn into Mexico has increased because of the North American Free Trade Agreement, there are certain characteristics about the importation of corn from the U.S. that remains constant. For example, yellow corn is imported

³⁶ Secretariado del TLCAN, *NAFTA*, <http://www.nafta-sec-alena.org/sp/view.aspx?conID=590> (Mar. 3, 2009).

more than white corn. Before NAFTA, the exportation of corn was controlled by product licenses. However, with these licenses, the importation of corn on average was three million metric tons during the eighties.³⁷

From 1998 to 2002, Mexico imported large quantities of white corn from the United States. White corn made up fifteen percent of corn imported from the U.S. during this four year span versus two percent in 1996-1997. In general, the importation of corn has grown two hundred and forty percent since NAFTA was implemented.³⁸ In 2003, Mexico imported around eight metric tons of white and yellow corn. However in 2002, the Mexican government began to support producers of white corn in an effort to preserve Mexican culture and white corn tortilla production. Consequently, the amount of white corn imported from the United States has declined since 2002.

NAFTA has drastically changed corn production in Mexico. The treaty has made corn production for small Mexican farmers more difficult as they struggle to compete with U.S. farmers who have better resources and subsidization from the U.S. government. The country continues to import large amounts of corn, mainly yellow corn, from the United States. Despite the

³⁷ United States Department of Agriculture, *U.S.-Mexico Corn Trade During the NAFTA Era: New Twists to an Old Story*, <http://www.ers.usda.gov/publications/FDS/may04/fds04D01/fds04D01.pdf> (May 1, 2004).

³⁸ <http://www.ers.usda.gov/publications/FDS/may04/fds04D01/fds04D01.pdf>.

economical advantages that NAFTA brings, many activists and citizens fight to protect Mexico's corn reservoir. NAFTA directly affects the amount of transgenic corn that is imported into Mexico and it is extremely important that the Mexican government take measures to protect the biodiversity of corn and domestic corn production. The Mexican government can do this by subsidizing domestic corn production and by investing in the traditional cultivation of corn by rural farmers. By taking these steps, the Mexican government can increase domestic corn production, reduce the amount of corn imported from the United States, protect the biodiversity of Mexican corn, and thus preserve the cultural value of corn in Mexico.

Chapter 5: Transgenic Corn

Mexico is the center of origin for corn and is the home of over sixty different races of the crop. During the past two decades, genetically modified corn has found its way into Mexican cornfields which has caused an uproar among activists and non-governmental agencies who argue that genetically modified corn threatens the health of native races.

Transgenic Corn

There is much controversy over the use of genetically modified corn in Mexican corn fields. Some scientists have discovered that genetically modified (GM) corn has been unknowingly sown and is breeding with native strains. In 2001, scientists, Ignacio Chapela and David Quist from the University of California at Berkley discovered traces of GM corn in samples taken from remote mountain villages in Oaxaca, Mexico.³⁹ The discovery was surprising because there has been a moratorium on genetically modified corn in Mexico since 1998. Chapela and other activists argue that GM genes threaten the biological diversity of native Mexican corn.

Genetically modified foods that are vitamin enhanced and pest resistant have been the products of recent advances in biotechnology. Genetic modifications are created by inserting specific genes into plants or animals to get desired

³⁹ Michael, O'Boyle, *Breaking with tradition*, Business Mexico 12 (June 2002) 52-55.

characteristics. In the case of corn, the desirable characteristics are resistance to insects and herbicides. Genetically modified corn was commercially released in 1996 but has been in development for over twenty years.⁴⁰ Although there have been no health risks of GM foods approved for human consumption, activists and critics are more concerned about the effects of GM corn on native corn and its environment. Mexico is where corn was first cultivated and is home to at least sixty identified Mexican corn varieties with more awaiting classification. Many critics fear that GM corn will eventually displace native strands and Mexico would lose a huge genetic reservoir. Transgene introgression can occur if genetically modified corn offers a survival advantage to some varieties, which might out-compete related plants that carry potentially valuable characteristics. Some scientists think that these effects will not be significant or severe at all, which is the official argument of the CGIAR's International Center for Maize and Wheat Improvement.⁴¹ However, CIMMYT has ensured that its seed collections are not infected with transgenic corn. If gene flow from transgenic crops causes any of these problems, the risk of harm is greater in centers of genetic diversity and regions like Mexico.

⁴⁰ O'Boyle 53

⁴¹ Gerardo Otero, *Food for the Few*, (Austin: University of Texas Press, 2008), 76.

A particular form of genetically modified corn that poses a significant threat to native strands is Bt maize. Bt maize is a variety of corn that has been genetically modified to produce its own insecticide, a bacterium, *Bacillus thuringiensis*.⁴² Concerns also arise if corn is modified with the "terminator gene," a gene that makes the seeds of a plant sterile which could lead to native strands becoming infertile. Also, pests and insects are becoming more resistant to Bt which poses the issue of the development of new pests who are completely immune to the bacterium. This could be a further problem as the pest that the Bt maize was created for is not present in Mexico and close relatives of the pest could become resistant to the Bt toxin if exposed to Bt corn. In 1998, the Mexican government banned the cultivation of transgenic corn however, it has not been enough to prevent Bt corn from entering Mexico.

In Mexico, only controlled, experimental planting of genetically modified crops was allowed. However, there is a current moratorium on the planting of GM corn. But, since the implementation of NAFTA in 1994, the importation of yellow corn from the United States has increased drastically. In 2001, Mexico imported six million tons of yellow corn.⁴³ Between thirty and forty percent of the corn imported was GM corn and it was

⁴² Otero, 278.

⁴³ O'Boyle 54

mixed with non-genetically modified corn. Although yellow corn is meant to be used as animal feed or as material to make tortillas, corn syrup and other products, it is believed that some farmers have unintentionally planted some GM corn in their fields. Another possible source of transgenic corn in Mexican cornfields is corn seed shipped by relatives in the United States or brought back from the U.S. by Mexican immigrants. Corn is a food staple in Mexico and for many Mexicans, the invasion of GM corn is not just an environmental issue but a cultural one.

Besides economic and consumption purposes, corn holds a strong cultural significance. Mesoamerican ruins and murals show corn as a sacred symbol of life and indigenous legends tell of how the gods created men from corn.⁴⁴ It is to no surprise that genetically modified corn has sparked political debates and actions. Senate commissions are thinking of an initiative to ban the import of GM corn from the United States. Also, the Chamber of deputies has been creating bio-security laws that have made many biotech industries wary.

There are also several groups in Mexico who strongly oppose genetically modified corn. One of them is the Mexican chapter of Greenpeace, a non-governmental organization whose main goal is

⁴⁴ Shorris, 26.

to preserve the earth. Greenpeace is one of the most vocal nongovernmental organizations who began to target genetically modified corn in 1998.⁴⁵ Greenpeace uses the symbolic power of corn to make its stand against GM corn. The organization uses a very resonant nationalist and anti-imperial attitude that is still among the Mexican population to its advantage. For example, in 1999, the *Angel de la Independencia*, a monument to the heroes of the Independence in Mexico City, and a historic fortress in Veracruz have been symbolized by Greenpeace who have announced the "Mexican declaration of genetic independence."⁴⁶ The organization sees the import of transgenic corn as another form of U.S. imperialism and they put on elaborate demonstrations to show how the Mexican government does not follow its own regulations. In the past, Greenpeace activists have attached themselves to rails in front of trains which contained corn imported from the U.S. and protested in the port of Veracruz in front of the shipments of U.S. corn, asking to see the permits for transgenic corn.⁴⁷

Unión Nacional de Organizaciones Regionales Campesinas Autónomas is another organization that opposes transgenic corn. UNORCA has hosted forums dealing with the issue and has gathered farmers' support against the use of transgenic corn by showing

⁴⁵ Otero, 277.

⁴⁶ Otero, 279.

⁴⁷ Otero, 280.

the dangers and potential hazards of the modified crop. Activism has also spread in the agricultural regions of Mexico. In Chiapas, more than one hundred Indian communities' representatives met in April of 2001 and vowed to never use transgenic corn in the region. In January of 2002, the seminar "In the Defense of Maize" was organized in Mexico City and attended by one hundred and thirty eight Mexican and international organizations.⁴⁸ One of the outcomes was an international declaration calling for an immediate moratorium on the imports of transgenic corn into Mexico. Also, they called for a rejection of the Biosafety law in preparation. They considered it a legalization of genetically modified food. This movement emphasized that it was indigenous farmers in Mexico who developed the existent diversity of corn races and that the culture of maize has to be protected.

In general, the Mexican movement against genetically modified corn has shown a regulatory gap between GM crop field trials and the import of GM corn. Although field trials of genetically modified corn was halted under the moratorium of 1998, genetically modified corn has been imported into Mexico without adequate regulation or monitoring.⁴⁹ The United States does not require its corn distributors to separate genetically

⁴⁸ Otero, 280.

⁴⁹ Otero, 139.

modified corn from other natural varieties. As a result, when imported corn from the U.S. arrives in Mexico, it is hard to track and control the flow of GM corn into corn fields.

The first field trials of genetically modified corn in Mexico were performed by the General Directorate of Plant Health of the Ministry of Agriculture in 1988.⁵⁰ The Directorate was advised by a committee of scientists which later became the National Agricultural Biosafety Committee in 1992. In 1998, the Directorate decided to impose the moratorium because the traits in the genetically modified corn that were commonly tested, were not of any special benefit to Mexico.⁵¹ After Dr. Chapela and Dr. Quist published their findings in *Nature*, their work led to criticisms of the study's scientific methods. The Mexican Ministry of Agriculture and biotech industry representatives stated that if the study's findings were true, the gene flow between genetically modified varieties and natural varieties was part of a natural process of hybridization. However, GM critics have argued that the finding of GM corn in remote areas is not hybridization but a form of genetic contamination.⁵²

The issue with corn is that the crop falls into conflicting regulatory categories because it is both grain and seed.

⁵⁰ Otero, 139.

⁵¹ Otero, 140.

⁵² Otero, 140.

Genetically modified corn that comes into Mexico as grain intended for food or animal feed cannot be restricted under the 2003 modification of the Cartagena Protocol on Biosafety.⁵³ However, if the same corn enters Mexico as seed then it is covered by the Cartagena Protocol as a Living Modified Organism, and the Mexican government has the right to refuse the shipment. The Cartagena Protocol contains the principal which allows countries to demand that such products be labeled as GMO's or to ban the shipment until such products are proven safe for human health and the environment. In April of 2002, the Mexican Senate ratified the Protocol and it became legally binding in the international system in September 2003.⁵⁴ Mexico also signed a trilateral agreement with the United States and Canada requiring shippers to label GM food or feed imports when the shipment contains five percent more of GMO's. Those shipments that contain less than five percent of GMO's are considered equivalent to a non-GMO shipment and do not require identification. In 2005, Mexico passed a law on Biosafety and Genetically Modified organisms. However, the legislation contains many contradictions and does little to remedy the five percent rule. The law establishes that a special regime is needed to protect corn and other plants for which Mexico is the

⁵³ Otero, 141.

⁵⁴ Otero, 141.

center of origin.⁵⁵ However, there is nothing in the law itself about this regime and how it is going to be implemented.

There are many efforts against the use of transgenic corn by different activists and nongovernmental organizations which show how important corn is to Mexican culture. As the origin of corn, many groups are fighting for the preservation of native corn strands. However, if the Mexican government fails to regulate the amount of transgenic corn that comes from the U.S., the efforts of these activists and groups will be in vain. For these reasons, the Mexican government can create laws that are specific and have no regulatory gaps in terms of the importation of transgenic corn from the United States. Transgenic corn directly threatens the biodiversity of Mexican corn and the Mexican government can protect this unique and natural reservoir through specific and detailed regulations.

⁵⁵ Otero, 142.

Chapter 6: Mexican Tortilla Industry

The tortilla industry is one of the largest industries in Mexico. There are some 45,000 tortillerias across Mexico with approximately 225,000 people working in the corn and tortilla industries. Although there are a significant number of tortilla and corn flour industries in Mexico, the majority of the industry is controlled by a few Mexican transnational corporations. In addition, recent changes in the tortilla industry show how a changing Mexican economy is affecting the cultural value of corn and how important it is for the Mexican government to take measures to protect the cultural value of corn.

Tortilla Production

Tortillas are a staple food product in Mexico with a rich history in indigenous culture. Consequently, the production of corn, corn flour and tortillas are important to the Mexican economy. In fact, the tortilla industry makes up one percent of Mexico's gross domestic product, an economic measure that gives the total monetary value of all goods produced domestically by a country.⁵⁶

Tortillas have been produced in traditional manners for centuries. The corn is first dried, washed and cooked in water and limestone. The mixture is then rinsed after it has sat

⁵⁶ Carolina Bank Muñoz, *Transnational Tortillas*, (Ithaca: ILR Press, 2008), 24.

out for twelve hours. This process is called the nixtamal and the nixtamal is then ground into a mixture called masa. The masa is cooked on a griddle and becomes the tortillas that families eat. Typically, tortillas have been made this way by women in their homes or by small tortillerias. In the 1970's, the tortilla making process was revolutionized by the invention of nixtamalized corn flour in which only the addition of water is needed to achieve the masa stage. As a result, the amount of corn tortillas produced from nixtamalized corn flour increased by thirty percent between 1991 and 1998.⁵⁷

Tortilla manufacturing has been long subsidized by the Mexican government because corn and tortillas are so essential to the Mexican economy. Compañía Nacional de Subsistencias Populares (CONASUPO) and other food agencies have made sure that producers of tortillas were given good prices for their harvest and that tortillas were sold to consumers at affordable prices. During the 1982 peso crisis, CONASUPO subsidized food products including corn and tortillas so that Mexican families could afford food although real wages were dropping unemployment continued to rise. From the mid 1980's, Mexico sought after a neoliberal strategy to solve its economic woes which included opening the world market to Mexico, foreign investment and privatization. Consequently, many of CONASUPO's were privatized

⁵⁷ Muñoz, 25.

and others eliminated which caused CONASUPO to import corn at higher levels in order to continue their subsidizing of tortillas and corn products.⁵⁸ NAFTA also increased the amount of corn importation from the United States to Mexico and currently, the US is the largest producer and exporter of corn.

⁵⁹Most specifically, twenty-five percent of corn consumed in Mexico comes from the United States. By 1996, the implementation of NAFTA and the disbanding of CONASUPO led to the privatization of Mexico's corn market, which led to importation of large amount of corn into Mexico from the U.S.

The passage of NAFTA and the privatization of the Mexican corn markets have been tragic for small Mexican corn farmers. Thousands of small farmers have been displaced in addition to strains on the economy. Originally, NAFTA created quotas and tariffs to protect Mexican production of corn. However, imports of subsidized corn from the United States was favored and many of the previous restrictions on corn were eliminated prematurely. Between 1994 and 2002, the amount of corn imported from the U.S exceeded quotas by over fifteen million tons and the financial loss resulting from these exemptions from tariffs during this time frame totaled US\$2,7900,000,000.⁶⁰ The slackening of restrictions on corn in Mexico has caused small

⁵⁸ Muñoz, 26.

⁵⁹ Muñoz, 26.

⁶⁰ Muñoz, 26.

farmers to buy more imported corn while the government raises the price controls on tortillas. Between 1994 and 2002, tortilla prices increased and in 1999, the Mexican government ended the historic subsidy of tortillas. The price of tortillas per kilo in Mexico has gone from MX\$0.75 in 1995 to between MX\$4.80 and MX\$8.00 in 2005.⁶¹ The latest tortilla crises occurred in 2007 when prices increased by forty percent from MX\$6 per kilo to MX\$10 per kilo. The drastic price increase caused many low income families to spend a third of income on tortillas.⁶²

Increased demand for corn to be used to make ethanol, primarily by the United States, has been theorized to be the cause of the latest increase in tortilla prices. Also, monopolistic methods used by Mexico's largest producers of corn and tortillas have been blamed for the increased prices.⁶³ In 2007, thousands of people protested the price increases in Mexico City and Felipe Calderon, the president of Mexico, struck a deal with Mexico's largest corn and tortilla producers, U.S. corn corporations located in Mexico, and large chain supermarkets. These parties agreed to cap tortilla prices at MX\$8.5 per kilo which is still significantly high. Unfortunately, many small producers of tortillas have not abided

⁶¹ Muñoz, 26.

⁶² Muñoz, 27

⁶³ Muñoz, 27

by the agreement and as a result, the prices of tortillas remain high in some communities.

Tortilla making has drastically changed in the past few decades. A large percentage of tortillas in Mexico are made from nixtamalized corn flour. Approximately half of the tortilla factories use powdered masa to make their tortillas.⁶⁴ This method of production is very cost and labor savvy as tortilla makers only need to add water to cook the tortillas instead of the elaborate traditional method that was described earlier. Although this method is very cost effective, the taste and quality of the tortillas have changed dramatically. A tortilla produced using the traditional manner is believed to taste better than a tortilla made with powdered masa. Although majority of the country, factories and government have been moving towards mass-produced tortillas, there is still some resistance to powdered masa mainly due to the concern about genetically modified foods and traditional methods. It has been found that some powdered masa contains genetically modified corn from the United States. Consequently, there has been a growing movement against genetically modified corn and towards the preservation of traditional methods. Nuestro Maiz (Our Corn) is an organization of small to medium-sized corn producers that

⁶⁴ Muñoz, 27.

have decided to preserve corn traditions.⁶⁵ The organization is committed to producing corn free of any genetically modified corn. In addition, they have set up over 131 tortilla shops that are committed to producing tortillas using the traditional method and one percent Mexican corn.⁶⁶

Tortimundo is a public corporation that owns dozens of tortilla factories throughout the United States, Mexico and Central America. This transnational corporation produces many products from tortilla production machinery to fried tortilla products. Tortimundo has a majority of the corn flour market share in Mexico and is thus one of the most powerful corn producers in the country⁶⁷. Changes in the corn and tortilla industry as well as changes in Mexico's economy facilitated the growth and success of Tortimundo. However, the fact that not enough Mexicans are eating store-bought tortillas could pose a significant threat to profit. Therefore, Tortimundo strives to modernize Mexico and bring the country to the 21st century by popularizing tortilla producing methods that are practiced in Mexico. Tortimundo also hopes to equalize NAFTA agreements. The pact has allowed U.S. firms to come into Mexico easily but has not effectively opened the border for Mexican firms to cross the border. They hope that restrictions in the future for Mexican

⁶⁵ Muñoz, 28.

⁶⁶ Muñoz, 29.

⁶⁷ Muñoz, 29.

companies exporting across the border will be loosened. Until then, they have to use cheap labor in the United States.

Part of modernizing Mexico for Tortimundo involves bringing women into the workforce. Tortimundo's vision of a modernized labor market is similar to that of the United States and the corporation wants to see an economy where the middle-class lifestyle depends on two incomes.⁶⁸ In Mexico, middle class families have servants that make fresh tortillas and the reason why store-bought tortillas are so popular in the United States is because families don't have time to prepare traditionally made tortillas and they don't have enough money to hire a servant. Therefore, Tortimundo believe that the economy of Mexico should change and they see their profit directly linked to the modernizing of the Mexican economy.

The tortilla industry is a clear example of how a changing Mexican economy can affect the cultural value of corn. Large multinational corporations, such as Tortimundo, aim to modernize Mexico economically and harm the traditional methods of preparing tortillas through mass production. The Mexican government can change these recent changes by re-subsidizing the tortilla industry. Before the tortilla industry was privatized and Mexican subsidies were eliminated, tortilla factories

⁶⁸ Muñoz, 31

produced tortillas in traditional methods. Nixtamalized corn flour was introduced in Mexico after the industry was privatized and under the control of a few multinational corporations who sought to mirror U.S. operations for greater profit. If the Mexican government provides more subsidies to companies such as Nuestro Maiz, who aim to preserve the traditional methods of tortilla making as well as the entire tortilla industry, the cultural value of corn through the process of tortilla making will be preserved. It is cost and labor savvy to produce tortillas using nixtamalized corn flour. If the Mexican government subsidizes this industry, companies can revert back to the traditional methods of tortilla making without any pressures on profit.

Chapter 7: Conclusion

Corn's importance to the Mexican Culture

Since pre-historic Mexico, corn has been a significant element in everyday life, as the main source of nutrition and as an integral part of Mesoamerican religious life. The Aztecs practiced extensive rituals and held elaborate ceremonies to worship and praise corn and earth gods. Even when the Spaniards invaded the New World and introduced wheat to the region, corn maintained its significance. Today, corn represents the indigenous culture of Mexico as the ancestors of Mesoamerica domesticated the crop from its primitive forms.

The cultural significance of corn in Mexico can be seen in how the crop is used and cultivated. Mexicans use corn in a variety of ways from animal feed to biofuel for machinery. Mainly, the crop is used for human consumption. Dishes and meals using corn are very prevalent in Mexican cuisine. Tortillas, tamales, and pozole are all common Mexican dishes that use the crop. In addition, farmers still practice rituals and recite prayers to evoke the corn spirits of maize fields. Like the Aztecs, farmers in rural regions hold festivals, ceremonies and rituals to please the corn gods and corn spirits. The continuation of these traditions shows how relevant corn is in the lives of Mexicans.

Corn is the pride of Mexican people and their reverence for the crop is seen in how they use and respect it.

NAFTA's changes on Mexican views about corn

The North American Free Trade Agreement has drastically changed corn production in Mexico. The agreement has opened trade barriers between Mexico, the United States and Canada. Consequently, the pact has opened Mexico to international competition and many small Mexican corn producers have suffered as they compete with U.S. farmers who have more efficient resources and U.S. subsidies.

NAFTA has also increased the amount of corn imported into Mexico from the United States. This has caused great controversy as transgenic corn has traveled from the United States into the cornfields of Mexico. As a result, many groups such as Greenpeace and UNORCA have mobilized to protect the native strands of Mexico.

From an economical standpoint, NAFTA has had both negative and positive effects. Mexico does not produce enough corn for its growing population and the agreement has allowed the country to supply this need financially cheaper than if NAFTA did not exist. However, this has been detrimental to small Mexican

farmers who are incapable of keeping up with U.S. corn producers and the world market.

Culturally, NAFTA has caused great debate not only amongst small corn producers, but with activists and nongovernmental agencies who strongly oppose transgenic corn. Although NAFTA has brought economical advantages, groups and agencies fear the harm and damage that could arise from the invasion of genetically modified corn. The Mexican government has also taken measures against transgenic corn by thinking of initiatives to ban the import of the modified corn from the U.S and by creating bio-security laws. However, it is crucial that the Mexican government implement these laws as the movement against transgenic corn has exposed regulatory gaps between Mexican law and the importation of corn.

Overall, NAFTA has strengthened Mexican views about corn as groups and citizens fight to preserve and protect the native strands of corn despite the obvious economical advantages of the agreement. NAFTA directly affects the biodiversity of corn in Mexico through the importation of transgenic corn. Groups and non-governmental organizations have taken actions to combat transgenic corn and the Mexican government could do the same through corn subsidization.

The effect of an economically changing Mexico on corn

The changes in the tortilla industry can be viewed as a microcosm for the effects of a changing Mexican economy on corn production. The tortilla industry is one of the largest industries in Mexico with over 40,000 tortilleras producing the flat cakes across the country. Although there are many tortilleras in Mexico, the majority of the industry is controlled by a few Mexican transnational corporations.

The tortilla industry has been revolutionized since the onset of nixtamalized corn flour which has made tortilla making cost and labor efficient. A large percentage of tortillas are made from this pre-mixed corn flour but there has been resistance to this powdered masa by groups who want to preserve the traditional manner of making tortillas.

Tortimundo, one of the multinational corporations who owns tortilla factories hopes to modernize the economy of Mexico as they see their profit directly linked to a changing economy where the middle class lifestyle depends on two incomes.

The economy of Mexico is currently changing as they adapt more neo-liberal strategies that include opening up to the world market, foreign investment and privatization. This could potentially cause more trade between countries and importation

of more corn from the United State which would have a negative effect on small Mexican farmers. Also, Mexico's changing economy to become more modernized leads to the mass production of corn and corn products such as tortillas.

The government of Mexico can take major steps to preserve the cultural value of corn. The most viable option is to subsidize domestic corn production and other corn products such as tortillas. As a result of these subsidizations, Mexican corn farmers and tortilla companies can produce more corn and corn products effectively while still using traditional methods. Also, subsidization will reduce the amount of corn imported from the United States and will consequently reduce the amount of transgenic corn that Mexican cornfields are introduced to. Secondly, the Mexican government can regulate the importation of transgenic corn into Mexico by creating and implementing effective laws that aim to protect the biodiversity of corn in Mexico by restricting imports with genetically modified corn. If these measures are taken by the government, their actions will mirror the sentiments of the Mexican people and their pride towards corn.

Although Mexico is moving towards becoming more modernized and economically open, the cultural importance of corn will remain embodied in the Mexican people through their culture and

fight to preserve the native strands of corn and traditional methods of tortilla making. The religious, cultural, and nutritional value of corn has been invested in the Mexican people for thousands of years and it can't be lost for economic profit.

Corn is money for the United States, but most importantly corn will always be the blood and heart of Mexico.

Appendix: Current Economy of Mexico

The Mexican economy has changed during the past two decades and these changes can affect the cultural importance of corn in the country. To understand how a changing Mexican economy can affect corn, it is necessary to understand the economy of Mexico.

Economy of Mexico

Mexico is a federal constitutional republic in North America and has the thirteenth largest economy in nominal GDP terms and the eleventh largest in terms of Purchasing Power Parity. As a member of the North American Free Trade agreement, Mexico has seen benefits from this trilateral trade block with their GDP growing an average of five percent during 1995-2002. Unfortunately, since 2008, Mexico's economic growth has declined due to the economic recession in the United States. In addition to the downslide in the U.S. economy, widespread disease added to the failing economy in 2009. Limited fiscal stimulus and monetary relaxation did very little to aid the economic recession.

In 2010, the Mexican economy showed signs of recovery. The upswing was the result of an increase in Mexico's exports, automobile production, manufacturing and increased imports of consumer goods.

Brief Economic History of Mexico

Two of the biggest financial blows to hit Mexico were the debt crisis in 1982 and the 1994 financial crisis. Both crises produced sharp reductions in per capita GDP that eventually affected other less developed countries⁶⁹.

The Mexican economy maintained rapid growth during the 1970's due to high oil prices that improved Mexico's international market standing and boosted government spending. However, Mexico's growth was undermined by poor fiscal management and a deterioration in investment. The macroeconomic policies of the seventies left Mexico's economy open to external conditions. By 1981, Mexico was plagued by falling oil prices, rising inflation, higher world interest rates and an overvalued peso. In addition, the balance of payments continued to deteriorate causing a massive capital flight⁷⁰. During 1982, the government had to devalue the peso three times which caused more inflationary pressure and prevented short term recovery. These series of events caused the worst depression in Mexico since the 1930's. The government declared an involuntary moratorium on debt payments and nationalized its private banking system.

President Miguel de la Madrid had to drastically reduce public spending, stimulate exports, and promote economic growth

⁶⁹ Federal Reserve Bank of Dallas, *Mexico's Financial Vulnerability, Then and Now*, <http://www.dallasfed.org/research/eclett/2006/el0606.html> (June 1, 2006).

⁷⁰ <http://www.dallasfed.org/research/eclett/2006/el0606.html>.

to balance the national accounts. However, economic recovery was extremely slow as a result of negative terms of trade, high domestic interest rates and scarce credit. Mexico's GDP grew at an average rate of .01 percent per year between 1983 and 1988. Throughout the 1980's, Mexico took steps to limit fiscal spending and raise tax revenues. In 1986, Mexico joined the General Agreement on Tariffs and Trade where the country's maximum tariff fell by eighty percent⁷¹. Also, most sectors opened to foreign investment in 1989 which led to privatizations.

By 1988, the economy of Mexico had seen uplift with lower interest rates, lower inflation and declining debt to GDP ratios. In 1989, the Brady Plan marked the completion of the debt-renegotiation which allowed Mexico to regain access to international financial markets. However, by the end of 1994, Mexico found itself in the midst of another financial crisis.

The Mexican peso crisis was caused by the sudden devaluation of the Mexican peso in December of 1994. The assassination of the leading presidential candidate and unrest in Chiapas, a region in Mexico, increased the risk of speculative attacks on the peso which led to President's Zedillo's sudden reversal of the former administration's policy of tight currency control. There were several macroeconomic

⁷¹ <http://www.dallasfed.org/research/eclett/2006/el0606.html>.

policy mistakes that precipitated the crisis. 1994 was the last year of the six-year administration of Carlos Salina de Gortari and following the PRI tradition on an election year, launched a spending splurge and high deficit⁷². To finance the deficit, Salinas issued tesobonos, a type of debt instrument denominated in pesos but indexed in dollars. Mexico had a fixed exchange rate system that accepted pesos during the reaction of investors to a higher perceived country risk premium and paid out dollars. Mexico, however, lacked sufficient foreign reserves to maintain the fixed exchange rate and was running out of dollars at the end of 1994. The peso then had to be allowed to devalue. Consequently, the investors who purchased the tesobonos sold them immediately which depleted the bank reserves even more.

Zedillo took office in December of 1994 and announced that the government would let the fixed rate band increase to fifteen percent but were unable to accomplish this and allowed the rate to float⁷³. Under the floating rate regime, the value of the peso fell tremendously. However, the United States intervened immediately by buying pesos in the open market as well as granting fifty billion dollars in loan guarantees⁷⁴. By 1996, the

⁷² Sebastian Edwards, *Mexico 1994: Anatomy of an emerging market crash*, (Washington D.C.: Carnegie Endowment for International Peace, 1997), 34.

⁷³ Edwards, 41.

⁷⁴ Walter Dellinger, *Use of the Exchange Stabilization Fund to Provide Loans and Credits to Mexico*. <http://www.justice.gov/olc/esf2.htm> (Mar. 2, 1995).

Mexican government was growing and they repaid all of the US treasury loans.

Exchange Rates

Mexico currently has a floating exchange rate system where the value of the peso fluctuates according to the foreign exchange market. The floating exchange rate system originated in 1994 when the government tried to implement a band to fix the ailing economy. Under the exchange rate system, the Banco de Mexico, Mexico's central bank, makes no commitment to adjust the level of the peso but possesses tools to smooth out volatility. In 1996, Banco de Mexico initiated a plan to acquire foreign reserves when the peso is strong which has improved the terms and conditions on debt Mexico places on foreign markets.

From April 1, 1998 through April 1, 2008 the Peso traded around a range from \$8.46 MXN on per \$1.00 USD on April 21, 1998 to \$11.69 MXN per \$1.00 USD on May 11, 2004.

After the US credit crisis that worsened in October 2008, the Peso had an exchange rate during October 1, 2008 through April 1, 2009 fluctuating from lowest to highest between \$10.96 MXN per \$1.00 USD on October 1, 2008 to \$15.42 MXN per \$1.00 USD on March 9, 2009⁷⁵.

⁷⁵ X-rates, <http://www.x-rates.com/d/MXN/USD/graph120.html> (Mar. 3, 2009)

From the \$11.69 rate during 2004's low to the \$15.42 rate during 2009's low, the peso depreciated 31.91% in that span covering the US recession coinciding Iraq War of 2003 and 2004 to the US & Global Credit Crisis of 2008⁷⁶.

Trade Openness

Mexico is an export oriented country and is currently the biggest exporter and importer in Latin America. In 2005, Mexico was the world's fifteenth largest merchandise exporter and twelfth largest merchandise importer with a twelve percent annual percentage increase in overall trade⁷⁷. Mexico trades heavily with its North American partners. Approximately ninety percent of Mexican exports and fifty percent of imports are traded with Canada and the United States⁷⁸.

Mexico is a member of the North American Free Trade Agreement, General Agreement on Tariffs and Trade and the World Trade Organization. During the past three decades, Mexico has signed twelve free trade agreements with forty-four different countries.

Oil is Mexico's main export and largest generator of foreign income for the country. Mexico is the sixth largest oil producing country in the world and the Mexican government regulates the production of oil while private companies oversee

⁷⁶ <http://www.x-rates.com/d/MXN/USD/graph120.html>

⁷⁷ Edgar W. Butler, *Mexico and Mexico City in the World Economy*. (Boulder: Westview Press, 2001), 69.

⁷⁸ Butler, 69.

the shipping of oil. In addition to oil, automobile exports are another main source of revenue for Mexico. Many major automobile companies such as General Motors and Ford operate in Mexico. Due to an infrastructure that can support research and development, many Asian automobile manufacturers have recently begun setting up factories in Mexico. In addition to oil and automobile parts, Mexico also exports coffee, fruit, vegetables and various electronics.

Monetary policy

The central Mexican bank, also known as Banco de Mexico's main objective is to safeguard the purchasing power of the Mexican currency. In the past they did this by using a system called corto which literally means shortage. It was called corto because the policy entails leaving the banking system short of its daily demand for money by a predetermined amount to influence interest rates. This system allowed Mexico to push up the interest rates up by increasing the corto and vice versa if the central bank wanted to lower the interest rates. Since 1995, Mexico has used this as their guide because the benefits of this system were in line with their policy goals. The benefits of this system included not having to determine a specific short term interest rate and it allowed interest rates to decrease in line with inflation expectations. These are both positive things if the country is in a state of turmoil and very unstable which

was true for Mexico beginning in 1995. However as time went on, Mexico's experience with this target revealed that the Banco de México's monetary policy may have not been the best choice⁷⁹.

They found that under corto policy the interest rates were determined more by changes in the current account balances than by the specific level of it. Thus, an increase was interpreted as a tighter monetary policy stance which signaled an increase in interest rates. This may not necessarily reflect and affect interest rates in the way that they wanted them to.

In 2008 the Mexican government decided to implement a system that focused on fine tuning their monetary control instead of a broad focus on stabilizing the economy. They call this initiative "Strengthening of Economic Competition and Regulatory Improvement for Competitiveness in Mexico". The country is changing their system because while their corto system had benefits, there are benefits that the country has outgrown. As they have become more and more stable the need for a system in which they could better control specific aspects of economic variables emerged. This system aims at improving the regulatory environment and strengthening competition. It is designed to facilitate the creation and running of business, and other factors of growth, thereby contributing to innovation and expansion. This new system allows them to specify interest rates

more clearly, which you cannot do with the old target. The Mexican government did this through implementing a system that controls inflation by affecting different operating targets. These operating targets are nominal variables that affect other determinates of inflation since the central bank cannot directly control key determinates of inflation. Some of these variables that affect key determinates of inflation include short-term interest rates and banks' current account balances. To replace the old system, Banco de México chose to target overnight interbank rates instead of commercial banks current account balances. This was their first step in a multiphase plan to gain more control. The next step has recently begun with the signing of a memorandum of understanding between the OECD Secretary General, Jose Angel Gurria, and Mexico's Minister of Economy, Gerardo Ruiz Mateos⁸⁰. The purpose of this memorandum is to expand Mexico's competitiveness and their initiatives to better control their economy.

Mexico's economy depends heavily on the United States' economy unless Mexico can become more competitive. If the country can do this through the policies that they have implemented, they can increase their market shares which will give them leverage in

⁸⁰ Export Development Canada, *Mexico*, http://www.edc.ca/english/docs/gmexico_e.pdf (Feb. 15, 2011).

free trade agreements. If they are unable to do this it could cause further downgrades in their ratings⁸¹.

A changing Mexican economy could affect corn production in Mexico. The direction that the economy is currently heading in includes using more neo-liberal strategies that include opening to the world market, foreign investment, privatization and becoming more competitive internationally. These policies would allow more trade and openness between countries which could lead to the importation of more corn and distress for small Mexican farmers.

⁸¹ http://www.edc.ca/english/docs/gmexico_e.pdf.

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