

## *Graveyards Are Filled with Sweet-Tooths and Gluttons: Culture and Food Risk in Sonora*

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### INTRODUCTION

In recent years, different studies in Mexico have recognized the reciprocal influence between diet and culture—the relationship linking production, business, consumption, nutrition, and the production of health risks (Chávez et al. 1994; Nolasco 1994; Martínez and Villezca 2000; Bourges et al. 2001; López 2003; Sandoval and Meléndez 2008). Today, the simple act of eating not only constitutes a cultural phenomenon that nourishes identities but is also a polemical act that presents risks to human health. Its close relationship with various political, ecological, biogenetic, nutritional, and biotechnological aspects has required researchers to give as much attention to the restructuring of the global agro-food system as to the dietary traditions of *los pueblos* and to the analysis of their symbolic relationships.

In the state of Sonora, studies on cultural food phenomena are still scarce and limited in scope. This is due in part to scant attention paid to the topic and in part to the reductionist ideas about culture that permeate most work. The studies that do exist, in large measure, are prepared for presentations at conferences or are partial results of wider research projects in which references to dietary culture appear as a minor theme. Only the University of Sonora and the Centro de Investigación en Alimentación y Desarrollo, A.C. (Food and Development Research Center, or CIAD for its Spanish initials), have given systematic and long-

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range attention to food topics in the region, although they are equally lacking in their treatment of food's cultural implications.

In the interest of generating new discussions to compensate for the above-mentioned gaps, this article uses a cultural focus on "risk" as a way to identify some of the aspects that impact processes of production, assimilation, and transformation of Sonorans' food culture and their relationship with food security. This entails identifying and describing the most representative components of habits, traditions, values, and dietary patterns and preferences, while also requiring familiarization with the primary risk factors affecting the chain of production, commercialization, and consumption. Finally, it implies identifying and describing the types of social, individual, collective, institutional, and non-institutional responses to problems of food security.

The study assumes that there exists a meaningful correlation between the market for food, food culture, and food security. Based on this, it intends to demonstrate that a continuous and ascending process exists of constitution and reconstitution of meanings regarding food for Sonoran people, meanings that are constantly appraised and reappraised. The perceptions Sonorans have of their foods are explained as resulting from the adoption of two relatively distinct consumption patterns, one with its origins in tradition and the other rooted in modern food production processes.

The following results, while representing only partial results of our research, reveal the magnitude and associated tendencies of dietary risk, as well as the response to this risk by state institutions and civil society organizations. The statistical databases and other sources of information used to support this article come from two complementary approaches: One is fieldwork, organized around three surveys containing a total of 78 questions with 524 answer choices.<sup>1</sup> The other is a documentary and news analysis, which allowed information to be extracted from research, government institutions, and print and electronic media sources.

As part of the cultural analysis of food risk, the study returns to the idea of a semiotic focus on culture and on the so-called risk society. The first refers to "an historically transmitted scheme of meanings represented by symbols, a system of conceptions inherited and expressed in symbolic forms by means used by men to communicate, express, and develop their knowledge and activities in life" (Geertz 1990:88). In this sense, a definition of the concept of food culture refers to processes of signification: cognitive, normative, evaluative, and intersubjective means through which

men and women generate, carry out, transform, and structure their conceptions of production, preparation, preference, and consumption of food. The second focus refers to “a stage of modernity in which, with the development of industrial society up to our times, provoked threats occupy a dominant place” (Pries 1996:205). This threat to food safety involves irreversible risks to the lives of human beings and is no longer limited to specific places or groups, but rather results from the globalization that now spans production processes, which does not respect borders (Beck 1998). A central mystery in the analysis involves not only knowing how to tackle the risk factors, but also knowing how those inherent risks are distributed and thus can be avoided and prevented. These risks include the use of agrochemicals in agriculture, the use of chemical substances for food preservation, genetic alterations of food products, and the generalization of dietary habits with proven health consequences.

Finally, in the cultural analysis of risk, the concept of food security is understood in a broad sense, as part of the contemporary sociocultural food system, with both structural and symbolic dimensions. The first has to do with guaranteeing the provision of safe and innocuous food,<sup>2</sup> while the second has to do with the perception of consuming food free of any health risk. Both cases deal with a process that is as objective as it is subjective, which socially orders a situation that both affects the subject and moves him or her to act. Hence, food security evolves from current situations and intellectual developments. Current situations are understood as “the food problems that, untied from economic, political, and/or environmental causes, violently transform the dietary situation of the population” (Carrasco 2008:40), whereas intellectual developments are considered “the resources that interested and devoted scientists and specialists have offered in order to comprehend and treat said situations” (Carrasco 2008:40). This implies that “the sciences dedicated to dietary problems are sciences whose development obeys the circumstances, in which they simultaneously acquire great responsibilities and great challenges” (Carrasco 2008:40).

With these explanations, we are able to push beyond traditional theoretical-conceptual categories, which in most articles precede the empirical results. Instead, we prefer to concentrate on the results. For this reason, we follow three ideas that structure the work: (A) the relationship between dietary habits and consumer risks, (B) the relationship between the food market and the production of risks, and (C) the relationship between social actors and the control of dietary risks.

EATING HABITS, SYMBOLIC REPRESENTATIONS,  
AND CONSUMER RISK

Sonora's food culture is thousands of years old, originating in subsistence production of grains such as corn and wheat and, later, beans, beef, cereals, and garden vegetables. Beginning in the 18th century, the relationship between the natives of the region and the Jesuit missionaries, with their forms of preparing and eating food, impacted the area with distinct food preparation, eating habits, and the overall concepts of nutrition. Part of the regional identity of Sonora has developed around food, with different ways of representing, feeling, enjoying, tasting, speaking about, and even dreaming of food. Food constitutes part of the language of tradition, of daily living, and of modernity. Symbolic differences stand out between regions and express variations in status, gender, and social class.

Currently in Sonora, as in other areas of the country and the world, possibly one of the most common symbolic indicators reflecting the cultural processes of food is that it appears as a factor of social integration. Undoubtedly, a large portion of the time we share with others revolves around food. This would be of little relevance if it weren't for the fact that typical Sonoran food and its culinary traditions imbue social gatherings in this region with a particular kind of identity. Large and small festivities of all kinds in rural communities and cities alike are motivated by sharing a good dish: some *carne asada* with flour tortillas and beer or *barbacoa* accompanied by *frijoles puercos* (mix of beans, bacon, pork sausage, and cheese), and, along the coast, a good *mariscada* (seafood platter), which without fail includes shrimp or fish *ceviche*.

In modern cities—or at least those that aspire to be, like Hermosillo and Ciudad Obregón—politicians often meet in restaurants to comment on the headlines, while businessmen discuss commerce. Restaurants are also the sites of family reunions or other celebrations. And, of course, they are where friends and lovers meet. These encounters are often accompanied by typical dishes: *tamales de carne* or *de elote* (meat or corn tamales); *carne machaca* (dried jerky cooked with chile, tomato, and onion, and, sometimes, with diced potato or egg); fine cuts of meat, guacamole, and *coyotas* (flour tortillas filled with *piloncillo*, or brown sugar, cooked in a wood stove, and served as a dessert). Similarly, Sonoran families gather around the table each day in their homes to share a *carne con chile*, *caldo de queso* (cheese soup), a heaping bowl of *cocido* (beef

stew), or a *gallina pinta* (a kind of *pozole* prepared with oxtail, corn, and beans), among many other typical Sonoran dishes. Of course, all of these activities take on a variety of tonalities depending on food shortage or abundance, and also depending on the problems, feelings, and anxieties of daily life. In any case, food is always a factor that induces and promotes social gathering.

We should mention that family represents the most important of social integration for Sonorans, around which a large part of dietary decisions are based. According to the survey data, a preference for certain foods is connected primarily with family and secondarily with the home. Following these are traditions, friends, health, parties, memories, trips, diet, community, and loved ones. Of those surveyed, 82% emphasized the pleasure of eating with family. Consequently, 80% prefer to eat at home, while the rest eat in restaurants, the homes of friends, and at open-air food stands. Likewise, in 29% of the cases Sonorans saw cooking as an act associated with the pleasure of serving the family, which is the second-most-frequent selection among the seven options (figure 1).

Nevertheless, as with many Mexicans, food is also a cultural indicator for Sonorans that permeates regional language and is full of significance for daily life. Part of this language is manifested in common sayings and refrains that allude to food as synonymous with happiness and total satisfaction:

*“Panza llena, corazón contento”* (Full belly, happy heart)

*“A comer y a la cama nomás una vez se llama”* (To eat or to bed, one need call only once)

*“Al corazón se llega por el estómago/la boca”* (The way to the heart is through the stomach/mouth)

Some allude to situations of health risk and warn of the dangers of eating without moderation or being overcome by gluttony:

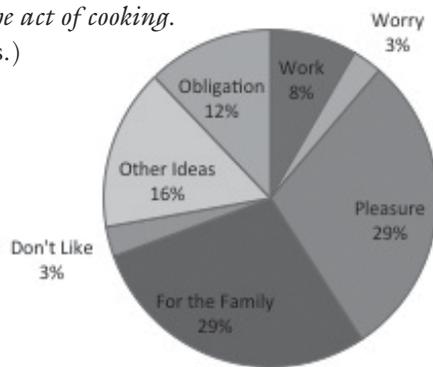
*“De golosos y tragones están llenos los panteones”* (Graveyards are filled with sweet-tooths and gluttons)

*“Lo que no mata engorda”* (What doesn't kill you makes you fat)

*“Comer sin apetito hace daño y es delito”* (Eating without appetite is harmful and a crime)

By contrast there are also those sayings that associate food with good health, independent of the food's flavors and textures:

Figure 1: Significance given to the act of cooking.  
(From data collected by authors.)



*“Bueno es pan duro cuando es seguro”* (Even stale bread is good bread when it’s a sure thing)

*“El que fruta come de buena salud dispone”* (Those who eat fruit have good health)

*“Lo que es amargo al paladar es bueno para el estómago”*  
(What is bitter on the palate is good for the stomach)

*“Comer ajo y beber vino no es desatino”* (Eating garlic and drinking wine is not nonsense)

Still others refer to food as a condition for existence that is insufficient to fulfill humans’ vital basic needs:

*“No sólo del pan vive el hombre”* (Man does not live by bread alone)

*“Por dinero baila el perro y por pan si se lo dan”* (The dog dances for money, and for bread if they give it to him)

In all of these sayings, just as in a large number of songs, commercials, and Mexican films, we can find part of the symbolic context that makes up the Sonorans’ dietary culture. Nevertheless, it is still more common to find these symbolisms in the culinary traditions of the region and in its consumer habits, which undoubtedly structure cultural processes in an even clearer way. For example, preparing and consuming *carne asada de res* accompanied by regular-sized wheat flour tortillas or by the *“sobaqueras”* or *“de agua”* (whose texture is thinner, prepared with a bit of lard, and measuring on average some 45 centimeters, or 18 inches, in diameter) with roasted tomato sauce and refried beans is perhaps one of the traditions that most characterizes the Sonoran people, regardless

of whether they come from the sierra, the coast, the center, or the border. Something similar occurs with the preparation and consumption of other typical dishes such as *carne machaca*, which is generally enjoyed rolled inside a wheat tortilla “burrito.” Similarly, *carne con chile colorado* and *la barbacoa de res*, slow-cooked in a mesquite fire pit or a baker’s oven, occupy a special place within the region’s culinary preferences. There is also the “*cochiri*” (pig), prepared in a similar manner, as well as other dishes mentioned above, such as *gallina pinta* or *caldo de queso* (cheese soup).

The results of the field study indicate that *carne asada* occupies first place as the typical dish that is most commonly consumed by Sonorans. *Queso fresco* (fresh cheese) came in second place, while corn and meat tamales came in third, followed by tostadas, tacos, and *sopes*; *ceviche*; and *cocido*. *Pozole*, *carne con chile*, and *carne machaca* are all among the most representative (table 1). It is worth mentioning that the three dishes with the greatest indices of consumption, and which are eaten at least once a week, are *queso fresco* (74%), *carne asada* (46%), and tostadas, tacos, and *sopes* (42%). Nevertheless, among those who report eating these foods at least once a week and those who report eating them at least once a month, the results indicate that *queso fresco* increases to 91%, *carne asada* to 82%, and tostadas, tacos, and *sopes* to 91% (table 2). These numbers coincide in part with the study carried

**Table 1. Typical Dishes and Most Consumed Foods (2009)**

Dish/Product	(%)
Carne asada	98.4
Queso fresco	93.4
Tamales (meat and corn)	91.8
Tostadas, tacos, and sopes	91.3
Ceviche	88.1
Cocido	86.1
Pozole	84.3
Carne machaca	84.1
Caldo de queso	83.9
Carne con chile	83.6
Menudo	83.2
Tortillas de harina	78.7
Gallina pinta	74.4
Coyotas	68.0
Chimichangas	66.8
Capirotada	66.2
Carne seca	57.9
Other	6.0

From data collected by authors.

**Table 2. Typical sonoran Dishes and Frequency of Consumption (2009)**

	Do Not Eat (%)	Consumed Once a Week (%)	Consumed at Least Once a Month (%)	Consumed on Special Occasions Only (%)	Almost Never Eaten (%)
Carne asada	1.2	46.1	35.9	15.7	1.2
Carne con chile	6.7	20.5	48.2	11.5	13.1
Carne seca	20.1	7.2	24.8	21.2	26.7
Tostadas, tacos, and sopes	3.6	42.1	39.3	9.7	5.2
Cocido	3.5	26.5	49.4	11.7	8.9
Ceviche	5.4	18.3	42.3	27.0	6.9
Carne machaca	7.7	26.0	41.1	9.3	15.9
Caldo de queso	6.0	25.7	49.0	8.8	10.5
Gallina pinta	8.1	10.5	46.1	20.4	15.0
Tamales (meat/green corn)	1.7	12.8	33.3	45.6	6.6
Chimichangas	14.3	13.7	36.6	13.6	21.8
Pozole	5.3	7.7	40.0	36.6	10.4
Menudo	5.8	5.3	30.4	48.7	9.7
Capirotada	15.1	1.2	3.2	60.5	20.0
Queso fresco	3.5	74.4	16.6	2.7	2.8
Coyotas	16.6	5.3	22.8	30.8	27.5

From data collected by authors.

out in Hermosillo by Palacios (1994), which revealed that among the five ingredients with the greatest level of acceptance for use in regional dishes, meat came in at 90%, with the consumption of *carne asada* standing out as the dish with the highest score.

Likewise, with the idea of demonstrating the cultural significance that marks the consumption of *carne asada*, another study from CIAD (Camou 1994) describes the process as a kind of essential ritual. It is a socially regulated event with certain characteristics that are more or less fixed and which presupposes a series of participant attitudes; it is perhaps one of the rituals most deeply rooted in Sonoran traditions. According to Camou (1994), one of the virtues of such events is their simplicity as much in the methods of preparation as in the forms of gathering together. There are few ingredients and the attire is informal dress, contrasting with the much higher expectations of social gathering required by other dishes. At the heart of the event is Sonorans' nostalgia for "*la sencillez de la vida del campo*" (the simplicity of rural life); for this reason, in these gatherings people tend to "ignore the urban origin of participants" and "*se hace desplante de sencillez*" (allow everyone to show their affinity for simplicity). This is why, the author concludes, "in a certain way *carne asada* is for urban Sonorans what the songs of José Alfredo Jiménez were for the Mexican middle class of the mid-century: the emotional symbol of nostalgia and an image of what they would like to appear to be" (Camou 1994:428).

Hence, preparing and consuming red meat, above all in the form of *carne asada*, is synonymous for many people with "the pride of being Sonoran," of being "good, simple, hard-working people"—a stereotype voiced by everyone else and revealed to be one of the more or less believable characteristics among the Sonoran people regarding their regional identity and the supposed essence of what it means to be Sonoran.

Modernity has brought with it other new identifying and symbolic constructions that are evident in consumer habits and in ways of preparing food. They also exist as a recurring phenomenon among the Sonoran people. We refer here to the incorporation and preference for so-called fast food, such as hot dogs<sup>3</sup>; hot dogs occupy first place among modern fast food, followed by pizzas, sushi, hamburgers, and fried chicken. Nonetheless, some traditional dishes also classified as fast food still occupy a place among the favorites—for example, tacos (*de carne asada* or *de cabeza*, *pescado*, or pork) reached 28% of preferences (figure 2).

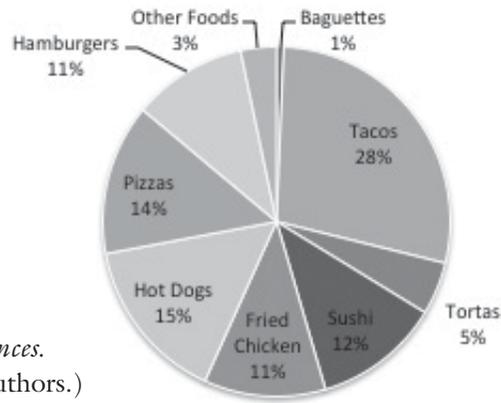
There is an abundance of gastronomic ideas surrounding these foods.

The mixtures and varieties are themselves part of what defines consumer practices. The foods reflect contemporary hybrid culinary forms, all dependent upon the possible range of alterations available in terms of ingredients and methods of preparation, and whose results are hard to find in any other region. Although they are outside inherited stereotypes regarding the consumption of meat and products derived from wheat and corn, the “new” products, or what could be called the “new Sonoran cuisine,” reflect symbolic dietary contrasts and the ability to adopt and adapt foods from other regions and countries. This situation, without a doubt, has been influenced by the presence of multiple foreign food chains—in the form of restaurants, self-service stores, and big-box food stores—as well as the recent incorporation of women<sup>4</sup> into the workforce, the relative increase in quality of life, the purchasing power of certain social classes, and Sonorans’ changes in lifestyle.<sup>5</sup>

The transformation of dietary habits due to less time invested in cooking has pushed families to adopt new forms of food preparation and organization, which has provoked an increase in the demand for fast food, precooked or prepared outside of the home, as well as a higher rate of attendance at restaurants whose food options are not always the healthiest. The results of our survey indicate that 20% of the urban population is accustomed to eating outside of the home. Of these, 44% do so fewer than 3 times a month, 28% between 4 and 6 times, 8% between 7 and 10 times, and 14% more than 11 times. It is worth mentioning that 26% of those interviewed often frequent fast food restaurants such as McDonald’s, Pizza Hut, etc.; 19% go to specialty restaurants; 13% to buffets; and 42% to open-air food stands such as *taquerías*, *torterías*, and mobile food carts. Likewise, 16% of the population shops for food at big-box stores, whose product displays are directed toward consumers of fast, precooked, and frozen foods.

These findings may seem of little significance compared to other areas with a higher level of industrial concentration, such as Mexico City, Monterrey, Guadalajara, or Tijuana. Nevertheless, we can safely assume that in Sonora these trends are producing not only a substantial increase in businesses linked to food sales, but also, and above all, a shift in the traditional significance of food and the concept of nutrition in general.

Everything seems to indicate that these aspects produce important changes in dietary structures, which have also occasioned a growing epidemic of so-called illnesses of abundance. Low-cost traditional diets, rich in fiber and grains, are being replaced by more expensive diets that



*Figure 2: Fast Food preferences.*  
(From data collected by authors.)

include higher quantities of sugar,<sup>6</sup> oil, and animal fat, with an increase in associated costs, body weight, obesity, and chronic illnesses, as much in children as in adults.<sup>7</sup> Ninety-one percent of Sonorans interviewed agreed that obesity is a health risk that they would like to avoid. Just over 70% have a negative perception of the consumption of products like sugar, salt, soft drinks, energy drinks, and beer, which they identify as having health risks. Curiously, other foods such as lactose, diet products, wheat tortillas, pasta, desserts, shellfish, white bread, and red meats are considered of little risk or completely free of risk by more than 50% of those interviewed, which indicates that there is not a very clear idea among the Sonoran population of which foods have higher rates of health problems.

Through coordinated efforts to investigate nutrition, institutions such as CIAD in Sonora have widely documented some of the above-mentioned facts in thorough studies that draw attention to the gravity of dietary health problems. Since the early 1980s, CIAD has developed studies on the state of nutrition and on changes in access to the basic consumer “food basket” in Sonora. In a timely manner, it has drawn attention to dietary deficiencies as well as the risk factors related to chronic degenerative illnesses induced by the consumption of certain foods. Ortega and Valencia (2002) offer some of the most important findings on problems with the nutritional state of Sonorans and recognize in this a socioeconomic and cultural component that determines consumption decisions. In addition to nutritional deficiencies and problems of obesity among marginal urban and rural populations in Sonora, they also find low levels of consumption of fruits and vegetables and high levels of consumption

of animal fat and protein, which they consider a cultural aspect of Sonorans. Findings suggest that if diets do not include a consistent balance of all sources of nourishment required by the human body to be healthy, sicknesses arising from nutritional causes could continue to increase while the opportunities to prevent these risks will be reduced.

We can say that the most visible result of all of these cultural expressions related to the consumption of food has historically produced at least two patterns of consumption of very high risk: One restores traditions and has the common denominator of a high level of animal protein and saturated fats (such as *carne asada* and typical Mexican food); the other promotes modernity (fast food), but also brings serious health risks, observed in the increase of chronic degenerative illnesses such as diabetes and heart disease. Both patterns reflect consumption decisions that alter the nutritional state of Sonorans and are associated with imbalances in the consumption of proteins, fats, carbohydrates, vitamins, and minerals; these imbalances produce risks that can become chronic, noncommunicable illnesses, obesity, and heart problems, among others.<sup>8</sup>

It is worth clarifying that these are not risks that are intentionally ignored, and they are not uncontrollable or unavoidable. To a certain extent, however, they are inevitable in practice, which “is integrated and explained within a cultural context characterized by certain social values and morals, by certain conceptions about the body and body image, by a certain vision of sickness and of health” (Contreras 2008:71). At the same time, there are different networks of meaning that mold the cultural processes of eating and induce and generate new subjectivities and identities. One of the networks is formed around the fear people have about eating certain foods because of their associated health effects. Consumers informed about dietary risks are not the only ones responsible, but also the public powers that be: dieticians, purveyors of junk food, and, above all, diverse media,<sup>9</sup> which amplify and contribute to spreading fear through a “nutritional discourse that has become the dominant ideology” (Apfelbaum 1989). As Contreras (2008) clearly indicates, dietary anxieties have found in this way a “scapegoat” in the image of people with obesity, diabetes, and high cholesterol. And although the perception of dietary risk varies widely depending on the region, this means that food insecurity is already built into social representations of contemporary consumers.

In Sonora, although the level of perception regarding dietary risk<sup>10</sup> is as high as 61%, it does not seem to be related to a significant concern

to take care of one's nutritional health. As we mentioned, heart complications, diabetes, and obesity have been on the rise. In any case, in one sense or another, it is clear that the dietary practices of the Sonoran people have been experiencing radical changes in recent years. As we will see below, this is reinforced by other kinds of risks that are created in the sphere of production and commercialization.

### GLOBALIZATION AND MARKETS IN THE PRODUCTION OF RISK

The above-mentioned tendencies would seem to indicate that the globalization of the food system is transforming the diversity of local food cultures. This is due to the imposition of a global monoculture established in society via patterns of production and consumption more or less defined by large agro-industrial companies (Shiva 2004). The demand for new products to meet the necessities of lifestyles, fashion, and the transformation of labor markets has contributed to this process. Nevertheless, in the complex international food production and distribution system, consumers know only certain characteristics of the products and the places where they are distributed since the rest of the system, as Contreras (2008:61) rightly indicates, "is truly a black box that contains a fear made even greater because of the [unbreakable] association between subsistence and eating." Although in scientific and legal terms food production is more controlled today than ever before, according to Contreras the food commodity chain is farther away from citizens because we know less and less about what we eat.

The above makes sense considering the extent to which large agro-industrial companies pushing the phenomenon of globalization and the free market economy have produced a variety of health risks, which were unknown previously. These are risks that are induced as a consequence of ineffective and careless practices in the sphere of production, but which can be avoided. The most common associated illnesses are caused by the toxicity of agrochemicals, genetic contamination, and microscopic pathogens in animals intended for consumption.

In effect, just as some specialists have indicated (see, for example, Toledo 1999), the increase in food production has put pressure on agricultural and ranching systems with risks that affect ecological equilibrium. In the state of Sonora, the environmental repercussions of

food production caused by the pollution of primary resources and poor agrarian and fishing practices are a confirmed fact. According to Castro (2008), the Yaqui Valley (Cajeme, BÁCum, San Ignacio Río Muerto, and Benito Juárez) is one of the agricultural regions in the country that is most exposed to pesticides and pollutants (such as the insecticides aldrin, dieldrin, heptachlor, and DDT and the insecticide and rodenticide endrin. It is estimated that almost 4 million liters of pesticides are used on 220,000 hectares of crops in this zone each year: 197,000 hectares of wheat and the rest in vegetables.

Similarly, research out of the Instituto Tecnológico de Sonora (Santana and Meza 2008) shows significant concentrations of lead and arsenic derived from agrochemical use in the same region. Santana and Meza find that one of the main routes of public exposure to arsenic is via potable water: 20.68% of the communities in the Yaqui and Mayo Valleys surpass the maximum amount permissible under the law (NOM-127-SSA1-1994). The authors warn that exposure to these contaminants can cause health effects such as anemia, neuropathies, hyperpigmentation, and irritation of the skin, mucosa, and gastrointestinal system. Chronic exposure leads to hyperkeratosis (thickening and increased pigmentation of skin), loss of skin pigmentation, and various kinds of cancers such as those of skin, liver, and lung.

Although the use of pesticides in the region dates back to the 1940s, health authorities claim that no scientific information exists proving the relationship between these sicknesses and the application of agrochemicals. Nevertheless, in April 2006 the delegate from the Ministry of Agriculture, Livestock, Rural Development, Fishing, and Nutrition (SAGARPA for its Spanish initials) pleaded with farmers in the Empalme and Guaymas Valley to reduce the risks of contamination and disease caused by the use of agrochemicals in their fields. This was intended not only to prevent health problems but also as a way to certify best farming practices, fulfill quality standards, and generate value-added products (*El Imparcial* 4/12/2006).

Similar to the case of agrochemicals, there are also concerns that the use of biogenetics in agriculture and systems of industrial production could render some foods toxic or introduce allergens capable of provoking reactions damaging to people's health. These concerns create a state of alarm for various national governments, leading to the closure of borders, boycotts of certain products, and food crises. Some of the most recent cases (divulged in the newspaper *El Imparcial* 10/27–10/28/2008)

took place in Asia in October 2008, when Singapore found 17 different brands of cookies made in Malaysia contaminated with a high content of melamine, a toxic substance used in plastics and fertilizer manufacturing that causes renal problems. In China, its use in lactose products to simulate higher nutrition content caused the death of five babies and affected 25% of infants in Peking after they consumed the contaminated milk.

One year before that, the United States had forbidden and reinforced its sanitary controls of certain Chinese products considered toxic for consumers. A syrup from China had caused the death of 100 people in Panama, and pet foods containing melamine caused the death of a number of pets in the United States. In response, in July 2007 the Chinese government prohibited the importation of foods coming from the United States out of concern that products such as Tyson Foods' frozen chicken products were contaminated with salmonella. Likewise, residues of an antiparasitic medicine were found on frozen chicken drumsticks, as well as on pork ribs and ears, coming from different companies in the United States. Orange pulp, dried apricots, grapes, and various dietary supplements were removed from shelves due to their failure to meet sanitation standards (*El Imparcial* 7/16/2007). Also in 2007, based on Swedish investigative reports carried out in 2002, the U.S.-based Center for Science in the Public Interest filed a claim to investigate 30 food companies due to suspicions about the use of a chemical compound known as acrylamide, whose carcinogenic effects are released when certain foods are cooked with starch at high temperatures. It is found in a variety of foods such as French fries, cereals, cookies, and organic baby foods.

In Mexico, in September 2007, through the Federal Commission for the Protection against Health Risks, the Health Department released an alert for the public to avoid overconsuming diet soft drinks containing sodium cyclamate. This was established as a preventive measure oriented toward children, adolescents, and people with low body weight who are considered to be at greater risk in response to concern that products such as Coca-Cola Zero lacked scientific proof that they meet health standards established in different parts of the world. Another case of food toxicity that affected Mexico occurred in April 2004, when research carried out in the United States found high levels of lead in candies made in Mexico, such as tamarind and chili. Frequent consumption of these products was considered extremely dangerous for children's health, supposedly resulting in memory loss, behavioral changes, and kidney

damage. Likewise, authorities in the United States prohibited the importation of popular Mexican products such as *Mazapán de la Rosa* and “Japanese Peanuts” after finding the carcinogenic substance *aflatoxin*, which is produced in plants infected by *Aspergillus flavus*, considered to be one of the most potent natural carcinogens.<sup>11</sup>

Similarly, some studies have shown that the epidemiology of illnesses transmitted through food changes periodically, resulting in new pathogenic microorganisms that cause chronic health complications, some of which have been spread throughout the world (Vaqueiro 2000). The microorganisms take refuge in healthy animals that are used as a source of food; from there, they spread to a huge quantity of food products. The original source of contamination comes from using untreated wastewater for irrigation, fertilizers with animal origins, water consumed by animals, and the contamination of fodder, among others.<sup>12</sup>

A study by the World Health Organization (2007) highlights the avian flu in China and Taiwan between 2003 and 2004 as a significant case. This illness is caused by the virus H5N1, and is highly contagious among chickens, ducks, and other domesticated birds. It is transmitted to humans through direct contact with sick animals or their feces. In response to the possibility that a genetic mutation of the virus could produce inter-human transmission and provoke a pandemic of grave consequences, the World Health Organization suggested strict measures to prevent the spread of the virus to other countries.

Another well-known case was that of foot-and-mouth disease, an illness that attacks cattle and affected various countries. According to reports from the World Health Organization (2007), one of the most severe cases occurred in England in July 2007 when vectors of the illness were found for the second time in less than a decade. In 2001, the spread of the disease in England had resulted in the sacrifice of 6.5 million cattle and economic losses of nearly 12 billion euros. This, in addition to the case of spongiform encephalopathy or “mad cow disease,” resulted in a food crisis with serious consequences two years later.

Among the cases that have affected Mexico and Sonora is that of the Nuñez Company Inc., which, in October 2006, announced the likely contamination with *E. coli* bacteria of escarole lettuce produced in the Sabines Valley, California, and distributed in the northwest region of Mexico under the brand name “Foxy.” This alarmed Mexican health authorities, particularly in Sonora, who pleaded with the public not to consume this imported product. One month later, an American producer

of turkeys and derivative products announced the withdrawal of over 21,000 tons of their products in the United States due to the risk of listeriosis, a bacterial infection caused by *Listeria monocytogenes* that results in fever, headaches, and vomiting, and which can be fatal if untreated among people suffering from cancer or diabetes (*El Imparcial* 10/10/2006 and 11/26/2006).

A recent case of illness associated with pathogenic microorganisms in food occurred in Mexico in April 2009 and was known as “swine flu”—a respiratory illness commonly found in pigs and caused by the influenza virus A(H1N1), considered highly dangerous for its ability to modify its organic structure and cause complications that can result in death. Its transmission among humans provokes symptoms ranging from headaches, fever, loss of appetite, and nasal congestion to otitis, sinusitis, rhinitis, bronchopneumonia or pneumonia, and inflammation of the heart or brain.<sup>13</sup> The sickness spread to various countries in Asia, Europe, and America, with America being the most affected continent. The World Health Organization (2009) and the Secretary of Health, Health Department of Mexico (2009) reported 15,045 confirmed cases of influenza A(H1N1) in 48 countries at the end of May 2009. The United States had the greatest number of cases with 7,927, while Mexico reported 5,029 cases, of which 97 resulted in death. At the same time, Sonora reported 63 infected people. The World Health Organization considered the illness to be one of the most dangerous epidemics of the century. Although Mexican authorities insisted that the illness did not provoke a food crisis, various news sources (both electronic and printed) reported that it resulted in nearly an 80% reduction in pork production and a significant reduction in the consumption of pork in Sonora and throughout Mexico, with losses measuring some 600 million pesos.

Lastly, another source of dietary health risk, which, unlike the above-mentioned examples, does not appear to have a consensus regarding its immediate or long-term implications, is the so-called transgenic products. Corn is the most representative case in Mexico. Over the past decade, diverse farmer and ecology organizations have questioned the planting of transgenic corn due to concern that the long-term health risks in human food, as well as in feed for animals used for human consumption, are not being thoroughly evaluated. Its production is associated with an increase in toxins in agriculture, genetic and soil contamination, and threats to the rich biology of Mexican maize, already contaminated by modified species.

Although Sonora does not produce transgenic maize,<sup>14</sup> researchers at the University of Sonora (*El Imparcial* 3/25/2007), as well as from CIAD (Calderón 1999), join the controversy over the importance of proof for statements that allude to the health safety or risk of these products and argue in favor of sufficient scientific understanding before they can be consumed without any fear whatsoever. In June 2005, though, the World Health Organization released a report that declared not only that genetically modified products are harmless for human consumption, but also that “they can improve human health and development” (World Health Organization 2005). Nevertheless, as Millán (2008:106) indicates,

in the confrontation between those who take a favorable or unfavorable position towards genetically modified foods, the alternative emerges between two ways of food production that correspond to two basic kinds of society, of social interaction, of relationship with the environment, of ethical norms and values, of understanding of the world and of life.

Everything would seem to indicate that the risks originating in the sphere of production, as well as those caused by consumer habits and decisions, are creating new forms of social conditioning that result in a reevaluation of the meanings related to food. An increasingly significant portion of the population has doubts about the harmless nature of food; nevertheless, people are also consuming a greater amount of processed foods and on a more frequent basis. This may be because consumer distrust reflects a primary characteristic of human survival that does not change with simple explanations about the dangers caused by industrial applications. Hence, although concerns regarding food multiply, provoking disordered reactions from the government, changes in the culture of consumption of certain products don't occur at the same pace.

Nevertheless, unlike in the past, eating is no longer only about meeting a biological need but also represents a stance on ecological health. Additionally, it implies a questioning of the scientific model, of scientific objectives, and, above all, of politics. As Contreras (2008:75) indicates:

Every food controversy manifests the same questions: uncertainty, hidden information, insufficient means, contradictory scientific evaluations. . . . For experts, many of the food crises have been only “scares” that are more or less irrelevant as soon as the number of affected people and the probability of contracting some grave

illness or even death has remained low. Nevertheless, for most of populations, these problems tend to have other meanings. They reveal certain “invisible” aspects of the food chain. They also reveal that, despite being legally and scientifically more controlled than ever before, there are still important failures among different links in the chain of food production.

It seems that civil society organizations, the state, and individuals in general have begun to perceive the importance of confronting the problems with food security, even though the initiatives toward sociocultural transformation are still distant.

### INSTITUTIONS AND SOCIAL ACTORS IN THE CONTROL OF FOOD RISKS

As can be observed, recent changes in production practices and the transformation, consumption, and marketing of food have been occurring on a global scale, yet the perceptions regarding the control of risks and the promotion of food security have differed by country and region (see, for example, Sánchez 1988; Food and Agriculture Organization 2004). Due to its preventive nature, initiatives toward these ends in the state of Sonora continue to be limited. A low level of social consciousness regarding the environment remains the case, despite the need to recover a balance with nature, to support cleaner production practices, commercialization, and consumption of food, and to avoid greater risks in order to favor food security. Though all of these things involve the whole of society, levels of awareness about them reach only certain strata of the population.

It is worth noting that in some developed countries these problems constitute a latent worry among consumers. The food crises experienced recently by European society in the form of salmonella or listeria, dioxins, spongiform encephalopathy, swine flu, and foot-and-mouth disease have produced a general state of alarm among citizens regarding the safety of the food chain (MAPA 2004). This has also generated distrust in society toward new products that have been genetically modified, which has contributed to campaigns and boycotts against them promoted by ecological groups that emphasize the extreme danger of these products. Even in the United States there has been a proliferation of individual lawsuits against well-known hamburger and pizza chains based on

arguments about nutritional ill effects and coronary damage (Marcel 2003). All of this is leading to a serious questioning of existing systems of industrial production and revisions of their operations, norms, economics, administration, and politics.

In the United States in particular this has led the U.S. Department of Agriculture to create a substantial online network of information regarding different themes related to food and nutrition, which allows producers and consumers to make informed decisions. This information helps to support nutrition programs and nutritional profiles, oversee food management, and prevent the spread of food illnesses. The database also includes information regarding the irradiation of food and withdrawal of certain unsafe products from the market. The U.S. Food and Drug Administration is another resource, which offers consumers a dedicated alert system of the recall of products from the market. Both of these agencies provide educational and public assistance resources for food safety and establish a normative stance on safety and biosafety of food consumption. In addition, they carry out diverse research initiatives regarding food security and hunger in communities and homes within the United States.

Within the Republic of Mexico there are various public and private institutions dedicated to themes related to food safety. The most representative office is the Federal Commission for the Protection against Health Risks (COFEPRIS for its Spanish initials), which is in charge of protecting the population from health risks related to food production and consumption. The National Service Food Sanitation, Safety, and Quality Service (SENASICA for its Spanish initials) is a SAGARPA office that supports the COFEPRIS's work; SENASICA is responsible for carrying out sanitation services to protect agricultural, aquacultural, and fisheries resources from disease. It is also responsible for regulating and promoting the application and certification of food quality and of systems that reduce risks of food contamination. All of this is intended to facilitate national and international commerce of vegetable and animal products. On the other hand, the Interdepartmental Commission on the Biosafety of Genetically Modified Organisms (CIBIOGEM for its Spanish initials) is in charge of establishing and coordinating the policies of the Federal Public Administration toward products of genetically modified origin. It can be said that, independent of their results, issues related to food sanitation, safety, and biosafety are covered by Mexico's governmental offices.

Something similar occurs regarding the management of risks related

to dietary habits of consumers. There are diverse national programs such as PrevenIMSS and PrevenISSSTE that offer educational and preventive services, organized by age (children, youth, women, men, and elderly), which aim to prevent and control chronic degenerative illnesses, as well as promote self-care measures among patients with chronic illnesses. Similarly, certain campaigns stand out, such as “*Vamos por un Millón de Kilos*” (“We’re Going for a Million Kilos”), whose goal is to invite the general public to participate in a national crusade to improve dietary habits and physical activity. Another campaign called “*Bien Contigo*” (“OK With You”) aims to send a message to the public about a healthy life based on exercise and a good diet, through health, sports, ecology, and technology for well-being. The campaign utilizes important media such as Televisa to broadcast public, promotional, and informative spots, as well as special programs and messages integrated to the channel’s various programs and using multimedia approaches.

In a parallel fashion, civil society nongovernmental organizations (NGOs) have begun to participate in various initiatives to raise public awareness regarding the problems of being obese or overweight. In November 2007, dozens of NGOs asked legislators and the executive branch to apply an effective Plan of Action to combat the epidemic of obesity, which affects 70% of adults and one of every four children in Mexico and, according to information from the Health Department, has caused (among many other consequences) 10 million Mexicans to suffer from diabetes. The Plan of Action has been included as part of the Dietary Health Manifesto that the civil association named “El Poder del Consumidor” (“The Power of the Consumer”), presented in its document “*El Ambiente Obesigénico: Entre el Poder Legislativo y el Ejecutivo.*”

Other NGOs such as Greenpeace have focused their efforts on two campaigns related to food security: One is concerned with sustainable agriculture and genetically modified foods, which has its goals impeding the authorization of experimental planting of GMOs; promoting a model of sustainable agriculture with socially, economically, and environmentally just agro-ecological projects; and continuing to work for the implementation of policies that reduce the use of fertilizers in favor of products that reduce greenhouse gas emissions and avoid the contamination of food items. The second campaign is based on disseminating information for consumers and a list of Mexican fair trade stores and organic foods throughout the country.

In Sonora, public policy for the prevention of health risks caused by

the consumption of certain foods, although limited and insufficient due to their dependence on federal decisions and funding, does have a place on the governmental agenda. Departments such as the Dirección de Regulación y Fomento Sanitario, as well as state delegations that form part of the Federal Commission for the Protection against Health Risks and the Office of Food Sanitation and Safety of SAGARPA, help implement systems of quality food production and processing by exploring the application of systems of sanitation standards, as well as promoting systems of risk analysis and control at critical points to produce safe and high-quality foods. There have been positive developments as well as serious limitations. Public officials at institutions charged by the Health Department with the task of dealing with these issues admit—in response to the detection of lead in Mexican candies—that there is a lot of room for improvement in protecting consumers from health risks, especially because the study of potentially risky products is carried out only after the United States raises concern about these problems (see, for example, *El Imparcial*, 4/27/2004).

In terms of food health, the State Commission on Meat stands out with international recognition for having achieved the highest level of sanitation due to its successful Program of Certification of Origin designed to differentiate Sonoran beef products. In terms of nutritional security, there is the School Breakfast Program, which currently benefits 176,420 students in marginal rural and urban areas in Sonora. The menus are developed and verified by CIAD to ensure children receive the necessary nutrients and can achieve optimum academic performance. Likewise, in October 2007, as part of government initiatives aimed at reducing the high levels of obesity, diabetes, and cardiovascular disease, the State Congress of Sonora approved the “Ley Churrumais,” a kind of law against junk food that intends to control the sale of junk food products in the cooperative stores of elementary schools.

Similarly, there are other institutional initiatives developed by higher education organizations and research centers such as CIAD to give special attention to problems of dietary health and risk through research that evaluates the chemical composition of food, its toxicological aspects, its adulteration, its safety, its microbiology and parasitology, and its nutritional health, among others. The University of Sonora also carries out research on food safety and health, and develops, through the Center of Health Promotion in the Biological Sciences Division and in the Area of Health in Nutritional Orientation, a program that helps university students by

encouraging a culture of healthy eating. The program emphasizes the relationship between food and health through the promotion of good eating habits, nutritional guidance, and physical activity. Among civil society organizations, the concern regarding food safety led to the founding of the Mexican Association of Food Illnesses (AMTA for its Spanish initials) in March 2008 in the state of Sonora. Its objective is the prevention, investigation, and treatment of pathologies such as anorexia, bulimia, and overeating that are associated with dietary conduct.

Nevertheless, among the majority of the population, awareness about food safety has not spread, not even in lawsuits at the individual or NGO level. Local demand for safe and healthy foods and a uniform food legislation that includes analysis and evaluation of risk—as well as the control of food safety by establishing an exhaustive system of traceability and facilitating the identification of origin of food ingredients and supplying that information to consumers—are still lacking despite its importance as an essential requisite for the proper functioning of markets and healthy eating practices.

Social responses to dietary risk are more frequently oriented toward prevention rather than an ability to diagnose and develop solutions to “modern” illnesses that create global alarm, such as the recent swine flu epidemic. Responses continue to be tied to the institutional environment, limited by federal budgets and current situations, with a political attitude oriented toward fixing, preventing, and directing with a greater emphasis on the right to food rather than to the problems of food safety and health. Although both of these are of equal importance, this explains why the concerns regarding risk are growing rather than being resolved, which raises questions about the ability of institutions to prevent and control crises and risks.

## CONCLUSIONS

The increasing complexity of food systems associated with globalization and the integration of regional markets is generating dietary problems that are shared by distinct societies and regions of the planet. For this reason, today, in the case of Sonora, the challenge is not only to carry out in-depth studies about dietary values, habits, and traditions in the state, but also to incorporate the ways that individuals, society, and institutions respond to risks that are the result of dietary habits and patterns and to

risks caused by inefficient and careless production practices.

A sociological or cultural anthropological perspective on these issues does not exist in an integrated form. Only the epidemiological studies of nutrition, which treat different dietary issues, have been able to locate sources of risk whether caused by a lack or excess of micronutrients and their relationship with chronic degenerative diseases. Nevertheless, due to its disciplinary orientation, these same studies have failed to incorporate analyses of the responses by social actors. It is clear that this is an urgent matter for investigation, since the social forces of the free market and modernization increasingly weaken regional cultures and realities. At the same time, government institutions appear to be losing their ability to regulate and respond to these issues.

Addressing the problems of global food risk and its links to culture requires establishing perspectives different from those that, until now, have been the focus of field studies. By focusing on the cultural aspects of food risk, we have been able to demonstrate how the diets of the Sonoran people have been experiencing important changes in recent years. New eating habits, new patterns of production and commercialization, and Sonorans' models of consumption (among other issues) have begun to erode the social bases of reproduction and conservation of regional identity, while at the same time generating and reproducing new networks of meaning associated with a pathology of fear. This can be seen in a kind of "cultural crisis" that impedes people from reflecting on the problems of food risk and safety since these issues are still considered of little significance to Sonorans in their consumer decisions. This may be due to the fact that many of the new risks are completely hidden from immediate human perception because they reside in the realm of chemical formulas and biotechnological advances, which are unfathomable to the common citizen.

Nevertheless, in response to media reports of foodborne illnesses, new "anti-chemical" dietary habits have emerged that are oriented toward organic products and attempt to recover "healthy" forms of consumption and traditions from the past. This emphasis on consuming chemical-free food has begun to influence the more informed sectors of Sonoran society, who generally have higher incomes and are more concerned with buying food free of contamination.

Even so, in general, the responses of civil society and state institutions faced with these issues are still limited, lacking a vision of ecological and human sustainability. All of this allows us to culturally locate the

weaknesses and potential of Sonoran society so as to encourage the need to build a new model of civilization based on a healthy diet, which will reduce the pernicious effects generated by unhealthy models of food consumption and the modern market economy. ❖

## NOTES

<sup>1</sup>The questionnaires were carried out between October 2008 and February 2009 based on the integrated criteria of population density and conventional regionalization. This includes the three most populated cities of the state of Sonora (Nogales, Hermosillo, and Guaymas), corresponding to three of the most representative zones of the state (border, central, and coastal zones). Simple random sampling was used with a confidence level of 95%. The themes of the survey were divided into consumption habits, food, cuisine, food customs, and risk perception. The questions were closed and semi-open, with dichotomous, multiple-choice, and scale-based answers, for an adult population between 20 and 65 years of age. The mountainous area of the state was excluded due to the inadmissibility of a large number of respondents.

<sup>2</sup>This is the meaning promoted by the Food and Agriculture Organization, which in 2005, with the objective of reducing world hunger, created the Programa Especial de Seguridad Alimentaria (PESA), which promotes participatory initiatives to reduce poverty in coordination with the agencies of rural development in each country in communities with high levels of socioeconomic marginality. This is of lesser interest to the present study than are the symbolism and culture of food.

<sup>3</sup>The appearance of hot dogs in Hermosillo dates to the second half of the 20th century, as one of the modes of fast food imported from the United States. Its methods of preparation incorporate regional particularities that distinguish it from its original version. Among the ingredients used to prepare hot dogs today are beans, red and white onion, sausage, mushrooms, avocado, cucumber with cream, jalapeño chiles, pickles, shredded yellow cheese, cooked onion, Huichol salsa, Sonoran salsa, Tampico salsa, onion fried with bacon, ketchup, mayonnaise, lettuce, and tomato. As a complement to all of this are French fries, chiles rellenos, and chicharrón (fried pork skin). Among the varieties of preparation offered by some hot dog vendors are “traditional,” “double sausage,” “fantasy,” and “jumbo.” In February 2006, a well-known culinary magazine in the United States published a list of the “100 favorites in the world of food” and placed the Hermosillo-style hot dog as number 66 on the list. Today, hot dogs even have a special day for their celebration: June 21.

<sup>4</sup>In the manufacturing sector alone, female employment went from a little more than 10,000 in 1985 to almost 40,000 in 2005, after having represented just over 50,000 in 2000. According to the statistics produced by the Encuesta Nacional de Ocupación y Empleo Trimestral of the Instituto Nacional de Estadística y Geografía (INEGI; 2009), between the first quarter of 2005 and

the first quarter of 2009, the economically active population of women in Sonora increased from 338,934 to 372,222, an increase of 9.8%.

<sup>5</sup>It bears mentioning that 35% of Sonorans in urban areas are accustomed to eating their meals while watching television, whether alone or in company. On the other hand, of all women interviewed who work, 23.28% claim they do not like to cook, 10.42% say they do not know how to cook, and 29.49% say that cooking is pleasurable.

<sup>6</sup>Regarding the consumption of sugar, 35% of those interviewed reported accompanying their food with soft drinks, 44% with aguas frescas (prepared fruit drinks), 16% with water, and the rest with other drinks.

<sup>7</sup>According to data from the 2006 Encuesta Nacional de Salud y Nutrición (ENSANUT), between 1999 and 2006, obesity in Mexico increased by 2.4% annually. This last year, the problem had affected 65% of the population. Likewise, in 2006, more than 4.1 million people between the ages of 5 and 11 and around 6 million adolescents suffered from being obese and overweight. No state in Mexico has levels lower than 55%. At the time, it was estimated that by 2010, Mexico could take first place as the world's most obese country. In the state of Sonora, 77.9% of women and 68% of men suffer from this problem. Thirty-five percent of school-age girls (between 5 and 11) are obese, surpassing the level among boys of the same age (27.1%) and occupying third place nationally, surpassed only by the states of Baja California Sur (35.5%) and Nayarit (35.1%).

<sup>8</sup>According to information provided by the Ministry of Health of the State of Sonora (2007), 2,216 people die of arteriosclerosis each year, a sickness associated with changes in the constitution of arteries and veins caused by a diet of excessive ingestion of fats and few carbohydrates. Sonora occupies first place nationally for its average of 100 deaths per 100,000 people, a statistic relatively higher than the national average of 70. Unlike the decade of the 1970s when digestive illnesses, pneumonia, and influenza were the principal causes of death, today heart illnesses related to obesity and other diseases such as diabetes, hypertension, stress, and high cholesterol have moved into first place, which coincides with the primary cause of death worldwide. In Sonora, the risk of dying from cardiac complications is three times higher for men and two times higher for women compared to inhabitants in the south of the country.

<sup>9</sup>It is worth mentioning that at least 54% of the population agrees that advertisements on the radio, television, and in the press are significantly influencing food decisions.

<sup>10</sup>Calculations are based on an average of 27 responses. These are the results of questions related to the habitual consumption of certain foods, their methods of preparation, hygiene practices, product expiration dates, as well as opinions about the production of genetically modified foods.

<sup>11</sup>It is worth mentioning that, according to the Health Department of Sonora, the possibility of carrying out similar research in Mexico to evaluate health risks and generate a new attitude toward consumption "is a matter of culture and it's going to take time, that is why we are trying to induce a new dietary culture among children" (El Imparcial 4/21/2004 and 4/27/2004).

<sup>12</sup>A recent study from the Centers for Disease Control and Prevention calculated that there are approximately 46 million cases of food-borne illness each year in the United States (<http://www.newswire.net/newsroom/financial/70591-foodpoisoningsurprisingnumbersinrecentcdcstudy.html>).

<sup>13</sup>According to a newspaper report (*El Imparcial* 8/7/2007), the only antiviral medicines that can counteract this virus are patented in most parts of the world and are the property of two large pharmaceutical companies: zanamivir (under the commercial name Relenza and marketed by GlaxoSmithKline) and oseltamivir (whose commercial brand is Tamiflu, patented by Gilead Sciences and exclusively licensed to Roche). Glaxo and Roche are the second- and fourth-largest pharmaceutical companies in the world and, similar to what happens with other pharmaceutical products, epidemics are their greatest business opportunity.

<sup>14</sup>According to *El Imparcial* (3/25/2007), cotton is the only genetically modified product that is planted in Sonora. The newspaper reports that approximately 21,000 hectares were planted in 2005, representing 80% of the total planted area.

<sup>15</sup>The Plan of Action presented in the Dietary Health Manifesto focuses on seven points:

1. A national campaign of nutritional orientation that clearly establishes which foods and drinks are recommended for habitual consumption and which ones, if consumed, should be consumed only occasionally.
2. Establishing minimum nutritional requirements for food and drink offered and sold in schools.
3. Making nutritional education an obligation in schools, associating it with school food offers and regional food production.
4. Prohibiting junk food advertisements during television shows directed at children and in any media or spaces dedicated to children.
5. Establishing clear and useful labeling for all processed food and drink that allows consumers to identify if the products have low, medium, or high concentrations of sugar, total fats, saturated fats, trans fat, and salt.
6. Making the installation of drinking fountains a mandatory obligation in schools, parks, and public spaces.
7. Guaranteeing the food security and sovereignty of the country through the national production of, and public access to, basic foodstuffs.

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