

The evolution of entomophagy in the Yucatan Peninsula: a food cultures perspective

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Colophon

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Abstract

Insect consumption has existed for a long time, it is a traditional alimentary habit that originated in the Paleolithic era (7000 years ago). Mexico is a country where insect collecting is an old practice, notable and typical of many rural areas. Many of the insects currently used have been consumed since pre-Hispanic times; there are more than 504 species of edible insects in Mexico.

Even though, entomophagy remains as something traditional in most of the country there are some regions, like the Yucatan Peninsula, where this practice has been abandoned. Considering the fact that insects have recently become a worldwide topic as a possibility of fighting food insecurity, this research focuses in the importance to understand why people in a country that has traditionally consumed insects for many centuries have ceased this activity.

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1. Introduction

1.1 Insects as food

The world population will reach the 9.6 billion people in 2050 (Heilig, 2012) meaning that food demand is increasing with 200,000 more mouths to be fed every day (UNEP, 2010). Taking into account the changes in the composition and level of consumption associated with growing household incomes, the Food and Agriculture Organization (FAO) of the United Nations estimates that feeding the world population will require a 70 percent increase in total agriculture production (Bruinsma, 2009). With oceans already overfished, unsustainable ways of agriculture, land and water scarcity, insects have become a centre of attention as having the potential to improve food security (Huis, 2012).

Insects are one of the dominant organisms in number of individuals, species and biomass, in both land and water ecosystems (Ramos-Elorduy & Viejo Montesinos, 2007). They have provided humans with multiple benefits such as food, clothing, medicine, and importantly crop pollination. Many of them form part of the food chains of different animal groups; some act also as organic waste recyclers (flies) or corpse eaters (bugs), helping to the restart of biological cycles. Moreover, they have been useful to humans since ancient times, like bees for honey and wax production or the silk worm, which has been established as an extensive and high profitable agroindustry (Ramos-elorduy, 2009).

The word 'insect', derived from the Latin *insectum*, a calque of Greek ἔντομον [*éntomon*], which means "cut into sections", has no equivalent word in the local languages of the regions where insects are eaten, due to the fact that it was most probably introduced after colonization by European countries (Ramos-elorduy, 2009). Insects are named in many different ways, depending on their purpose which could be medicinal, edible, magic or mystical, and even religious. In contemporary English there is still a reminiscence of this ideas, with sayings such as "hardworking as an ant", "tough as a bug", "organized as a bee", "beautiful as a butterfly", etc. (Ramos-Elorduy, 2009).

The practice of eating insects is known as entomophagy (*entomos* =insect, *fagus* = to eat), also known as anthro-po-entomophagy when referring to the consumption of insects by

humans. Insects are commonly consumed by many human groups in a variety of ways: as a normal element of diet; as a famine or survival food; for medicinal purposes, for ritual purposes, as a novelty; and by accident (Ramos-Elorduy & Viejo Montesinos, 2007).

Insect consumption has existed for a long time. Anthro-po-entomophagy is a traditional alimentary habit that originated in the Paleolithic era (7000 years ago) as evidenced by testimonies in the form of pictures, sculptures, totems or deities that survive to this day (Ramos-elorduy, 2009). Cave drawings of grasshoppers, executed by Cro-Magnon man more than 10,000 years ago, are known from the grotto "Les Trois Frères" in Ariège (Bodenheimer, 1951); a Paleolithic cave drawing from the caves of Araña in Spain give a vivid picture of a honey-hunting man (Bodenheimer, 1951); illustrations on shards of Chinese pottery, 2,000 years old, clearly show bees (Feng, Zhao, He, Chen, & Sun, 2009) and even antique Greek coins bear the image of the honey-producing insect or the grasshopper on one side (Ramos-Elorduy, 2009).

Pager (Maggs, 1981) discovered ancient rock paintings in Natal, South Africa where one can appreciate the image of a honey collector, who carries a sack on his back, using several lianas to form a ladder to reach the bees' nest. Furthermore, in the Matopo Hills, a rock was found with a painting that showed a person smoking a lit torch at the entrance of a bees' nest in Zimbabwe (Maggs, 1981).

The early Greeks and Romans wrote about insect consumption not only in their own lands but in others as well. Herodotus, 4th Century BC Greek historian, described tribes that "hunt for locusts, which having dried in the sun, they reduce to powder and eat, mingled with milk" (Burr, 1910).

In one of the earliest references to the eating of insects in Greece, Aristophanes, a foremost Greek poet of the 4th Century, quotes poulterers who sell "four-winged" fowl on the market (Bodenheimer, 1951). According to Bodenheimer (1951) these four-winged fowl were grasshoppers which apparently were cheap and consumed by the poorer classes.

While the lower-class Greeks ate locusts or grasshoppers, the upper-class Greeks were more inclined for the consumption of cicadas. According to Aristotle (3rd Century BC) as

cited by Holt (1885), the most polished of the Greeks considered cicada nymphs the greatest of treats. Aristotle hinted that they were not an uncommon food in Attica (Athens).

Pliny the Elder, 1st Century AD Roman natural history author, mentions that cicadas were eaten in the East (Bodenheimer, 1951), and that Roman epicures of his day highly esteemed the *Cossus* (the larva of *Cerambyx heros*) grub and fattened them for the table on flour and wine.

In the USA, particularly in the Great Basin, edible insects were collected by indigenous people, dried and stored in empty trunks (Sutton, 1995); it is also recorded that the tribes that neither practiced agriculture nor possessed domestic animals, fed themselves on insects (Harris, 1998). In Mexico, insects were stored in ceramic pots dating back 3000 years (Ramos-Elorduy & Viejo Montesinos, 2007). In Australia, insects were dried and stored in empty squashes (Rochow & Changkija, 1997). Even in the Old Testament record of it can be found: in Leviticus (Lev. 11:20-25) and Exodus (Ex. 8:31) it is mentioned the consumption of bees, beetles and locusts. In the New Testament John the Baptist survived in the desert by eating locusts and honey (Mark 1:6).

It can be said that insects took part in human evolution. With time, this co-evolution and synergy decreased when humans left the field and became sedentary (Ramos-Elorduy, 2009).

The consumption of insects as an alternative food source is something that is being discussed for over a century already. It has always been thought that insect consumption in Europe was inexistent, due to the aversion that Western cultures have towards this practice. One of the most complete works regarding edible insects is "Insects as food" published in 1951 by F. S. Bodenheimer. In his books he sums up all the previous research about edible insects.

According to Bodenheimer (1951), the renaissance of entomophagy begins with the appearance in 1602 of Aldrovandi's "*De Animalibus Insectis Libri Septem*." Aldrovandi mentions various insects as food, quoting from earlier sources the consumption of locusts and cicadas.

In Bodenheimer's book the following authors mention the presence of insects in Europe. Consett, an Australian entomologist, states that in some parts of Sweden, ants are distilled with rye to give flavour to "their inferior kinds of brandy," and ant pupae are used for the production of good gin; Immanuel Kant in his "Physical Geography", devoted a paragraph to edible locusts and how Ludolph Hugo, who knew this, cooked the great locusts which devastated Germany in 1693 like crayfish, ate them, preserved them with vinegar and pepper and with this dish treated the Council of Frankfurt; Illiger, a German entomologist and zoologist, provides recipes for preserving may-bugs (*Melolontha*); Westermann, a Danish businessman and entomologist, reported cock-chafers and related species are eaten by the mountain inhabitants of Europe; Kirby and Spence, two British entomologists, devoted a chapter to the direct benefits from insects, including their use as food by peoples in other parts of the world, mentioning palm grubs, locusts, caterpillars, silkworm pupae, termites, bees, ants, gall-apples and honey.

In addition, the revolutionary Vincent Holt (1885) is recurrently cited by Bodenheimer. In the booklet "Why Not Eat Insects?" first published in 1885, Holt summarizes the reasons for eating insects and compares the herbivorous insects clean eating to the lobster, crab, eel, and pig (p. 12): "The lobster, a creature consumed in incredible quantities at all the highest tables in the land, is such a foul feeder that, for its sure capture, the experienced fisherman will bait his lobster-pot with putrid flesh or fish which is too far gone even to attract a crab."

Holt lets out his frustration against the denial of insect consumption (pp. 16-17):

It may require a strong effort of will to reason ourselves out of the stupid prejudices that have stood in our way for ages; but what is the good of the advanced state of the times if we cannot thus cast aside these prejudices, just as we have caused to vanish before the ever advancing tide of knowledge the worn-out theories of spontaneous generation and barnacle geese?

A few pages later (pp. 29-30): "Fashion is the most powerful motive in the world. Why does not someone in a high place set the common-sense fashion of adding insect dishes to our tables? The flock would not be long in following." Holt states that chemical analyses

indicate that insects have a high protein and vitamin content, which makes them fit to replace meat and suggests that farmers could be aided in their battle against insect pests if the insects were collected by the poor as food. After mentioning the consumption of insects by the Greeks and Romans of ancient times and by people in far-away lands, Holt concludes the second of his three chapters as follows (p. 47):

We pride ourselves upon our imitation of the Greeks and Romans in their arts; we treasure their dead languages: why not, then, take a useful hint from their tables? We imitate the savage nations in their use of numberless drugs, spices, and condiments: why not going a step further?

Howard, an American entomologist, suggests that, with many nations facing food shortages because of war conditions, it is a propitious time to consider new and cheap food supplies (Notes, 1866). He notes that although there is an extensive literature on the historical use of insects as food, there has been little modern experimental work.

In 1992, Gene De Foliart, one of the major exponents of the use of insects as a global food resource and founder of *The Food Insects Newsletter* said that:

During the past few years there has been a new upsurge of interest in insects as food. One factor that may be responsible is an increasing awareness in the western world that insects are traditional and nutritionally important foods for many non-European cultures . . . Other factors may be increased pride in ethnic roots and traditions, increased concern about environment and overuse of pesticides, and better communication among scientists who are interested in the subject. Edible insects may be closer now than ever before to acceptance in the western world as a resource that should be considered in trying to meet the world's present and future food needs (DeFoliart, 1992).

Since 1988 a newsletter dedicated to "Food Insects" has been published, and the number of scientific studies dealing with insect consumption is increasing. Today it is estimated that insect-eating is practiced regularly by at least 2 billion people worldwide (Huis, 2012). Edible insects are a natural food resource to many ethnic groups in Asia, Africa and America where entomophagy can be sustainable and has economic, nutritional and

ecological benefits for rural communities (Gahukar, 2011). The number of consumed species that has been registered rises up to 1475, and the continent where the greatest number of species is consumed is America, with 699 (Ramos-Elorduy & Viejo Montesinos, 2007). The idea that insects may be a valid food item is arousing increasing interest, in both scientific and public domains.

Mexico is a country characterised by remarkably rich biological (ranked 5th in the world biodiversity) as well as cultural diversity (Bureau & Educational, 2004). Insect collecting is an old practice, notable and typical of many rural areas. Many of the insects currently used have been consumed since pre-Hispanic times; there are more than 504 species of edible insects in Mexico (Ramos-Elorduy & Viejo Montesinos, 2007).

Entomophagy is believed to have been practiced since before the arrival of the Spanish conquerors (Christenson, 2007). The indigenous people made the most of the animals which they could find in land and water; with them a great variety of nutritious dishes were prepared for the emperors (B. Del Castillo, 2010). Women were in charge of the collection of insects, their activities were repetitive, not dangerous and close to the settlement, so their role as a mother, in addition to taking care of the house and teaching the children, carried out the transmission of the entomophagous tradition (Ramos-Elorduy & Viejo Montesinos, 2007).

Entomophagy remains as something traditional in most of Mexico but what was brought to my attention while researching for texts and information was the almost non-existent data in the Yucatan Peninsula about why it is no longer practiced by its inhabitants. For a country as big as Mexico, that one region does not longer practices entomophagy might not seem as something really important, modernization is something that is reaching every corner of the globe. However, considering the fact that insects have recently become a worldwide topic as a possibility of fighting food insecurity, it is important to understand why people in a country that has traditionally consumed insects for many centuries are no longer doing it.

Even though insects are eaten throughout the country, the Yucatec Maya culture in southern Mexico was limited in their dietary choices. Unlike other Mexican cultures, they ate few insects; their most relished ones were wasps and bee larvae (Anderson, 2014).

There has been quite a lot of research in relation to the history of entomophagy; the health and environmental reasons why insects should be eaten; and the amount of edible species that exist worldwide; but, there is little or no information regarding the regions where entomophagy was once practiced and now it is either practiced just by a part of the population or not practiced at all.

Most of the literature related to the introduction of insect consumption is based on Western eating habits, for them insects are not considered a food product. While in countries like Mexico, where entomophagy has been in their tradition since ancient times, insects are known to be an available food choice. The interesting matter here is that they are known to be a food choice but that doesn't always mean that it is considered edible and included in daily diets. This is the case of the Yucatan Peninsula, where most of the people are aware of the existence and consumption of insects in other parts of the country but do not consider it as something edible or that could, at some point, become part of their diets. Why is there a denial to consume them? What could change people's perspective towards insects?

This leads me to consider culture as the main factor surrounding the acceptance or rejection of insects as food. Rozin (1988) suggests that culture is probably the major determinant of people's food choices. It is known that different cultures tend to eat different foods (Pollan, 2006) and that people like the foods in their own cuisine more than those found only in other cuisines (Einstein & Hornstein, 1970). So, is there a real possibility to introduce insects as a food choice or is just a utopia?

Despite much public interest most Westerners are still not enthusiastic on the idea of eating insects (Shan et al., 2015; Verbeke, 2015). They often react with disgust at the

prospect of consuming beings that are not familiar as food (DeFoliart, 1992; Yen, 2009), but are familiar as pests and transmitters of disease (Harris, 1985).

But what if the species is not unfamiliar? A recent study by Tan and colleagues (2015) considers that cultural exposure exerted its influence by making available a certain range of species and preparations to individuals within the culture, hence determining which items individuals recognize as food. They studied people from Thailand, where insects have long been a part of the local cuisine, and from the Netherlands, where insects are only recently being regarded as a potential food. Thai eaters demonstrated a rich knowledge about how to obtain, prepare and consume insects, even Thai non-eaters, by being exposed to a culture with entomophagy tradition, had also gained knowledge by direct exposure to insect consumers. Cultural exposure also resulted in common preferences and underlying expectations within cultures that differed between cultures. Species that were available as food tended to evoke fewer negative responses, but different species were available in each culture, resulting in the Thai participants having preferences towards different species than the Dutch participants. In general, it was showed that the preparation method strongly influences the expected liking and willingness to try an unfamiliar species. Reducing the visibility of the insect and incorporating it into a familiar and liked product generally improved the willingness to try an unfamiliar species (Martins & Pliner, 2006).

The outcomes of this study have shown that the novelty and benefits of insect consumption have generated much interest in insects as food amongst the Dutch participants. However, arguments like health and environmental benefits were found to be insufficient to encourage consumption, and acceptance of insects as food; it will require the development of appropriate products that not only lower the barriers to trying, but also taste good and deliver the benefits that consumers are interested in (Tan et al., 2015).

Human beings are perhaps unique in their ability to acquire strong positive attachments to a wide variety of edible substances (H.V. Kuhnlein & Receveur, 1996). Although some of the source of these strong preferences is physiological in nature (Bolles, Hayward & Crandall, 1981; Cabanac, 1979), the strong regional and cultural differences in food preferences most likely arise from social forces. As mentioned before, culture is probably the major determinant of people's food choices (Rozin, 1988), therefore trying to

understand why people that have been culturally exposed to insects do not eat them will help to develop a possible way to introduce them in countries that have never been in contact with them.

1.2 Objective and Research Questions

The consulted literature leads me to further explore the possible reasons that led to the disappearance of entomophagy in the Yucatan Peninsula. Having a deeper understanding of the social norms that led to the avoidance of insect consumption could be used as guidance to the possible introduction of insects as a food choice in Western cultures.

The main research question for this thesis is:

Which are the socio-cultural factors that contributed to the absence of entomophagy in the Yucatan Peninsula?

From this main question three subquestions are derived:

- What effects did the syncretism of cuisines have on the Mayan people of the Peninsula of Yucatan?
- Where taboos established to make the Mayas avoid the consumption of insects?
- Is it possible to reintroduce insects as a food choice?

This thesis is divided in seven chapters. In the first chapter the Theoretical framework is presented. The second chapter gives a background and historical view in Mexican food culture and the role of insects. Then, the fifth chapter tells how the data was collected and analysed. The sixth chapter is an Analysis of the gathered data, followed by Discussion and Conclusion, as chapters seven and eight respectively. Finally, the author's personal reflection on the writing of this thesis is given.

2. Theoretical framework

In this chapter the theoretical and conceptual framework for this research will be discussed. In the first section an introduction to the food cultures theory in relation to the concept of 'identity' is given. This theory was chosen because one of the objectives of this research is to understand how culture exposure affects people's eating habits; therefore, it is important to know what is a food culture. The concept of identity is also defined considering that people and groups of people seek to identify themselves within a society and, most of the times food is a path through which they find a sense of belonging. But why do some cultures consider some food items edible and some others not? This brings us to the socio-cultural factors that have been interfering with the adoption of insect consumption, which are presented in the second subsection. These four factors help explain why within a given food culture there exist specific rules, written or not, to what is good to eat and what is not good to eat. By understanding the relation between this factors a possible explanation could be given to the reason why entomophagy was abandoned in the southern area of Mexico. The chapter concludes with a discussion of the overlap and gaps of the theories and concepts.

2.1 Food Cultures and Identity

When describing a food culture, we are talking about 'traits that are common for certain groups of people' (Askegaard and Madsen, 1998), this traits come out of the place of people's origin and they are shaped by their environment, their beliefs and education, their ethnicity, colonization and globalization (Wahlqvist & Dph, 2007).

To make this definition more complete society should also be considered as having a big influence in shaping our food culture. For most inhabitants of industrialized Western societies¹, food has long ceased to be merely about nutrition and nourishment, it is packed with social, cultural and symbolic meanings (Bell & Valentine, 2013).

¹ When talking about 'industrialized Western societies', it refers to people living in Europe, United States and Canada.

Bell and Valentine (2013) have noted that “every mouthful, every meal, can tell us something about ourselves, and about our place in the world”. Therefore to better understand a certain food culture it is necessary to consider all the perceptions, conceptions and symbols that represent each group. Cultural patterns go from the psychological processes of appetite and satiety to the representations that give a personal structure to dietary patterns (Ramos-Elorduy, 2009). These not only include the ones related to the body and mind, but also to the social norms like the establishment of schedules, types of food, when and what to eat. All these factors represent our social and cultural identities and the psychological ownership in a social group, food helps make modern social life intelligible (Finkelstein, 2003).

To recognize that food has many diverse and important social functions leads us to consider what actually happens when these functions are either altered or questioned (Finkelstein, 2003). The history of eating is one of constant adjustment to new foods and new cooking techniques. Food tastes and cuisines are always evolving. Although some of our daily basis ingredients may now seem ordinary in our diets, they were not part of it until a few hundred years ago. For example the potato, originally from Peru, was first introduced in the 16th century by the Spanish conquerors as a food for livestock. However, in the 18th century its value as a food security crop was recognized after saving Europe from being decimated by famine (Lutaladio & Castaldi, 2009). Nowadays it even forms part of traditional cuisines in some European countries. The same applies to certain Mexican ingredients such as cacao, tomato, turkey, and capsicum. The consolidation of a cuisine most often result from a complex interplay of various social forces, including inventiveness, nostalgia, and commercial pressure (Finkelstein, 2003).

As Arjun Appadurai (1981) said, food is both “a highly condensed social fact” and a “marvellously plastic kind of collective representation with the capacity to mobilize strong emotions”. Food connects people; it may be consumed individually but is mostly always prepared collectively. Our rites and social gatherings always involve food. So to say that it has the capacity to mobilize strong emotions, means that through food memories are created; and when this happens food is transformed into heritage. Therefore, food is an important social context, food indicates who we are, where we came from, and what we

want to be, it becomes part of our identity. And in a world in which self-identity and place-identity are linked through webs of consumption, Brillat-Savarin's (1862) aphorism suits the best "Tell me what you eat and I tell you what you are".

Talking about "identity" involves considerations of personal preference, pleasure, creativity, and the sense of whom and where you are (Belasco, 2008). We are particularly aware of food as identity when we think of ethnic groups. Like heritage, ethnicity is not a fixed thing but a process of creating and reproducing classificatory distinctions between in-groups and out-groups by people who perceive themselves as distinct from others (Eriksen, 2002). It is known that ethnic groups are characterized by, and often defined by, their food ways (Anderson, 2014). Using food to signal ethnicity has clearly grown with the rise of trade, contact, and regional interaction. It has also grown with nationalism; each ethnic group feels it must confirm its identity by having a distinctive cuisine (Anderson, 2014).

All groups have an identifiable cuisine, a shared set of "protocols", communications, behaviours, etc. (Belasco, 2008). Anthropologists Peter Farb and George Armelagos (1980) compare a cuisine to a culture's language – something that is taught since birth and which is hard to change when you are fully grown.

Every child when is born forms part of particular community with its distinctive beliefs and values. Food is foundational to this process. From birth, in receiving nourishment from others the roots of psychological attachment, identity, and social place are laid down (P Rozin, 1996). Children learn what is safe to eat and what is dangerous, and also to distinguish between self and not-self (Burris, 2004). Food, which is 'not-self' but becomes 'self' through ingestion, then plays an important symbolic role. It can be explained by going back to the aphorism 'you are what you eat', on the one hand, food biologically becomes part of us; on the other hand, that so-called ethnic food often has distinctive tastes, textures and smells that set it apart from that of the majority; as Bourdieu (1984) famously revealed, the cultivation of preferences or 'taste' is itself integral for denoting the 'authenticity' of one's membership in such groups. Food now is a "readily recognized marker of ethnicity and perceived as a major form of traditional culture" (Lu & Fine, 1995).

Food choices also enable members of a culture to reiterate and reinforce their identity as distinct from other cultures. Ethnic communities within host countries are marked as different, and attempt either to maintain that difference or to erase it, through cultural processes and practices (Bell & Valentine, 2013). The very idea of being different is only fully realized through alienation, cooking and eating are really important, as ethnic cuisine too “only becomes a self-conscious, subjective reality when ethnic boundaries are crossed” (Berghe, 1987). The consumption of foods viewed as traditional by ‘insiders’ and unappetizing by ‘outsiders’, is a powerful statement of identity and difference. With that clarified, we are what we eat, and we are not them. We are different.

But what makes us different? One way in which many cultures identify themselves is by delimitating what is edible and what is not. As mentioned before, while growing up children learn what they should and should not eat. Sometimes these rules are clearly written (i.e. Kosher and Halal) but quite often they are not. So how to make these differences clear? In the following section some of the main factors behind food avoidances are explained in a more detailed way.

2.2 Socio-cultural Factors Hindering Entomophagy

This section starts presenting the theory of Disgust, one of the most important theories surrounding the denial towards insect consumption. Then it follows up describing food taboos, poor people’s food and globalization; and their link to insect consumption.

2.2.1 Disgust

The biggest reason used to explain why Western people do not practice entomophagy is that they not only consider insects as inedible, but also look at them with disgust. Most Western people shudder by the idea of insects – let alone by the idea of eating them (Defoliart, 1999).

One of the most important factors that obstacle the widespread acceptance of insects, as food is ‘culture’. *Taste is culture* and in many countries and societies there is a strong emotion of disgust when considering insects as food (Looy, 2014; Rozin, 2008). Humans

are food generalists who make choices of what to eat based on education, experience, economics, and fashion trends in food selection, among others (Paul Rozin, Kurzer, & Cohen, 2002). The fact that most human–food relationships are learned means that they can also be altered both positively and negatively.

The word ‘disgust’ comes from Latin [*dis*] expressing reversal and [*gustus*] which means ‘taste’, so literally meaning ‘bad taste’. Disgust is a basic universal emotion that is often interpreted as an aversion reaction to that which is foul and toxic, thereby protecting the organism by inducing recoil and revulsion (Korsmeyer, 2002). Disgust, like other basic emotions, has a characteristic facial expression associated with it, a specific physiological state (nausea), a behavioural component (distancing oneself from the offensive object), and a characteristic feeling state (revulsion) (Rozin & Fallon, 1987).

Rozin and Fallon (1987) give several examples of disgust and they consider it to be mainly a food related emotion. They define it as:

Revulsion at the prospect of (oral) incorporation of an offensive object. The offensive objects are contaminants; that is, if they even briefly contact an acceptable food, they tend to render that food unacceptable.

A useful framework for understanding acceptance and rejection of both familiar and unfamiliar foods comes from a taxonomy of basic motivational dimensions identified by Fallon and Rozin (1983).

The first dimension, distaste, involves accepting or rejecting a food because of its real or imagined sensory characteristics (i.e. taste, smell, texture, or appearance). The second dimension, danger, refers to reactions to foods based on the anticipated harm of eating them; this could be bodily harm (i.e. stomach cramps), or social harm, such as degradation of social status. Finally, the knowledge of the nature or origin of the substance may also play a role in food acceptance or rejection. There are two types of ideational reasons for acceptance or rejection of foods: inappropriateness and disgust. Rejections based on inappropriateness occur for items typically not classified as foods within a given culture, such as toilet paper for example. The second type, disgust, occurs because of what a food is, where it comes from or its social history. Foods rejected on the basis of disgust have

offensive properties; they are presumed to taste bad and they have the capacity to contaminate other foods.

These aspects of contamination are referred to as the laws of sympathetic magic. These two laws were described by James Frazer and Marcel Mauss (Jonathan Haidt, McCauley, & Rozin, 1994) to explain a wide variety of magical practices and beliefs in traditional cultures. The first one is the *law of contagion*, which means “*things which have once been in contact with each other continue ever afterwards to act on each other*”(P Rozin & Fallon, 1987). For example, if we can consider the presence of an insect inside a bag of chips, the chips are no longer considered edible, even after the removal of said insect. The second is the *law of similarity*, which means that two objects that resemble each other are assumed to have like properties(P Rozin & Fallon, 1987). That can be used to explain why people won't eat chocolate shaped insects.

As stated above, disgust is regarded as a food related emotion. Haidt et al. (1994) like Rozin and Fallon (1987) states that disgust is not only rooted in evolution but is also a product of culture; elicitors of feelings of disgust differ strongly among cultures and are learned. This is most probably the origin of food taboos, as they might serve as survival tools, by teaching the young ones what is 'good to eat' and what is not.

Distaste responses can be seen in adult humans and neonates only a few hours old, as well as nonhuman animals, including rats, apes, and monkeys (Chapman & Anderson, 2012). Because many toxins are bitter, distaste has a clear and concrete adaptive function in motivating the avoidance of poisonous foods (Chapman & Anderson, 2012). Therefore, both humans and animals have to learn what is edible and what is not.

As omnivorous, humans have tried to eat almost everything they have encountered, this lack of dietary specialization may lead to frequent exposure to dangerous foodstuffs (Chapman & Anderson, 2012). Being omnivorous has both, advantages in flexibility and freedom from dependence on any food source and disadvantages, with the fact that not all foods that seem edible, are good to eat. This creates what is now known as “the omnivore's dilemma”, which means we want to try new foods but at the same time are afraid to do so (P Rozin & Fallon, 1987).

The omnivore's dilemma was first described by Rozin in 1976 (Advances in the study of behavior, 1976) and it has its origins early in evolutionary development; it refers to the conflict in which an organism needs to seek new foods (neophilia) to meet their nutritional needs and the fear (neophobia) that what they are about to eat may be toxic, infectious, and deadly.

Humans are reluctant to consume unfamiliar foods; this is one of the emblematic behaviours of omnivores. In learning a culture's food ways, the emotion of disgust is primary. Disgust signals that the object or action we are contemplating, such as eating a particular food, will have physically or culturally threatening consequences and therefore should be avoided or rejected. It supports the belief that 'we are what we eat' by ensuring that we avoid foods that will give undesirable characteristics. Disgust has its roots in the sensation of distaste, an innate rejection response to bitter-tasting substances (Steiner, 1981; Fallon & Rozin, 1983). But disgust is elaborated through enculturation to motivate rejection of several categories of objects or events including food (Jonathan Haidt et al., 1994). Therefore, what we find disgusting is primarily learned.

In the first years of life, children must learn what is edible and what is not. Since very young, children tend to put almost anything into their mouths, it is basic for them to learn what not to eat. In their work 'Food likes and dislikes' (1986) Rozin and Vollmecke discuss how, after adults and children have made the basic edible/inedible distinction, they come to like or dislike some foods. They considered three contrasting pairs of categories: distasteful vs dangerous foods, good-tasting vs beneficial foods, and disgusting vs inappropriate items.

The first category involves foods that are initially neutral or liked and later become distasteful or dangerous. This happens when the ingestion of a food is followed by some types of bad experience (e.g. vomit, nausea, stomach cramps, etc.) humans develop a strong aversion to that food. For example, a lactose-intolerant person will avoid milk because of the after effects it causes (e.g. gas, belly pain, bloating) but if the intolerance could be suppressed he/she will happily consume milk. While, a person that after having

milk in a bad state (i.e. decomposition) without knowing and though got sick, will develop an aversion to milk and whilst avoid it.

For the good tasting versus beneficial foods category there is no single factor that clearly causes acquired likes in the way that nausea causes dislikes. Therefore, some of the possible reasons could be: just by mere exposure, with the exposure the fear of neophobia disappears because the food is now considered safe; physiological consequences of ingestion, like satiety; and, social valuation, here it can be distinguished between social pressure and the perception that a food is valued by respected others (e.g. parents).

Last, the disgusting versus inappropriate items category. There is no evidence for an innate basis for disgust: infants do not manifest an aversion to feces, and decay odour does not seem to be innately aversive (P Rozin & Fallon, 1987). It is thought that the offensiveness of disgusting items is somehow conveyed to children by their parents, perhaps through facial and other forms of emotional expression.

Cultures have developed elaborate ways of selecting and preparing foods. The cuisine is a cultural system that defines the items in nature that are edible, how these items are extracted from the environment, eaten, or processed into food, the flavours used to enhance the taste of food and the rules about eating. Cuisine was the solution to the omnivore's dilemma and remains an essential feature of human adaptation. Therefore it is an advantage that at every meal the eater will not experience neophobia when making a dietary choice resulting in an expanding dietary repertoire (Armelagos, 2014; Pollan, 2006)

Sometimes it seems rational to be disgusted by certain foods. Avoiding the consumption of rotten food, for example, is a survival strategy. However, most disgusting objects or acts are culture-specific and arbitrary (Looy et al., 2014). Western people eat organisms strongly associated with decay such as fungi and marine scavengers such as lobster, crab, and shrimp (Holt, 1885). Yet they don't make distinction when considering insects as food, all of them, either herbivorous or parasites are treated as objects of revulsion and fear.

Haidt (1997) argues that all disgust triggers ultimately serve the same function: to separate ourselves psychologically from reminders of our animal nature. We are people, not animals. This desire to separate from our animal nature is a particularly strong concern in

Western culture, where human rationality, understood as the highest capacity of our disembodied mind, has historically been enshrined as our unique heritage, evidence of our superiority to and distinction from all other creatures. Because food inevitably serves as a reminder of our animalness it is not surprising that food boundaries are protected through disgust.

Another, perhaps more powerful, negative association is that of insects and the alien. Disgust and fear can support and reinforce all of these associations, which in the end produce an image of insects as a threat. Therefore, for Western cultures, insects cannot be simply considered as 'exotic' and 'ethnic' food, as was sushi until very recently. Once more, if 'we are what we eat', then all the alien, dirty, disgusting, dangerous characteristics we attribute to insects will be transferred to us if we eat them. Many Western people really do view insect eating as "perverse, barbaric or desperate", "the stuff of nightmares", something they would do only under duress as a disgusting act (Looy & Wood, 2006; Menzel & D'Aluisio, 1998).

Now that insects are seen as a possibility to improve food security (Huis, 2012) it is important to make people from western societies approve the consumption of insects.

Research on food rejection has emphasized the physical nature of the food item and their meanings and functionalities for a particular cultural group (Meyer-Rochow, 2009; P Rozin & Fallon, 1987). Surveys within a cultural group have shown strong findings on the tendency to avoid foods such as viscera and insects due to aversive textural properties and animal associations (Martins & Pliner, 2006).

People make decisions about a food choice based on previous experiences. Food could thus be rejected on the basis of inaccurate presumptions of bad taste, often resulting in the rejection of items that evoke disgust before it is even tasted (P Rozin & Fallon, 1987). This is especially relevant in the case of insects where negative associations are common (Shan et al., 2015).

When there has been no previous contact with a certain food item there is no background on the taste and usage of the same. This leads to rely on what is known about the category in order to form a judgement. In the case of insects in Western culture, this

alludes to the frequent associations of insects as pests and disease-transmitters (Shan et al., 2015).

Getting people to taste insects that they have never been tasted before is a big challenge, as the familiarity of insects in our environment tends to evoke strong negative associations (e.g. pests, disease). These associations could be sufficient to result in rejection before tasting (P Rozin & Fallon, 1987). However, there is evidence that offensive food items could be accepted if prepared in an appropriate way, as the study of Schösler (2012) with pizza containing processed insect protein was rated somewhat more positively, than dishes with fried mealworms, especially by younger people.

Many psychological and biological factors govern food preferences and aversions, but while there are certain predispositions, food likes and dislikes are mostly acquired through experience (Tan et al., 2015). Similarly for insects, there is no evidence of an innate aversion (Bodenheimer, 1951). This suggests that both cultural exposure and individual experience would play an important role, where locals learn from a young age to accept foods that are available in their culture (Tan et al., 2015)

However, food dislikes are not only related to disgust; sometimes other circumstances, like safety for example, were the reason why some foods were forbidden. But somehow, even after these foods were declared safe for consumption, people in some cultures still avoid them. These foods have become taboos.

2.2.2 Food Taboos

Through time, ideas about what is 'good to eat' and what is considered disgusting have become rooted in society and now are much more than just an evolutionary tool for survival. In most cultures, there are strict, unwritten rules on what is edible and what is not. The term 'food taboo' is used to distinguish the deliberate avoidance of a food item for reasons other than simple dislike from food preferences (Meyer-Rochow, 2009).

The term *taboo* is of Polynesian origin and was first noted by Captain James Cook during his visit to Tonga in 1771. He introduced it into the English language, after which it achieved widespread currency (Britannica, 2000). The word meant to something that was

profane or sacred was forbidden to common people to touch. If someone broke the 'taboo', they were severely punished. Although taboos are often associated with the Polynesian cultures of the South Pacific, they have proved to be present in virtually all societies past and present. It was through Sigmund Freud's (1938) work "Totem and taboo" that the concept gained popularity during the 20th century. Due to Freud's influence, the meaning of 'taboo' has changed. The focus of the concept shifted from sacred and profane objects, to the aspect of prohibition itself.

Food taboos are known from almost all human societies. Most religions declare food items fit and unfit for human consumption. There exist dietary rules and regulations that may govern particular phases of the human life cycle and may be associated with special events such as menstrual period, pregnancy, childbirth, and in traditional societies, as preparation for the hunt, battle, wedding, etc. (Meyer-Rochow, 2009). Some taboos can be explained while others make no sense at all; while some foods may be considered a delicacy to one group it may cause repugnance to another. Food taboos have been persistent throughout history, yet no single theory may explain why people employ special food taboos (Meyer-Rochow, 2009).

Frazer (Fieldhouse, 2013) suggests that the laws of sympathetic magic (explained in the Disgust section above) could be the origin of taboos; an avoidance of what is believed could cause harm.

Of all the foods consumed by humans, those of animal origin appear to have a special status. Anthropological research suggests that they are the most valued foods in most cultures. According to Harris (1998) "... all over the world... people honour and crave animal foods more than plant foods and are willing to lavish a disproportionate share of their energy and wealth on producing them." Across cultures, consumption of animal foods is often linked to wealth and status. In a contradictory way, animal foods are also the most likely to be defamed and associated with taboos against eating them. Simoons (1961) states that "of all the group food avoidances, those which pertain to foods of animal origin, particularly flesh, are accompanied by the strongest feelings, are most frequently incorporated into religious observance, and are supported by the most severe sanctions."

Harris (1998) explains that a species will be apotheosized or abominated depending on its residual utility or harmfulness. For example, a horse not eaten plows fields and wins battles. A pig not eaten is useless; it competes with us for grain, does not plow fields, nor wins wars. Therefore it is abominated. Insects not eaten are worse than pigs not eaten. They are plagues to the crops, bite and sting, make you itch, and suck your blood. They bring nothing good. There are few useful species such as bees and silk worms but they do not compensate for the thousand others. We have learned to identify them as something dirty, to fear and loath.

Pliner and Pelchat (1995) found that disgust is an important motivation for the rejection of novel foods, at least those of animal origin, and, that people were more likely to reject unfamiliar foods of animal origin than those of non-animal origin.

Angyal (1941) and Rozin and Fallon (1987) have suggested that animals, along with their products (including waste and mucous), are the primary offensive entities, therefore, the main trigger of the disgust response. As stated in the 'Disgust' section, humans want to separate themselves psychologically from the reminders of their animal nature. Consequently, it makes sense to consider all or almost all animals as potentially offensive. In most cultures, even though people have a big range of different edible animal species just a small part is consumed, and even among those consumed animals, the head and viscera are generally avoided, which clarifies that only certain parts of these animals are actually considered acceptable. It can be suggested that the head and the viscera are avoided because they remind the consumer, which is the origin of the food. Angyal (1941) talks about the importance of animalness as an elicitor of disgust, he noted that in many languages, meats often have names that are markedly different from their animal names (e.g. beef vs cow) as though to put some distance between the two. Moreover, meats are often prepared and served in a manner intended to disguise their animal origin (e.g. by removing the bones, cutting into filets).

Our relation to animals is a modern paradox. On the one hand, animals in modern industrial society have a newfound role and place in the family as pets; and on the other hand, science has turned animals into 'de-animalized matter', so that we have no need to identify the steak on our plate with the steer from which it came (Weil, 2007).

Again, going back to the aphorism 'you are what you eat', there have been several studies (MacClancy, Henry, & Macbeth, 2009) in which ethnic groups believe that by eating the flesh of an animal, he/she acquires not only the physical but even the moral and intellectual qualities which were characteristic of that animal. Some examples are the snails and jackals avoided by hunters who don't want to become cowardly and weak; lions and hearts of predators may be eaten to confer strength (MacClancy et al., 2009). Therefore, one might expect ingestion of offensive objects to cause one to become offensive.

Anthropologists have stressed the similarity between sexual and food prohibitions, suggesting that the foods we eat must be at "intermediate distances", neither too close nor too far (Weil, 2007). To consume those that are too close is to perform an act of cannibalism, or at least to let ourselves fall to a kind of animal state by not knowing or paying no attention to such distinction. An example could be horsemeat. Horses seem to slip in and out of the category of pet, thus part of the family, which may be one reason why horse meat has remained primarily a food of necessity, not one of choice (Bordieau, 1984).

As Claude Lévi-Strauss might say, for something to be good to eat, it must be good to think (Lévi-Strauss, 1994).

Finally, it ought to be mentioned that any food taboo, acknowledged by a particular group of people as part of its ways, aids in the cohesion of this group, helps that group stand out amongst others, assists that group to maintain its identity and creates a feeling of 'belonging' (Meyer-Rochow, 2009). Therefore, food taboos can also be a way to define identities.

However, food avoidances are not only related to disgust or harm. People identify themselves with food; therefore food can convey certain attributes like intellectual or economic status. This social statuses can become determinant factors in being accepted by a certain group or society. This is further explained in the following section.

2.2.3 Poor People's Food

Although, the social, economic, environmental and nutritional values of insects are well-documented and validated, developed nations still generally consider insects as an emergency and non-conventional food of low prestige; they are sometimes referred to as famine foods (MacClancy et al., 2009; Ramos-Elorduy, 1997).

As stated in the “Disgust” section, one of the motivational dimensions towards food rejection is danger, which relates to the anticipation of harm. But the harm that is going to be discussed here is that of social harm, more specifically, the degradation of social status conferred by the consumption of a specific food item.

Historically, food has always been linked to social prestige and status; some foods confer social status on the eaters, while others assume high status because of the groups who habitually eat them (Fieldhouse, 2013). Status is also earned by the nature of the foods served. High status is attached to exotic foods, complex dishes and, usually, to expensive items.

Bourdieu (1984) described the knowledge we have about which foods to choose, which cutlery to use and how to look after our bodies as ‘cultural capital’, arguing that practices of the self, such as eating, betray people’s origins or *habitus* (which refers to the lifestyle, values, dispositions and expectations of particular social groups that are acquired through the activities and experiences of everyday life). Educated professional people tend to eat greater variety of food and are more likely to follow special diets like vegetarian; while lower-income groups consumption patterns are characterized by ‘vulgar foods’ rich in fats and sugars (Bell & Valentine, 2013).

Foods may assume high status and become a feeding fashion within a society simply because they are consumed by high-status groups (Fieldhouse, 2013). An example of this is the evolution of white sugar and white bread. When white sugar first became available it was an expensive commodity, which could only be afforded by the rich. It therefore

became a symbol of status to which others, lower in social hierarchy, aspired in an attempt to elevate their own social status. Once white sugar became widely used through all social statuses it lost its value; brown sugar has now assumed that prestige (Brekman & Nesterenko, 2013). A similar behaviour may be observed in white bread. The coarse dark flours characterize peasant status; when milling procedures became perfected, everyone wanted white flour, despite its inferior nutritional value. Preferences may develop for high-status foods without regard to actual taste or nutritional value, the importance of prestige food lies in how much social recognition it confers (Fieldhouse, 2013). The shift to whole bread was made after prominent specialists concluded that dark bread was much healthier than white bread (Kaplan, 2006).

In his article *"Real Belizean Food": Building Local Identity in the Transnational Caribbean* Wilks (1999) provides another example of a food item that acquired high-status: lobster. The 'stratified taste' attributed to lobster comes from the fact that it was eaten by the poor because it was cheap, by the elite because it was a prized item in Europe, but avoided by the middle class as a 'trash fish'. It was only until it became a major export commodity in the 1970's that it was no longer considered poor people's food.

Gillespie (1995) considers that taste is also "one of the most significant markers of ethnicity in plural societies." In her studies of young British Indians, she found that young people eat Western food as a way of exhibiting more cultural capital, while eating their traditional food marks them as 'different'.

In their paper Looy and colleagues (2014) found that the African groups which whom they worked were reluctant to tell those of Western origin of the traditional practice of entomophagy. This might be because they know that this practice is considered by Westerners to be only for uncivilized and poor people, which could lead to prejudice against them.

Since last year (2014), newspapers (Insect-eating is the latest culinary trend to hit the UK | Daily Mail Online) and magazines (Eating Insects: Why The Newest Food Trend Is Actually An Amazing Idea | Marie Claire) have published articles about insect-eating as a

new food trend. The media cites the guide released by the FAO (Food and Agriculture Organization) in 2013 about edible insects, mentioning the various benefits of insect consumption, highlighting their high-protein and low-calorie content. Portraying insects, as a fashion item and listing expensive restaurants where they are already being served. Perhaps as a way to try and convince people to try them.

Entomophagy is disappearing from the menu of many ethnic groups in the developing world because it has always been perceived as 'low status' and 'non-food'; on the other side, the Western world is rediscovering them as a new protein source, as a luxury food (Schiefenhovel in MacClancy et al., 2009). Maybe, in a way, the approach of introducing insects as an exotic and luxury food could manage to convince people from high-social class to try them and with this, people of lower statuses will want to imitate them.

2.2.4 Globalization

In food there is nothing new about globalization (Lang, 1999). Trade has spread foods, techniques and diets around the world (Tansey & Worsley, 1995). Millennia of travelling overseas, followed by colonialism and widespread migration, have brought a two-way exchange of foods, from colonized to colonized and vice versa (Mennell, Murcott, Otterloo, & Association, 1992); this movement of foodstuffs is the start of what Goody (1982) calls a 'world cuisine'. The incorporation of colonial empires was marked by the cultural exchange in which seeds, diets, recipes and products penetrated the world (Bell & Valentine, 2013).

The definition of globalization has been discussed widely. Giddens (2013) refers to globalization as 'the intensification of worldwide social relations, which link distant localities in such a way that local happenings are shaped by events occurring many miles away and vice versa'. Robertson (1992) defines globalization as 'the compression of the world and the intensification of consciousness of the world as a whole'. Waters (2001) portrays globalization as 'a social process in which the constraints of geography on economic, political, social and cultural arrangements recede, in which people become increasingly aware that they are receding, and in which people act accordingly'. All these definitions together describe globalization as worldwide interdependence and global awareness.

The existence of a world cuisine has become a reality. The development towards the internationalization of eating habits and cuisines has been strongly facilitated by the growth of international food industries and large-scale trade in food (Goody, 1982). An important characteristic of globalization is the shaping of taste, which lately has been influenced in its majority by giant corporations. As processed food styles are exported, consumers in the developing world are encouraged to think of food and drink as coming not from farmers or the earth but from processed food corporations (Lang, 1999). Centuries-old diets are being influenced and altered at a really fast pace.

While human entomophagy is accepted as normal part of the diet in Latin America, Asia, Africa and Oceania, the phobia of eating insects in western societies and globalization have had a huge influence in modern food costumes. Globalization is resulting in the use of more fast foods and prepared foods and the loss of traditional ways of life (Yen, 2009).

Recent studies reported that in cultures where insects are traditionally eaten consumption is now in decline (Acuña, Caso, Aliphat, & Vergara, 2011; Looy et al., 2014; Yen, 2009). For example, in their studies in Sanambele, Mali; Looy (2014) found that because of the crops being grown near their villages and the use of pesticides on them, Sanambele parents warn their children, “Don’t eat the grasshoppers. They are bad for you.” Yet not eating the grasshoppers is bad for them too. A complete and free protein source has been removed from their diets. The risk for protein-energy malnutrition and its associated negative physical and mental consequences, especially for developing children, has now considerably increased.

Some other reasons identified for the decline in insect consumption are the increasing westernization of local diets in traditional communities (Yen, 2009), dietary change towards cheaper imported and refined foods and the long-standing image of insect-eating as a ‘primitive peoples’ practice (Neto & Ramos-Elorduy, 2006). The taboo of insects as food for the poor is still rooted in many societies.

Insects are still widely important as food, and they contribute significantly to local economies. A new attitude towards entomophagy is needed from the Western countries because acculturation toward Western lifestyles tends to cause a reduction in the use of

insects, frequently in populations that are economically marginal, without affording the means by which the lost nutrition can be replaced (DeFoliart, 1992).

2.3 Conclusion

The four factors (i.e. disgust, food taboos, poor people's food and globalization) described in this chapter are the main focus of this study. These four concepts can help explain the possible reasons why entomophagy ceased to be practiced in some areas such as the Yucatan Peninsula.

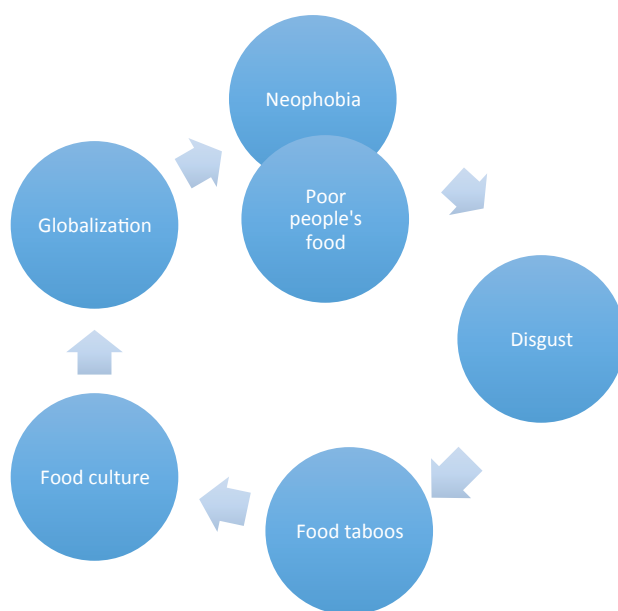


Figure 1. Possible pathway in the development of a food avoidance

The relationship between the first three factors is strong. As it can be observed in the figure above, if a food item is considered either new or low class food can lead to a thought of disgust, which then causes the avoidance of such product. If the avoidance is transmitted through generations it can then turn into a taboo. Therefore both, disgust and poor people's food are reasons why some food items might become food taboos.

A food taboo can become part of a food culture and in consequence to the identity of the people belonging to such culture. This is the reason why both concepts of 'Food culture' and 'identity' are included in this chapter, to give the reader a general idea of how strong is

the relationship between people and their food culture, how people can define their identity through food. Therefore, these three factors (i.e. food taboos, disgust and poor people's food) can help shape food choices and avoidances within a culture.

The last factor (i.e. globalization) is important to consider because this is how the influence of Western Food Cultures has reached the world changing and endangering Traditional Food Systems². It is interesting to see how some of the habits and costumes of other Food Cultures (in this situation Western Food Culture) can be accepted and embraced by other Food Cultures, while some other habits (like entomophagy for example) are not so welcomed. But then again we go back to the fact that the habits and costumes that get incorporated are most of the time considered fashionable, modern and of high social status.

This is a suggested pathway and cannot be considered as a rule, as some other relationships between the already mentioned factors can occur. Food cultures and globalization might be a possible influence towards people giving importance to a high social status, therefore making poor people's food their main motivator behind food avoidances. Also, globalization could be the cause of neophobia, thinking of all the novel foods and ingredients that are introduced on a daily basis. So, as it can be seen, there are many different pathways and relations between all these factors and how they contribute to the development and maintenance of food avoidances.

² Defined as all food within a particular culture available from local natural resources and culturally accepted. It also includes the sociocultural meanings, acquisition, processing techniques, use, composition, and nutritional consequences for the people using the food.

3. Food culture background of the Yucatan Peninsula

This chapter puts the reader in context of the situation in Mexico and the Mayas regarding insect consumption.

3.1 Study setting

Yucatán is the name of the peninsula situated in the southeast part of Mexico. It is made up by three states: Campeche, Quintana Roo and Yucatán, which gives name to the peninsula. The official languages of the Peninsula are Spanish, which is spoken more or less by more than 90% of the population, and Maya, which is commonly spoken in the rural areas.



Figure 2. Map showing placement of the Yucatan Peninsula within Mexico (source <http://world-traveling.info/yucatan-peninsula/>)



Figure 3. Map of the Yucatan Peninsula depicting the most important archaeological sites (source <http://www.royalresorts.com/cancun-riviera-maya-mexico.asp>)

3.2 Mesoamerica

Mesoamerica is the cultural region that includes much of present-day Mexico and extends far south in Central America; the area can be divided into several large areas whose climate, geography, and natural resources later played a role in determining the type of diet developed in each region (Long & Vargas, 2005).

The Olmec, the Maya, the Aztecs, are just some of the well-known cultures that were part of this region. However, there were hundreds of cities and towns and dozens of autonomous groups throughout this cultural area.

This is what the Spanish conquerors encountered when arriving to the New World, such a diversity of cultural groups with their various cosmological views, religious practices, political structures, and own food ways.

In this chapter, we will focus only in the part of Mesoamerica that comprises the country of Mexico. First, I will give a general description of the evolution of the Mexican Food Culture since its roots in the pre-Hispanic cuisine until modern days, giving special attention to the role played by entomophagy. Then, a small description of the study setting is given. Afterwards, I will focus on the Maya culture that occupied the region known as the Yucatan Peninsula. To finish, I will discuss the influence that not only colonialism but also globalization have had in entomophagy and Mexican Food Identity.

3.2.1 The colony and the food culture clash

Mexican food as we know it today has its origins in the sixteenth century. The people of Mesoamerica had been eating tortillas for two thousand years before Hernán Cortés's arrival (Pilcher, 1998).

The Popol Vuh, or "Council Book", is the most important sacred book of the Quiché Mayas; an important text for understanding Maya religion, myth and history (Christenson, 2007). This book helps us to understand the importance of maize for the pre-Hispanic

cultures. The story narrates how the gods created the world and then men; first they tried with mud, but they were weak; then they tried with wood, but this men were not good for worshipping; finally, the gods decided to shape mankind from maize (Christenson, 2007). Maize provides the essence of pre-Hispanic people's identity. Thus, the efforts of Cortés and his followers to transform the New Spain into a copy of the old was met with stubborn resistance from the indigenous groups who were reluctant to abandon their traditional cuisine (Sahagún, Austin, & Quintana, 1995).

The making of a Mexican national cuisine was a long and hostile process. The Spanish conquest of Mexico brought together two vastly different cultures with equally distinct culinary traditions (Long & Vargas, 2005). While conquerors spoke with awe of Moctezuma's splendid banquets (B. D. del Castillo & Remón, 1632), Spanish colonizers tried to install their cuisine to the New Spain and to eradicate the existing one, a constant battle between wheat and maize.

They used as many means as they were able to. Spanish missionaries taught the goodness of wheat as part of their evangelical message to pagan Mesoamericans (Pilcher, 1998). Fray Bernardino de Sahagún instructed them to eat "*that which the Castilian people eat, because it is good food, that with which they are raised, they are strong and pure and wise... You will become the same way if you eat their food.*" (Sahagún et al., 1995)

The friars also launched campaigns against native festival foods that were identified with pagan practice; like with amaranth, which indigenous people shaped into idols and ate afterwards (Pilcher, 1998). It was impossible for them to ban maize without originating a widespread starvation, so instead they taught women to make the sign of the cross over the dough before forming it into tortillas (Long & Vargas, 2005).

To understand more about Mexican cuisine it is important to consider what is called in Spanish "*mestizaje*", the blending between two different cultures, which took place during the European exploration and colonization.

The word *mestizo* was a racial label created by the colonizers, both Spanish and Portuguese, to identify the off springs of European white men and Amerindian women (Vasconcelos & Jaén, 1979). It was, therefore, a racial category designed to place the 'hybrid' within the racialized caste system imposed by the colonizers in Latin America (Amado, 2012). Therefore, when talking about a 'mestizo' cuisine, we refer to a hybridization between the existent pre-Hispanic cuisine and the one brought by the Spanish colonizers.

The introduction of European plants and food products were combined with local foods and gave birth to this new cuisine. European foods that made a strong impact upon the Mexican diet then and are still be observed in the Mexican food tradition today can be reduced to six major items: wheat; meat and its derivatives, such as milk, cheese and eggs; sugar; citrus fruits; new vegetables such as onions and garlic; and the herbs parsley and coriander (Long & Vargas, 2005). All the ingredients mixed in an authentic representation of a mestizo national cuisine (Pilcher, 1998).

There was never a victory, but rather a fusion of both, maize and wheat. As it can be seen until today when two of the most common food choices are either 'taco' (maize) or 'torta' (wheat).

3.2.2 The abandonnement of Entomophagy

Spanish colonizers were confronted with many different new foods and practices which generated a whole set of reactions, from pleasure to disgust. As discussed in the 'Disgust' section there are several motivational dimensions that can lead to disgust to a food item. For the Spanish colonizers two dimensions apply, the Danger dimension and the Ideational dimension. They were afraid of trying these new foods and to the possible harm they could cause to their bodies but also, there were food items that they simply not considered 'good to eat' (i.e. cactus) or they were already seen as something dirty and foul (i.e. insects).

This could be one of the reasons why not all the food sources of the pre-Hispanic diet were accepted or managed to adapt and remain in the Mexican cuisine. The pre-Hispanic groups took advantage of everything that nature could give them, which made their diet and food sources endless, this of course included insect consumption, which was met with

mistrust by the Spanish conquerors. All of this was recorded in documents such as *“Historia General de las cosas de la Nueva España”*, wrote by Fray Bernardino de Sahagún (1995). Here he mentions the consumption of maguey worms, escamoles (ant eggs), chapulines (grasshoppers), ahuahtli (beetle eggs better known as Mexican caviar), ezcahuitli (eggs from a fly); chicatanas (a type of ant), axayácatl (a type of bed bug), etc. An abstract of the book says:

There are many types of locusts in this land and they are not as the ones in Spain, some of them are called acachapolin which means arrow locusts; they called them that way because they go fierce when flying and roar like an arrow; they are used to eating them.

The consumption of insects in some regions of Mexico survived after the conquest, due to the strong popularity of its consumption, besides it was no competition against the crops the Spanish validated as food (Hernández, 1959).

For the Spanish not all of these products were appreciated and considered edible and it was common to refer to those foods they were not used to eat as part of another type of foods, those known as vermin. Even for some indigenous groups the consumption of some of these foods was sign of social inferiority (Gibson, 1964).

Around the XVI century in Toluca, a city in the centre of Mexico, according to León García (2002) there was a Friday market where you could buy insects and *“the Spanish favorites were fish, frogs, duck and, what can be surprising, the eggs of axayácatl insect, called ahuahtli, which were prepared during fasting.”* Thus, the Spanish did not ban all insects as food but most of the consumption was left to the indigenous groups.

Both concepts of ‘food taboos’ and of ‘poor people’s food’, which are described in chapter 3, can be related to this scenario. Apparently, a taboo of ‘insects as food for the poor’ was created by the Spanish and continued by the indigenous groups. Though, there were exceptions like the *ahuahtli* that Spanish’s fancied maybe due to the fact that it was considered by the Pre-hispanic people as food for the gods and only served in special banquets for the emperor. Therefore, it could be considered as a food ‘good to eat’ and included in the colonizers diet.

There exists little reference about the insects consumed after Mexico's independence and during the XIX century, because they were food for the indigenous people and low social class groups. At the beginning of the XX century the rural diet with indigenous origins was still attacked and disregarded, even at some point it was blamed for the social and cultural underdevelopment of the country (Hernández, 1959).

3.2.3 Entomophagy and Mayan Food Culture

The Mayan culture originated around 2600 BC, when Mayan people moved to the Yucatan area of Mexico from the west. There is a misconception about the Mayas, for they are most of the time related to Yucatan, therefore to Mexico; but the truth is that the Mayan civilization were not one large group of people, but many smaller groups that established individual villages and cities in the region that goes from the south of Mexico, Guatemala, Belize, Honduras and El Salvador (Scholl, 2009). They are now considered part of a group because they shared a similar language, architecture, religion and customs.

When talking about the Mayan diet it can be said that it was also based in maize and the triad formed by squash, beans and chili.

Much of the information on the Maya diet comes from the book "*Relación de las cosas de Yucatán*" (An Account of the Things of Yucatan), written by the Franciscan bishop of Yucatan, Diego de Landa, in the late sixteenth century. Landa is a much hated figure in Mexican history, as he incinerated 27 Maya painted books and therefore destroyed valuable information on Maya culture and religion.

Landa (2012) mentions that maize served the Maya as both, food and drink. Meat, fish and fowl were high-status articles in Mayan diet; it formed part of the elite diet and was mainly consumed on holidays or during special banquets. The bones of several animal species have appeared in archaeological sites, for example, bones of the white-tailed deer, iguana, dog, spider monkey, tapir, armadillo, manatee, rabbit, etc. Seafood was also high-status nourishment reserved for the tables of the elite.

Yucatan was an excellent place for producing honey. The honey the Maya produced was white, of good quality, and used to sweeten some maize drinks, such as *atole* and *pozol*, and to make a ritual beverage called *balché*.

The Maya were very efficient at exploiting the resources available to them. Their diet was varied and sufficient, but probably not abundant, during certain seasons of the year. At other times, hunger reigned when their crops were destroyed due to drought or locust plagues. Both, the presence and the impact of the locust in the subsistence of the ancient Mayas are information hard to find and mostly inexistent (Corona-m, Hunn, & Vargas, 2013, pp. 35–43).

For the Yucatan Peninsula there was little information to be found. It is known that the Maya Peninsular culture had a tight bond with some insects and other arthropods not only for their functionality but for their attributes in the world view (Corona-m et al., 2013, pp. 58–68). These can be found in books like *Chilam Balam* and *El Ritual de los Bacabes* chants that make reference to ants, bees, spiders and scorpions. Ramos-Elorduy mentions in various papers (2007; 2004; 2009) both the presence of edible insects in the peninsula and the consumption of the same by the Mayas, but there exists little record about this. As mentioned before, the Maya culture was not only present in the Yucatan Peninsula. The Mayan territory covered an area of more than 350,000 km, which comprise most of the southeast of Mexico (the states of Yucatán, Campeche, Quintana Roo and some regions of Chiapas and Tabasco), Belize, and the centre and north of Guatemala and the northwest border of Honduras (data obtained from www.centrogeo.org.mx/.../biodiversidad_1.htm).

With this it can be inferred that the Mayas to which Ramos-Elorduy refers about the insect consumption are the ones located in Chiapas and Guatemala. In the paper “*The consumption of insects by Lacandon Ethnos of the Bethel community and their nutritional value*” (2001), she mentions that the Lacandon are considered to be originally from the Yucatan Peninsula and the Guatemalan Petén, and it is thought that they migrated to Chiapa’s jungle running from the colonial authorities, who were trying to congregate them in established communities. They were part of the Maya people living in the peninsula and

most probably maintained their entomophagy traditions due to running away and hiding in the Lacandon jungle, which gives them their name.

Fray Diego de Landa in his book "*Relación de las cosas de Yucatán*" (2012) mentions the use of bees was tolerated because of the production of honey and wax for the friars use. So, as long as it brought the Spanish a benefit the permanence of certain traditions or ways of living was permitted.

Little was found about the contemporary consumption of insects in the Yucatán Peninsula. It is believed that the ancient Mayas did practice entomophagy; there is no available information about when was the precise moment this practice died.

One of the most recent studies "A local view of arthropods in Yucatán, México" (Corona-m et al., 2013, pp. 58–68) describes the current knowledge about arthropods in three different zones of Yucatan (South, North Coast and East).

As stated above, arthropods have been present in many expressions of Mayan culture, in the study made by Pinkus (Corona-m et al., 2013, pp. 58-68) people showed extensive arthropod knowledge, which resulted in the identification of more than thirteen orders. Knowledge was around species biology, benefits (economic, therapeutic, or alimentary) and those considered pests.

Inside the 45 different categories found for arthropods, more than 50% was assigned a harmful use, from which only four were found edible or to provide and edible product (Corona-m et al., 2013).

The most important edible product related to arthropods is honey; which has been produced since pre-Hispanic times from many different native bee species.

Nevertheless, there has been a decline in honey production as reported by González-Acereto and colleagues (2015) where they mention that the decrease in the use of native bee species is due to the increased deforestation and the little or no interest in what they

call 'meliponicultura' (i.e. bee culture, the native bee is *Melipona beechei*, its Mayan names *xunan cab* or *cole cab*).

In all the communities that were studied by Pinkus only two types of wasp larvae were mentioned for consumption: the *Xuux* (*Polybia occidentalis*) and the *Ek* (*Brachygastra mellifica*), even though people are able to identify more species, which they don't use.

The consumption of other insects like wild bees, ants, wasps and even beetles, has been reported (Ángel & Rendón, 2010; Ramos-Elorduy & Montesinos Viejo, 2007), however, in the studied communities none were mentioned (Corona-m et al., 2013). In addition, some of the interviewed people said that they were well aware about the existence and consumption of other edible insects in the rest of the country (i.e. grasshoppers and worms), although in Yucatan their 'traditionally' not eaten. Some of them also mentioned they did not eat them because they found their appearance disgusting.

3.2.4 The impact of Colonialism and Globalization in Entomophagy

According to Yen (2009) the situation in the countries which still practice entomophagy is similar; there are two forces in operation: the desire to encourage the sustainable traditional use of edible insects and at the same time the 'westernization' of these societies which is leading to a movement away from entomophagy.

As mentioned before in the "Globalization" sub-section, colonialism had a great impact in shaping the world's cuisines and food habits. The contact between the European and Mexican culture had consequences in food habits. The religious orders through their different monasteries around the world spread hundreds of edible goods, spices, seeds, fruits, flowers, vegetables, etc. which transformed the Western habits.

The arrival of the conquerors also had a strong impact in the food traditions of Mexico with all the new ingredients brought either from Europe or from Asia and which later became included in the pre-Hispanic recipes. Most of Mexican culinary tradition has survived in spite of the historical and environmental changes that have occurred throughout the

country. In settlements of 19 states at least one or more of the 57 edible species of insects in Mexico are included in the traditional diet (Vel, Unidos, & Europea, n.d.).

To talk about traditional diets is to refer to a very broad possibility of food items, but the term 'Traditional Food System' is used to enclose all the food available from local natural resources which is accepted within a particular culture (H V Kuhnlein & Receveur, 1996). These food resources are associated with local knowledge which represents many generations of observation and adjustment and it is important to study and preserve this knowledge in order to understand how traditional food contribute to the diets that support indigenous people³ (H V Kuhnlein & Receveur, 1996; Wahlqvist & Dph, 2007). This becomes more critical as socio-cultural and ecological factors threaten the already fragile condition of the Traditional Food Systems (Armelagos, 1980; Kuhnlein & Johns, 2003).

Entomophagy most commonly forms part of the cultural heritage; knowledge of how to find, collect and prepare insects is passed down through generations by imitation, instruction and oral transmission (Neto & Ramos-Elorduy, 2006; Ramos-Elorduy & Montesinos Viejo, 2007; Ramos-Elorduy, 1997).

Entomophagy among indigenous people in Mexico has been extensively studied from a biological and entomological point of view, but not as a component of Traditional Food Systems (Acuña et al., 2011). Though, there is one study (Acuña et al., 2011) made in a village in the state of Puebla in central Mexico where the indigenous people known as the Popoloca hold insects in high regards as food, considering them a true delicacy rather than merely a famine food, it is part of their cultural heritage and identity; which therefore makes edible insects together with other practices like *milpa* agriculture, animal husbandry, firewood collection and wild food gathering their Traditional Food System. The practice of entomophagy has been passed on from one generation to the next, recently people all over the world started to show interest in entomophagy. In fact, there are markets in cities like New York, Paris, Japan, Los Angeles or Mexico City, where insects are sold at unbelievable prices (Looy et al., 2014). Books like *Creepy Crawly Cuisine* by Julieta Ramos-Elorduy or *The Insect Cook Book: Food for a Sustainable Planet* by Arnold Van Huis and Henk Van Gorp are being sold to introduce people to this millenary practice.

³ The term 'indigenous people' refers to a cultural group in a particular ecologic area that developed a successful subsistence base from the natural resources available (H V Kuhnlein & Receveur, 1996)

As stated before, the preservation not only of entomophagy but also of Traditional Food Systems is widely important because they are important food and economic resources for indigenous communities in Mexico and in the world.

4. Methodology

This thesis applies qualitative research methods which according to Hancock and colleagues (2006) is concerned with developing explanations of social phenomena; it aims to help us to understand the social world in which we live and why things are the way they are.

First a literature review was undertaken (chapter 1 and 3) made. Articles, which related entomophagy and the Yucatán Peninsula, were hard to find. During the stay in Mexico three different libraries were consulted, two from universities and one from the government. The little information that could be gathered for this study was found in the books written by the Spanish during the conquest.

For data collection two types of tools were used: one-on-one interviews and online surveys.

4.1 One-on-one interviews

According to Creswell (2012) for one-on-one interviewing the researcher needs individuals who are not hesitant to speak and share ideas, and needs to determine a setting in which this is possible. The less articulate, shy interviewee may present the researcher with a challenge and less than adequate data. For the in-expert interviews this was not the case, both interviewees were qualified researchers familiarized with this data collection tool, which made the interview easier and easy going. The interviews were semi-structured which are non-standardized and are frequently used in qualitative analysis (Kajornboon, 2005); an interview protocol was designed prior to the interviews. In this type of interview the order of the questions can be changed depending on the direction of the interview though it gives the researcher opportunities to probe for views and opinions of the interviewee. Probing is a way for the interview to explore new paths which were not initially considered (Gray, 2004). The strengths of semi-structured interviews are that the researcher can prompt and probe deeper into the given situation. The disadvantages are inexperienced interviewers may not be able to ask prompt questions; if this is the case, some relevant data may not be gathered (Kajornboon, 2005).

Before traveling to Mexico, contact with two researchers from the Autonomous University of Mexico (UNAM) was made. The *Centro Peninsular en Humanidades y Ciencias Sociales* (CEPHCIS) is the research institute located in the city of Mérida in Yucatan. The first researcher interviewed figures a line of research regarding Cultural Ecology, Ethnobiology and Archeozoology. He is responsible for the projects “Mayan Ethnoentomology” and “Ethnoecology and Biocultural Patrimony” both research projects taking place in the Yucatan Peninsula. He provided some of the bibliography that was used in this study. The other researcher has a PhD in Science in Ecology and Sustainable Development. His line of research focuses in the local knowledge of natural resources with emphasis in arthropods, landscape ecology and community dynamics due to fragmentation. He wrote one of the most important articles used for this study, “*A local view to the arthropods in Yucatan, Mexico*” (2013). His research in the Yucatán Peninsula has shed a little light to the actual consumption of insects in this region. These were the two in-expert interviews that were done. Each interview lasted about 45 minutes and was recorded with a mobile phone device, for later transcription (See Appendix 2 pp. 79-83).

Ten other one-on-one interviews were made to people living in the Yucatan Peninsula, most of them in the city of Merida, Yucatan. Not all them were locals but had been living in the region for more than 2 years. These interviews were also semi-structured; they lasted about 30 minutes and were written down (See Appendix 2 pp.84-93).

4.2 Online Interviews

Other 40 interviews were gathered using the facilities provided by Internet. The Internet offers many advantages as a data collection tool (Wharton et al., 2003), which is the most important reason why online surveys were chosen. Some of the advantages and disadvantages of using this method are listed below:

1. Global reach

With online interviews it is easier to achieve samples that are more representative than traditional approaches, as it reaches ‘busy people – often educated and well-off – who systematically repel or ignore cold callers but are willing to answer questions posted on their computer screen (Kellner, 2004 as cited by Duffy, B. et al., 2005).

After the stay in Mexico, this method gave the advantage to continue gathering answers through the web. One of the downsides of this method could be the availability of Internet connection for the entire population. Often, an online survey may be very useful when gathering information from communities that have exceptional Internet access, such as high school, college, or business communities. These communities will likely have homogeneity in hardware and environment, allowing for more consistency in both the setting in which the survey is completed and in appearance of the survey itself. But as online access grows, so will the utility of Internet-based surveys.

2. Convenience.

For this study the difficult part was to fit in the difficult schedules people have. Online surveys provide convenience in several ways. Respondents can answer at a convenient time for themselves, it was easier for them to answer the survey during their work break or some spare time they had. They also may take as much time as they need to answer individual questions. Some online surveys let respondents start and then return later to the question where they left off earlier. So, instead of being annoyed at an inconvenient time with a telephone survey, a respondent can take an online survey whenever he or she feels it is convenient.

3. Flexibility.

Online surveys are quite flexible. They can be conducted in several formats: e-mail with a link to a survey URL; link to a survey URL through social networking (Facebook, Twitter); e-mail with embedded survey; etc. (Evans, 2005).

For this study e-mail with a link to the survey and social networking (Facebook) were the chosen formats.

Facebook is a popular free social networking web site that allows registered users to create profiles, upload photos and video, send messages and keep in touch with friends, family and colleagues.

According to Baltar and Brunet (2012) the use of Facebook to contact individuals can minimise problems associated with “spam” message, impersonal contact, unclear answers and low response rates. Moreover, the possibility to have access to offline contacts by the recommendation given by online ones can reduce problems associated with selection bias and representation.

As it is observed by Brickman-Bhutta (2012):

Online social networking sites offer new ways for researchers to run surveys quickly, cheaply, and single- handled, especially when seeking to construct snowball samples of small or stigmatised subsets of the general population.

Therefore, Social Networking can be a good complement for sampling because they make possible to expand the size and scope of the sample; making them an appropriate tool to apply snowball sampling which can improve the representativeness of the results (Baltar & Brunet, 2012).

To use snowball sampling in this study a hyperlink was shared in the author’s own Facebook with a brief description of the purpose of the study, specifications of the population towards which it was intended (i.e. people between the age ranges of 20 to 45 and which had been living in the Yucatan Peninsula for at least 2 years) and a request to ‘share’ this post with other friends.

Snowball sampling is defined as: “a technique for finding research subjects” (Atkinson & Flint, 2001) . The researcher begins with a small sample from the target subpopulation and then extends the sample by asking those individuals to recommend others for the study (Brickman Bhutta, 2012).

Snowball sampling is a useful methodology in exploratory, qualitative and descriptive research, especially in those studies that respondents are few in number or a high degree of trust is required to initiate the contact (Baltar & Brunet, 2012).

For this study Facebook represented the maximum quantity of gathered responses. It is believed that the reason why it worked better than via e-mail was that sometimes people

have different addresses or they have abandoned accounts, which makes difficult to know if people are going to be reached. Other disadvantage of online surveys is that when sending them via e-mail they can be considered SPAM, which automatically will be deleted hence reducing the amount of responses. On the other side, through Social Media it was possible to leave a self-written message explaining the reason of the study and inviting people to answer and it was shared by contacts which help widespread the interview. Virtual snowball sampling not only facilitates the access to the 'hard to reach' population, but also can expand sample size and the scope of the study and reduce costs and time (Benfield & Szlemko, 2006).

4. Speed and time.

A fourth advantage is that Internet-based survey research may help you save time (Evans, 2005). As already noted, online surveys allow reaching thousands of people with common characteristics in a short amount of time, despite possibly being separated by great geographic distances. Online surveys may also save time by allowing collecting data while working in other tasks (Llieva, Baron, & Healey, 2002 as cited by Wright, 2005). Once the invitation to participate in a survey is posted or emailed to people it is possible to collect data while performing other activities ((Andrews et al., 2003 as cited by Wright, 2005).

5. Costs.

Online survey researchers can also save money by moving to an electronic medium from a paper format (Wright, 2005). Survey costs can be divided into two categories: preparation and administration. With regard to preparation costs, until recently, online surveys could be costly to construct because of the technological and programming requirements; today, with the availability of advanced survey software and specialized online questionnaire development firms, preparation costs are much lower (Evans, 2005). For this study the online surveys were designed through the website Survey Monkey®. In terms of survey administration, and because surveys are self-administered and do not require postage or interviewers, costs are also kept down (Evans, 2005). The disadvantage here was that because this was a small study, only the free version of Survey Monkey® was used, which limited the amount of questions and spreading media available.

These are some of the most important advantages and disadvantages to consider when using online surveys. Some other factors need to be taken into account when using online surveys in research, including its uncontrolled environment (for example, respondents might be affected by random factors and events, including distractions at home or the presence of family or co-workers); surveys are impersonal then we have a lack of information related to facial expressions and respondents reactions (Wharton, 2005) which can be compared to the one-on-one interviews where it was possible to observe the respondents reaction (which varied from disgust to confusion and surprise) at the mention of “edible insects”.

4.3 Data Analysis

Data analysis was first started with transcribing the one-on-one interviews, which is the procedure for producing a written version of an interview (Hancock, 2006). The interviews were kept in their original language (Spanish) only the quoted sections were translated into English. The online surveys results were gathered from the website used and coded. These codes were also translated from Spanish to English.

According to Temple and Young (2004) if researchers see themselves as neutral and objective transmitters of messages, the translation act itself poses technical issues that can be overcome.

Coding is the process of examining the raw qualitative data (in the form of words, phrases, sentences or paragraph) and assigning codes or labels. Two forms of coding were used, as described by Strauss and Corbin (1990): Open Coding, which is to code or label words and phrases found in the transcript or text; and Axial Coding, creating themes or categories by grouping codes or labels given to words and phrases.

Codes were selected in relation to what people thought or knew about the practice of entomophagy. A total of 152 codes were obtained from both the one-on-one interviews and the online surveys. Afterwards they were grouped into five categories: Cultural, Poor people's food, Reintroduction (luxury/fashion), Region and Family influence (See Appendix 3).

5. Analysis

In this section the results from the Data Analysis will be discussed in relation to the theory and concepts that were defined in chapter 2.

5.1 Culture

Culture has the strongest impact when relating a specific food item to a group's diet. As seen in the interviews and on-line survey results, most of the respondents consider culture and tradition the two defining factors of entomophagy's prevalence in Mexico. In the following quotes extracted from the one-on-one interviews, it can be observed that interviewees agree to the fact that it was a really old tradition and that it has been kept alive by cultural influence.

"People in Mexico consume insects because it is a tradition, I think it is the mayor motive behind it." (Male, 32)

"I think is a tradition from pre-Hispanic times, insects must have been as important as maize and beans." (Female, 24)

"Is part of our tradition and culture as a country." (Male, 28)

5.2 Disgust

Above, I discussed the most important socio-cultural factors, which influence insect consumption. Disgust appears to be the main motivator behind the aversion related to insect consumption, as it can be observed in the following quotes from the one-on-one interviews.

"No, I have never eaten insects and never will, the only thought of it makes me feel nausea." (Female, 26)

"Never. I find it revulsive." (Female, 29)

As discussed in the Disgust section, there are three different dimensions in which food can be classified as disgusting. After the data analysis, it was found that the second dimension (danger) and the third dimension (disgust) were the ones more related to insect consumption. Insects have been considered dangerous for the human society since quite a long time; these feelings have been encouraged through terror movies and insecticide campaigns (Ramos-Elorduy, 2007; Ramos-Elorduy, 2009). This generates fear towards them and therefore makes people consider them as something dangerous for consumption. It is also important to remember that not only bodily harm is considered in this danger dimension, but also social harm. This social harm is related to one of the other factors previously discussed, poor people's food.

5.3 Poor people's food

In these quotes from the one-on-one interviews we can see how insects are considered as something that people eat in case of need, when there is nothing better, the so called starvation foods.

"... The state of Oaxaca has many different ethnic groups and many of them live in really poor regions, were perhaps insects are eaten not only because of tradition but for necessity." (Male, 32)

"I don't know why they eat them, maybe because they have nothing else to eat." (Male, 30)

"It can be that some people do it for tradition and some others because of need." (Female, 26)

The fact that they are considered poor people's food makes them unappealing to people in the developing world, who wish to imitate their Western counterparts in their ways of living. This might be thought of a silly reason to avoid insects, why not eat something that can provide you with all the nutrients you need and which is at hand? To acquire social status and prestige through food has been, for quite a long time, a strong motivator behind the rejection of many food items considered "low class" and "famine foods". As it happened to

whole wheat bread and brown sugar, insects will have to overcome the stigma they have of being considered poor people's food.

Both situations of fear only help to intensify the feel of disgust generated by insects. These feelings of danger and disgust take us to the third factor hindering entomophagy, food taboos. According to Meyer-Rochow, a food taboo is the deliberate avoidance of a food item for reasons other than simple dislike from food preferences. Even if there are no written taboos surrounding insect consumption in the Yucatan Peninsula, it can be considered the existence of a silent one. People in the study area avoid insect consumption, they know other populations in Mexico base their diets on them and that they are really nutritious, but not even that is good enough to convince them to do so.

5.4 Globalization

Globalization is the last, but not least important factor to consider; I can even think that is one of the most important ones. The fact that developing countries are always trying to imitate the Western culture, has led to a rejection of their own traditions, so if they think of insects as something disgusting and foul, they have to do it too.

As shown in the tables in the Appendix 2, just 20% of the respondents didn't find insects edible, while the other 80% said they were aware of their properties as food but only 65% have actually eaten insects. What should be mentioned here is the most of the respondents that had eaten insects were not originally from the Yucatan Peninsula. Most of them came from other parts of the country, mostly from the states in the centre of Mexico, where entomophagy is a more common and daily practice.

"My family is from the centre of the country, where insects are more frequently used in cooking." (Female, 24)

"My father is from Jalisco, where the consumption of maguey worms and chicatana ants is quite common." (Female, 24)

Globalization occurs at all levels, and here we can observe two manifestations of it. On one side, people inside of Mexico are aware of the traditions of other regions in the country, which before was not possible. Insects are now known to be eaten in many states of the country; people that come from these states sometimes even bring them along. With all the internal migration of people, new recipes and food items have been incorporated to the traditional cuisine of other states. This awareness has in some way influenced the inhabitants of the Yucatan Peninsula, which still not consider insects as part of their diet but with continued exposure might well at some point be willing to try them.

“I know they (insects) are eaten in other places, but I do not consider them edible. In the traditional cuisine from the state you cannot find a dish that includes insects.” (Female, 26)

And on the other side, we can observe how the influence of Western culture has reached even far away communities. People are shifting more and more into food fashions such as sushi and molecular gastronomy; it is okay to evolve but it is important not to forget traditions.

“... insects have become something popular and exotic, high class restaurants serve them at ridiculous prices, people who eat them do it more for fashion and status. What happened to eating them as a street food?” (Female, 24)

5.5 Summary

Going back to Figure 1 from chapter 2 (showed below) it is more clear now that this pathway is not the only one that these factors may follow. For people in the Yucatan Peninsula, globalization has played an important role. On one side, it has made possible for them to know the food cultures of other regions in the country therefore, knowing that insects are an edible food product. From the other side, it has increased their possibilities of Neophobia, considering the big amount of migration that has occurred in the last years.

Poor people's food is a factor that enters a paradox in this region. Some of the respondents mentioned that they think people in other parts of the country consume them because they have no other resource available, so they are seen as a starvation food. On the other side, local restaurants are serving them as an exotic food and by the influence of

globalization (as sketched on the figure) they are starting to consider the possibility of trying them because now they are given a high status attribute. Therefore, the pathway in this specific situation can be started from globalization and then move on to disgust.

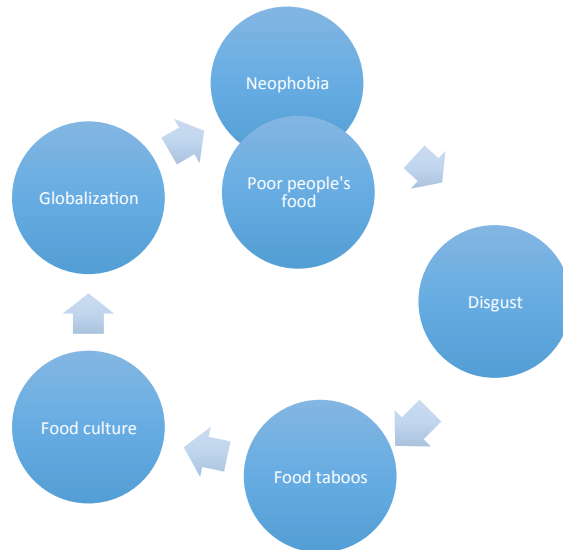


Figure 1. Possible pathway in the development of a food avoidance

As already mentioned, disgust is considered one of the strongest factors regarding food avoidance. Insects have a bad reputation among people and thus produce fear and disgust reactions. Which lead to their avoidance and at some point to the establishment of a food taboo.

In conclusion, it can be said that the four factors are strongly related and together have shaped the view people have about insects. Getting people to consider the consumption of insects goes further than just improving taste; it has many social and psychological factors to overcome. Cultural exposure should be considered as one of the possible ways to overcome this refusal.

6. Discussion

Disgust is the main motivator behind the aversion related to insect consumption, not only now, but it is also believed that it was what motivated the Spanish conquerors to try and ban insect consumption. Though, as we have seen, it was not an easy task. The indigenous people had a very rooted way of living and had been leading their lives with specific diets for thousands of years, for the Spanish it was really hard to change this already established and solid culture.

Nevertheless here is when other three important factors enter: taboos, poor people's food and globalization. It is not yet clear if the Spanish established taboos but what could be possible is that through banning and marking as low-class certain foods they became avoided which might have later turned into a non-spoken taboo. Also in the interviews it is just barely mentioned, some respondents consider need and low income as reasons to consuming insects, what reflects their consideration of insects as a poor people food. Insects have a dual value characterization, either they are considered as a cheap meal or an expensive delicacy, like escamoles. Which also might have something to do with the marketing factors surrounding the product.

One of the defining points of this thesis took place during the in-expert interviews. After talking to them it was clear that there was so little information about how the Mayas once related to insects and its consumption, not even them, whom have been doing research related to this topic for years have been able to explain the reasons behind its disappearance.

Regarding the possible reintroduction of insects as a food choice in the region, based on the answers obtained through the online interviews it could be considered but due to the fact that the sample size was limited it is not possible to speculate about the thoughts of the general population. Most of the participants in the one-on-one interviews mentioned that they had never considered the possibility of consuming a protein supplement coming from insects, but they thought this could be a more reasonable and less disgusting way to consume them.

A reintroduction might be possible but there are a lot of factors to consider, not only economical ones but cultural as well. Apparently, it seems that most of the influence of insect consumption comes from family members. As it was mentioned in the literature review, most of this ancient knowledge has been passed from fathers to sons for generations.

In a study made in Belgium by Verbeke (2015) called *Profile consumers who are ready to adopt insects as a meat substitute in a Western society*, adopting insect protein was generally perceived as a rather unrealistic, unacceptable and ineffective way to improve dietary sustainability. Not even consumers that reported ecological awareness, who one might have assumed to be more open to the consumption of insects, were just as averse as the wider population when asked about their readiness to eat insects.

Despite most of these findings, which show a clear reluctance among Western consumers to include insects in their diet, there are indications of the presence of a nucleus of some kind of market for insects or insect protein in Western countries (United Nations News Centre, 2013). For example, an increasing number of restaurants now serve insects as a delicacy and more insect cookery books become available (Ramos-Elorduy, 1997). The findings of Schösler et al. (2012) about consumer reactions towards chocolate-coated locusts and pizza with insect protein suggest that there may be opportunities to present insects as a delicacy or as an ingredient in convenience foods.

Insects as a fashion are something that is already happening in countries like the UK, Denmark, The Netherlands, etc. but the question is if it will actually influence the perception of low-class consumers to follow up this high-class fashion. Even in Yucatan high-class and gourmet restaurants such as Néctar and K'uuk are serving insects as an exotic delicacy, the problem is that the people involved in all this edible insect project as a way of achieving food security are people that don't have economical means to eat for fashion. Though, most probably it will make them consider the consumption because people of the elite eat them, the example of white sugar and white bread was already given for this, the fact is that it has to become something more than a mere fashion, it has to become something real and feasible.

7. Conclusion and recommendations

The presence of entomophagy in the Yucatan Peninsula remains unclear, if it was once extensively practiced, all trace of it is now gone. The transmission of this old knowledge takes place from one generation to the next, from grandfather to sons and grandchildren, but at some point its importance diminished and now is barely acknowledged. What remains is a small scattered consumption through the region and mostly centred on honey. The existence of a Mayan bee god states the importance that insects-human relations had for this culture.

The main research question was:

Which are the socio-cultural factors that contributed to the absence of entomophagy in the Yucatan Peninsula?

It was difficult to answer this question, because there is not enough information about how or why insect consumption diminished after the arrival of the Spanish. But after analysing the answers of people living today in the area of the Yucatan Peninsula, it was possible to make some inferences of the main factors that contributed to the disappearance of entomophagy. Disgust, food taboos, poor people's food and globalization are the factors that have been discussed, compared and contrasted throughout this thesis. As discussed in the Analysis Section, it seems that there exists a strong relation between all of them, which makes the reintroduction of insects a more complex situation than just a flavour improvement.

The first subquestion helped to put on perspective the possible consequences of the shift in diets after the arrival of the Spanish conquerors.

What effects did the syncretism of cuisines had in the Mayan people of the Peninsula of Yucatan?

The literature review shows that Spanish people put all their efforts in trying to change the diets of the Mayan people. They manage to incorporate many new ingredients and with them create a hybrid cuisine, a mestizo cuisine. Maize remained as a staple food, while the consumption of other food items died; such is believed to be the case for insects. Which takes us to the second subquestion.

Where taboos established to make the Mayas avoid the consumption of insects?

It is not possible to answer this question truly. But it can be inferred that it was possible that they forbid the consumption of insects because they found it uncommon and disgusting. If compared to the maize, for example, it was not possible to ban its consumption because wheat couldn't substitute the properties and uses of maize; while it is possible that the new meats brought by the Spanish, such as pork and beef, replaced insects.

And to answer my last question, *Is it possible to reintroduce insects as a food choice?* I can say it is a fact that the reintroduction of edible insects is not as simple as it seems and it involves many different factors, not only cultural and social, but also psychological. Some research has been done regarding the acceptance of insects as food (Looy & Wood, 2006; Tan et al., 2015; Verbeke, 2015) but they are still not seen as a food option, not even with the possible environmental benefits that could come with their introduction. I can venture to say that more than an introduction as a meat substitute the focus should be of the kind mentioned in the paper by Tan and colleagues (2015) and Looy and colleagues (2014) where they discuss the importance of considering the cultural background of people as a big influence for their acceptance or rejection of insects and other new items as food. Maybe not the existent generations but the future ones will be able to include them in their diets through education. Also it is important to make people aware about entomophagy and in general about eating habits of other cultures around the world, so this will create a respect between cultures and towards their food, avoiding the disappearance of such Traditional Food Cultures.

There is a need for further research not only from sociological perspective and consumer preference but also from entomologists, to work in the relations and interactions between humans and insects, which could help to improve the relationship between them.

8. Personal reflection

When I think of me at this point I realize how much I have overestimated myself. I always thought I was not going to be able to pursue a Master in Food Sciences do to my background in Gastronomy. But I got accepted into this university, and I completed my first year. Then I decide to make it even more difficult, jumping into an almost unknown area for me: Rural Sociology.

But after the Food Culture and Customs course I knew I had to do something related to it for my thesis. I had a couple more courses, which just increased my desire to deepen into this area of Food Studies.

The writing of this thesis was a big challenge for me. I am not a sociologist and I lacked a previous background in this field. It was hard from the beginning. Choosing the subject and then narrowing it to a specific topic was the first hard decision. At some point after starting I had a breakdown and thought the topic was not interesting enough but after a while I realized my research was just one more little piece of knowledge for all this on-going research about insects.

It was really hard for me to try to think as a sociologist and ask myself questions of how and why things happened. I needed to understand more about how they worked and what a qualitative research was, so besides reading about edible insects, I also did a little bit of research in the area of Sociology. I have read so many papers, so many different point of views that have just increased my fascination for Food and Food Studies.

After my literature review, I was a little bit worried of how the study was going to turn out, there was so little information about insect consumption in the chosen area of study, which made me fear the worst. After arriving to Mexico and meeting with the experts from the UNAM, my fears were made real; there was no material to work with for the development of an ethnographic research; so I had to change the direction of my research.

At the end, with the help of my supervisor I was able to develop a new set of research questions and a new setup for data collection. It was not what I expected but in the end it turned out well.

After the recollection of data for this research, I realized how little willingness we have to help others. I got rejected many times for the one-on-one interviews that at the end I was just able to gather a few and all the others were made online; and even then, there was not a high rate of response. I have committed myself to try to help my fellow students in their research whenever is possible to me; it is really discouraging when you don't receive help from others.

I had ups and downs during the whole process. It took me almost a year to finish this thesis, but I at the end I manage. It was a very enriching experience; I learned a lot and also got to know my own limits. Maybe, in the future I will go back to exploring the relationship between people and food.

9. References

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Online Surveys

Tradiciones Gastronómicas

Esta investigación es llevada a cabo por una estudiante de maestría para el departamento de Sociología Rural de la Universidad de Wageningen en los Países Bajos.

Toda la información que se obtenga de la siguiente encuesta será estrictamente confidencial y anónima.

La encuesta sólo le tomará unos minutos de su tiempo.

Agradecemos de antemano su participación.

El consumo de insectos es conocido como entomofagia.

La entomofagia es una tradición que aún perdura en varios estados del centro y norte de México, así como en otros países alrededor del mundo.

Los insectos son una fuente de alimento alta en proteína y su producción requiere poco espacio lo que los convierte en un alimento sustentable.

Me gustaría conocer tu opinión acerca de esta práctica, contestando las siguientes preguntas.

P1. Proporciona tu edad, género y lugar de residencia (si no eres yucateco, favor de indicar de dónde eres originario):

1. 29, femenino, yucateca
26/06/2015 10:44
2. 35, masculino, D.F pero resido en Mérida
25/06/2015 9:33
3. 26, femenino, yucateca
24/06/2015 16:37
4. 41, masculino, Yucateco
22/06/2015 10:33
5. 28, femenino, Mérida Yucatán
31/03/2015 23:50
6. 22 femenino de Mérida Yucatán
31/03/2015 23:02
7. 27 años, femenino, Yucatán
31/03/2015 20:36

8. 27, Masculino, Múnich (Pero soy de Mérida)
31/03/2015 20:30
9. México D.F. 49 años femenina vivo Yucatán
31/03/2015 20:15
10. 26, femenino, DF
31/03/2015 19:48
11. 24 femenino Mérida Yucatán
31/03/2015 19:34
12. 24, femenino , Yucatán
31/03/2015 19:16
13. Mérida Yucatán México, 25 años, femenino.
31/03/2015 17:22
14. 40 años femenino yucateca
31/03/2015 17:08
15. 28 // Masculino // Múnich // Soy Yucateco
31/03/2015 16:54
16. 25 años femenino
31/03/2015 16:06
17. 23 años femenino Mérida, Yucatán
31/03/2015 14:15
18. 26, masculino, Mérida
31/03/2015 4:42
19. Yucatán, femenino, 56 años
31/03/2015 4:40
20. 24, Masculino, Mérida
31/03/2015 4:29
21. 57 mujer yucateca
31/03/2015 0:58
22. 59-femenino-Mérida
31/03/2015 0:49
23. 25, femenino, Mérida
30/03/2015 23:10
24. Mujer, 24 años, Mérida, Yucatán.
30/03/2015 22:59
25. 24, femenino , Yucatán
30/03/2015 22:19
26. 26 Mujer Mérida
30/03/2015 21:13
27. 24 femenina Yucatán
30/03/2015 20:52
28. 26, femenino, Yucatán.
30/03/2015 20:51
29. 25 años, masculino, Yucatán
30/03/2015 20:20
30. 25, mujer, Mérida, Yucatán
30/03/2015 20:15
31. 40, H
30/03/2015 20:03
32. 25, mujer, Mérida Yucatán
30/03/2015 19:54
33. 32 femenino yucateca

- 30/03/2015 19:48
34. 25 masculino Mérida
30/03/2015 19:43
35. 23, femenino, Tampico
30/03/2015 19:42
36. 25 años, Femenino, Yucateca.
30/03/2015 18:25
37. 28 años. Mérida, Yucatán
30/03/2015 17:24
38. 27, masculino, San Luis potosí, Holanda
16/03/2015 16:46
39. 29, femenino, yucateca en Vietnam
16/03/2015 16:45
40. 25, masculino, de Celaya pero vivo en Yucatán
16/03/2015 16:42

P2. ¿Consideras que los insectos son comestibles? ¿Por qué?

1. No, pues porque son **sucios**
26/06/2015 10:44
2. Si, porque son una **fuentes alta en proteína**
25/06/2015 9:33
3. Si, por que son parte de nuestras **tradiciones prehispanicas**.
24/06/2015 16:37
4. Si, contienen **muchos nutrientes**
22/06/2015 10:33
5. No, porque no me enseñaron que pudieran serlo, por el contrario me enseñaron que por **grotescos** no deberían estar en la cocina
31/03/2015 23:50
6. sí, porque en la **tradicón** mexicana los hay (Oaxaca)
31/03/2015 20:36
7. Sí, porque lo he visto en varias ciudades.
31/03/2015 20:30
8. No, me dan **asco**
31/03/2015 20:15
9. Sí, **fuentes alta en proteína**
31/03/2015 19:48
10. si, los he comido siempre por costumbre
31/03/2015 19:34
11. sí, porque son **ricos en proteínas**
31/03/2015 19:16
12. si algunos porque aún en algunos poblados de Yucatán se comen.
31/03/2015 17:22
13. si son **buena fuente de proteínas**, están en la naturaleza
31/03/2015 17:08
14. Si, **algunas culturas comen insectos**.
31/03/2015 16:54
15. si porque son **orgánicos**
31/03/2015 16:06
16. sí, porque son una **buena fuente de proteína**
31/03/2015 14:15

17. si, gran cantidad de nutrientes
31/03/2015 4:42
18. aportan vitaminas
31/03/2015 4:40
19. si
31/03/2015 4:29
20. sí. Por su contenido proteico
31/03/2015 0:58
21. Sí. si animales se alimentan de ellos, los humanos pueden hacerlo, e inclusive lo hacen.
31/03/2015 0:49
22. sí, porque hay quien los come
30/03/2015 23:10
23. Sí, por el gran valor nutricional que poseen
30/03/2015 22:59
24. No , ya que es antihigiénico
30/03/2015 22:19
25. si
30/03/2015 21:13
26. si son nutritivos
30/03/2015 20:52
27. No, porque son bichos.
30/03/2015 20:51
28. sí. Porque contienen nutrientes importantes.
30/03/2015 20:20
29. si
30/03/2015 20:15
30. NO, asco
30/03/2015 20:03
31. Sí
30/03/2015 19:54
32. si son comestibles pero no me gustan en lo absoluto
30/03/2015 19:48
33. si, proteína.
30/03/2015 19:43
34. no, me dan asco
30/03/2015 19:42
35. Si, bueno por lo que he visto ya prendido de cultura gastronómica de otros estados y países
30/03/2015 18:25
36. No lo considero pero sí se comen. Para mí, los insectos no se comen.
30/03/2015 17:24
37. Si, son nutritivos y los comen en Oaxaca
16/03/2015 16:46
38. sí, algunos como los chapulines, pero no se me antojan para nada
16/03/2015 16:45
39. si por su alto contenido proteico
16/03/2015 16:42

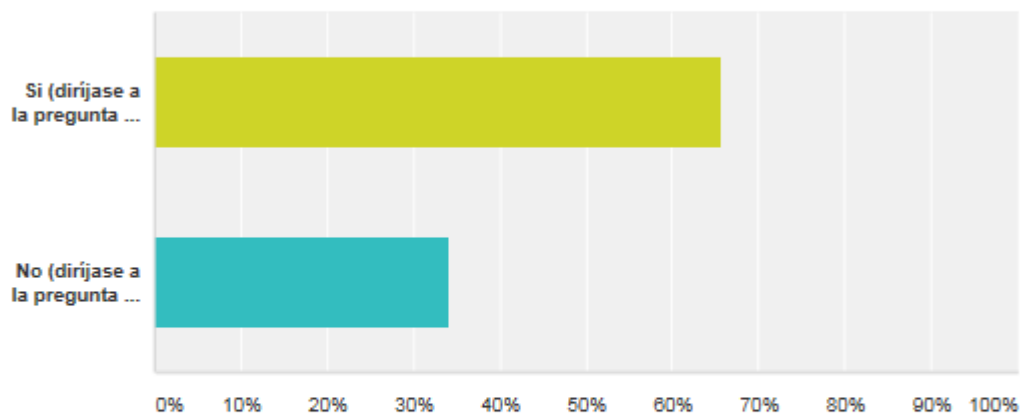
P3

Personalizar

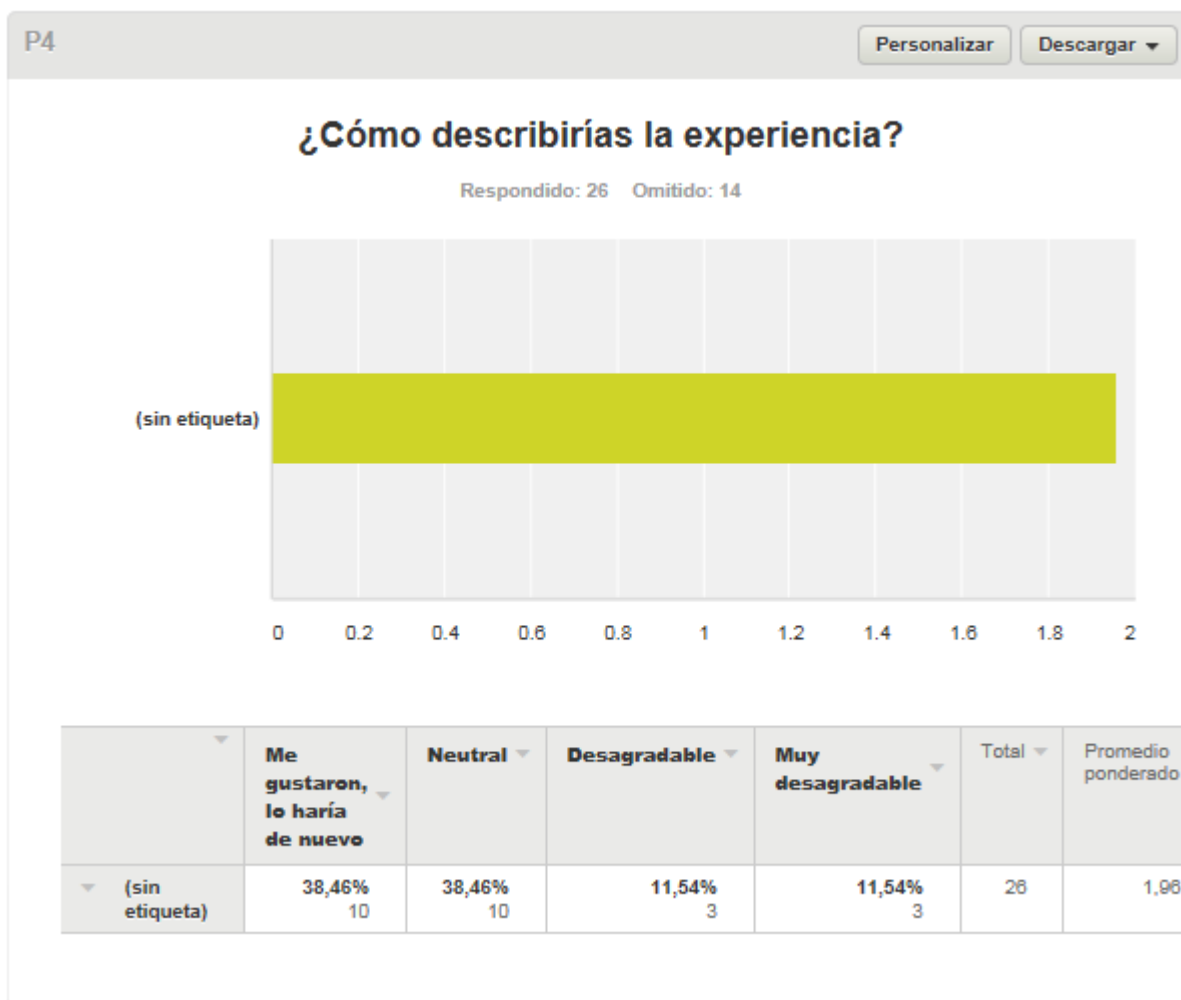
Descargar ▼

¿Alguna vez has comido insectos?

Respondido: 38 Omitido: 2



Opciones de respuesta	Respuestas
Si (dirijase a la pregunta no. 4)	65,79% 25
No (dirijase a la pregunta no. 5)	34,21% 13
Total	38



P5. ¿Por qué crees que la gente come insectos?

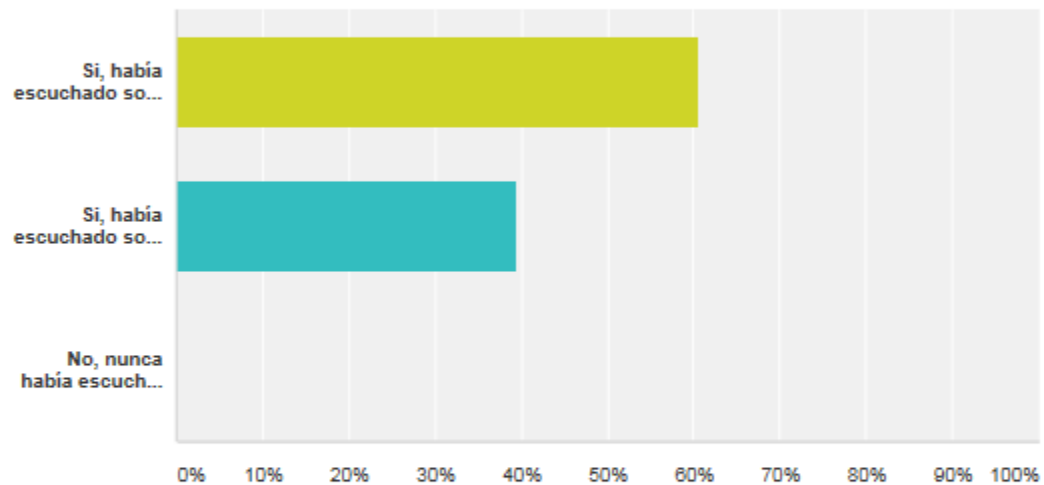
1. Por **costumbre**, porque no tienen otra cosa que comer
26/06/2015 10:44
2. Por **costumbre**.
25/06/2015 9:34
3. Por **tradición**.
24/06/2015 16:37
40. Porque es parte de su **cultura**.
22/06/2015 10:34
4. Por **costumbre**, sé que en ciertas regiones son muy apreciados
31/03/2015 23:51
5. Por **gusto**
31/03/2015 23:04
6. por **tradición de nuestras raíces indígenas**
31/03/2015 20:37
7. Creo que a alguien en algún punto de la historia se le ocurrió, los demás lo siguieron **por imitación** y se convirtió en **una tradición**.

- 31/03/2015 20:31
8. por tradición y falta de solvencia económica
31/03/2015 20:15
9. Cultural
31/03/2015 19:49
10. cada quien se adapta a lo que su entorno provee y muchas culturas basan su alimentación en estos,
31/03/2015 19:35
11. porque desde épocas prehispánicas y evolutivamente el hombre ha tenido al insecto como fuente de alimento, y producen una fuente alta de energía en el cuerpo
31/03/2015 19:18
12. costumbre
31/03/2015 17:09
13. Por costumbre, es algo cultural, para ellos es normal, como para nosotros es normal comer pollo, res o puerco.
31/03/2015 16:55
14. Porque son comestibles
31/03/2015 16:07
15. porque en algunas partes del país son considerados como comida y fuente de proteína o simplemente por tradición
31/03/2015 14:16
16. algunos por gusto, otros por alimentación
31/03/2015 4:43
17. por tradición ancestral
31/03/2015 4:41
18. costumbre
31/03/2015 4:30
19. Por costumbres
31/03/2015 0:59
20. Ejemplo que han seguido de sus antepasados.
31/03/2015 0:52
21. Es una tradición, como consumir cualquier comestible de tu región
30/03/2015 23:12
22. Cultura, Aspecto nutricional y curiosidad en probar nuevos sabores
30/03/2015 23:01
23. Por gusto
30/03/2015 22:20
24. por tradición y nutritivos
30/03/2015 20:53
25. Porque es un factor cultural.
30/03/2015 20:52
26. Por gusto por lo exótico
30/03/2015 20:21
27. por tradición
30/03/2015 20:19
28. Tradiciones.
30/03/2015 20:16
29. diferentes gustos
30/03/2015 20:04
30. Curiosidad, gusto

- 30/03/2015 19:55
31. Salud, antojo, es barato.
30/03/2015 19:44
32. cultura
30/03/2015 19:42
33. Realmente no sé, en algunos lugares es parte de sus cultura gastronómica,
siempre lo han hecho
30/03/2015 18:26
34. Por cultura, tradición y/o gusto.
30/03/2015 17:25
35. Tradición y por su sabor
16/03/2015 16:47
36. es cultural yo creo
16/03/2015 16:45
37. son fáciles de conseguir
16/03/2015 16:42

Antes de contestar ésta encuesta, ¿tenías conocimiento del consumo de insectos en México?

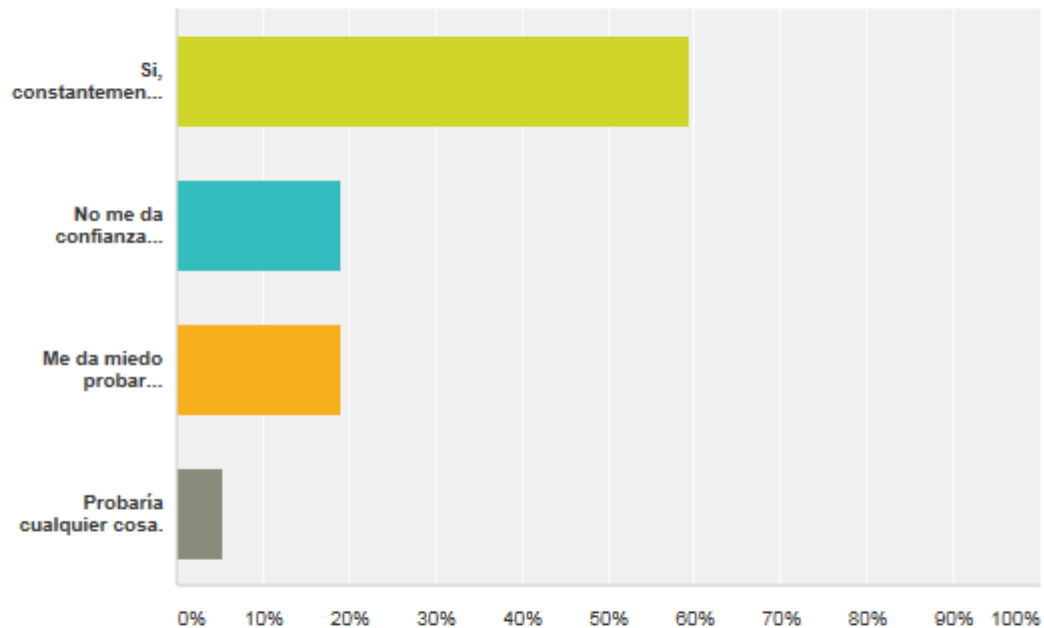
Respondido: 38 Omitido: 2



Opciones de respuesta	Respuestas
▼ Si, había escuchado sobre el consumo de insectos y conozco el motivo.	60,53% 23
▼ Si, había escuchado sobre el consumo de insectos pero desconozco el motivo.	39,47% 15
▼ No, nunca había escuchado sobre el consumo de insectos.	0,00% 0
Total	38

Cuando sales de viaje a un lugar nuevo es muy común querer conocer y probar su gastronomía típica. Si te dijeran/ofrecieran insectos porque es un platillo típico del lugar, ¿los comerías?

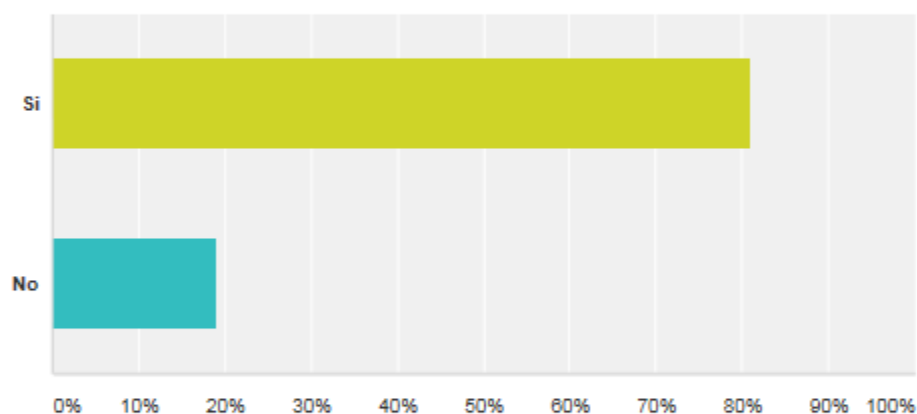
Respondido: 37 Omitido: 3



Opciones de respuesta	Respuestas	
▼ Si, constantemente pruebo nuevos y diferentes platillos.	59,46%	22
▼ No me da confianza probar alimentos nuevos y diferentes.	18,92%	7
▼ Me da miedo probar alimentos que nunca he comido.	18,92%	7
▼ Probaría cualquier cosa.	5,41%	2
Total de encuestados: 37		

Suponiendo que en 10 años ocurra un déficit de carne (res, cerdo, pollo) y la solución para cubrir nuestro requerimiento diario de proteína y saciar el hambre sea comer insectos, ¿estarías dispuesto a comerlos?

Respondido: 37 Omitido: 3

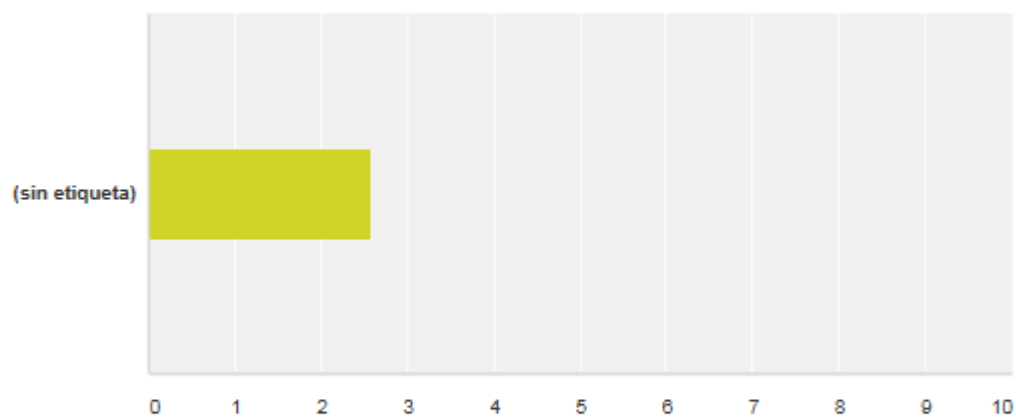


Opciones de respuesta	Respuestas	
▼ Si	81,08%	30
▼ No	18,92%	7
Total		37

[Comentarios](#) (34)

Cuando compro mis alimentos trato de considerar en cómo esto afecta al medio ambiente:

Respondido: 38 Omitido: 2



	Nunca	Poco	A veces	Siempre	Total	Promedio ponderado
(sin etiqueta)	13,16% 5	26,32% 10	50,00% 19	10,53% 4	38	2,58

One-on-one Interviews

Expert interviews

#1

Yo realmente estoy muy molesto con Ramos-Elorduy porque no me había detenido a ver con detalle las cosas y es una barbaridad que en todos los artículos dan los números pero no nos dan las fuentes de como los obtuvo y como bien dices ella pudo haber ido con un entomólogo que le pudo haber dicho que en Yucatán había ciertas especies comestibles pero nunca documentaron en verdad si los mayas yucatecos los comen. Y efectivamente, los reportes que hay de los que se comen son de Chiapas, mayas de los altos de Chiapas (lacandones, zotziles) que no son mayas yucatecos, ellos consumen la chicatana, gusanos y otros insectos, muchos. Porque además incluso el ambiente es como de bosque, parecido al del centro del país, donde sí se consumen y aparecen especies como el jumil. Seguimos con la idea de que no hay registros claros.

Platiqué con unos biólogos de la UADY, entomólogos, que me platicaron que había un señor que aun hacia unos meses vendía chapulines en el mercado, que lo veían raro. Sería conveniente rescatar esa información. Se puede decir que todavía en Mérida, hace unos cinco años, se vendían insectos (chapulines).

Cuestionario:

1. En breve una descripción de su área de trabajo.

Mi área de trabajo es la etnobiología y actualmente estoy enfocado en estudios de etnoentomología. La relación de los grupos culturales mayas con los artrópodos en general, enfocado en la obtención de información del pasado pero basándose en la información actual. También se incluyen especies encontradas en las costas como cangrejos, jaibas, camarones, etc.

2. En la actualidad no existe rastro del consumo de insectos por los mayas de la península, ¿a qué cree que se deba esto?

Los datos que se tienen son numéricos, seguramente de catálogos o censos realizados por los biólogos, no hay muchos datos o si los hay son aislados para el consumo de insectos en las zonas rurales. La gente en el campo solo llega a

referir el consumo repentino del grillo, los insectos no figuran en el menú diario ni temporal (temporadas).

3. Ramos-Elorduy cita en varios artículos las especies comestibles y del consumo por los mayas. ¿Cómo respalda esta información?

La información desde el punto de vista etnográfico no está bien sustentada dado que desconozco hasta la fecha de algún estudio particular. Solo existe un estudio de la institución ECOSUR con mayas de Quintana Roo donde se reportan algunos cuantos casos de consumo de insectos, de ahí en fuera no hay más. Yo creo que Ramos-Elorduy se basa en datos numéricos proporcionados por entomólogos.

4. ¿Cuál cree usted que fue la razón primaria que obligo a los mayas a abandonar esta práctica?

Es muy probable que durante la época colonial, el uso o consumo de insectos haya sido abolido o hayan intentado erradicarlo con el propósito de imponer lo que son las costumbres españoles y criollas. Conforme paso el tiempo la costumbre del consumo de insectos se fue perdiendo hasta que prácticamente desapareció de las tradiciones de los pueblos. La influencia de la Iglesia Católica y las costumbres españolas las que pudieron provocar esto.

5. ¿Este abandonamiento solo se registra en los insectos o también puede verse en otras especies?

Al parecer se puede ver en muchas otras especies como la iguana u otros pequeños mamíferos que se sabe eran consumidos de manera extensa y sistemática. Actualmente solo en algunos pueblos se puede aún encontrar el consumo de estas especies.

6. ¿Conoce algún lugar en la Península en el que aún se conserve esta práctica?

Sí, en Zazil Dzul, en los pueblos mayas de Quintana Roo.

7. ¿Cree que sería posible lograr su reintroducción?

Honestamente, no. Porque en primer lugar el ambiente juega un papel muy importante. No es propicio para la propagación natural de muchas especies de insectos, que no eficientaria su colecta. El actual maya yucateco es muy cerrado

con respecto a la introducción de nuevas ideas y formas de hacer las cosas, sobre todo en el caso de la comida.

8. ¿Es posible la creación de granjas?

Si es posible, pero volvemos a la baja demanda para hacerlo viable. Como alimento para animales tampoco sería eficiente en cuanto a productividad.

9. Restaurantes gourmet, rescate de la cocina yucateca, ingredientes locales para ayudar al productor local. Usted cree que si este tipo de establecimientos introducen los insectos como algo exótico o gourmet, ¿podrían aceptarse?

La secuencia que mencionas es interesante. Considero factible que la gente de bajos recursos al ver que se están utilizando este tipo de animales como fuente de proteína y alimento barato, si podría llamarles la atención e incidir en sus decisiones. Pero también me atrevo a pensar que la introducción de los insectos en los restaurantes sería más una moda (i.e. mezcal). Para las personas de un nivel socioeconómico alto y que se pueden dar el lujo de experimentar con este tipo de comida, como moda, pero el nivel de incidencia sería muy bajo, en la población en general.

#2

1. En breve una descripción de su área de trabajo.

Doctor en Ciencias en Ecología y Desarrollo Sustentable. Mis líneas de investigación son el conocimiento local de recursos naturales, saberes que tienen las personas respecto al entorno, poniendo énfasis en los artrópodos, la ecología del paisaje y la dinámica de las comunidades con respecto a la fragmentación, así como el cambio de uso del suelo en el sureste de México y sus posibles repercusiones que se tiene en los saberes locales respecto a los organismos. Disponibilidad de recursos, percepción de las personas respecto a los lugares y a la evolución del entorno.

2. En la actualidad no existe rastro del consumo de insectos por los mayas de la península, ¿a qué cree que se deba esto?

Escrito en los códices, ha habido un consumo de los insectos, tan importante fue por el consumo de miel que incluso tienen un dios conocido como Ah Mucen Cab, las meliponas no solo servían para endulzar bebidas si no también utilizaban la miel para rituales (balché). Hay organismos comestibles registrados, lo que he visto en campo es que se concentran en el consumo de himenópteros, los organismos más consumidos son las avispas, dos especies mayores: *xuux* y *ek*. Se comen a las crías, no cualquiera sabe manejarlos. Se asan en comales, se condimentan y se ingieren. No obstante, también en algunos lugares mencionan el consumo de abejas melipona, como la abeja europea, pero no es tan amplia esa práctica. La cosmovisión les permea si pueden o no comer ciertas cosas, si están cerca de un cenote o un pozo, no lo consumen porque puede darles un aire (¿), está muy ligado el consumo a la cultura. Se encuentran especies que se consumen en otras regiones pero no aquí, como la chichatana, la langosta, etc.

3. ¿Cuál cree usted que fue la razón primaria que obligo a los mayas a abandonar esta práctica?

Es más difícil encontrar a los insectos que se consumen, debido al crecimiento urbano y la desaparición del terreno para siembra. En el área cultural, debido al bajo consumo se deja pasar esa tradición.

Estatus por comer insectos, te ven como una persona pobre por comer insectos (contraste con el consumo de escamoles).

4. ¿Cuáles cree usted que son algunas de las causas históricas que ocasionaron la desaparición de la entomofagia?

Adversidad que crean los insectos, por ser insectos rastreros. Existen muy pocos entomólogos que trabajan con insectos, por consiguiente, se pueden encontrar pocos estudios en el área de etnoentomología.

5. ¿Es posible la creación de granjas?

Varias instituciones apuestan por eso. Ha habido muchos problemas con la langosta, están proponiendo su consumo. Podría ser viable pero es un proceso a mediano plazo.

6. ¿Cree que sería posible lograr su reintroducción?

Dependiendo de a quién va dirigido (chapulines en el mercado). Se debe trabajar una revaloración de los insectos, para su consumo, por su alto valor nutricional.

Encuesta 1

P1. Proporciona tu edad, género y lugar de residencia (si no eres yucateco, favor de indicar de dónde eres originario):

Mujer de 24 años, soy originaria de Huimanguillo en el estado de Tabasco, 9 horas en autobús de la ciudad de Mérida. Actualmente resido en la ciudad de Mérida desde hace 4 años ya que vine a estudiar mi licenciatura aquí.

P2. ¿Consideras que los insectos son comestibles? ¿Por qué?

Sí, en Tabasco se consumen pero no tanto como en otros estados del centro. Mi papá es originario de Guadalajara dónde el consumo del gusano de maguey y las hormigas chicatanas es muy común. Fue de hecho en los viajes que hacíamos para visitar a la familia donde probé los insectos por primera vez. En los pueblos de Guadalajara y Tabasco se consumen porque están a la mano y es algo tradicional, son relativamente económicos y ahora sé que también tienen un alto contenido nutricional.

P3. ¿Alguna vez has comido insectos?

Sí, como dije en la pregunta anterior, los como desde que era pequeña.

P4. ¿Cómo describirías la experiencia?

Realmente no recuerdo cual fue mi reacción cuando mi abuela me dijo que si quería comer hormigas, supongo que debí encontrarlo divertido.

P5. ¿Por qué crees que la gente come insectos?

Yo creo que depende mucho de a qué grupo de personas nos referimos. En muchos estados del país los consumen por tradición, ya que son una fuente de alimento que está a la mano y fácil de recolectar, y hasta cierto punto económica. Yo que estudié gastronomía sé que los insectos se han vuelto algo popular y exótico, en los restaurantes sirven platillos que los contienen a precios exorbitantes, en este caso la gente que los consume es más bien por presunción y moda. ¿Qué paso a comerlos en la calle?

P6. Antes de contestar esta encuesta, ¿tenías conocimiento del consumo de insectos en México?

Sí.

P7. Cuando sales de viaje a un lugar nuevo es muy común querer conocer y probar su gastronomía típica. Si te dijeran/ofrecieran insectos porque es un platillo típico del lugar, ¿los comerías?

Claro que sí. Definitivamente me gustaría saber qué tipo de insecto estaría comiendo, pero en general debido a lo que estudio siempre soy abierta a probar nuevas comidas.

Encuesta 2

P1. Proporciona tu edad, género y lugar de residencia (si no eres yucateco, favor de indicar de dónde eres originario):

Masculino, 32 años y soy originario de Oaxaca, pero desde hace 7 años que radico en la ciudad de Mérida.

P2. ¿Consideras que los insectos son comestibles? ¿Por qué?

Definitivamente. En el estado de Oaxaca los insectos son uno de los productos más comunes que se encuentran en el mercado, los más famosos son los chapulines que las señoras tienen en canastas y te venden como botana en la calle, acompañados de chile y limón. Yo creo que en el estado de Oaxaca al menos, es una tradición que se ha mantenido desde la época prehispánica, ahora es que se han hecho populares debido a su alto contenido nutrimental.

P3. ¿Alguna vez has comido insectos?

Sí, chapulines, chichatanas, escamoles, gusanos de maguey, he probado muchos tipos y en muchos diferentes platillos, desde unos simples tacos hasta moles.

P4. ¿Cómo describirías la experiencia?

Como algo normal. Realmente jamás he pensado que estoy comiendo algo extraño o que no sea considerado comida.

P5. ¿Por qué crees que la gente come insectos?

La gente en México que consume insectos lo hace por tradición, creo que es el mayor motivante. Aunque ahora que lo pienso en el estado de Oaxaca hay muchísimos grupos étnicos diferentes y tiene regiones muy pobres, donde muchas veces los insectos son una de sus principales fuentes de alimento, estos grupos los comen por necesidad.

P6. Antes de contestar esta encuesta, ¿tenías conocimiento del consumo de insectos en México?

Sí, he viajado mucho en el centro y norte del país. En la mayoría de los estados donde he estado siempre hay al menos un platillo relacionado con insectos.

P7. Cuando sales de viaje a un lugar nuevo es muy común querer conocer y probar su gastronomía típica. Si te dijeran/ofrecieran insectos porque es un platillo típico del lugar, ¿los comerías?

Si, como ya he dicho, para mi es algo normal.

Encuesta 3

P1. Proporciona tu edad, género y lugar de residencia (si no eres yucateco, favor de indicar de dónde eres originario):

Masculino, 23 años, originario del estado de Guanajuato en el centro del país, pero he vivido en la ciudad de Mérida desde hace 8 años.

P2. ¿Consideras que los insectos son comestibles? ¿Por qué?

Sí, claro. Pues porque son una tradición en la comida mexicana.

P3. ¿Alguna vez has comido insectos?

Sí, los he probado de distintas maneras. No tienen mal sabor, es más bien la textura lo interesante.

P4. ¿Cómo describirías la experiencia?

¿Experiencia? No sé, realmente no es como que estaba pensando “¡Estoy comiendo insectos!”, hasta que la gente que no lo encuentra normal te lo dice, no se siente como algo diferente.

P5. ¿Por qué crees que la gente come insectos?

Como ya dije antes, en México es una práctica muy antigua y que se ha conservado con el paso de los años. Sé que en muchos lugares los consumen como parte de su dieta normal, no creo que está gente realmente sepa que están consumiendo un alimento muy nutritivo.

P6. Antes de contestar esta encuesta, ¿tenías conocimiento del consumo de insectos en México?

Sí, ya que en el centro del país es donde más consumo de insectos existe.

P7. Cuando sales de viaje a un lugar nuevo es muy común querer conocer y probar su gastronomía típica. Si te dijeran/ofrecieran insectos porque es un platillo típico del lugar, ¿los comerías?

Definitivamente.

Encuesta 4

P1. Proporciona tu edad, género y lugar de residencia (si no eres yucateco, favor de indicar de dónde eres originario):

Masculino, 30 años, yucateco.

P2. ¿Consideras que los insectos son comestibles? ¿Por qué?

Sé que hay gente que los consume, pero yo no los considero alimento.

P3. ¿Alguna vez has comido insectos?

No, nunca.

P4. ¿Cómo describirías la experiencia?

N/A.

P5. ¿Por qué crees que la gente come insectos?

Porque no tienen nada más que comer. No sé realmente cual sea su razón para consumir insectos, puede que también sea parte de su comida tradicional.

P6. Antes de contestar esta encuesta, ¿tenías conocimiento del consumo de insectos en México?

Sí.

P7. Cuando sales de viaje a un lugar nuevo es muy común querer conocer y probar su gastronomía típica. Si te dijeran/ofrecieran insectos porque es un platillo típico del lugar, ¿los comerías?

No lo sé, no creo.

Encuesta 5

P1. Proporciona tu edad, género y lugar de residencia (si no eres yucateco, favor de indicar de dónde eres originario):

Femenino, 24 años, originaria de Chetumal, Quintana Roo (parte de la península de Yucatán) pero vivo en la ciudad de Mérida.

P2. ¿Consideras que los insectos son comestibles? ¿Por qué?

Sí. Mi familia es originaria del centro del país, donde los insectos son de uso más frecuente en la cocina. Cuando viajábamos a visitar a la familia mi abuela nos mostraba a mi hermana y a mí la diferente variedad de insectos que se podían comprar en el mercado. Yo creo que son una fuente de alimento tradicional de los pueblos indígenas de México, algo tradicional.

P3. ¿Alguna vez has comido insectos?

Sí, mis favoritos son los escamoles o hueva de hormiga, aunque son muy caros debido a que su obtención es complicada y riesgosa.

P4. ¿Cómo describirías la experiencia?

Con los insectos en general, como algo normal. Creo que puedo verlos como alimento, solo cuando la gente que no está acostumbrada menciona lo asqueroso que les parece es cuando realmente caigo en la cuenta de que me estoy comiendo un bicho... Si lo ponen así definitivamente no podría comerme una cucaracha, ¡que asco!

P5. ¿Por qué crees que la gente come insectos?

Creo que es una tradición, que viene desde la época prehispánica, y puede deberse al hecho de que los insectos se encontraban ahí presentes, así como las frutas y el maíz.

P6. Antes de contestar esta encuesta, ¿tenías conocimiento del consumo de insectos en México?

Sí, como ya había mencionado mi familia es originaria del centro del país y por eso tuve contacto con ellos desde pequeña.

P7. Cuando sales de viaje a un lugar nuevo es muy común querer conocer y probar su gastronomía típica. Si te dijeran/ofrecieran insectos porque es un platillo típico del lugar, ¿los comerías?

Soy gastronoma, es parte de mi naturaleza querer probar cosas nuevas y diferentes, aunque eso no garantice que me guste.

Encuesta 6

P1. Proporciona tu edad, género y lugar de residencia (si no eres yucateco, favor de indicar de dónde eres originario):

Femenino, 26 años, nacida y criada en Mérida, Yucatán.

P2. ¿Consideras que los insectos son comestibles? ¿Por qué?

Sé que los comen en otros lugares, pero no los considero comestibles. En la cocina tradicional del estado no se puede encontrar ningún platillo que incluya insectos.

P3. ¿Alguna vez has comido insectos?

No, jamás. El solo pensarlo me produce náuseas.

P4. ¿Cómo describirías la experiencia?

NA.

P5. ¿Por qué crees que la gente come insectos?

Nunca me había puesto a pensar en eso, como no es un ingrediente que yo considere comestible, me cuesta trabajo pensar que hay personas que si los comen. Pero puedo pensar que algunas lo hacen por tradición y otras por necesidad.

P6. Antes de contestar esta encuesta, ¿tenías conocimiento del consumo de insectos en México?

Sí, no he viajado mucho. Pero en la televisión he visto documentales sobre eso y amigos que han viajado por el país me han contado sobre los chapulines de Oaxaca por ejemplo. Lo más cerca que he estado de un insecto "comestible" es al de una botella de mezcal.

P7. Cuando sales de viaje a un lugar nuevo es muy común querer conocer y probar su gastronomía típica. Si te dijeran/ofrecieran insectos porque es un platillo típico del lugar, ¿los comerías?

No lo sé. Ahora podría decirte que sí, como un reto o por curiosidad, pero porque no lo tienes delante... ahora bien si me pones el plato en frente... no sé qué haría la verdad. Me inclino a pensar que no lo haría.

Encuesta 7

P1. Proporciona tu edad, género y lugar de residencia (si no eres yucateco, favor de indicar de dónde eres originario):

Femenino, 29, Mérida Yucatán.

P2. ¿Consideras que los insectos son comestibles? ¿Por qué?

No realmente. El sólo hecho de pensarlo me genera un sentimiento de asco. Los insectos son animales sucios, que se arrastran por el suelo y los encuentras en la tierra, en la basura. ¿Cómo podemos comernos algo así?

P3. ¿Alguna vez has comido insectos?

Jamás, lo considero algo muy desagradable.

P4. ¿Cómo describirías la experiencia?

N/A.

P5. ¿Por qué crees que la gente come insectos?

Nunca me había puesto a pensar en porque la gente los come, ni siquiera en el hecho de que la gente los come. Yo creo que es más bien por costumbre, en las regiones de México que es parte de su comida tradicional.

P6. Antes de contestar esta encuesta, ¿tenías conocimiento del consumo de insectos en México?

Sí, he viajado un poco y los he visto, también en la televisión.

P7. Cuando sales de viaje a un lugar nuevo es muy común querer conocer y probar su gastronomía típica. Si te dijeran/ofrecieran insectos porque es un platillo típico del lugar, ¿los comerías?

Depende mucho de lo que tenga el platillo nuevo si lo como o no. Los insectos definitivamente están muy lejos de tener una posibilidad.

Encuesta 8

P1. Proporciona tu edad, género y lugar de residencia (si no eres yucateco, favor de indicar de dónde eres originario):

Masculino, 28 años, originario de Cancún, Quintana Roo pero resido en Mérida Yucatán.

P2. ¿Consideras que los insectos son comestibles? ¿Por qué?

En Cancún, la ciudad donde crecí no son considerados alimento, ni siquiera puedes encontrarlos en mercados o tiendas para comprarlos y prepararlos. Pero mi familia es originaria de la Ciudad de México, donde si se consumen, así que si los considero comestibles.

P3. ¿Alguna vez has comido insectos?

Sí, cuando era chico llegue a probarlos. Más tarde cuando estude una temporada en la Ciudad de México, llegue a probar distintas variedades y en preparaciones diferentes.

P4. ¿Cómo describirías la experiencia?

Pues como cualquier experiencia cuando pruebas algo nuevo. Cuando eres pequeño yo creo que realmente no prestamos mucha atención, pero ya de adulto si buscaba identificar sabores y texturas cuando los probaba.

P5. ¿Por qué crees que la gente come insectos?

Es parte de nuestra tradición y cultura como país. Pero también creo que es porque en algún momento hubo una gran abundancia de insectos lo que llevo a que la gente de los pueblos los consumiera, como es el caso de los chapulines en Oaxaca.

P6. Antes de contestar esta encuesta, ¿tenías conocimiento del consumo de insectos en México?

Sí.

P7. Cuando sales de viaje a un lugar nuevo es muy común querer conocer y probar su gastronomía típica. Si te dijeran/ofrecieran insectos porque es un platillo típico del lugar, ¿los comerías?

Claro que sí. Puede que se deba a la carrera que estudie (soy gastrónomo), pero también es parte de mi curiosidad

Encuesta 9

P1. Proporciona tu edad, género y lugar de residencia (si no eres yucateco, favor de indicar de dónde eres originario):

Femenino, 24, originaria de Minatitlán, Veracruz pero vivo en Mérida desde hace casi 8 años.

P2. ¿Consideras que los insectos son comestibles? ¿Por qué?

Si, en Veracruz se comen aunque no con demasiada frecuencia como en otros estados del centro del país.

P3. ¿Alguna vez has comido insectos?

Sí.

P4. ¿Cómo describirías la experiencia?

Como algo normal. No tiene nada de extraordinario el comer bichos, son texturas diferentes, pero es como comer cualquier otra cosa.

P5. ¿Por qué crees que la gente come insectos?

Por tradición. Creo que esa es la causa más fuerte, también existen otras como la facilidad de obtenerlos para la gente que vive en los pueblos.

P6. Antes de contestar esta encuesta, ¿tenías conocimiento del consumo de insectos en México?

Sí.

P7. Cuando sales de viaje a un lugar nuevo es muy común querer conocer y probar su gastronomía típica. Si te dijeran/ofrecieran insectos porque es un platillo típico del lugar, ¿los comerías?

Siempre me ha gustado probar cosas nuevas, así que sí, si probaría otros platillos con insectos.

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Encuesta 10

P1. Proporciona tu edad, género y lugar de residencia (si no eres yucateco, favor de indicar de dónde eres originario):

Masculino 28 años, originario de Campeche pero vivo en Mérida desde hace más de 15 años.

P2. ¿Consideras que los insectos son comestibles? ¿Por qué?

Sí, mi familia es de la Ciudad de México, y ahí se consumen más insectos que en el sur.

P3. ¿Alguna vez has comido insectos?

Sí, los chapulines que se compran en la calle con chile y limón.

P4. ¿Cómo describirías la experiencia?

Pues fue extraño. Si sabía que los insectos se comían, pero jamás había comido uno... la sensación de las patas moviéndose en tu boca es algo perturbador, pero te acostumbras... o se las quitas.

P5. ¿Por qué crees que la gente come insectos?

Porque están acostumbrados a hacerlo, así los crecieron en casa, con los insectos como parte de su alimentación.

P6. Antes de contestar esta encuesta, ¿tenías conocimiento del consumo de insectos en México?

Sí.

P7. Cuando sales de viaje a un lugar nuevo es muy común querer conocer y probar su gastronomía típica. Si te dijeran/ofrecieran insectos porque es un platillo típico del lugar, ¿los comerías?

Generalmente me gusta probar de todo aunque ahora que hablamos de insectos no estoy tan seguro, podría decirte que si lo probaría, porque mi curiosidad sería enorme, pero creo que también dependería mucho del tipo de insecto que sea y como se vea.

Table 1

Reasons why insects are good to eat	Reasons why insects are not good to eat
<p>Health:</p> <p>High protein source Protein rich Good source of nutrients Vitamins High nutritional value Nutritious Mostly made up of protein Healthy</p> <p>Environmental:</p> <p>Organic</p> <p>Cultural:</p> <p>Tradition Ancestral tradition Habit The way our ancestors lived Tradition since pre-Hispanic times Part of the Gastronomic Culture Tradition that makes up our indigenous roots</p> <p>Motivational:</p> <p>Because it is liked Curiosity Exotic Imitation Adaptation</p> <p>Economic:</p> <p>It is cheap Easily gathered Low income families</p>	<p>Health:</p> <p>Not hygienic</p> <p>Motivational:</p> <p>Grotesque Revulsion Disgusting</p>

Table 2

CODE	TEXT	NOTES
Cultural Consumption Spanish influence Close-minded	<p>1)... había un señor que aun hacia unos meses vendía chapulines en el mercado, que lo veían raro.</p> <p>La gente en el campo solo llega a referir el consumo repentino del grillo, los insectos no figuran en el menú diario ni temporal (temporadas).</p> <p>Es muy probable que durante la época colonial, el uso o consumo de insectos haya sido abolido o hayan intentado erradicarlo con el propósito de imponer lo que son las costumbres españoles y criollas. Conforme paso el tiempo la costumbre del consumo de insectos se fue perdiendo hasta que prácticamente desapareció de las tradiciones de los pueblos. La influencia de la Iglesia Católica y las costumbres españolas las que pudieron provocar esto.</p> <p>Al parecer se puede ver en muchas otras especies como la iguana u otros pequeños mamíferos que se sabe eran consumidos de manera extensa y sistemática. Actualmente solo en algunos pueblos se puede aún encontrar el consumo de estas especies.</p> <p>El actual maya yucateco es muy cerrado con respecto a la introducción de nuevas ideas y formas de hacer las cosas, sobre todo en el caso de la comida.</p> <p>2)Escrito en los códices, ha habido un consumo de los insectos, tan</p>	<p>People not often talk about the consumption of insects (if they do it).</p> <p>Due to the prohibitions most likely a taboo developed surrounding insect consumption.</p> <p>This pattern can not only be seen in insects but other endemic species as well.</p> <p>Close-minded people.</p> <p>The existence of a Mayan bee god states the importance that insects-human relations had for this culture.</p>

	<p>importante fue por el consumo de miel que incluso tienen un dios conocido como Ah Mucen Cab, las meliponas no solo servían para endulzar bebidas si no también utilizaban la miel para rituales (balché). Hay organismos comestibles registrados, lo que he visto en campo es que se concentran en el consumo de himenópteros, los organismos más consumidos son las avispas, dos especies mayores: <i>xuux</i> y <i>ek</i>. Se comen a las crías, no cualquiera sabe manejarlos. Se asan en comales, se condimentan y se ingieren. No obstante, también en algunos lugares mencionan el consumo de abejas melipona, como la abeja europea, pero no es tan amplia esa práctica. La cosmovisión les permea si pueden o no comer ciertas cosas, si están cerca de un cenote o un pozo, no lo consumen porque puede darles un aire (¿), está muy ligado el consumo a la cultura. Se encuentran especies que se consumen en otras regiones pero no aquí, como la chicatana, la langosta, etc</p> <p>3)En los pueblos de Guadalajara y Tabasco se consumen porque están a la mano y es algo tradicional, son relativamente económicos y ahora sé que también tienen un alto contenido nutrimental</p> <p>4)En muchos estados del país los consumen por tradición, ya que son una fuente de alimento que está a la mano y fácil de recolectar, y hasta cierto punto económica.</p> <p>5)Yo creo que en el estado de Oaxaca al menos, es una tradición que se ha mantenido desde la época prehispánica, ahora es que se han hecho populares debido a su alto contenido nutrimental.</p>	<p>From number 3 to 12 we can observe that entomophagy is seen as a cultural and traditional practice between people. Something that you have been taught to do since a young age.</p>
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	<p>6)La gente en México que consume insectos lo hace por tradición, creo que es el mayor motivante. Como ya dije antes, en México es una práctica muy antigua y que se ha conservado con el paso de los años.</p> <p>7)No sé realmente cual sea su razón para consumir insectos, puede que también sea parte de su comida tradicional.</p> <p>8)Yo creo que son una fuentes de alimento tradicional de los pueblos indígenas de México, algo tradicional.</p> <p>9)Creo que es una tradición, que viene desde la época prehispánica, y puede deberse al hecho de que los insectos se encontraban ahí presentes, así como las frutas y el maíz.</p> <p>10)Pero puedo pensar que algunas lo hacen por tradición y otras por necesidad.</p> <p>11)Yo creo que es más bien por costumbre, en las regiones de México que es parte de su comida tradicional.</p> <p>12)Es parte de nuestra tradición y cultura como país.</p>	
Not enough data	<p>1)...ella pudo haber ido con un entomólogo que le pudo haber dicho que en Yucatán había ciertas especies comestibles pero nunca documentaron en verdad si los mayas yucatecos los comen. Seguimos con la idea de que no hay registros claros.</p> <p>2)Adversidad que crean los insectos, por ser insectos rastreros. Existen muy pocos entomólogos que trabajan con insectos, por consiguiente, se pueden encontrar pocos estudios en el área de etnoentomología.</p>	<p>Not enough information to state the consumption by the Mayas of Yucatan.</p> <p>There is a need of interest from entomologists to work in the relations and interactions between humans and insects, there is barely enough information related to the subject.</p>

<p>Poor people food</p>	<p>1)Estatus por comer insectos, te ven como una persona pobre por comer insectos (contraste con el consumo de escamoles).</p> <p>2)Pero puedo pensar que algunas lo hacen por tradición y otras por necesidad.</p> <p>3)Porque no tienen nada más que comer.</p> <p>4)Aunque ahora que lo pienso en el estado de Oaxaca hay muchísimos grupos étnicos diferentes y tiene regiones muy pobres, donde muchas veces los insectos son una de sus principales fuentes de alimento, estos grupos los comen por necesidad.</p> <p>5)En muchos estados del país los consumen por tradición, ya que son una fuente de alimento que está a la mano y fácil de recolectar, y hasta cierto punto económica</p>	<p>Again the relationship between a low social status and eating insects is remarked. Need and non-availability are two factors considered important when considering the consumption of insects. There is a contrast between considering them “cheap” and the fact that there are some species like <i>escamoles</i> (ant eggs) which are a really expensive delicacy.</p>
<p>Reintroduction Luxury/fashion</p>	<p>1)Si es posible, pero volvemos a la baja demanda para hacerlo viable. Como alimento para animales tampoco sería eficiente en cuanto a productividad.</p> <p>Considero factible que la gente de bajos recursos al ver que se están utilizando este tipo de animales como fuente de proteína y alimento barato, si podría llamarles la atención e incidir en sus decisiones. Pero también me atrevo a pensar que la introducción de los insectos en los restaurantes sería más una moda (i.e. mezcal). Para las personas de un nivel socioeconómico alto y que se pueden dar el lujo de experimentar con este tipo de comida, como moda, pero el nivel de incidencia</p>	<p>A reintroduction might be posible but there are a lot of factors to consider, not only economical ones but cultural ones too.</p> <p>Insects as a fashion is something that is already happening in countries like the UK, Denmark, The Netherlands, etc. but the question is if it will actually influence the perception of low-class consumers to follow up this high-class fashion.</p>

	<p>sería muy bajo, en la población en general.</p> <p>2)Es más difícil encontrar a los insectos que se consumen, debido al crecimiento urbano y la desaparición del terreno para siembra. En el área cultural, debido al bajo consumo se deja pasar esa tradición.</p> <p>Dependiendo de a quién va dirigido (chapulines en el mercado). Se debe trabajar una revaloración de los insectos, para su consumo, por su alto valor nutricional.</p> <p>3)Yo que estudié gastronomía sé que los insectos se han vuelto algo popular y exótico, en los restaurantes sirven platillos que los contienen a precios exorbitantes, en este caso la gente que los consume es más bien por presunción y moda.</p>	
Family influence	<p>1)Fue de hecho en los viajes que hacíamos para visitar a la familia donde probé los insectos por primera vez.</p> <p>2)Cuando viajábamos a visitar a la familia mi abuela nos mostraba a mi hermana y a mí la diferente variedad de insectos que se podían comprar en el mercado.</p> <p>3)Pero mi familia es originaria de la Ciudad de México, donde si se consumen, así que si los considero comestibles.</p>	<p>Apparently, it seems that most of the influence of insect consumption comes from family members. As it was mentioned in the literature review, most of this ancient knowledge has been passed from fathers to sons for generations.</p>
Region	<p>1)Sí, en Tabasco se consumen pero no tanto como en otros estados del centro.</p> <p>2)En el estado de Oaxaca los insectos son uno de los productos más comunes que se encuentran en el mercado, los más famosos son los chapulines que las señoras tienen en canastas y te</p>	<p>There exists a clear common knowledge that the centre south of Mexico is where the mayor consumption of insects takes place.</p>

	<p>venden como botana en la calle, acompañados de chile y limón.</p> <p>3)Sí, ya que en el centro del país es donde más consumo de insectos existe.</p> <p>4)Mi familia es originaria del centro del país, donde los insectos son de uso más frecuente en la cocina.</p> <p>5)Pero mi familia es originaria de la Ciudad de México, dónde si se consumen, así que si los considero comestibles.</p>	
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