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Classification of Chemical Substances in Food by Pregnant and Breastfeeding Women

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Abstract

Individuals today classify foods conditioned by the way the food industry manufactures products and their ignorance about that process. This lack of knowledge about how foods are produced increases negative perceptions about the industrial process and the chemical substances that are used. We want to find out how pregnant and breastfeeding women classify these substances based on these perceptions. The data analyzed come from 4 ethnographies carried out in the Spanish regions of Catalonia and Andalusia. Semi-structured interviews were conducted; women filled in a food diary, and eating practices were observed. The qualitative data were transcribed and analyzed with the Atlas.ti program. This analysis allowed us to classify chemical substances based on 4 categories. A) the organoleptic characteristics they contribute to food; B) their level of impact on health C) the handling of products in the food production chain and in the domestic sphere; D) the interaction of these substances with the body. In general, the informants consider all chemical additives to be harmful. It's necessary to continue studying.

Keywords: Food; Chemical substances; Food production chain

Introduction

Fischler [1] states that all known cultures have food classification systems. Classifying consists of ordering concepts into groups that are distinct from each other. However, these groups are not simply arranged in isolation; rather, they have definite relationships with each other and together form a single and unique whole. The goal of classification is not to facilitate action, but to make the relationships that exist between the objects being classified comprehensible [2]. One of the characteristics that the objects must have to be classified is that they must be known by the members of the society [3]. In addition, within a single society there are different classification systems. One important difference in classification systems is the way that experts and the rest of the society – "non-experts" or "laypersons" – classify the same objects. Non-experts build classification systems based on superficial characteristics, while expert thinking creates a greater number of categories and has a more complex structure of knowledge organized around central ideas and concepts, which enable experts to identify more significant characteristics and patterns than laypersons [4].

Individuals internalize their classification of foods, and choose, prepare and serve dishes based on this. Today, the individual must take into account a new factor in food classification: having no direct knowledge of the production process involved in the products produced by the industry. Fischler calls such products "UEO" (unidentified edible objects), because the production process and what substances are added and their components are unknown. According to him, the French population believes that these "UEO" foods are not nutritious and are full of chemical substances whose

effects on humans are unknown [1].

The classification of the chemical substances commonly used in the production, processing and preservation of foods, as well as in the materials used to package them, which may also affect human health [5,6], varies, depending on who is classifying them. Many European studies [7,8] have confirmed that negative perceptions regarding the technological applications of these chemical components in the food industry have increased. With this increase in distrust, due to a lack of knowledge about the industrial process [9], the population of Spain seeks information through different media and is not satisfied with scientific discourses alone [10]. Scientists are influenced by a medicalized discourse on food and nutrition [11], although no scientific or technical consensus exists due to the uncertainty of chemical and technological advances [12]. Taking this situation into account, scientists classify the substances used in the food production chain (additives, sweeteners, dyes, etc.) based on organoleptic properties. Food physical characteristics are known as organoleptic properties like taste, texture and colour.

The objective of the current study is to understand how pregnant and breastfeeding women classify the chemical substances contained in food.

Material and Methods

The ethnographic data used for the analysis in this article come from 4 ethnographies that were carried out in the autonomous regions of Catalonia and Andalusia in Spain. Three of them were carried out over a period of 9 months (January-September 2016) and one over 12 months (a longer period because it was part of the PhD thesis of the first author). The general methodology of the study was to observe selection practices in buying food and in the preparation and preservation of food to analyze perceptions about the chemical substances contained in food.

The ethnographies began once approval was obtained from the corresponding ethics committees. All the participants were informed about the research objectives and methods, and written informed consent was obtained from each of them.

The interviews and diaries were conducted in three Primary Care Centers in Catalonia (Northeast of Spain) and two Health Centers in Andalucia (South of Spain), in the homes of some of the participants and in the shops frequented by the women.

The selection of the sample was intentional or purposive, based on the specific parameters of the study, in order to achieve maximum variation, heterogeneity and significance, as well as obtain a balanced sample with a similar representation of age groups, by education level and by occupational sector. The inclusion criteria were that the women were born and currently living in Spain, at least 20 weeks pregnant, breastfeeding and/or formula feeding was at a maximum period of 6 months, and that they belonged to different socioeconomic strata. Those who were under a prescribed diet due to a maternal pathology were excluded.

Interviews and personal food diary

Participants were recruited in the local breastfeeding group. Interviews were conducted during the ethnographic fieldwork, and based on questions about dietary habits (where they shop, usual foods in their diet, knowledge about production methods, etc.) as well as their perceptions regarding the chemicals added to foods.
After the interviews, women had to keep a personal food diary where they wrote about their eating habits and their perceptions about chemical substances.

Observations

The ethnographies included observations about food practices when shopping and in the preparation of food, accompanying the women when they were carrying out these tasks. This allowed us to ask questions and make observations about the choice of one food or another and ask about how they classified them according to their criteria.

All the interviews, ethnographic fieldwork and the personal food diary were transcribed for analysis using initial letters of the name and surname to identify women to protect the participant's anonymity. A system of categories was established to classify and organize the information. Periodically, the categories were reviewed among all the ethnographers in case of changes during the process of analysis. Once the categories were agreed upon and the narratives coded, the Atlas. ti computer program was used, making it possible to organize relationship networks or flow diagrams, with the final decision regarding the selection of units of analysis left to the researcher [13].

Results

Since this is a qualitative study, sample was collected until data was saturated.

The sociodemographic characteristics of the participants are shown in Table 1. Most women were pregnant, between 30 and 39 years old, with secondary or high school studies and awaiting their first or second child. Table 2 shows the different locations where the ethnography was carried out and the description of the techniques used in each of them.

In the ethnographies, 33 interviews were made. Most food diaries collected were in Catalonia. And the observations were made, mostly, in Barcelona.

Women's profile	Pregnant	Breastfeeding	Total
	23 (69,7%)	10 (30,3%)	33
Age	**20-29**	**30-39**	**40 o +**
	5 (15.2%)	18 (54,5%)	10 (30,3%)
Education	**Primary**	**Secondary**	**Higher**
	5 (15,2%)	12 (36,3%)	16 (48,5%)
Number of children	**1 child**	**2 children**	**3 or more children**
	15 (45,5%)	17 (51,5%)	1 (3%)
Province	**Almería**	**Barcelona**	**Tarragona**
	12 (36,3%)	11 (33,3%)	10 (30,3%)

Table 1: Pregnant and breastfeeding women.
Source: By M.Fàbregas

In this article we analyze a set of 83 narratives and classify chemical substances into four categories: 1) the organoleptic characteristics these substances contribute to food; 2) the level of impact on health the participants believe these substances have; 3) the handling process of the products in the food production chain and in the domestic sphere; 4) the interaction of these substances with the body (elimination, transmission to the fetus in pregnancy or to the baby during breastfeeding, and accumulation in the body)

Ethnography aspects	Almeria	Barcelona	Tarragona	Total
Interviews	12 (36,3%)	11 (33,3%)	10 (30,3%)	33
Food diaries	3 (9%)	10 (30,3%)	10 (30,3%)	23 (69,6%)
Observation	1 (3%)	25 (75,7%)	1 (3%)	27 (81,8%)

Table 2: Location of ethnography.
Source: By M.Fàbregas

Organoleptic Characteristics

This category in the cataloging refers to all the narratives where the participants specify characteristics about the taste, color, smell, and texture of food. For women, chemicals are substances added to foods to preserve them and to improve their organoleptic characteristics:

"Chemical compounds are substances that are added to food to preserve it or to give different textures that are more appealing or to add color or flavor." (SS; Breastfeeding, student, 2 children, 37).

The participants believe that adding chemical substances causes foods to lose their natural properties. This loss of the natural organoleptic characteristics of the product makes them feel it is not as safe for health:
"What happens is that, since everything contains 20 thousand dyes, stabilizers, I don't know what's carcinogenic and what isn't; I don't know!" (MJ; Pregnant, nurse, 1 child, 34).

They also reflect on the protections institutions grant to producers in giving permission to use substances suitable for consumption:

"These types of preservatives, known as food additives, don't change the nutritional value of food, but they make it taste better and look more attractive. There are different types of additives. In terms of the health effects, it's true that they have to meet health and consumption requirements to be used, but their use and the mass and uncontrolled production of some of them can be harmful to health." (MJ; Pregnant, biologist, 1 child, 30)

The Impact of Food Additives on Health

The discourses expressed here reflect on the effects of ingestion of foods with added chemicals and their consequences on health. There is no consensus among the participants on the effects these substances might have on health; the opinions vary:

Most women consider chemical substances to be pathogens and harmful to health. Sometimes they describe the consequences of their intake and the need to avoid them:
"... toxic compounds are artificial substances that are used in some foods altering their naturalness, and they should be avoided." (MF; Pregnant, speech therapist, 1 child, 39).

In the case of substances such as alcohol and tobacco, the conviction about their negative effects on health is almost unanimous, and women who are planning on having children often stop using them:
"I stopped when I thought 'I want to be a mother, and by the time I'm pregnant, I don't want any nicotine in my body.' " (AG; Pregnant, optical industry, 1 child, 39).

Some participants have doubts about the consequences these substances might have on health:
"Food preservatives: packaged products that we don't know the effect they have." (AR; Breastfeeding mother, speech therapist, 2 children, 39).

Some women relate the effects of a food to the amount ingested; in some cases, they explain that while pregnant, they reduced the intake of the substance considered harmful:
"Well, dangerous? ... I don't know if it reaches the point of danger; I suppose in excess, an excess of drinks, soft drinks, drinks with a lot of sugar, I think that can be dangerous." (MJ; Pregnant, biologist, 1 child, 30).

One participant explains that while pregnant, she has replaced a food considered to be dangerous in pregnancy with another that is similar, but without the associated risk:
"I ran into a friend in the supermarket the other day, who said: 'Well, look, we buy, now I don't remember what it was, I don't know if it's called 'merca' ... it's like a tuna but smaller', and it doesn't accumulate heavy metals. So, during pregnancy I eat this." (SM; Pregnant, teacher, 1 child, 39).

In some cases, although recognizing the dangerous effects of these substances, they are considered to be necessary for use in agriculture and to get rid of pests:
"Pesticides are necessary in conventional agriculture today to get rid of pests." (AA; Pregnant, architect, 1 child, 33).

The negative aspects of certain products, such as sweeteners if you suffer from diseases such as diabetes, tend to be minimized:
"Sweeteners: Mostly chemicals, but a solution for diabetics to have a life full of tastes. But for others, possible health problems." (NV; Pregnant, clerical worker, no children, 39).

For the need to eat foods that participants believe are beneficial in pregnancy, such as fish:
"They are questioning all the benefits of fish. That, sure, it's beneficial, but the sea is so polluted with mercury, lead ... it's very beneficial, but you're getting a lot of bad things in your body." (BL; Pregnant, clerical worker, no children, 33).

The few participants who do not vary the pattern of consumption they had before pregnancy do not do so because even knowing the danger, they prefer to "take the risk" of continuing to eat these foods:
"When I was first pregnant, they scared me about eating salad. I'd always eaten salad, and they started telling me that it can cause toxoplasmosis. So I stopped eating it, but it really affected my diet: I prefer to wash it well and run the possible risk of eating it because I think it's good." (CR; Pregnant, computer engineer, No children, 30).

Or because they think there is no risk in ingesting these substances:
"I have the feeling that there isn't a very high risk from eating foods that contain heavy metals or a lot of food preservatives because of them being harmful to health." (YP; Pregnant, clerical worker, No children, 39).

This last participant, who sees no danger in the consumption of foods containing chemical substances, explains that "the body is wise" and can protect itself from the possible negative effects of these substances:
"I don't know if our bodies can eliminate these chemical compounds and how they accumulate. As I understand it, the body is smart, and if it's negative for the baby, it won't be transmitted." (YP; Pregnant, clerical worker, No children, 39).

Finally, in some of the participants definition of chemical substances, the use of words with negative significances is common. They refer to fats or substances added during the production process as "negative things", "nasty" and "garbage". Women define these products contemptuously, but admit consuming them:
"I had the fridge full of a thousand nasty things and bought custards, coffee, rice pudding, and we were eating more or less everything, and then the jello was left, and I looked at it, and as soon as I picked it up, it went in the trash ... isn't it just water with powder?" (SS; Breastfeeding, student, 2 children, 37).

Handling Process in the Food Production Chain and in the Domestic Sphere

In this section we look at the discourses of participants on the origin of products, the processes of production and distribution of food, as well as their handling and preparation in the domestic sphere. The participants believe that the use of chemical substances in industrial processing is massive and that they are found in all kinds of food:
"Which foods contain preservatives? Well, all of them ...,

anything that lasts more than three or four days, I guess." (BL; Pregnant, clerical worker, No children, 33).

In the majority of narratives, women list the products they believe contain chemicals:
"Sugar: 1. Packaged baked goods: sugar, trans fats, salt, additives and preservatives; 2. Milk chocolate: sugar; 3. Flavored yogurt: sugar and more additives." (NJ; Breastfeeding, chemist, 3 children, 32).

The participants agree that these foods contain a lot of chemicals, but when the ethnographers go shopping with them, they see that all the participants take home some type of industrial baked good (cookies, cereals, pastries, etc.). They justify this by saying that "it's quicker for breakfast", "it has a better flavor", "I don't eat it every day", etc.

Some participants think that chemical substances can be eliminated, by what you do with them when you prepare them:
"Pesticides: substances that are sprayed on fruits and vegetables. If they're washed well and the fruit is peeled, they're eliminated." (VE; Pregnant, nurse, No children, 32).
The participants in order to prevent entering the body these chemical substances, they wash fruits and vegetables before eating them:
"I clean fruits and vegetables because they can have pesticides" (NA; Pregnant, administrative, 31).

In this regard, contradictions were found between dialogues and observations. For example, in the discourses, the need to wash fruits and vegetables before consuming them to diminish pesticides is stated very clearly; however, when the observations were carried out, we found that the vegetables were either not washed (but later peeled before cooking), or they were washed very superficially.

Some participants prefer organic foods because they believe they are free of chemical substances:
"(Partner of participant): You look at it a lot and you try to always look for the most organic possible, you know?" (GR; Breastfeeding, fish seller, 1 child, 27).

However, many of the participants do not believe that organic food is less contaminated:
"I could tell you that there are things I buy that are organic, and I could say I trust them more, but it's not true. I mean, no, I don't have blind trust, I couldn't say that." (NJ; Breastfeeding, teacher, 3 children, 33).

The participants are also concerned about how to prepare different foods: for example, that they should be cooked enough, that they are washed well, that the fish has been frozen before eating it:
"What foods do you not trust?- I don't trust meat. Although I haven't had toxoplasmosis, I'm kind of obsessed about it." (EV; Pregnant, supermarket cashier, 1 child, 36).

In this regard, the breastfeeding participants or those who have been mothers before asked about the food they should buy for their children. In the observations, the women asked vendors for advice on which was the best piece of meat or the best fish for children:
"She buys sole cut into fillets for the oldest child; first she is not sure whether to get it because it costs € 19 / Kilo, but the fish seller tells her it's enough fish for three meals, so she decides to buy it. She also gets black monkfish tail that the fish seller prepares for cooking for the child." (Researchers observations based on a fragment of diary, AR, breastfeeding, speech therapist, 2 children, 39).

Interaction of Chemical Substances in the Body

This category refers to the women's explanations about how, after substances are ingested and they come into contact with the body, they are eliminated, accumulate in the body of the woman, and are transmitted to the fetus. There are varying opinions:

Regarding the elimination of chemical substances ingested:
Some participants believe that the chemical substances ingested by pregnant or breastfeeding women are completely eliminated by the body:
"I: Do you think these chemical substances accumulate in your body, are eliminated or transmitted? - You eliminate them." (NA; Pregnant, clerical worker, No children, 31)
Others say that they are partially eliminated and that there are certain drinks that can help eliminate them, specifically water:
"Toxins: important to drink water; sweat and urine eliminate them." (SM; Pregnant, teacher, 1 child, 39).

Relationship between the elimination and accumulation of these substances in the body:
There are participants who talk about stopping the consumption of certain foods because they contain chemical substances that accumulate and are not eliminated:
"According to studies that have been done, fish accumulate mercury, and if we eat them, it also accumulates in our bodies. Mercury is accumulated and is not eliminated." (NV; Pregnant, clerical worker, No children, 39).

As in the category regarding the possible effects of chemical substances on health, the participants' opinions vary in function of the amount of the chemical substance ingested: The greater the amount ingested, the greater the accumulation of these substances in the body. If it is a small

amount, it can be eliminated:
"I believe that a large part is eliminated because the body eliminates it, and nature is wise, the kidneys... if you have a tendency to consume a lot of these products, no matter how much the body eliminates them, some things will remain." (MF; Pregnant, speech therapist, 1 child, 39).

Regarding accumulation, and as seen in this last quote, in the discourses there is the idea that the body is a receptacle of toxic substances:
"I saw a 'Salvados' program a year ago, I think; it was about us being chemical receptacles. Then I understood that we don't eliminate them." (BL; Pregnant, clerical worker, 1 child, 33).

Regarding the transmission of substances to the fetus or the baby, the narratives refer to pregnancy:
"When I was pregnant, I saw a documentary that said something like, to compensate for all the substances that you've accumulated, you pass it to the child through the placenta." (MJ; Pregnant, biologist, 1 child, 30).
As well as transmission during breastfeeding:
"Chemical compounds are added to food. We eat these foods. One of the ways of eliminating them is through breast milk, so they would pass to the baby through breastfeeding." (VE; Pregnant, nurse, No children, 32).
In the case of alcohol consumption, most pregnant women stop drinking because of the possibility of transmission to the fetus:
"So during pregnancy did you stop drinking alcohol? - Yes. And also when I was breastfeeding. I read something about the amount that goes to the baby, which is much smaller, but ..." (SM; Pregnant, teacher, 1 child, 39).

Discussion

Following the classification that has been developed, will proceed to comment on the most significant findings. Have been created four categories to describe how women classify types of foods. In the literature, have been found a classification by Cáceres and Espeitx [10]. They use the category of "quality" to describe the value that is given to foods. In this work, quality as a result of subdividing into two: differentiating the organoleptic, characteristics that these substances contribute to the products and how they are thought to affect the food production system.

The safety aspect refers to the effects that these substances may have on health, and harmlessness refers to their interaction with the body. The category about the classification covers the previous items and shows how women refer to foods that they believe are less healthy, such as industrial products. In addition to chemical substances that are added in the production process, this classification also includes toxic substances such as alcohol and caffeine and pathogens such as toxoplasma and anisakis. The women in this study cite these toxins and pathogens, without distinguishing them from chemical additives in food, when they comment on the level of their impact on health and their interaction with the body.

Regarding on the organoleptic characteristics, the participants repeatedly mention sugar. There is growing social disapproval of sugary foods, and medical and governmental organizations have warned about the dangers of excessive sugar consumption as well [1]. The participants relate excessive consumption of sugar to the appearance of diseases, and they see its consumption as especially dangerous for children. This agreement in criteria between women and medical organizations is repeated in the case of chemical sweeteners. Both the participants and the experts agree on their use in case of diseases in which sugar cannot be consumed, such as diabetes [14,15], but both have concerns about their long-term side effects [16].

About the side effects of ingesting these substances, in a study by Pumarega et al. [17] found that participants answered it was possible that throughout their life, they could have accumulated in their body, toxic substances potentially dangerous to their health in the mid-or long-term. We find two opinions about this. The first considers chemical substances to be harmful agents that must be avoided. Thus, some pregnant women stop drinking regular coffee and replace it with decaffeinated coffee because it is recommended by the professionals they consult with. This is also the case with the participants who say they drink beer "without" alcohol. Avoiding substances perceived to be dangerous to health can be defined as avoidance behavior [18]. A contradiction in the narratives was detected related to avoiding chemical substances added to packaged products and specifically, industrially-produced baked goods. Another behavior visible in the narratives is substitution, as defined by Fischler [1], which consists of replacing one product with another that reduces the risk or eliminates the effects of exposure and that, in the eyes of the eater, has flavor, is practical, and has symbolic advantages. This is the case of the participants who stopped eating tuna during pregnancy and replaced it with "perca", a smaller fish, with a similar taste to tuna but that is not a source of heavy metal accumulation. Medical and scientific recommendations advise to reduce tuna intake due to the high content of heavy metals, substituting it for smaller fish [19,20]. The second opinion found is that of the participants who consider these substances to be dangerous, but choose to take the risk of continuing to consume them. Some women talk about the "acceptable risk" of consuming them and provide different reasons for doing so: for example, they do not want to stop eating a particular food because of

its taste; or they may believe that a particular food provides benefits in pregnancy. They say that it is very difficult for them to eliminate salad from their diet; they say they wash vegetables better to eliminate the pesticides, and in some cases, they do not eat them when they eat out. By not giving up the consumption of foods that are a potential source of exposure to chemical substances, women accept and assume certain risks. This "assumable risk," described by Peretti-Watel [21], and that each culture constructs, is accepted because the food that is not avoided can provide benefits that compensate for the risk, either because it is believed to be a source of vitamins (salads), provides omega3 (fish), or because it is a food that they like for its flavor (sausage, sweets, etc.).

On the subject of handling of food, women talk about certain biological agents such as anisakis or toxoplasma. In both cases, government agents provide guidelines to avoid these during pregnancy [22,23]. When the participants talk about them, they express doubts about the recommendations they receive and act according to their own criteria. Other authors have studied the food recommendations that pregnant women receive and also reflect these doubts [24,25]. In the case of anisakis, it is not clear to them what type of food preparation eliminates them, and many women stop eating raw fish (sushi, anchovies in vinegar), even knowing that it is frozen and assuming they are not at risk. In the case of toxoplasma, when they talk about the risk of eating sausage, participants (those who have not been in contact with the agent before pregnancy) have internalized the guidelines and stop eating it or freeze it for a few hours to eliminate the risks. Others express doubts about certain cured foods and the possible risks of consuming them.

When women are asked about category about the interaction of chemical substances with the body, the majority say they have never thought about this issue. However, they do have some ideas about it, such as the case of a mother who after watching a television program, thinks of the body as a receptacle accumulating contaminating substances, which over time can affect health [26] This image of the body as a receptacle is related to what some women also say regarding the quantity of and exposure over time to chemical substances that may be ingested and the risk this entails [27]. The greater the amount of chemicals and the time exposed to them, the greater the accumulation of the substance in the body and the greater the risk to health. However, there are participants who believe the "body is smart" and does not accumulate substances that can be harmful, or that these substances are only transmitted to the fetus if they have positive effects. This assumed ability of the body to guide our choices has been under question for a while, and it seems that this ability is certainly relatively limited [1]. Subsequently, when they are asked about the bodies' interaction with chemical substances and become aware of it, we find discourses that address the elimination of ingested substances, substances that are accumulated after consumption and substances that are transmitted both in pregnancy and in breastfeeding. For example, women know that alcohol crosses the placenta during pregnancy and is transmitted through breast milk. They think it is a substance that should be avoided. This is exactly what official bodies recommend in information addressed to women [22,23]. Mercury is another substance they know they should avoid, due to its accumulation in the body. They know that it is a heavy metal that is present in large fish and once ingested, cannot be eliminated. However in their discourses they do not mention other heavy metals, such as cadmium or lead, although official bodies make explicit recommendations about avoiding these metals for pregnant and breastfeeding women [15,22,23]. Mothers are also unable to identify other sources of these metals, such as cocoa, algae, mushrooms or oily seeds [22]. Women have partial information, a fact that does not guarantee the conscious avoidance of these metals during pregnancy and breastfeeding. We should bear in mind what Thomas [28] warned about, that being familiar with nutritional terminology, even incorporating it into everyday language, is not related to more optimal dietary behaviors.

Faced with doubts about diet, individuals are forced to be critical in relation to the scientific experts and question the information they receive. In this way they become "lay-experts," as they are forced to consult different sources to become better informed about the food issues that concern them [29]. The medicalization of nutrition and the massive diffusion of multiple discourses is reducing the distance separating lay persons from the experts [30]. In our study, we find that the participants have, to some extent, expert knowledge regarding chemical substances. Their speeches coincide completely with those of experts when they talk about the industrial use of preservatives and dyes [15,16]. Only in two cases have we found participants who are "double experts", being both professional and lay persons [31]. In these cases, these mothers define PTCs in the same way as the experts, as chemical substances used in agricultural and industrial production, which accumulate in the body in small doses and cause diseases in humans [12,32].

In general, the discourses show that there is a relationship between the participants' perceptions about the risk of chemical substances and whether they are already mothers or not. When women already have children, their speeches express greater concern about the health consequences of these substances, especially exposure over the long term or in large quantities. Taking into account that the children of the participants are young (under 3 years old), and that they,

as mothers, are responsible for their diet, as they explain in their narratives, their greater concern about chemical substances may have different causes. Mothers say they receive nutritional information from health professionals during routine pediatric visits to health centers. There are studies that show that the guidelines provided by professionals are taken into account by mothers when choosing foods and ways of cooking for their children [33]. As women are responsible for feeding their children, they become more concerned about the foods they buy and how they are prepared [34]. One example of this can be seen in the concern mothers express about the sugar consumption of their children, especially if it is in large quantities. They also express doubts about feeding children prepared foods when they do not have time to cook and they do not know what added substances they contain or how the food has been prepared ("baby food", pre-packaged broths or soups, etc.).

The main limitations of the study are given by the characteristics of the sample. On one hand, we worked with women who were visit on the public health service. Thus, the opinion of women who do not control pregnancy or post-part or do so in the private health system are not included. On the other hand, all the women in the sample are Spanish. We believe that if we collected the opinion of women of different origins, we would not have reliable results due to the complexity of the food variety. This fact would not have allowed us to compare food practices.

Conclusions

Have been found different opinions among our participants regarding each of the five categories of our classification; but a common element has been detected among those who are already mothers. They are more sensitive to chemical substances added to food. Pregnant and breastfeeding women classify chemical substances according to how they affect the organoleptic characteristics of the food, impact on health, the production process and their interaction with the body. In terms of the organoleptic characteristics, concern about sweetness and the use of sugar stands out. This is also of concern to the scientific community. In terms of the impact on health, most participants believe that chemical substances are harmful and should be avoided. Regarding the production or handling of foods, they express doubts about how the biological agents that may affect them during pregnancy can be eliminated and about the information they have received from professionals. The idea of the "body as a receptacle" of substances also appears, which contradicts the idea of "the body is smart" and does not accumulate substances harmful to the fetus. Lastly, they understand that chemical substances can be passed from mother to child through the placenta during pregnancy and through breast milk.

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