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**“Like a sediment that stays in the body”:  
Social perception of persistent toxic  
substances and other synthetic  
chemical substances in food among  
pregnant and breastfeeding women  
in Spain**

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#### ABSTRACT

This paper analyzes the ways in which pregnant and breastfeeding women perceive the presence of chemical substances in food products. It also addresses how they reflect on the effects of those substances on their own health and that of the baby and the fetus when they think about processes of accumulation, transmission and elimination of those substances inside their bodies. Our first hypothesis is that women's discourses about the health effects of Persistent Toxic Substances (PTS) are related to the social distance of the social actors that reproduce these discourses. The acceptability of these discourses is more evident the greater is the trust in the social actors who transmit this information. This paper analyzes the discourses of health workers and the close social environment of these women, since both play an essential role in the transmission of these discourses. Despite the fact that the dietary advice received by women is strongly medicalized, the information provided on chemical substances in food in the medical environment is scarce and not homogeneous. Thus, this type of risk is made invisible in the doctor-patient relationship, and the responsibility for managing it usually falls on women.

#### KEY WORDS

Social perception of risk, internal contamination, Persistent Toxic Substances, pregnant and breastfeeding women, defenselessness.

#### **«COMO UN SEDIMENTO QUE SE VA QUEDANDO EN EL CUERPO»: PERCEPCIÓN SOCIAL DEL RIESGO SOBRE COMPUESTOS TÓXICOS PERSISTENTES Y OTRAS SUSTANCIAS QUÍMICAS SINTÉTICAS EN LA ALIMENTACIÓN ENTRE MUJERES EMBARAZADAS Y LACTANTES EN ESPAÑA**

#### RESUMEN

El objetivo de este artículo es analizar cómo las mujeres embarazadas y lactantes perciben la presencia de sustancias químicas en los alimentos y reflexionan acerca de los efectos en su propia salud, la del feto y la del bebé, cuando piensan sobre la acumulación, transmisión y eliminación de estas sustancias de su cuerpo. Partimos de la hipótesis de que el discurso de las mujeres sobre los efectos en salud de los Compuestos Tóxicos Persistentes (CTP) está relacionado con la proximidad o distancia social de los actores sociales reproductores de estos discursos. La recepción y aceptación de estas argumentaciones son más evidentes cuanto mayor es la confianza en los actores sociales que transmiten esa información. Este artículo analiza los discursos del personal sanitario y el entorno social próximo de estas mujeres, pues ambos juegan un papel esencial en la transmisión de dichos discursos. A pesar de que los consejos alimentarios que reciben las mujeres están fuertemente medicalizados, las informaciones facilitadas sobre sustancias químicas en los alimentos en el entorno médico son escasas y poco homogéneas, de forma que este tipo de riesgos son invisibilizados en la relación médico-paciente, y la responsabilidad sobre la gestión de los mismos suele recaer en las mujeres.

#### PALABRAS CLAVE

Percepción social del riesgo, contaminación interna, Compuestos Tóxicos Persistentes, mujeres embarazadas y lactantes, indefensión.

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### 1. Introduction

The Spanish population shows a growing interest in information related to food and its relationship with health. This interest is related to the medicalization process of contemporary food, characterized by the tendency to substitute social and symbolic discourse around the selection and consumption of foods for discourse about their nutritional value based on a balanced diet. However, due to the fact that medicalization of food has been growing in laymen's knowledge, the practices have not been modified according to the hopes of the experts because of the insufficient attention conceded to the role of structural factors and societal motivations for food consumption (Gracia-Arnaiz, 2007).

Along with this medicalization process come other economic, political and technological transformations of the food system in which agroalimentary industries and chemical companies participate. In the context of the technification and increased production of food products, the chemical industry has played a relevant role in the control of pests, production of fertilizer, elaboration and conservation of foods, production of additives, conservatives, and other components. Scientists have taken note of some of these chemical compounds after confirming their harmful effects on human health. Despite the fact that some of these substances were prohibited by the Stockholm Convention, once the dangers associated with their toxic persistence were verified<sup>1</sup>, many of these chemical compounds continued to be permitted while their health effects were disregarded (Porta and Zumeta, 2002). Before the technification and abundance of foodstuffs, doubts and uncertainties increased over the potential risks related to the foods we consume, products which are increasingly being manipulated and processed (Contreras, 2011; Fischler, 1990).

Persistent Toxic Substances (PTS) are substances that are characterized by the accumulative effect of low doses inside the human body and also

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1. In 2001, the "Stockholm Convention" was adopted by the United Nations Environment Program, with the objective of reducing or elimination the emission of "Persistent Organic Pollutants" (POPs).

known for provoking long-term health problems (Porta, Puigdomènech and Ballester, 2009). Regular exposure, absorption and accumulation of these compounds, generally in fatty tissue and organs, like the liver, brain and nervous system (Bergman, Heindel, Jobling, Kidd and Zoeller, 2013), result in unseen risk due to the latency of their short term effects (Grandjean and Landrigan, 2006), and multifactorial causality of the illnesses and resulting disturbances which include endocrine disruption<sup>2</sup>, as well as immunosuppressive, oxidative, neurotoxic, metabolic, carcinogenic, and epigenetic effects (Barouki, Gluckman, Grandjean, Hanson and Heindel, 2012). They can also cause changes in reproductive health and in the development of the fetus (Valls-Llobet, 2010).

At the scientific level, the exposure to PTS in pregnant and breast-feeding women through food consumption shows diverse harmful effects on the health of the mother, the fetus, and the baby (Fängström, Hovander, Bignert, Athanassiadis, Linderholm, Grandjean, Weihe and Bergman, 2005; Veyhe, Hofoss, Hansen, Thomassen, Sandanger, Odland and Nieboer, 2015). It is reported that most dioxins enter women through dairy, fish, and meat products, and that they can affect the fetus through intrauterine exposure (CAPS, 2011). Recent studies on the exposure of PTS in pregnant women and children show, for example, their role as endocrine disruptors to be the most serious of the neurotoxic effects in pregnant women, babies, and young children (CAPS, 2011; Grandjean and Landrigan, 2006).

In a Western context, marked by the medicalization process, in pregnancy (Blázquez, 2005; Montes, 2007) as much as in contemporary foodstuffs (Gracia- Arnaiz, 2007), pregnant women are subject to increased autoregulation and self-care of their bodies in order to protect the health of their fetuses, since both woman and fetus essentially become monitoring centers and biomedical checkpoints (Lupton, 2012). In this context, in which biomedical discussions have played an important role in the construction of meaning around the fetus, practices and risk, many times the necessities for protecting the fetus over the rights of the pregnant woman have been prioritized (Imaz, 2001; Lupton, 2012). That is why the consumption of alcohol and tobacco during pregnancy has been a medical issue and its abstention assumed as a maternal responsibility (Bell, McNaughton and Salmon, 2009). Pregnancy has been converted into a stage marked by the discussion of risk where the principle of caution establishes itself as a strategy to manage the unknown, to protect the infant, and to construct the moral

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2 .Chemical compounds that can provoke hormonal dysfunctions (CAPS, 2011).

category of a “good mother” (Leppo, Hecksher and Tryggvesson, 2014). For this reason, the woman views her body during pregnancy with fear and mistrust (Montes and Bodoqué, 2002).

In this article, we analyze the perceptions of women on the presence and risk of absorbing chemical and synthetic substances within their bodies through food; we address three distinct processes: accumulation, transmission, and elimination of PTS. These processes are perceived in many ways according to the physical state in which the women find themselves, whether it be pregnancy, postpartum, or the first six months of breastfeeding. The persistence of synthetic chemical substances in foods and the risks to the health of the mother, the fetus, and the baby appeal to political irresponsibility and the economic irrationality of global capitalism in which we are immersed. Even though a previous study observed that people interviewed about the perception of chemical risk attributed a higher capacity of choice and individual responsibility than in the case of environmental contamination (Muñoz, Larrea, Zafra and Begueria, 2014), agroalimentary production continues to be an issue of major responsibility attributed to public and business administration.

First, we present the dietary advice given by health institutions that focus on risk management and dietary restrictions.

Next, we refer to dietary advice given by people closest to the interviewees, such as mothers, fathers, mothers-in-law, husbands, friends and neighbors, that come into play in the selection, preparation, and consumption of food. We intend to analyze the relationship between the information received and the agents producing this information in order to assess how advice about food is or is not accepted and how this impacts the level of uncertainty of the accumulation and transmission of PTS.

Lastly, we analyze the subjects’ perception of the body, keeping in mind processes of accumulation, transmission, and elimination of these chemical compounds and their relationship with safety and care of the self, the fetus, and the infant. We seek to study how pregnant and breastfeeding women perceive toxic corporality (Larrea-Killinger, Muñoz and Mascaró, 2017; Larrea-Killinger, Muñoz, Mascaró, Zafra and Porta, 2017).

## 2. Methodology

This data comes from ongoing interdisciplinary research conducted by a team of fifteen people (anthropologists, doctors, epidemiologists, nurses,

nutritionists, philosophers, and psychologists), whose aim is to analyze the trust and mistrust of food consumption in pregnant and breastfeeding women in Spain<sup>3</sup>.

The fieldwork consisted of a qualitative study centered on the application of semi-structured interviews with pregnant and breastfeeding women and medical professionals, the creation of daily food diaries, free listings, and focus groups with pregnant and breastfeeding women. This study concentrated on two autonomous communities in Spain: Catalonia (Barcelona and its metropolitan area, Baix Llobregat, Tarragona and Ribera d’Ebre) and Andalusia (Granada and the surrounding area, and Valle del Almazora, Almería). Access to pregnant and breastfeeding women was granted by two public hospitals and three primary care centers in Catalunya and two public hospitals and one primary care center in Andalusia. The objective was to compare the discourse in relation to the perception of chemical risk in food consumption.

The interviews and food diaries began in January 2016, once the corresponding ethical committees gave their approval, and were finalized in September of the same year. All of the participants were informed of the objectives and methodology of the investigation, and written informed consent was obtained from each participant.

Additionally, the fieldwork included four nine-month ethnographies (January to September of 2016) that were carried out in the two autonomous communities: a town in Baix Llobregat; a neighborhood of the city of Tarragona, two towns in Ribera d’Ebre, and two towns in Valle de Almazora. The aim was to observe the selection practices for the buying, preparation, and conservation of food. Of the six areas chosen, half were situated in zones that were highly polluted due to proximity to chemical industries and mining operations.

The selection of the sample was deliberate, or proactive, according to the specified parameters of the study, with the intention of finding the maximum variation, heterogeneity and significance, as well as obtaining a balanced sample with a similar representation between sexes, ages, ed-

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3. This project I+D+i is titled “Trust and responsibility in food consumption of pregnant and breastfeeding women in Spain: Narratives and ethnographies on the risk of internal contamination”/«Confianza y reponsabilidad en el consumo alimentario de las mujeres embarazadas y lactantes en España: narrativas y etnografías sobre los riesgos de la contaminación interna» (reference: CSO2014-58144-P), financed by the Ministry of Economy and Finance, State Program for the Promotion of Scientific and Technical Research, State Sub-program for the Creation of Knowledge (IP: Cristina Larrea-Killinger).

ucational level and work sectors<sup>4</sup>. The criteria of inclusion were that the women were born in Spain, that the pregnancies were at least 20 weeks of gestation and that the women breastfeeding (either directly and/or artificially) had been doing so for a maximum period of six months, and that they represented diverse socioeconomic tiers. Women on a prescribed diet due to maternal pathology were excluded.

Overall, 111 semi-structured interviews of pregnant and breastfeeding women, four focalized ethnographies, two focus groups, 71 food diaries, 71 free lists, and 19 interviews of health professionals took place.

Pregnant and Breast-Feeding Women						
Profile of women	Pregnant	Breast-feeding	Total			
	62	49	111			
Age	Age 20-29	Age 30-39	Age 40+			
	17	81	13			
Education	Primary	Secondary	Advanced			
	6	37	68			
Number of children	1	2	3+			
	58	45	8			
Province	Almería	Barcelona	Granada	Tarragona		
	30	51	20	10		
Township	Barcelona and metropolitan area	Ribera d'Ebre	Granada and surrounding area	Baix Llobregat	Tarragona	Valle de Alanzora
	40	5	20	11	5	30

**Table 1.** Characteristics of interviewed mothers, 2016 (source: authors).

4. Although these variables were kept in mind at the time of selecting the sample and this information was made available in disaggregated form, a comparative analysis has not been done for this article.

Health Professionals						
Province	Almería	Barcelona	Granada	Tarragona		
		3	10	3	3	
Township	Barcelona and metropolitan area	Ribera d'Ebre	Granada and surrounding area	Baix Llobregat	Tarragona	Valle de Almazora
	6	2	3	4	1	3
Professional Profile	Gynecologists	Pediatricians	Midwife	Pediatric Nurse		
	4	6	8	1		

**Table 2.** Characteristics of interviewed Health Professionals, 2016 (source: authors).

### 3. Adequate Diet: Narratives of trust

#### 3.1. “Eat as healthy as possible”: Expert discourse

Future mothers are worried about the type of products that they eat, knowing that diet influences the growth and development of the fetus. Doctors are the expert agents that reinforce the knowledge about healthy and harmful foods during pregnancy, those that are recommended for consumption and those that should be avoided to eliminate the risk of illness.

Part of the medicalization process of dietary behavior is produced in the doctor-patient relationship and focuses on preventing illnesses such as toxoplasmosis and listeriosis.

For that, health professionals recommend avoiding the consumption of raw meat, raw sausages, unpasteurized dairy, and soft cheeses, and to carry out certain practices like thoroughly washing fruits and vegetables:

What I recommend to them is that they mistrust cheeses and sausages and these artisanal things that you can find in festivals. It's not that these people don't do it well, but sometimes the shipping cannot guarantee adequate conservation and sometimes there can be... what's it called?... listeria that can lead to listeriosis which can gravely affect the child, that is one of the things that... Toxoplasmosis, I knew there was something else (professional, 65 years old, gynecologist).

Other focuses of the biomedical attention to risk are concentrated around discouraging the ingestion of large fish due to the high levels of



mercury. According to a 2010 report from the scientific committee of the Spanish Agency of Health Safety and Nutrition (AESAN), a study was conducted to evaluate the risk of consuming fish for pregnant and breastfeeding women in order to reduce the exposure of mercury and methylmercury by controlling the quantity and frequency of ingestion (AESAN, 2010).

Lastly, the greatest risk for pregnant women is the consumption of alcohol. In conjunction with the Spanish State, health experts as well as public institutions discourage any consumption of alcohol during pregnancy, since it is impossible to ensure a minimal level of consumption that would not affect the health of the fetus (Ministerio de Sanidad, Política Social e Igualdad, 2011).

On a tangential note, health professionals give advice on the process of food preparation. For example, there are those who recommend avoiding fried and breaded foods and suggest preparation of meals based on boiled or sauteed foods.

Even though the main source of information about risk is biomedical, other information is shared through the media, family and friends that points out the dangers of consuming certain foods. Mistrusting food alerts women to look for information about the origin and quality of a product in media coverage, as well as by reading labels. The women interviewed, on seeing these labels, focus on the expiration of the food, its origin, its components and their proportions, if it contains traces of any kind, if it is organic or has additives, dyes or preservatives, mistrusting over all the “E”s<sup>5</sup> that it might have:

For me, I don't like prepared meals, if I don't have another option, I'll eat them, but it's something that I don't like a lot... I don't trust not knowing how they are made, what they have in them. They put it there for you, but no one understands it, because of the E's and all that... what is that? So, I don't like it [...] It's just that I don't know what I'm eating... (breastfeeding, 29 years old, department store employee).

Economical and ideological factors favor that the distrust of chemical risks of certain foods implies the change in practices of buying and consuming of foods. This is the case in various narratives, which point out that the consumption of organic fruits and vegetables would be a healthier option that is conditioned by the economic possibilities of the family

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5. Translator's note: E's refers to a list of additives marked by the letter E then a number. These additives may be of chemical or synthetic, vegetable, animal, or indeterminate origin. Some are considered to be non-toxic like curcumin or riboflavin, while others are considered suspect or even dangerous such as sulfites or boric acid.

budget. Despite the fact that distrust is the main negative attitude that cautions women in their decision-making process at the time of purchasing a product, it does not mean that the acts of selection and consumption of certain products stop happening. For example, processed foods are most likely to be mistrusted, where “processed” is defined as a wide range of products manipulated by the food industry (jarred, canned, or pre-cooked foods), yet the consumption of them does not stop. There is also a distrust of red meat and cow’s milk, due to the possibility of being manipulated by animal growth hormones and antibiotics. This excessive manipulation can produce over time, according to most of the women interviewed, the development of illnesses such as cancer.

As distrust implies scrutiny of the products these women consume, the arguments that are most trusted are those that come from experts, above all the doctors and midwives, that attend to these women throughout the process. These narratives, that are also combined with those they hear from their mothers, husbands, friends and the media, are considered more trustworthy when they are more restrictive. When the advice about foods coming from friends is in conflict with those received from health experts, the women tend to follow that of the second group, always when they are more restrictive. At the beginning of the pregnancy, when the doctors and midwives suggest that they eat healthy, follow a healthy diet or pay more attention to the food pyramid recommended by the Catalan government (Agència de Salut Pública de Catalunya, 2012), the women in Catalunya assume that this is tired, overused advice that does not add qualified information to what they already know:

No, only that, that... I have to eat well. And even when I gained weight, they didn’t tell me anything. They simply said: “*Well, you already know what you need to eat.*” And I said to them: “*Hey, listen,*” because if I don’t have the paper, I don’t do it... I don’t take care of myself. I said: “*There isn’t any diet for pregnant women? That isn’t strict but a little something...*” “*No, you already know what you need to eat*” was the answer (breastfeeding, 30 years old, hairdresser).

The women know that, in general, they have to eat fruits and vegetables, but they complain that they are not told in what quantity, how to combine them, from what origin and what quality: “*They recommended that I eat well and maybe more often, but I don’t remember them telling me you have to eat this, or you can’t eat that*” (breastfeeding, 37 years old, social worker). The women felt the same way in relation to the consumption of meat and fish. Another recommendation from doctors and midwives is to accustom themselves to eating 5 times a day:

As advice, we try to say this, a balanced diet, that there is a little of everything, but that everything be healthy, to eat natural foods; that it not be this, hamburgers and the like, that they not overuse pastas, that they don't abuse anything [...] That they don't make a typical meal for breakfast, lunch, and dinner, but in between eat a fruit, a yogurt at night, in the middle of the afternoon another piece of fruit or another yogurt. That... less quantity and more often, is better (professional, 65 years old, gynecologist).

In general, the women complain that they do not receive enough information about food. We have also observed, in the interviews with the professionals, that the majority know very little about the risks of PTS for pregnant and breastfeeding women and that, if they do give advice, it is because the professional has a personal interest in nutrition and in similar topics:

No, there isn't any information, I believe there is no information at all. Because, for example, during pregnancy, I haven't had any dietary guidelines, that is to say they haven't told me any... unless you look for some on your own, eh... the doctors from social security don't tell you: "*look I'm telling you this is good, this is bad*" either. I don't know, they don't give you information at all [...] In the end, it's health, they should put more emphasis on this. On that and a lot of other things (breastfeeding, 34 years old, head of human relations).

The women report that they are more worried about their diet during their first pregnancy, and therefore, they ask for more information from the experts. Women are also more interested in diet when they have become pregnant through the application of new reproductive technologies. They perceive their pregnancy as being higher risk than those of other women, and, because of this, they ask for more information about diet. See the example of this narrative from an expert:

They ask you a lot about diet, infections, about things they can do or things they should not do, but I think that it's because, because they've spent so much time trying to get pregnant, you know? That they're a lot more obsessed with everything going right (professional, 40 years old, gynecologist).

### **3.2. *"Eating well": Narratives in the family and close social environments***

The evaluation of dietary behaviors is distinct among experts, who insist more on restrictions in order to avoid risks, and among relatives and friends, who recommend more positive behaviors like "eating well" to

favor the well-being of the mother. the pregnant women end up following the advice of the experts more: “*I prefer what the gynecologist says... well, the mothers do it with the best intentions, but in the end, they’re from another generation*” (pregnant, 31 years old, computer engineer).

In the case of Catalonia, many of them recognize that today there is a lot more information about the negative effects of certain foods, something that their parents did not know before. More information exists, but also more dangers lurk in the production and manipulation of foods. They trust in science, and, as such, in scientific and medical advances, but at the same time they mistrust these advances when they serve the interests of the industry.

Friends play a central role in the circulation of dietary advice during pregnancy. They almost convert themselves into “experts” because they have had the same experience (pregnancy, breastfeeding), and women trust in their advice, considering they are from the same generation and have lived through similar situations.

The mothers, whose dietary advice has great value for their daughters, consider themselves to be important agents of education about nutrition and because of their experience, even though, at times, their wisdom is questioned as outdated when compared to that of friends. The mothers advise them to take vitamins, to consume more iron (especially from meat and lentils), to drink more water, to drink milk (for those breastfeeding), and not to eat processed products.

As their mothers advise them to eat well in addition to whatever seems most appetizing to them, some women doubt if these suggestions are the most adequate. Some of them even reject what they have learned and take pride in having taught their mothers to cook differently:

Yes, the type of fish... before she was all about breeding. Now I say to her: “*mom, you buy the filet, and you cook it on the griddle*” ... Or rather, she has learned more from me than I did from her about nutrition. Because, since she’s from Andalusia, she’s a woman who makes stews with a lot of condiments, with a lot of oil [...] So I think that she has picked up more from me than not... (breastfeeding, 37 years old, social educator).

The advice from friends tends to be more medicalized than that from mothers, putting more emphasis on the consumption of healthy food and exercising: “*Well, yes, after all, another pregnant girl told me to eat as healthy as possible, because that’s what you’re really giving to the baby, right? And to try to exercise as well, to try to live as healthy a life as possible*” (pregnant, 35 years old, sign language interpreter).

With friends, they also share the same expert narrative that, in reality, what is important is to eat well and not to eat for two, like their mothers used to recommend. Because of that, weight management is another central worry during pregnancy: “*There’s a friend who told me something that stuck, and that... a friend, a friend that had been pregnant not long ago and told me: ‘don’t try to eat for two, like the yayas say; but try to eat twice as well’. And it stuck with me and I thought: ‘Of course’*” (pregnant, 39 years old, high school teacher).

Even though the women acknowledge the coexistence of advice among family and friends, some pursue their own criteria when it comes to making certain decisions. As Foucault (1987) notes, the ties between normative discourse and practice are complicated, and the different contexts can provide people with different grades of freedom in the face of interpreting, negotiating, or showing resistance to these narratives:

They’ve tried to give me a lot [of advice], but since they know that I don’t pay attention to anyone, I always tell them: “*I listen to everyone, but just so you know in the end I’m going to do whatever I want.*” And often when people ask me about my experience: “*and what about you?*” I say: “*look, the best advice that I can give you is that you don’t listen to me, I’ll give you lots of advice, but don’t listen even to me, ok.*” Because I believe that in the end maternity is 50% instinct and 50% common sense. So what worked for my mother, and what has worked for her, and what she did well, and the best she knows, does not mean that it is going to work for me [...] Of course, when my mom listens to me, my mom also knows that I am a person who likes to read a lot, that I like to be informed. So, I have never been... And my mother-in-law at best is sometimes more... not because of her mother-in-law, eh? The woman, because she is closer to me: “*this you do like this and that like so.*” I tell her yes, yes, well, I do it how I want, and since they already know that, eventually they just say nothing (breast-feeding, 32 years old, travel agency employee).

#### **4. “By eating better you feel much better inside”. Knowing how to select and avoid dangerous foods: the discourse of distrust**

What are women referring to when they talk about chemical substances in foods? In a general sense, they tend to emphasize processed and manipulated foods, such as additives, preservatives, emulsifiers, flavor enhancers added to foods and the E’s on the labels of products. Few refer concretely to PTS (insecticides, like lindane or DDDT, PCB, dioxins, methylmercury,

etc.). Other more specific chemical substances that women recognize as dangerous are pesticides, antibiotics and animal growth hormones.

The women classify foods in two groups: those that contain more chemical substances and, therefore, are more dangerous, and those that have fewer elements and are more trustworthy. Among the most dangerous, you can find processed, precooked, and elaborated foods; foods with a lot of ingredients; canned foods, red meat (hormones, antibiotics); fish (mercury, heavy metals) and, especially, those that come from outside the country (catfish from Vietnam); sugary drinks and sodas; and foods from large supermarkets. The foods that have fewer chemicals are organic, fruits and vegetables bought in markets, fruits and vegetables from orchards, and local produce.

The Andalusian women interviewed worried more about pesticides, particularly those who live close to large agricultural zones. However, even though they trust the fruits and vegetables from their own gardens and those of relatives more, they do not challenge the use of pesticides. In the case of Catalonia, the interviewed mothers show a greater interest in the consumption of organic foods. In the case of these products, the proximity of their production guarantees a greater perception of trust in them, as does the strength with which the ecological discourse has grown among specific social groups (Begueria, 2016).

## 5. Toxic Corporality: transmission and accumulation of chemical compounds

As previously stated, the dietary advice given by the mothers of the pregnant women was “to eat for two.” By contrast, the experts said the opposite. The narratives of the pregnant women and the health workers were similar, since they did not separate care for themselves from care for the fetus. The conflicts about duality (body of the mother/body of the fetus) and the moment, always ambiguous and interdependent, in which this awareness appeared, influenced the quantity and quality of ingestion, and a greater or lesser acceptance of dietary advice from experts and relatives.

As for the perception of synthetic chemical substances and PTS, the idea of transmission of these substances, and therefore, of duality, just as the idea of accumulation in the body of the mother, also prevails. For example, in one narrative we observe “*what you carry you can pass on to your baby... what you are consuming you are passing to him*” (pregnant, 38 years old, nurse). However, as we observe throughout this section, the information is scattered and vague.

Since health professionals do not inform the women about accumulation and transmission of chemical substances, they tend to look for this information in the media, preferring the digital realm. The internet queries range from random searches of dietary recommendations and/or pregnancy (stages, health problems and symptoms, what you can eat or not) to articles of rigorous scientific studies and specific web pages of pediatricians, dieticians or about organic food. The women go through pages, thematic forums, and articles from magazines specialized in pregnancy and first-time parenthood. The lack of information does not imply that they do not try to establish comparisons when asked, primarily resorting to ideas about the consumption of alcohol, tobacco and large fish:

The husband of a friend of mine, whose father is a gynecologist, and this friend who is now pregnant and her mother-in-law said to her: *“everything you drink, nothing, or only a sip of beer, the child drinks it too. In other words, if you want to give him a bottle of beer, help yourself.”* Right? I suppose it’s exaggerated, but what you were saying about whether it accumulates or not; I believe a large part of it is eliminated, because the human body and nature are wise... the kidneys. But if there is always a part, and more if you abuse [...] But if you, um... have a tendency to consume these products, for as much as your body removes it, something will stay (pregnant, 39 years old, speech pathologist).

The most widespread idea from the interviewed women is that for the transmission of these substances there has to be a minimal level of accumulation, related to the principle of toxicology that “the dosage makes the poison.” By contrast, they think that the excretory functions of the human organism can eliminate a large part of these substances eventually. In these narratives, we observe distinct opinions about accumulation and elimination:

Because they must accumulate somehow, I think, that’s my belief... well, I think the body can also go on eliminating them throughout its lifetime [...] There will always be additives.... Who knows if you will end up removing them all? — A healthy life helps with elimination! — (pregnant, 39 years old, nurse).

Well I don’t know... I don’t think, well, I suppose they’ll be eliminated some way (pregnant, 33 years old, cashier at a mall).

It takes the body a lot of effort to eliminate them (breastfeeding, 37 years old, social worker).

Are there foods that go through the placenta more quickly? Is the permeability of the placenta sensitive enough to allow certain substances

through and not allow others? The medicalized discourse recognizes that certain toxic substances like alcohol and mercury can pass through the placenta and affect the development of the fetus (Valls-Llobet, 2010). For the mothers, the placenta is a fragile border and, therefore, these toxic substances are able to pass through by way of the blood. This permeability is very entrenched in the discourse of the women more influenced by the medicalization and in the metaphor of the placental economy given by Imaz (2011) in her article. Most of the women do not doubt that the dietary behavior of the mother affects the health of the fetus. However, it is more difficult to find a consensus when they refer to whether or how synthetic chemical substances and PTS can be transmitted to the fetus: *"I don't think they can be transmitted"* (pregnant women, 34 years old, administrative assistant). The narratives vary when it comes to exploring the concept and space of accumulation, and it is not known exactly which chemical substances accumulate, or how and where they accumulate. Aside from recognizing that we don't know how chemical compounds are accumulated and transmitted, the women affirm that both processes end in producing illnesses in the long term, especially cancers:

I sincerely believe that most cancers are because of our diet. Every time there are more cases, more young people, and I think that a major part of it is because of the type of food that we eat (breastfeeding, 35 years old, school teacher).

I believe that they are not eliminated; that it's accumulative and, in fact, the girl we were talking about from work, she was saying: *"shoot, it's the food that, well, with other things, can result in -now I seem very exaggerated- but results in cancer and more, and it can come from this. Because they're like toxins that you have in your body that it's not able to get rid of"* (pregnant, 39 years old, high school teacher).

In the narratives about accumulation, they commonly use metaphors and comparisons to explain this process. In one case, a woman compares the effect of accumulation inside the body with a faucet with limescale: *"this is like a faucet that has lime, right? As you go on using it each time more, more, more, it keeps building up there. And every time it's more difficult to remove. So, I suppose this would be the same"* (breastfeeding, 30 years old, hairdresser).

In the second example, a metaphor of tree sap is used, and the compounds are described as residues and sediments:

I think that it's a little bit like a tree sap: that residues are being left behind, it's like that thing with the nails, right? The little lines of calcium, you know?



Until it reaches the end of the nail it doesn't, it just doesn't get eliminated. Or with hair, or I don't know what... that you've poisoned yourself with something and until it's cut, I don't know. I think it's very complicated, because it's like a sediment that stays in the body, right? That stays in the musculature (pregnant, 33 years old, freelance worker in catering).

In another example, it's said that your interior is a reflection of the exterior, and therefore acts like the skin: "*I think so yes!*" [that there is accumulation]. *Because, look, I went once, I don't know where I went, to the dermatologist and they said to me: 'suppose that the skin has memory'*" (breastfeeding, 39 years old, psychologist).

In summary, the women think that there are chemical substances that accumulate and that they are eliminated in certain moments and circumstances, and others that are accumulated, but are not eliminated immediately. Some of these substances accumulate and others are eliminated over time. The latter have the possibility of being transmitted or not. Those that are transmitted are the most dangerous, for example, toxins, which can lead to diverse pathologies, particularly cancer.

The first group of substances that are eliminated through urine, feces, and the liver, but can be accumulated, includes alcohol and preservatives. The women do not specify which substances are eliminated by urine or feces. Even though for the women the liver is the principal organ that filters alcohol, this toxic substance can be transmitted to the fetus. In the case of food preservatives, they think they can only be eliminated partially, since they are also partially accumulated.

In the second much larger group of substances, the women differentiate between chemical compounds and the types of food depending on the transmission, or not, of chemical substances. They believe that accumulation occurs in fat and in the cells, and that the chemical substances that cannot be eliminated are those that are capable of producing illnesses and transmitting themselves to the fetus or the infant.

Among the substances or foods that can produce illnesses are large fish and fast food. The chemical compounds or foods that are transmitted to children are pesticides, toxins, palm oil, and commercial bakery products. In general, there are substances and foodstuffs that are accumulated and are not eliminated such as PTS, preservatives, and some toxins present in processed food, meat, adulterated food, and foods packaged in plastic. Pesticides are substances that, in addition to transmitting themselves, are considered to have a capacity to accumulate in fats and cells. On the other hand, in the case of meat, the women referred to the accumulation of growth hormones in the animal and the use of antibiotics in the prevention of illnesses in animals raised for human consumption.

We observed that the women consider the dosage of chemical substances in food products as influencing the accumulation/transmission/elimination process. For example, they think that when the dosage is small it makes it easier for elimination. On the other hand, if the dose increases, they believe eventually elimination becomes difficult and the substances start to accumulate.

As we have seen, some believe that the chemical substances are sediments or residues that continue to accumulate within the body, even up to the point where they can alter the metabolism and produce genetic alterations and infertility. The effect of accumulation in fat and in the bones produces inflammation and irritation, therefore affecting the filtration process of the liver and kidneys, causing accumulation in the blood. The cumulative effect can even, according to the women, rot the intestines, cause damage to the body, and the organs. Although they recognize differences in individual susceptibility and genetic predisposition, they believe there is a large accumulative tendency when the person lives a sedentary life or has an unhealthy lifestyle.

Similarly, a very clear relationship exists in the transmission process between diet and the development of the fetus. They consider that toxic chemical substances pass through the placenta through the interchange of blood, since they consider that to be the most direct channel. This perception coincides with the scientific discourse around the transmission of PTS (Botella, Crespo, Rivas, Cerrillo, Olea-Serrano and Olea, 2004; Casas, Fernández, Llop, Guxens, Ballester, Olea, Basterrechea Irurzun, Santa Marina Rodríguez, Riaño, Tardón, Vrijheid, Calafat and Sunyer, 2011; Cerrillo, Granada, López-Espinosa, Olmos, Jiménez, Caño, Olea and Olea-Serrano, 2005; Fernández, Parera, Arrebola, Santa Marina, Vrijheid, Llop, Abalos, Tardon, Castaño, Abad and Olea, 2012).

The breastfeeding women think that some foods can change the taste of breastmilk, such as artichokes and asparagus. Although many of them think that, in the same way as flavors, chemical substances can also be transmitted to the baby through breastfeeding, this process is not very clear for all of them. Some think that while breastfeeding the mother acts as a filter and these substances do not have the same effects as during pregnancy. The belief in the transmission process of chemical substances through breast milk and the direct contact of the breast and the baby is very relevant and well reflected upon in this narrative:

That they accumulate, in fact, I have read recently on the topic of breastfeeding, that there are substances that accumulate in the body of the woman and are transmitted through milk. There is one that's called PET... or I don't remember how the substances are called... and that there were people who even defend-

ed not breastfeeding children because it transmits this substance. I have also read something like that, that women who eat more during pregnancy... that eat a higher quantity, they store it (breastfeeding, 32 years old, special education monitor).

At a scientific level, the literature shows certain PTS are transmitted through breast milk (Cerrillo et al., 2005). Aside from this nutritional consideration, the mothers believe that there is a transmitted educational dimension from mother to children in the formation of dietary habits: *“breastfeeding, of course, you’re passing it along there... I suppose so yes. And even if you don’t, it’s what your daughter sees and she’s going to copy it. So, in the future she’s going to do the same”* (breastfeeding, 30 years old, hairdresser).

## 6. Conclusions

Pregnant and breastfeeding women in Spain received dietary advice from distinct sources (medical workers, family, friends, media, etc.). The medical narrative is the most structured, focusing on dietary restrictions in order to avoid the risk of certain pathologies, while the discourse around closest family members and friends focuses on the well-being of the mother and can be condensed into the idea of “eating well.” Even though certain differences can be observed between the two narratives, they do not contradict each other, because medicalization permeates and conveys the transmission of expert discourse and the social rhetoric of family and friends.

None of this guidance emphasizes the risk and dangers of synthetic chemical substances or PTS, with the exception of certain toxins like mercury present in large fish. Pregnant and breastfeeding women find the information about this issue on the internet, through the media, or in the greater social environment. Women often complain that they are not provided with this information and therefore, believe that little is known about the effects of these substances, how and where they accumulate, which of them are transmittable, etc. The discourses of the interviewed women are inconsistent and varied, which evokes a certain helplessness in the assumption of individual responsibility which they feel compelled to accept in the care of their self, the fetus, the baby, and their family. This individual responsibility comes from the pressure of medicalized discourse (Lupton, 2011). The information generally comes from socially distant centers, and it explains the great uncertainty around them. In other words,

the greater the social distance, the less confidence there is in the veracity on statements about risk.

The recognition of a progressive mother-fetus duality implies that the interviewed women believe PTS and synthetic chemical substances can have a distinct effect on the mother and on the growth of the fetus, and afterwards, on the baby. For the mothers, the processes of accumulation, elimination, and transmission of these substances are diverse, depending on the type of substance, the ingested dosage, and the degree of dependency of the fetus and the baby on the mother.

By comparing the perception that women have on the processes of accumulation and transmission of PTS with the most well-known risks of alcohol and tobacco consumption, the principal concern is the danger that such effects can incur for the healthy fetal development. The body during gestation is converted into an ambiguous space, where it is difficult to clearly separate what represents one, the mother, and the other, the fetus, and also constitutes a liminal process characterized as a rite of passage from one social state to another (Imaz, 2011). In our study, we observe that the narratives indicate that at the beginning of gestation the woman perceives her body and that of the fetus as one unit, with a fragile boundary that separates the two bodies, the placenta, which is believed to be unable to filter out chemical compounds capable of harming the fetus. As the womb keeps growing, the woman begins to perceive a dual conception of her body, that leads to greater care of self and the fetus. As pointed out by Imaz (2011), the pregnant body constitutes a metaphor of maternity, because analyzing what occurs within the womb redirects us to the relationships between nature and culture, the conceptions of masculine and feminine, as well as the notions of person and individual. At the same time, the images used to refer to the relationship between the fetus and the mother tell us of a frontier zone and the manner in which the maternal-filial connection will be constructed in the future. The idea of a pregnant body defines itself in relation to the fetus, because the mother constructs her identity from the expression *body-for-another*.

Just as the consumption of tobacco, alcohol, and drugs is attributed to the individual responsibility of the woman, the lack of information on expert discourse about synthetic chemical substances means that the idea of toxic corporality (Larrea-Killinger, Muñoz and Mascaró, 2017; Larrea-Killinger et al., 2017), and internal contamination, widespread in the media (Begueria, Larrea, Muñoz, Zafra, Mascaró-Pons and Porta, 2014), is hidden in the doctor-patient relationship.

We believe that a future study should be conducted of how the media is converting itself into a focal point to disseminate information on the

risks of the contemporary diet. In any case, behind the informative silence, the problem of institutional responsibility for the control of food production becomes latent; especially production by agroalimentary industries, whose growing weight in the offering of processed products presents a social and economic problem of great importance. It is precisely in this environment where the research on PTS and its dissemination is of utmost importance, above all for the social groups most vulnerable to the risks, like pregnant and breastfeeding women, as we have shown in this article.

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