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Toxic bodies: perceived risk of internal contamination by chemical compounds in Spain

Cuerpos tóxicos: la percepción del riesgo de la contaminación interna por compuestos químicos en España

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ABSTRACT This article analyses the social perception of human exposure to chemical compounds and discourses and practices regarding bodily boundaries when faced with internal contamination. Based on qualitative and interdisciplinary research carried out in Catalonia, the social meanings attributed to the environmental and food dangers and risks related to chemical compounds that affect human health, and the place that the body takes in the production of these discourses, were explored. In order to do so, between June and November 2011, 43 semi-structured interviews with workers with some awareness of chemical contaminants were carried out, emphasizing how these people (re)interpret the different existing discourses about internal contamination as well as their perceptions regarding the introduction of chemical compounds into the body and the dangers that these substances pose to health.

KEY WORDS Anthropology; Qualitative Research; Risk; Chemical Contamination; Human Body; Spain.

RESUMEN Este artículo analiza la percepción social de la exposición humana a los compuestos químicos, y los discursos y las prácticas sobre las fronteras corporales ante la contaminación interna. A partir de una investigación cualitativa e interdisciplinar en Cataluña, se exploran los significados sociales que se atribuyen a los peligros y riesgos ambientales y alimentarios de los compuestos químicos que afectan a la salud humana y el lugar que el cuerpo ocupa en la producción de estos discursos. Entre junio y noviembre de 2011 se realizaron 43 entrevistas semiestructuradas a trabajadores con alguna conciencia sobre contaminantes químicos, en las que se profundizó cómo estas personas (re)interpretan los diferentes discursos existentes sobre la contaminación interna, sus percepciones sobre la introducción de compuestos químicos en el cuerpo y los peligros que estas sustancias representan para la salud.

PALABRAS CLAVES Antropología; Investigación Cualitativa; Riesgo; Contaminación Química; Cuerpo Humano; España.

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INTRODUCTION

This article analyzes the social meaning attributed to the environmental dangers and risks of the chemical compounds that affect human health and the place that the body occupies in the production of these discourses. Unlike poisoning, internal contamination caused by long-term exposure to low doses of persistent toxic compounds and other chemical substances in the air, water and food, is a health risk about which society knows very little.

The social and cultural construction of the body requires a deeper analysis which explores the connection between environmental risks and internal contamination, with the capacity to interfere in reproductive, hormonal and cell development. This allows us to reflect anthropologically on two levels: the first level, on the body representation of toxicity and, the second level, on the internal body image. Both levels converge in regards to the importance of the body as a receptacle for toxic accumulation in the elaboration of social discourses. The symbolic meanings of the toxic body are the darker side of contemporary progress, where thinking about a body without toxins is currently impossible. Social discourses reflect that the accumulation of toxins in the body will increase unless strict policies of food safety, industrial control and changes in the economic model are proposed.

The results are part of a broader research study on the sociocultural dimensions of toxic corporality, which aimed to study how society – being relatively aware of the presence of chemical compounds – perceived and reinterpreted the different social discourses on internal contamination, especially focusing on the interpretative process that people conducted with regard to the introduction of toxins into the body and the dangers they posed to health.[1,2,3,4,5,6,7]

Conceptual framework

In the contemporary discourses about the human being, it is common to hear Foucault's [8] statement that *the body is a battlefield* where philosophical, moral, scientific, cultural and social struggles are fought. The human body is the field where multiple discourses are deployed, which the rhetoric of power keeps transforming and shaping into ideals that regulate different social practices. It is from these ideals that the individuals of our globalized society are acknowledged, built and modeled. The objective is docility, "submission" – with greater or lesser degrees of resistance and conviction – to the norms, ideals and models of a *normal, healthy, pleasant and productive* corporality.

The set of mechanisms from which individuals internalize these regulatory models of their existence is *biopolitics*.[8] These mechanisms are maintained and activated from the instances of social power that the global sociopolitical system regulates. Without engaging in a debate on Foucault's conception on the nature of this regulatory power, as it is neither a personalized power nor is it located in a specific sphere, these mechanisms are usually acknowledged in multiple ways in today's social and political structures.

The mechanisms of *biopolitics* are evident in many social discourses, even in some scientific discourses, which grant credibility to certain beliefs about the body. For instance, the field of health proposes the development of the potentialities of a *natural* living body that the biomedical discourse has filled with descriptions of possible threats to be avoided, reduced or circumvented. The environment appears as a set of risks, which must be known, described and overcome. Risks that are, in principle, identifiable, measurable and preventable.

The uncertainties arising from technological and chemical advances in agricultural production and food, cosmetics, textile and chemical industries, with regard to the effects on the environment and human health, impact the conceptualization and management of new risks, for which there is still no scientific and technical consensus. We are facing the development of scientific discourses that have not yet configured hegemonic regulatory mechanisms at a sociopolitical level. In

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the field of environmental health, where the models of causality are reconfigured and precautionary principles are applied to avoid the effects of industrial contamination and technological risks, environmental knowledge threatens the biopolitical consensus. How are new regulatory mechanisms going to be internalized if there is not a hegemonic discourse at a scientific level on the effects that chemical compounds have on human health? How are these mechanisms maintained, activated and controlled from the power when some of these discourses are against the interests of the development of the capitalist market?

The rhetoric of health has historically been built on a typology of risk originating in the acknowledgment of the experience of pain and disease based on body dysfunction. The body was no longer anonymous and the person was faced with an adversity, discomfort and difficulty coefficient which hindered normal body functions. In this conception of health, which was common in most popular beliefs, the healthy body was perceived as an anonymous and silent reality that could be forgotten until certain internal or external factors altered this silence of the body.[11] The root of this alteration was, and still is, according to popular belief, the conviction that certain foreign substances entering the body cause harm.

The idea of a closed "natural body," which was attacked from outside by pathogens – organic causality – and magical agents – supernatural causality – has brought to the forefront, throughout history, the social need to establish a catalogue of possible dangers and toxins. At the same time, this idea has involved the need to understand which the pathways of corporal introduction have been (mouth, vagina, anus, ears, and so on), as well as the procedures for their possible neutralization. This conception of a closed and impenetrable body belongs to an archaic deeply masculine social imaginary, linked to the ideas of autonomy, strength and activity, in contrast with the porosity and penetrability of the weak and passive female body.

The Greeks called certain foreign substances *τοξον φαρμακον* (*toxón fármacon*), i.e. the *arrow drug*, the substance that Heracles put on the tip of the arrow to kill his enemy: a "toxin," a poison. This etymological root of the poisonous, the basic model of all toxicity, understood as the introduction of a foreign element into the natural body which destroys or corrupts it, has had important consequences in the conception of health risks.[1]

If we consider a typology of risk applicable to the pathological experience, one of the basic categories is that of the toxin coming from the environment, which is described as "poisoning." The list of toxins or poisons belongs to the empirical elaboration acquired throughout history, which is passed on by cultural diffusion. Therefore, there are risks that may have a symbolic nature or may be a magical, rather than a physical belief. In any case, these suggest the idea of an external attack, although their causes are not always visible. Prevention practices can be very diverse, ranging from magical protection activities to compliance with certain taboos or the most common practices, such as hygiene practices, with all their complexity and diversity, regarding the use of water and other body cleaning products.[12]

With regard to the forms of poisoning, body orifices are the basic means to explain them, and occupy a fundamental place as weak barriers against toxic aggressions, although infections linked to skin contact (allergies, insect bites, and others) are also important, and played an important role in major historical epidemics such as the plague or cholera, and as still evidenced by recent alarming epidemics, such as that caused by the Zika virus.

This idea of poisoning, of tangible toxicity, of a poison that causes damage inside the body – as a foreign substance – contrasts with the idea of a body at risk which receives small, imperceptible and painless doses, caused by industrial synthetic chemical compounds, which penetrate in low doses into the body via ingested food, inhalation or body cream spread on the skin. These invisible substances, which we ingest, breathe

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and absorb throughout our lifetime, are silent, painless and odorless. Given their potential adverse effects, they put our internal body at risk due to the bioaccumulative effect and the alteration of hormonal and cell functions, which eventually cause disorders, alterations and illnesses.

There is biopolitical controversy between those who defend the sociopolitical hygiene-based order as a regulator of human behavior and those who seek to integrate a socio-environmental discourse in order to transform the current political and economic model. The latter group searches for scientific evidence to show the environmental risks of industrial contamination and its effects on the balance of the ecosystem, among which human health is one of the main concerns.

Reflecting on the "toxic bodies" means delving into the idea of bodies at risk [13] due to persistent toxic compounds exposed in the long term, in small doses and affected by bioaccumulation.[14] The image of pure (children) and closed (male) bodies gives way to the idea of open, vulnerable and weak "toxic bodies," which contamination has left as a legacy for future generations. Internal contamination still reflects the dangers of the well-being on which the socioeconomic model of the last fifty years is based.

In this general context, our research study[2] aims to explore the social perception of new emerging risks, expressed in scientific discourses and their circulation in the media. These risks go beyond the experience of contagion and produce rhetorical narratives towards a future characterized by adversity.[15] The aim is to highlight the social meanings attributed to the dangers and risks derived from the chemical compounds that contribute to internal contamination through long-term exposure to low doses of the so-called persistent toxic substances.

The increase of chemical compounds in the environment, in the field of food production, handling and conservation, as well as in the composition of new industrial packaging, cosmetics and cleaning materials, can affect human health as a result of the interaction of these substances with pathophysiological processes. The internal contamination of human bodies caused by these chemicals is the result of systemic processes involving exposure, absorption and accumulation of compounds, generally in organs and fatty tissues.[16,17]

Persistent toxic compounds are the chemical substances used in agricultural and industrial production accumulated in the body in small doses, primarily through the consumption of food containing animal fat, which pose a silent risk, due to the short-term invisibility of their consequences,[18] as well as a diffuse and multifactorial causality of diseases and disorders resulting from this type of toxicity. Given their resistance to degradation and excretion, they remain in the environment and in living organisms for long periods.

In the last decades, the production and release of chemicals has increased. Many of these substances have been categorized as harmful to health and several scientific studies have shown that their daily intake at micro doses is associated with multiple diseases.[18,19,20,21]

METHODOLOGICAL ASPECTS

This research study was based on the discourse analysis of a set of 43 semi-structured interviews carried out between June and November 2011 to workers and professionals from the autonomous community of Catalonia. None of these people suffered from chemical-related illnesses; however, they all had a professional connection (veterinarians, farmers, firefighters, butchers, cleaning personnel, among others) or shared an ideological concern towards chemical hazards (environmentalists, vegetarians, consumers of environmentally friendly products, and so on).

The type of sample used was non-probabilistic and judgmental, in accordance with the specific parameters set for the research study. The aim was to find the maximum variation and the heterogeneity of the different professional sectors and to obtain a sample with a

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similar representation in terms of sex, age, educational level and geographical location.

The participants in the study were informed of the objectives and methods of the research study, for which they gave their informed consent, and confidentiality was guaranteed throughout the process.

Through the analysis of the semantic networks of the narratives,[8,9] there was an assessment of social discourses on the perception of the risk, toxicity and experiences related to the production of meanings on internal contamination.

TOXIC BODIES

Lay or non-expert discourses on toxicity are based on socially shared knowledge in which products of chemical origin are perceived as dangerous to human health. In the nutrition field, the distinction between organic and chemical food is linked to an association between natural products perceived as healthy, on the one hand, and processed products as dangerous, on the other. As one of our interviewees highlights:

> *Then, food. Well, I guess they are already genetically modified. You buy tomatoes and they all look the same. You buy apples and they all look the same, right? That's no longer natural. When a chemical product is added, I guess it ends up inside you, screwing up your health.* [...] *What is the effect it has on health? Well, I know it's not good. But I don't know exactly why. I know they're not good because they're not natural. And if it's not natural, it mustn't be good. Then, there are... they use pesticides…and chemical products that first pass on to the product and then to you. Well I guess that can't be very healthy. I guess that when it's time to… If… these products are not healthy, and as they're not healthy, they're not good.* (Male. Maintenance and cleaning operator)

The products considered the most dangerous are those connected with chemical substances, especially pesticides.[22] The greatest danger of these substances is that they cannot be eliminated; they never disappear and accumulate in the body, and may become stored in organs and body fat.

The different narratives show how the toxicity surrounding everyday life comes from the air, food, and the products, such as soaps, body creams or cleaning products, used on a daily basis. Chemical risk is part of certain working environments and of our daily life. Thus, everyday activities such as breathing or eating also become risks. It is thought that the contamination of the outside world enters the body and cannot be eliminated or eradicated, because the chemical compounds penetrate and accumulate due to their persistence and staying power.

These narratives show how toxicity is invisibly introduced into the body through different penetration pathways (by physical contact, breathing or ingestion) through the *holes in our body*, such as the nose, mouth, skin pores or wounds, and show how the perception of the risk of toxic substances changes depending on the pathways of contamination and the different contexts and types of relationships that people establish with the toxic products, be it in the production stage, the environment or the consumption process.

One of the interviewees highlights in his narratives that, when these toxic substances are periodically accumulated in the body in small doses, they form layers of waste and may, in the long term, be hazardous to health.

> *I think that eating a product that has been sulphated is something unusual... You could eat a pear that was covered in pyrethrin four days ago, but that… Let's see, I don't think your body will notice it... Now, if you eat a pear and every five days you eat another pear, I think it'll leave a residue, of course... And these may be primarily residual products that start to leave... they start creating several layers and may cause*

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problems in the long run. (Male. Farmer and stockbreeder)

This idea of accumulation is compared to other activities that pose a health risk, such as tobacco consumption. The difficulty in eliminating or excreting these toxic products that are adhered to the inside of the body is compared, in the following narrative, to the way cholesterol attaches to veins and arteries. Due to long term accumulation, these chemical substances can turn into poison, even if they are introduced in small doses. As shown, risks vary depending on predisposition and degree of exposure. Therefore, risks are not the same in all cases:

It reminded me a lot, for example, of tobacco... what we were just talking about. When people quit smoking, they still have the same risk of getting a tumor. If they continue smoking for at least, say, five years, if I remember correctly, [...] *their body has the same toxicity as a year before. You can't say that your levels of predisposition to a disease are the same as mine because I've never smoked in my life, so... it reminded me a lot of that. It is true that tobacco can..., it takes a lot of time, but it can be eliminated. Of course, there are other elements that do not... I mean, they remain adhered like, for example, we know about cholesterol when someone has plaques adhered to the arteries or veins, they are not going to simply disappear, they're there; I mean, the good thing is to try... to prevent these plaques from adhering in the first place* [...] *So, there are things that the body can't... anyway, there are things that the body cannot produce and needs from outside. It is also true that there are things that the body can't eliminate through its usual pathways. So, it is really dangerous to continue introducing these things into our bodies, because it is like bringing in poison into your body in small doses, and when the doses are enough, they become deadly.* (Female. Oncology nurse)

In general, the narratives stress two important aspects concerning internal contamination: the first aspect is the amount of toxic substances that enter the body – high doses make the poison – and the second aspect is the imminent dangerous effects of exposure to such toxins. These narratives differentiate between poisoning (food or environmental), in which the toxin is introduced into the body in a specific manner and at large doses, and low-dose exposures with cumulative effects over time, which are characteristics of persistent toxic substances.

The thing is that there is a large number of toxins that we are not aware of, but that accumulate in the body over time. And the older you get, the more evident it becomes. Of course, what happens is that the body is wise enough and tries to adapt to the different situations. However, there are things that the body cannot assimilate. (Male. Automotive Electrician)

It is interesting to highlight that in this last narrative a new idea is introduced: the agency (*the body is wise*) and adaptive capacity that the body has before an aggressive agent. Paradoxically, these toxic substances, due to their cumulative nature, affect the elderly more, as old age is a risk factor for this cumulative toxicity.

As can be seen in the following narrative, the interviewee talks about the effects of food poisoning and some of its visible and immediate effects, as well as about vulnerability depending on the age of the affected person:

The other day a piece of news came out [on TV], *I don't remember where, showing two nursing homes that used to buy meat from a stall when it had already expired and, of course, they bought it at a low price and some elderly people, two or three old men, died, so they reported it and it came out on TV. They searched and searched and the expiration date was finally known* [...]. *But, well, if someone is very young, for example, a kid, or an*

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> *elderly person, the defenses are not the same, and something like this can kill you... And it was proved that… it was the food that had caused it.* (Female. Butcher)

In contrast, in this other narrative, the interviewee explains how certain chemicals, for example, preservatives and additives in food, may lead to long-term adverse health effects. The greatest responsibility lies on the lack of control by health authorities over the increase in chemical substances and the industrial manipulation exerted on them.[4]

> *Common sense tells me that the more food there is, the easier it is to miss some health controls. And also, as food is increasingly manipulated, in the end, of course, I guess that with the substances or preservatives that are being tried today, I mean, with all these combinations and so many changes, we need to produce more preservatives, more antioxidants, more additives, which, in a way, we don't have information about the effects of a new additive that has been tried, and, in ten years' time, we'll know of the effects and the additive will be replaced by a new one. In other words, the more products or variants we have, the more additives we'll need. And, of course, it is still true... that many times we don't know their effects...* [...] *Well, in the end, there are so many chemicals in our bodies, and we will keep adding more and more... Sure, we will only know what would happen in ten years' time. How will this excess and so many types of food affect the current population? How will our health status be in 30 years' time? I don't know, but I am pretty sure that this will have an effect.* (Female. Administrative technician in a thermoplastics company)

It is about a more invisible type of toxicity in which it is more difficult to establish reliable causal relationships due to its effects in the long term and its dispersed multifactorial explanatory factor.

> *The thing is that these are not things that happen in the short run. And things in the long term are harder to accept. That means that... the fact that you consume a product and that the bad stuff it contains causes an immediate effect on you... not in the long term... And then, there are so many things that you consume that, in fact, although you probably got sick due to one thing, in the long term, you won't know if it was because of something else. If it wasn't for that, it might be for something else that contains the same stuff.* (Male. Maintenance and cleaning operator)

In the following narrative, two elements stand out. On the one hand, there is a more time- related reflection, which compares the large amount of herbicide used in the past to the amount that is used today. On the other hand, it describes how the substances that gradually penetrate into the body affect the internal system, without the person being aware or able to relate the effect (disease) to the cause (exposure):

> *I remember that some time ago, a lot of herbicide was used. A lot of herbicide and other things were sprayed on the cereal. And now, that's how things go. They try to use as little as possible. But, I guess that they use both this and others... Well, naturally, in small doses it may cause harm in the long run. The thing is that perhaps most of the times we are not aware of that* [...]. *As for me, I don't think there's awareness about the fact that this is something that exists and could affect us at any moment. And someone says, "He or she has liver cancer.... And where did that cancer come from?... Well, we don't know."* (Male. Metallurgical businessman)

Despite their invisibility, these narratives suggest, therefore, that the presence of persistent toxic substances and other chemicals in our bodies can lead to new diseases over time or stimulate the growth of already existing diseases such as cancer.

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The narratives also point to concerns about the hereditary transmission of these chemicals from the mother to her child. In the following narrative, we can observe a mother's concern about feeling guilty for having passed an intolerance to certain products on to her child. Moreover, the narrative highlights that deeper scientific knowledge on the effects of this intolerance does not improve health. Evidence shows that these problems are on the increase:

> *Well, the thing is that when the child was a month and a half old and the first intolerance was detected, which was an intolerance to milk protein and lactose, I didn't feel guilty... I didn´t think it was my fault; instead, I thought, well, this happens to many children. But, well, then came the intolerance to eggs and fish, which are also foods that cause intolerance in children, I mean, of course, I thought, 'Well, let's see, what have I eaten that my body couldn't eliminate? What has remained in my body and, logically, was passed on to the fetus?' And then, of course, you start blaming yourself. You think, 'What have I done?'. And you start thinking* [...] *Well, it's getting worse over time. You hear the typical phrase, 'Sure, there weren't so many studies in the past and people were just OK.' No. I mean, not that much. I'm not sure about it, why? Because I didn't live in those years, but I can't believe that there are so many health conditions now. And pediatricians confirm it.* (Female. High School Chemistry teacher)

In contrast to this perception of generational transmission of intolerances to certain products and their effects on health, in other narratives, there is also the idea that, over time, people will assimilate these substances and will become immune to their possible effects.

The next narrative uses as an example the lead pipes carrying drinking water and the effects they have on human health. The findings related to these effects are often late, as they were not detected or analyzed:

> *What I mean is, let's see, we have mostly talked about food, and fertilizers, which logically pass on to the product and then to you when you eat it, and you don't notice it, and at first sight you don't see it, but it is there. I mean, it accumulates. With industrial products... I mean, what you don't eat... All industrial products have small amounts of chemical components* [...] *Everything that's in the air, when you breathe, enters your body. That doesn't mean that all that remains inside your body. But, well... in small quantities, but it's there...* [...] *In the long run, this will cause serious illnesses. For example... fifty years ago, all the plumbing system in houses was made of lead* [...]. *There were things that were never analyzed or detected, or looked for... I mean residual lead waste remaining in the pipes where water passed. Over the years, what happens? Well, it was found that, after many years of drinking water that passed through those lead pipes, your body was full of lead in the end* (Male. Manager in a metallurgical company)

The narratives of the interviewees about the types of toxic substances vary according to the place of contamination. For example, few of them mention specific substances when talking about environmental toxic substances, with the exception of river and sea contamination. The first group generally refers to "contamination," and the second group mentions heavy metals such as lead or mercury as toxic substances present in fish.

In contrast, in the case of food, the terms used are generally more varied and specific. Interviewees mentioned that the risk in food could be due to the use of pesticides, herbicides and other chemicals used in agricultural production, as well as in the use of artificial animal feed. Other hazards were also observed in the subsequent processing and industrial handling of food and substances

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for their preservation, such as preservatives, additives, flavor enhancers, sweeteners, and so on. In addition, several interviewees were more specific when describing chemicals used in agricultural production (for example, pesticides, herbicides, fungicides, among others), with farmers and farm workers more frequently using specific names of product categories.

DEBATE

The body occupies an increasingly significant role in the social construction of environmental and food contamination in contemporary risk-related discourses. The fact that there is greater concern with regard to the cumulative effects that different chemicals such as herbicides, pesticides, preservatives or food additives may have on the human body leads to environmental risks shifting from the outside to the inside world. The image of a body in which chemical waste accumulates in layers, storing these substances in fats and organs and even transmitting them from the mother to the child, constitutes a metaphor of modernity. We are becoming a toxic waste repository, a garbage can, where the waste that we produce and consume ultimately ends up.

The set of different factors that comprise a typology of risk,[23,24] which we have attempted to describe, are part of the contemporary debates that nurture, confirm or deny people's beliefs about toxins and their consequences. In such debates, the old paradigm of the rhetoric described by Aristotle still remains visible, when he explains the presence of fear in terms of the belief about *reality, proximity and imminence* of risk. To determine, or believe, that the risk is real or not, meaning that it affects me or my surroundings, or is imminent or distant in time, is the usual topic that shapes beliefs about risks and, as a consequence, elicits a feeling of fear or relief.

These substances silently enter the body through different orifices such as the mouth, nose and skin, as if the body were in fact a sieve enabling the introduction of dangerous substances rather than a shield against external threats. These chemical substances, most of which have no odor, color or taste, act in an invisible and asymptomatic manner through the consumption of food, cosmetics and other products. Nevertheless, only in large doses and in the short term, a few chemicals can poison human beings and cause serious health consequences. These poisonings, which are symptomatic and perceived as truly dangerous, lead to more conscious and effective protective practices than low-dose exposure.

Nutrition plays a key role in the social conception of health risk, and concern increases just as the gap between production and consumption grows. We have observed in the results of our analysis that there is a fundamental belief: what is closer to us is healthier than what is distant, probably because it seems more manageable and reliable, especially in the case of plant products. The idea of what is closer to us as the healthiest natural product is often built on the prototype of a farm or vegetable garden of our town or city. At present, such an idealization, often not subject to empirical verification, is exalted when considering what is ecological, providing it is credited with the implementation of good practices. Nevertheless, it is true that such consideration must be verified and recognized in an objective and independent manner.

The alleged naturalness of what is closer to us is complemented, in turn, by its opposition to the artificiality of food production, conceived as the manipulation of the natural process of growth, through the use of chemicals that prevent certain pests from affecting vegetables and fruits, or products that increase the growth and productivity of meat or milk in animals. The distinction between the use of artificial products to prevent pests or diseases and those that simply tend to increase profits through an increment in productivity is not usually addressed in the belief that the risk of handling is greater. This explains one of the most notable paradoxes of the food risk that our research study has revealed,

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which is that narratives about risks tend to minimize the negative aspects of the use of certain chemical products. This becomes more evident when production takes place in nearer areas, as such risks are not exclusively oriented towards economic profitability, but towards preventing other usual risks typical of agriculture and livestock farming. In turn, there is growing awareness regarding the harmful nature of such chemical products. Rejection and risk awareness clearly increase in terms of distance and the industrial and commercial nature of such production.

Once again, the borderline between what is healthy and what is harmful is established in accordance with cultural criteria. Risk acceptability, a term borrowed from Douglas,[25] depends on cultural rhetoric factors rather than on objective realities. Ultimately, risk acceptability, nearly always, ends up in the repertoire of legal rules that competent authorities establish to protect the health of the citizens.

CONCLUSIONS

The conception of the risk of certain products that are deemed toxic has an important component, which is derived from its assimilation to the model of poison. In principle, toxicity is conceived in relation to the dose; therefore, small doses are considered harmless, at least in a visible way, and it is believed that harmfulness under such conditions helps the body to eliminate them or react by creating antibodies, as is the case with vaccines. The idea that the body is autoimmunized against the toxic effects received in low doses seems very common. Or, in the case of more visible effects, it is believed that there may be an antidote that annuls the consequences of the ingestion of certain products. Popular literature contains many elements that favor this conception, especially in the cases of poisoning.

Nevertheless, in our research study, there is an idea of accumulation of low doses of synthetic chemical compounds (pesticides, herbicides, preservatives, additives, and so on), whose persistence and assiduity in the products we eat cause them to be present inside our bodies, a discourse that is influenced by science, medicine and the media.

Despite variations in exposure levels and the hazard factors of certain types of products, there is growing concern about the difficulties related to receiving and disposing of these substances in the body. Growing concern is also observed in the effects that these substances may have on health as the fetus grows and develops, when we stop to think that they may be passed from mother to child. Images of how these substances attach to the inside of the body cause the interviewees to think of similar processes, such as the adherence of tobacco to the lungs and cholesterol to the veins and arteries.

In addition to this descriptive repertoire regarding the conception of food risk, it would be important to mention the recent emergence of a type of risk in which the threat to health does not derive from the harmfulness of the product itself but from the idiosyncratic structure of the body. The idea that dairy products are inadequate from a certain age onwards, or that meat is unhealthy in large amounts, is based on beliefs grounded on scientific discourses. These beliefs are based on the old paradigms on the internal balance of the body and its receptivity or rejection to certain products that alter it, reformulated in current discourses related to the conception of health as harmony and balance.

This model of balance, which insists on the idea of analysis, harmony and moderation as fundamental factors in the popular conception of health, finds new paradoxes to be solved in the scientific discourses on persistent toxicity. The model of balance which, on the one hand, seeks to avoid this toxicity through a change in the model of food production and consumption in organic agriculture in order to prevent the balance from breaking, on the other hand, suffers the effects of uncertainty. We are dealing with synthetic chemicals about which there is not enough scientific evidence of their effects on human health and of which there is insufficient information due to the technical

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limitations to study them. Economic and political interests hinder research studies on these compounds so as to avoid their regulation and prohibition. These uncertainties have turned these compounds into a subject for further reflection as regards the risks of modernity.

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