Consumer purchase habits and views on food safety: A Brazilian study

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This study aimed to evaluate the attitudes towards food safety among consumers in the city of São Paulo, the major consumer market in Brazil. Focus group sessions were conducted with 30 adults responsible for food choices and purchases. Results indicated a preference for supermarkets over street markets, for the variety of foods, convenience and confidence in the safety assurance. On the other hand, the “naturalness” of the products in the street markets was the main reason for purchases in those places. Participants showed concerns with respect to food additives, hormones and pesticides – technological rather than “natural” hazards. Minimally processed and ready-to-eat foods were considered convenient products meeting the need for time/labor-savings in the kitchen, although suspicion about wholesomeness and safety came up among consumers. Lack of awareness regarding potentially risky behaviors was observed, including handling and storage of foods in the domestic environment. In conclusion, this study suggests that Brazilian regulators should create more effective risk communication combining technical information with actual consumer perceptions of food risks.

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1. Introduction

Recent reports in the Brazilian media focused public attention on a scandal involving the milk industry: tons of UHT processed milk produced in the State of Minas Gerais and subsequently sold across the country had been deliberately contaminated with a mixture of hydrogen peroxide, soda, and sodium citrate in order to extend shelf-life and to hide the addition of water in the product (IDEC – Instituto Brasileiro de Defesa do Consumidor, 2007; UOL – Universo on line, 2007). This is an illegal practice, which in addition to having negative health impacts, also fuelled the national discussion about consumer trust in different actors in the Brazilian food sector, from producers to the authorities responsible for the surveillance of food safety in the country. Despite of high levels of societal concern regarding food safety issues, consumer perceptions of the risks associated with food consumption have not, to our knowledge, been investigated within the Brazilian context.

According to the World Health Organization, millions of people are directly affected by food-borne diseases every year in the world (WHO – World Health Organization, 2000). The occurrence of such illnesses is particularly problematic in developing countries, although food incidents also occur in the most affluent and developed countries. The globalization of food commerce, urbanization, changes in life styles, pollution, natural disasters and the deterioration of water supplies are all potentially problematic. In this scenario, hazards to human health come up and may be especially caused by chemical substances or microbiological contaminants. So, food safety can be understood as the inverse of food risk or the assurance that a food will not cause harm to the consumer when it is prepared or eaten in accordance with its intended use (WHO – World Health Organization, 2009; Wilcock, Pun, Khanona, & Aug, 2004).

Most of the literature on food risks has focused on risk assessment from the perspective of the natural sciences. From this perspective, risks are quantitatively assessed in terms of probabilities of occurrence of an adverse effect. Considering a microbiological or a chemical risk, it is the likelihood that a contaminant can cause harm to the human health. However, it may be difficult to express such risk numerically and so, on occasion, risk can be qualified as “low”, “moderate” or “high” (Fischer, de Jonge, de Jonge, Frewer, & Nauta, 2004). On the other hand, differently from the scientific perspective, consumers perceive risk in their own manner and it determines his/her responses to food risks. Indeed, the individual perception of risks is dependent on a number of factors, including how an individual gathers and processes information about an event, how he/she perceives the level of risk associated with such an event and the personal experience of the risk. In other words, consumer risk assessments depend on the individual’s own judgment of the event (Hansen, Holm, Frewer, Robinson, & Sandoe,
Previous research has investigated consumer perceptions in food safety related to the safety of particular product categories and specific food-related hazards (Miles & Frewer, 2001; Miles et al., 2004; Pennings, Wansink, & Meuleneng, 2002; Rosati & Saba, 2004; Smith & Riethmuller, 2000; Sparks & Shepherd, 1994). Consumer concerns about food safety issues tend to focus on chemical substances, which have been either deliberately or accidently included in foods (e.g., hormones, pesticide residues, toxins, veterinary drugs, food additives, packaging components, etc.), food processing methods and innovative food technologies (Bäckström, Pirtillä-Backman, & Tuorila, 2003; Deliza, Rosenthal, & Silva, 2003; Frewer et al., 2004; Macfarlane, 2002; Spence & Townsend, 2006; van Putten et al., 2007) and microbiological contaminants such as Salmonella spp., Campylobacter spp., Listeria monocytogenes and E. coli O157:H7 (Brewer, Sprouls, & Craig, 1994; Wilcock et al., 2004). There is evidence to suggest that risks of technological and biological origins have been a focus of concern within the media and the public, either following food safety incidents and crises (e.g. the dioxin scare and BSE outbreak in Europe) (de Jonge et al., 2004; Macfarlane, 2002; Wilcock et al., 2004), or when the public recalls past incidents involving food contamination (Parry, Miles, Tridente, Palmer, & South & East Wales Infectious Disease Group, 2004).

Consumers’ general confidence in the safety of foods has been associated with the level of trust they have in the actors in the food chain (de Jonge et al., 2004; Poortinga & Pidgeon, 2005). Siegrist et al. (2000) argue that trust is the minimum requirement for the development of consumer confidence (the individual’s general expectation that a food product will not cause any harm to the health or the environment). In this line, consumers tend to expect the government, the food industry, producers and retailers to be responsible for the safety of the food they consume (Wilcock et al., 2004).

Most research to date has focused on risk-increasing factors and external events. However, understanding consumer perceptions of food risk (and indeed, determinants of safety) in the domestic environment is key to assessing the actual level of risk to which consumers are exposed when they handle foods. It is estimated that a considerable number of illnesses are caused by improper food handling practices in the domestic kitchen (Flint et al., 2005; Gorm, Bloomfield, & Adley, 2002; Humphrey, Martin, Slader, & Durham, 2001). Sinks, refrigerators, knives and dishcloths are examples of potential sources of pathogenic bacteria. Microbiologists understand these issues, although little is known about the actual consumer behavior regarding the avoidance of food contamination and subsequent improvement of safety. It is thus important to investigate consumer domestic hygiene practices in a culturally and situational specific context, which can be made with a social science approach (Redmond & Griffith, 2003).

The objective of this study was to use a qualitative methodological approach to identify key factors that influence on how Brazilian consumers perceive food risks, in order to provide information directly relevant to the development of effective risk communication and consumer protection policies. São Paulo was selected as the most important Brazilian consumer market, reflecting urban consumption patterns within Brazil. As the research is exploratory in nature, it was decided not to impose a theoretical model or framework on the data acquisition and analysis. The intention was not to test a particular theoretical perspective, but to examine a relatively under-researched area and to begin the process of developing a model of the factors driving consumer conceptualization of food safety in Brazil.

### 2. Methods

The present study utilised the focus group methodology to examine similarities and differences in perceptions and concerns about the food safety across different consumer groups. A focus group is a carefully planned group discussion, usually with seven to ten participants, designed to obtain perceptions on a defined topic in a permissive, non-threatening environment (Krueger, 1988). An advantage of a focus group is that it allows for group interaction, providing greater insight into why opinions are held (Kitzinger, 1995; Krueger, 1988). Because of their participant-defined nature, focus groups are explorative and open to themes not anticipated by the researcher (Calder, 1977), rendering the methodology useful for developing insights into possible problems and preferences. Moreover, a distinctive characteristic of focus groups is the explicit use of the group interaction to collect data and insights that might be less accessible without the interaction found in a group (Flick, 2004).

#### 2.1. Participants

Three focus groups of 10 persons each were conducted in São Paulo, Brazil, in January 2006. All participants were recruited through the socio-demographic classification criterion of the Brazilian Institute of Geography and Statistics (IBGE – Associação Brasileira das Empresas de Pesquisa, 2006). All individuals selected for inclusion in the focus groups were responsible for food choices and purchases in their households.

The demographic characteristics of the groups are summarized on Table 1. Two groups were comprised of women. The first one comprised housewives aged between 26 and 55 (mean age = 40 years), in paid employment, with college degree and high income; the second group comprised housewives aged between 27 and 60 (mean age = 41 years) most of them non-employed, with primary or secondary degree and lower income. Men were included in the third group aged between 28 and 60 (mean age = 41 years), all of them employed, with high school or college degree and income varying from medium to high. The reason for choosing such groups was because, in Brazil, women are still primarily responsible for food shopping and preparation in the majority of the households. However, there is evidence to suggest that men of higher educational background and income are also taking the responsibility for food preparation (Sanger, 2006).

#### 2.2. Focus groups

The focus group discussions were led by a moderator and two assistants. The participants were seated around a table – to allow

### Table 1

Profile of the participants in the study.

<table>
<thead>
<tr>
<th>Group</th>
<th>Gender</th>
<th>Mean age</th>
<th>Educational levela</th>
<th>Socio-economical statusb</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>W1</td>
<td>Women</td>
<td>40</td>
<td>Higher</td>
<td>A1, A2 and B1</td>
<td>10</td>
</tr>
<tr>
<td>W2</td>
<td>Women</td>
<td>41</td>
<td>Lower</td>
<td>B2 and C</td>
<td>10</td>
</tr>
<tr>
<td>M</td>
<td>Men</td>
<td>41</td>
<td>Higher</td>
<td>A1, A2, B1 and B2</td>
<td>10</td>
</tr>
</tbody>
</table>

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a Higher education: academic or equivalent. Lower education: elementary school, vocational school or equivalent.

eye contact and free flow of discussion – and were informed about the presence of a camera filming the session and a stenotypist registering the dialogues. They were also encouraged to state their opinions freely and were informed that no wrong or right answers were expected by the researchers. After stating the objectives of the interview, the participants and the moderator introduced themselves as a means of getting people acquainted.

Table 2 summarises the interview guide describing the sequence of questions asked to each group. Semi-structured questions were used to provoke discussion about purchase habits, interests in unprocessed or minimally processed foods and food safety issues. Focus group discussions took approximately 120 min each.

2.3. Content analysis

The transcripts of the interviews were analyzed for themes and content according to guidelines given by Flick (2004). Prior to actual analyses, group by group case summaries were constructed and irrelevant information were identified. Case summaries enabled comparisons between groups and common categories were developed - reflecting the main themes rising from the discussions. Each category consisted of analysis units – excerpts of the interviews – which, however, could pertain to more than one category depending on its content.

3. Results

The focus groups interviews revealed the consumers main concerns regarding purchase choices and food safety, (both within the supply chain and in the domestic environment). The themes are discussed in the following sections:

3.1. Purchase habits in São Paulo

The three most important food supply channels discussed in the interviews were supermarkets, street markets and green grocers. Many green grocers in São Paulo are maintained by the city government, and normally sell fruits and vegetables at a fixed price per kilogram. On the other hand, in the local street markets customers usually pay for a dozen of each article. Supermarkets were described as the preferred outlet for purchases as they offer variety, convenience and are trusted by the participant:

“Everything can be found in the supermarkets. One can buy fruits, vegetables and household products. They are functional, convenient. Supermarkets are more attentive to quality, appearance, brands.” (W1)

“I go to the supermarket. I find everything I want there.” (M)

“I always go to the supermarket. I find everything there. You see [the employees] working and cleaning all the time” (W2)

With respect to the street markets, the freshness and “naturalness” of the fruits and vegetables were frequently mentioned as desirable qualities. However, on one side, street markets were referred as being uncomfortable to shop in, besides restricting freedom for consumers who have to pay for a dozen of a particular item instead of a kilogram, as is the case in supermarkets and greengrocers. On the other side, street markets were viewed as providing a more “economical” shopping environment:

“I think you find fresh and quality products [in the street markets]. That’s why I prefer to shop for vegetables in the street markets. As you pay for a dozen, you can take more.”(W2)

“If I go on Saturday, the vegetables will last until the next Friday. Fruits from the supermarket last no more then three days.” (M)

“Vegetables from the street markets are fresher because they are not kept in refrigerators, as it is done in the supermarkets. As they maintain fruits chilled, when you take them home and let them in a bowl, they will spoil in a few days from inside out”.(M)

“I dislike to shop in street markets. They are crowded places with people shouting…And you hit your head in the tents” (W1)

“The advantage [considering supermarkets] is, you can take how much you want, while in the street market you have to buy a dozen. As I live by myself, what am I going to do with a dozen?” (W1)

“I can pay for only one carrot in the supermarket. In the street market I have to take a dozen, a lot!” (M)

“I dislike to buy in the supermarket because there’s always the same ‘little fruits’.” (M)

“One kilo of oranges; how much is it? In the street market I shop one dozen for the price of half-dozen – or 1 km – in the supermarket.”(W2)

With respect to meats, consumers said that they generally shop for beef, poultry and seafood in supermarkets or in butcher shops, although these products can also be found in São Paulo’s street markets. Participants expressed a preference in choosing a retailer who they can trust, as a means of reducing risk and improving safety. However, some people showed distrust of packaged and frozen meat cuts found in supermarkets, which was explained by the perceived loss of freshness, as a consequence of refrigerated storage. Moreover, buying frozen meats was considered a waste of money, since part of the weight is thought to be ice. This concern appeared to be most evident among the housewives of group W2, for whom the “value of money” may be more of an issue. It is interesting to note that housewives in the higher income group (W1) seemed to prefer frozen chicken as a means of ensuring safety:
“Chicken meat spoils easily and that’s why I usually buy it frozen. If it [considering texture] isn’t firm enough, it means that it isn’t good to eat.” (W1)

“I buy [meat] in a butcher shop near my house because of the quality found there. I dislike meats from supermarkets; they look like ‘old’ meat. The butcher is an acquaintance and he prepares good cuts for me.” (W2)

“I don’t purchase lots of meats, because they were once frozen in the supermarket, and I’ll have to do it again at home. For me the flavor of fresh meat is different…” (M)

“I shop for chilled chicken because it contains less water. Otherwise, I pay for ice. Frozen chicken is cheaper sometimes, but it’s not worth paying for 300, 400 g of ice.” (W2)

“I shop for fresh chicken for the entire month and put it in the freezer. It’s cheaper than buying it frozen.” (W2)

3.2. Minimally processed and ready-to-eat foods

Participants related minimally processed or ready-to-eat foods to convenience, ease of preparation, time and work reduction and “up-to-date” processing methods. As value-added products, these foods were seen as expensive and, then, price appeared to be the main barrier to habitual consumption, even for the wealthier consumers:

“I’m used to buying such products because they are practical, especially for a hurried meal. I save time in the kitchen.” (W2)

“I prefer to buy chopped legumes, like carrots. It’s practical; I just put in the pan.” (W2)

“I think it’s a need for those living alone. We are married, but the singles search for ease.” (M)

“I don’t buy because it’s too expensive for a too little amount.” (W2)

“Ready-to-eat salad is practical, though expensive.” (M)

“I like these processed, sanitized foods. It is convenience. The problem is the price.” (W1)

Participants were also concerned about both quality and safety issues associated with minimally processed vegetables:

“I think that chopped legumes spoil more easily and lose vitamins. They turn bitter, depending on how long they were processed. Upon storage, green leaves turn yellow.” (W1)

“They may keep the nutritional value, but ready-to-eat salad has a different taste.” (M)

“I don’t eat… I get sick with greens that I myself haven’t soaked in vinegar. Revolting!” (W2)

“Packaged on January, 19th. I can’t believe it! They say the product is fresh but the shelf-life could have been altered. Who guarantees that it was processed in that date?” (W2)

3.3. Food safety

In addition to general concerns about food safety, specific food hazards were discussed: these were pesticide residues, toxins, hormones, microbiological contaminants and food additives. Participants showed concern about these hazards, although their lack of knowledge about the risks was observed in the discussions. Noteworthy was the underestimation of the risk of contamination by chemicals and microorganisms, especially among men:

“I wash leaf by leaf, trying to find out if there are tiny larvae…” (M)

“No matter how hard you try, something is always missed… and larva is protein!” (M)

“You find those fresh, appetizing vegetables and you know they contain lots of chemicals. You should choose vegetables with worms, so you know they have less chemicals.” (M)

Many different practices to eliminate contaminants were spontaneously described by the participants. Washing under running tap water and soaking in solutions of vinegar or lemon juice appeared to be “commonsense” ways to sanitize fruits, green leaves and vegetables. Mechanical abrasion (with brushes or sponges) was also mentioned as a suitable approach:

“Half-glass of vinegar in a bowl with water: it is acid and kill worms.” (W2)

“You have to soak the greens in water with vinegar for a while and then rinse.” (M)

“I soak in cold water with vinegar for 10 min.” (M)

“I prefer using lemon.” (M)

“I soak in sodium hypochloride solution. They say vinegar doesn’t kill germs.” (W1)

“Drop four little chlorine drops and that’s ok!” (W2)

“I have a sponge to wash vegetables.” (W2)

“I wash tomatoes with a sponge. I’m cleaning the dirt up, you know?” (W1)

A higher perception of risk associated with meat products was expressed in the groups. The assessment of sensory characteristics such as appearance, colour, smell and tactile texture seems to provide consumers with the first insight into the quality and safety of specific products. Interestingly, acquaintance with the butcher was seen as a way to minimize risks and build consumer trust. This behaviour was more frequently observed for women from the lower socio-economic groups (W2):

“I prefer to shop in the butcher shop where I’m acquainted with the butcher. I’ve been shopping there for many years and therefore I trust him.” (W2)

“I don’t buy minced beef, unless it is minced in my presence. You never know how long it’s been displayed in the shop.” (W2)

“A meat with good appearance is that with a reddish color” (M)

Different risk perceptions associated with the consumption of vegetables and meats were observed in all of the focus groups. Dirt and pesticide residues were mentioned as contaminants which could be to be eliminated through washing and soaking – reflecting the belief that their presence was restricted to the surface of the vegetable – whereas meats merit more attention regarding safety. Despite this, none of the participants were able to name a food microbiological contaminant (e.g., Salmonella, E. coli, etc.), even when they were asked about why food safety was an issue for them. Some domestic hygiene practices were mentioned in the discussions as means of ensuring safety when storing or preparing meats. For example, some participants associated cooling/freezing
with preservation and heating/cooking with decontamination. Again, the addition of salt, vinegar or lemon juice was mentioned as ways to improve food safety as these substances are thought to kill microorganisms. Nevertheless, risk perception seemed to be so high to justify extreme – and sometimes inappropriate – behaviours being applied to improve the safety level:

“I cut in small pieces, remove skins [from chicken], and add salt.” (W1)

“I prepare some for dinner and the rest I put in the freezer.” (W1)

“I add vinegar; soak in boiling water and remove skins.” (W2)

“Once, a medical doctor told me to boil red meat and chicken. By boiling, a dark scum is formed.” (W1)

“Some people scald chicken. I don’t do it; I just put in hot water with lemon juice.” (M)

A reported behavior could potentially have a negative impact – besides being risky – on the quality of the food:

“I take the meat out from the freezer and let it defrosting at room temperature.” (W2)

When asked about farmers, industries, retailers and their own responsibility regarding food safety, the three groups agreed that the supermarkets are primarily responsible for the safety of the foods they sell. According to the participants’ general opinion, retailers must determine quality standards so that farmers and food suppliers ensure that these standards are appropriate to maintain consumer protection. Indeed, when the discussions focused the role of farmers and producers in promoting food safety, the interviewees turned the focus back to the supermarkets:

“I prefer branded products, including meat, chicken and even some vegetables. But sometimes you don’t pay attention to the brand and in this case the supermarket should be responsible [for safety].” (M)

“Supermarkets are responsible for food safety in the food chain.” (M)

“If something is wrong, I go back to the supermarket. I keep the receipt to make a claim.” (W1)

“I make purchases there [in the supermarket] and it doesn’t matter to me who are their suppliers. That’s their business.” (M)

“I’m worried. Every housewife shopping foods in a supermarket is concerned with health issues and try to choose which is less risky, less harmful.” (W1)

Trust in the street vendors also represented an important issue, as some participants’ beliefs about the origin of the food sold in such places was ill-defined:

“When I shop in the street market, I wonder where those vegetables come from. Where were they grown? So I have to trust the supplier. What else can I do?” (W1)

4. Processed foods

Many people showed suspicion and distrust of processing technologies, in particular the role of food additives and growth hormones:

“In almost all products, when you read the labels, they contain preservatives.” (W2)

“Do you know all the preservatives in food products? Preservatives PA, P5… I don’t know anything about this issue. What is that for? I can only figure out that it is for preservation...” (W1)

“If you are allergic, you know what you don’t tolerate. But in everyday life, there are ‘millions’ of preservatives and dyes…” (W1)

“I heard that the sticky stuff in the chicken meat is hormone. That’s why I wash to remove it all.” (W2)

4.1. Natural and artificial hazards

Organic foods appear in the local market as an alternative to the conventional production system that uses pesticides and artificial fertilizers. Only women in W1 group demonstrated an interest in the organic foods appeal to “naturalness”, although the main barrier to change to foods produced using organic or other sustainable production methods is still the higher price of such products:

“Organic products are more natural. I think on the pesticides and then I choose the organics…” (W1)

“I buy hydroponic lettuce, without pesticide residues.” (W1)

“Greens grown in water are hydroponic. They are more expensive, though the taste is even better. They are pesticide-free” (M)

“Nowadays it is possible to avoid pesticides through new cultivation techniques. They can control pests by modifying the seeds.” (M)

“Organic foods are healthier, ‘lighter’. Free from pesticides... But I go on buying the conventional products. The price is still the key point.” (W1)

5. Discussion

A survey published by the São Paulo’s Supermarkets Association (APAS) in 2006 showed that about 51% of the supermarket customers in the city of São Paulo are housewives, aged between 30 and 49 years old, whose main motivations to buy in such outlets are price (21%), health issues (20%) and preferred brands (15%). When asked about satisfaction, 62% of the interviewees said to be satisfied with the fresh produce found in the stores; 67% with the assortment of goods and 70% with the organization of the shops (APAS – Associação Paulista de Supermercados, 2006). Street markets seem not to offer the expected convenience and comfort found in the supermarket. Indeed, during the focus group discussions, some people mentioned discomfort and disorganization as reasons for the dislike for shopping in street markets and, interestingly, the most negative comments about street markets in the group composed of the housewives from of the higher socio-economic levels. However, participants recognized that street markets provided fresher and more “natural” vegetables and fruits when compared to produce from supermarkets. Even so, for the wealthier consumer segments, the main driver for shopping in supermarkets must certainly be convenience.

The importance of convenience reduces as economic constraints associated with food choices increase. The Brazilian Institute of Geography and Statistics (IBGE – Instituto Brasileiro de Geografia e Estatística, 2006) reported that Brazilian families spend, on average, about 17.5% of their disposable income on food purchases. In the lower social-economical groups, the expenditure with foods can reach 32.7%, almost four times more than for the more affluent socio-economic groups. Thus, the lower the household income, the more important is the control of food expenditure. This could
explain the behavior reported by housewives from the lower income group (W2), when they look for promotions and sales.

According to São Paulo Supermarkets Association (APAS) the ratio of supermarkets per inhabitants increased from raised from 1:208 in 1995 to 1:170 in 2005 (APAS, 2006). Moreover, supermarkets have been making even more organized efforts to achieve consumer’s loyalty, for example, by creating store brands and quality assurance policies, including traceability systems (Carrefoir, 2006; Guerrero, Colomer, Guardia, Xicola, & Cloket, 2000; Pão de Açúcar, 2006). Some supermarket chains have succeeded in creating a trustworthy relationship with consumers so that consumers choose retail outlets which promote safety – which seems to be part of the concept of quality in consumer’s mind. Indeed, the findings suggest that besides safety, convenience and price are other dimensions of quality expected by consumers (van Rijswijk, Frewer, Menozzi, & Fiaoli, 2008).

Another explanation for the consumer preference for supermarkets observed in this study may be associated with the changes in the Brazilian food habits during the recent decades. In 2004, a national survey regarding the budget of Brazilian households showed that, in comparison with previous surveys, the consumption of traditional foods such as rice, beans, potatoes, sugar and bread has reduced in the last 30 years, while the consumption of ready-to-eat and minimally processed foods has increased, substituting whole and in natura foods in Brazilian daily meals. In 1974, the consumption per capita of ready-to-eat foods was 1.7 kg and reached 5.4 kg in 2003 (IBGE, 2006), in line with international changes in food choice (Frewer & van Trijn, 2007).

Convenience was a theme which emerged not only in the discussions about purchase habits, but also when processed and minimally processed foods were discussed. Minimally processed foods were seen in two different manners by the participants: on one side, for the participants in the higher socio-economic groups, these are considered convenience foods, related to ease of preparation and labor-saving. Against this, participants who were members of the lower socio-economic focus group tended to suspect the quality and safety of such products. Nevertheless, price appeared to be the main barrier to higher consumption of minimally processed vegetables, especially for housewives with lower educational background and income. This study did not explore in-depth the economic constraints in food choices, but it must be reasonable to conclude that price may operate as a barrier to the purchase of convenience foods, even though this results in more time and labor in meals preparation. A second barrier to consuming convenience foods was the suspicion about the wholesomeness of minimally processed foods, since some interviewees questioned the safety of the process and the nutritional quality of the products.

Bleil (1998) argued that the changes in Brazilian food habits are a consequence of the globalization process, being more evident in the largest metropolitan areas. The modern life style, which demands labor and time-saving efforts, has reduced the time available for food preparation and consumption. As a consequence, ready-to-eat products and minimally processed foods have become more popular and the supermarkets are the main outlets for these products. In line with this trend, 25.7% of the meals in Brazil are consumed outside the home and the consumption of ready-to-eat foods is 358% higher in the largest urban area as compared to those consumed in the countryside (IBGE, 2006). None the less, processed and ready-to-eat foods cause suspicion among some consumers. This might reflect a feeling of uncertainty caused by a lack of personal control regarding the hygiene and preparation of these foods.

In common with other consumer studies (Fife-Schaw & Rowe, 1996; Miles et al., 2004), participants in the present study were more concerned about food hazards with technological origins and appeared less concerned about natural risks, such as microbiological contaminants. This observation is similar to the results of research from European countries such as the Netherlands and UK, where consumers are typically more concerned about technological food risks compared to those which are perceived to be “natural” in origin (Fife-Schaw & Rowe, 2000; Kirk, Greenwood, Cade, & Pearman, 2002; Miles et al., 2004).

In this study, participants described specific behaviours which aimed to reduce their domestic food hygiene risk, even though these behaviours were not underpinned by scientific and technical knowledge. Indeed, some individuals, especially men, seemed to underestimate risks associated with food handling in the domestic environment, suggesting that they feel in control of their hygiene and safety practices regarding food preparation and storage (Fischer et al., 2005). However, despite the observation that participants were not able to name microbiological pathogens specifically, they showed to be aware that several food-borne illnesses may have a microbiological origin.

None of the participants mentioned their practices and care about objects and kitchen appliances (e.g., sanitization of surfaces, knives, dishcloths, etc.). These findings suggest that participants felt in control of their food handling practices, which, in turn, minimize the personal perception of risk in the domestic environment. Miles and Frewer (2003) discussed the “optimistic bias” effect, when people believe that they are less at risk from a hazard than other people, in part potentially attributable to the lack of awareness about vulnerability to hazards associated with personal behaviour. This could be caused by ineffective risk communication solely based on technical risk assessment, whilst failing to take into account the actual consumer behavior regarding food safety issues (de Jonge et al., 2004; Hansen et al., 2003; Wilcock et al., 2004).

6. Conclusions

Summarizing the findings presented herein, consumers can make rational decisions only when they are aware of the risks associated to their personal behaviours. For this, they must have sufficient knowledge and judgement of the risk involved in their behaviour. It is important to understand consumers’ attitudes and behaviours prior to providing information to them and create familiarity with food safety hazards and awareness of safe food handling practices. This approach would lead to educational programs that encourage consumer to accept the views of the experts.

For the participants included in this study, food safety is clearly an important issue, although other factors as, for example, convenience related to both food purchases and retail outlet also influences food choices. In line with findings from other countries and cultures, participants expressed more concern about food risks perceived to be of technological origin. Concerns about the effectiveness of domestic hygiene practices were limited, and information about more efficacious domestic hygiene practices might usefully form the basis of future risk communication activities.

This work provided insights that suggest differences between males versus females and lower versus higher income groups, regarding food purchase habits and domestic food hygiene practices. However, further research, both with qualitative and quantitative scopes will be required. Regional differences in Brazil – considering cultural and socio-economic features – should be taken into account with a more representative sampling of the population. The aim of such in-depth study would be to identify those groups in the population most likely to increase food safety risks through application of inappropriate domestic hygiene practices. This will provide the Brazilian regulators with information to be used in the development of efficient risk communication within the proposal of the new nutrition and food safety national system.
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