Consumer Perceptions and Attitudes towards Food Safety in Portugal

Maria Raquel Ventura-Lucas
Universidade de Evora – Dep. Gestao de Empresas

Paper prepared for presentation at the 84th EAAE Seminar
'Food Safety in a Dynamic World'
Zeist, The Netherlands, February 8 - 11, 2004

Consumer perceptions and attitudes towards food safety in Portugal

Maria Raquel Ventura-Lucas (mrlucas@uevora.pt)
Universidade de Évora – Dep. Gestão de Empresas
Largo dos Colegiais, 2
7000-554 Évora - Portugal

Abstract

The recent food crises and its great diffusion through the media had as consequence a reduction of the European consumer's confidence, in general, and of the Portuguese ones in particular, in the products that they buy and consume. These events also served to disclose some of the existing problems in the current marketing chain, in which many sectors result to have low, or no transparency or unknown ones to the consumers. For moreover, these crises had demonstrated that science and technology, in set with the governmental regulation do not offer guarantees that the risks associated with food have acceptable levels. All these questions triggered the interest of researchers to study the impact of food safety related issues on consumer behaviour.

The objective of this paper is to increase knowledge on Portuguese consumer perceptions and attitudes towards food safety. Specially, consumers' level of concern about food crises, their view on the safety of several products throughout the supply chain and the assessment of different practices that may reduce food poisoning risks are here analysed. Likewise, the role of labels and the different information channels on purchasing habits are studied. Internet interviews have been used as the main source of information and have been conducted throughout Portugal and addressed to a sample of 1497 persons, representing the different geographic areas and age groups.

The results indicate that, with exception of the residence place, the other socio-economic variables play an ever-decreasing role when explaining the consumer behaviour. The factors measuring lifestyle, especially those related to safety, and mainly, consumption experience, seem to be the main aspects explaining Portuguese consumers' perception on food safety. For moreover, one evidences of the reading of labels, the date of caducity is the information more consulted by the consumers, leaving of part other important food safety information and relation diet versus health, such as the instructions of storage and cooking, the nutritional value and the ingredients. In order to restore the confidence lost, an effort of diffusion of clear and truthful information is necessary, for beyond the necessity of an efficient coordination throughout all the marketing chain in order to offer food safety products.

Key-words: food safety, consumer behaviour, perceptions, attitudes, Portugal

1. Introduction

The field of consumer behaviour has been explored extensively, with a view to understanding how, when and why consumers make purchase decisions. Common research themes have included studies that explored what factors influence the purchase making decision process and the attitudes towards a product, which depend heavily on his perception of the product (Padberg et al, 1997).

The European food market, in general, and the Portuguese market, in particular, has suffered from several food scares, the most recent being the BSE and nitrofuranes scandals. Under the glare of intandensive media attention, specific consumer food safety concerns can erupt into widespread alarm.

Consumers are therefore more and more concerned about food safety and quality, more discredit about food supply, desiring more transparency in production and distribution channel and, for some products, losing their trust in the production process. According to Henson and Northen (2000), food scandals as BSE, driving the individual consumers to react in different ways, depending on their perceptions of the risks associated with the product.

Consumer behaviour is very complex and determined by emotions, motives and attitudes (Alvensleben, 1997). The attitudes play a fundamental role in consumer behaviour field, because determines his disposition to respond positively or negatively to an institution, person, event, object or product (Azjen and Fishbein, 1980). However, the relations between motives/attitudes and consumer behaviour are not unilateral. Consumption leads to experience with the product, and vice versa this affects attitudes. When a consumer evaluate a product alternatives that may satisfy the same need, desire or want, he integrate the perceptions of the alternatives into an overall judgement, or attitude, about the attractiveness of each product alternative (Steenkamp and Trijp, 1989). In their alternative evaluation, the perception of sanitary risk due to the consumption of certain products could drive consumers attitudes away from those products. Government regulation of this sector is a response to market failure (Caswell and Mojduszka, 1996), and the necessity of the social regulator to interfere in order to assure consumers that the products are healthy.

The existence of concerned consumers has been well documented over the past. Throughout this period reports, surveys and academic research have consistently highlighted the existence of consumers who are concerned about a broad spectrum of issues ranging from the environment and animal welfare, through to social concerns. Recently, a report by the New Economic Foundation (Doane 2001) suggested that despite the rapid growth of ethical consumerism to date, this is only the beginning of a market which has immense future potential. The impact of crises including BSE and foot and mouth disease, nitrofuranes, salmonellas and dioxin scare has focused attention on food production, quality, and food safety. For example, since the BSE, and foot and mouth outbreak, the number of vegetarians, meat reducers and vegans in the Europe, and specially and UK, has risen significantly. In UK the value of the vegetarian foods market has increased by 56% between the years 1995 and 2000 (Mintel 2000). In Portugal, consumption of beef declined sharply by 21% in 1996 (Marreiros and Ness, 2001), as well in all European Union countries where beef meat reducers around 30% in 1996 (Gracia and Albisu, 2001).

Studies of consumer at an individual level may help to understand the concept and perception of food safety, that is, the trade-off between quality and safety. However, there is a certain resistance to change unhealthy food habits because of tradition. Many consumers agree on eating healthier diet as long as there are not significant changes in their consumption's patterns (Briz, 2001).

Despite the attention to the subject of food safety and the rising concern for quality issues, research developing a deep understanding of the safety food in Portugal is limited (Soares, 2003, Lucas and Toscano, 2003). Important contributions have been done in this area in Europe (e.g., IEFS, 1996, Wessells et al, 1996, Cowan, 1998, Becker, 2000, Porin and Mainsant, 1999, Briz and Felipe, 2000, Henson and Northen, 2000, Verbeke and Viaene, 1999 and 2001, Stefani and Henson, 2001, Ben Kaabia et al, 2001, Tamburo, 2002, Gil et al, 2002 and Fearne, 2003). In USA, also several papers have dealt with food safety and consumer behaviour in a broader sense (e. g. Brown and Schrader,1990, Chern and Zuo, 1995, Kinnucan et al, 1997, Kim and Chern, 1999, Lusk and Fox, 2000, and Mojduszka and Caswell, 2001).

The objective of this paper is to increase knowledge on Portuguese consumer perceptions and attitudes towards food safety, presenting results of empirical research focused on this issues. Specifically, the paper concentrates on consumers' level of concern about food crises, their view on the safety or several products throughout the supply chain and the assessment of different practices that may reduce food poisoning risks. Likewise, the role of labels and the different information channels on purchasing habits are studied.

2. Research methodology

With the exception of the survey implementation method, this study follow the research methodology used by Tamburo (2001) and Gil *et al* (2002) in Spain.

In 2002 statistics annual report of National Communication Authority (ANACOM), the number of Internet assessment in Portugal was higher than the number of telephone assessment (5,155 million costumers vs. 4,362 million telephone costumers) and consequently, the market penetration rate was also superior (50% from Internet vs. 42,2% from telephone).

According the data mentioned and the size of the questionnaire, it was decided to implement the survey to investigate attitudes towards food safety in Portugal using Internet technology. The survey, was conducted during 2002 and the data collection interval from November until December was mainly marked by former food safety related information flow. Without secondary data about a consumer typology for food safety, it was considered to be reasonable to use an confidence level of 95,5% (k=2), and restrict the universe of the study to consumers over 18 years of age who eat and buy food.

A random stratified sample was used, with age and geographical area of residence as stratification criteria. The sample comprised 1497 respondents. The categories and values for each variable were supplied by INE (Census 2001). Table 1 shows the characteristics of the sample concerning the percentage of the national data.

Table 1 - Sample characteristics by region, age and gender (%)

Characteristics	**Gender**	
Region	**Male**	**Female**
North	17,2	18,4
Center	8,3	9,0
Greater Lisbon	16,1	17,3
Alentejo	2,5	2,6
Litoral South	1,9	1,9
Azores Islands	1,2	1,2
Madeira Islands	1,1	1,3
Total	48,3	51,7
Age		
18-34 years old	15,6	17,8
35-49 years old	13,7	16,7
More than 50 years old	15,9	20,3
Total	45,2	54,8

The survey questionnaire included questions related to buyers and consumers' characteristics, attitudes, perceptions and concerns about food crisis, and about their view on the safety or several products throughout the supply chain and the assessment of different practices that may reduce food poisoning risks. Consumers were also asked about the role of labels and the different information channels on their purchasing habits and buyer behaviour.

In order to test the survey questionnaire in Portugal, it was pre-tested with focus groups methodology (5 marketing specialists) and 50 food consumers. After the analysis of the pre-test, some improvements of the initial questionnaire were done.

In the analysis of the consumers attitudes towards food safety, a format proposed by Likert was used, as part of their attitudes scaling method (Azjen, Fishbein, 1980). With this method, indicating their agreement or disagreement with an 8-item scale, consumers answered different items, by choosing one of five alternatives, from 5 (strongly agree) to 1 (strongly disagree). In the consumer perceptions analysis, the same method, with a different scale, was used. In this situation, respondents evaluated diverse food, by choosing one of five alternatives, from 5 (higher safety level) to 1 (lower safety level). In both cases, the items used in the scale were based in secondary information (specially Tamburo, 2001, but also other literature review) and in the results of the focus groups.

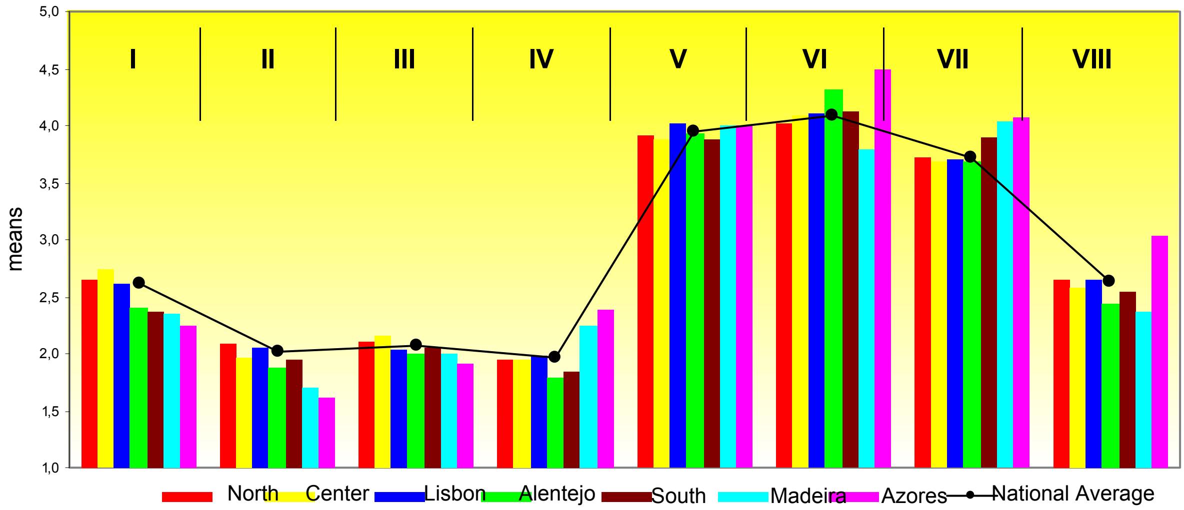
3. Empirical results

According to the mentioned survey, the presentation of empirical results was divided in four parts. In the first one, the specific consumer food safety attitudes related to nutrition and health and to food price and their trust to the production process and environment impacts was discussed. In the second part, the specific consumer's food safety concerns, communication sources influence it and their food behaviour changes, were analysed. Subsequently, the third part studies the consumer's perception about food safety. Finally, the relation between food safety and labelling, was discussed.

3.1 Consumer attitudes

As Figure 1 shows, all Portuguese consumers consider in a large proportion that food is not so healthy as it should be (4.08), available information is not enough to judge its safety (3.72) and they are concerned about food handle in restaurants (3,94). They don't associate food safety with product caducity (2.61).

Figure 1 - Attitudes to food safety

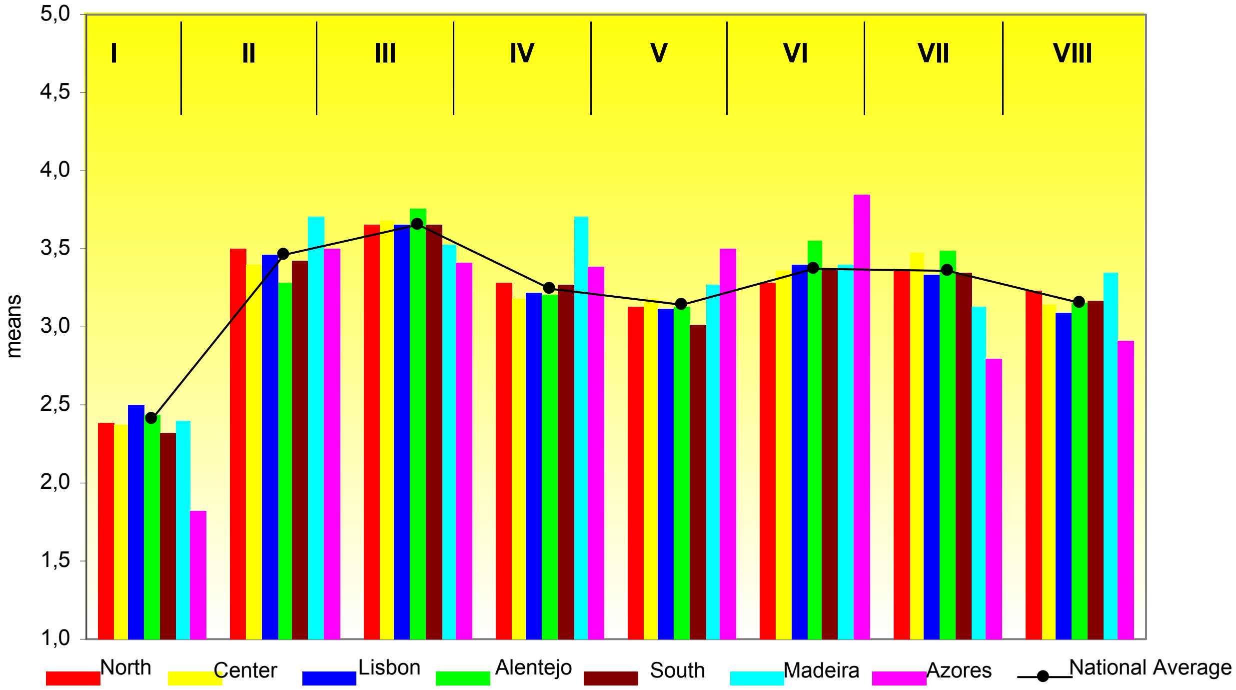


Note: I - Caducity is the same as safety; II- Additives don't damage health; III- Industries hygiene is better than standard; IV- Control pesticides is effective; V- Food handle in restaurants are not so good as expected; VI- Food is not so healthy as it should be; VII – Available information is not enough to judge it safety; VIII- In general, food safety is quite good

Source: Consumers survey, 2002

Regarding the relation between nutrition and health, the general consumers attitude is the indifference (about 3,0), with one particular exception - the item "Food label provide all the needed nutritional information" (Figure 2). Madeira islands presented the main regional differences in consumers attitudes concerning health and nutrition.

Figure 2 - Attitudes to healthy vs. nutrition

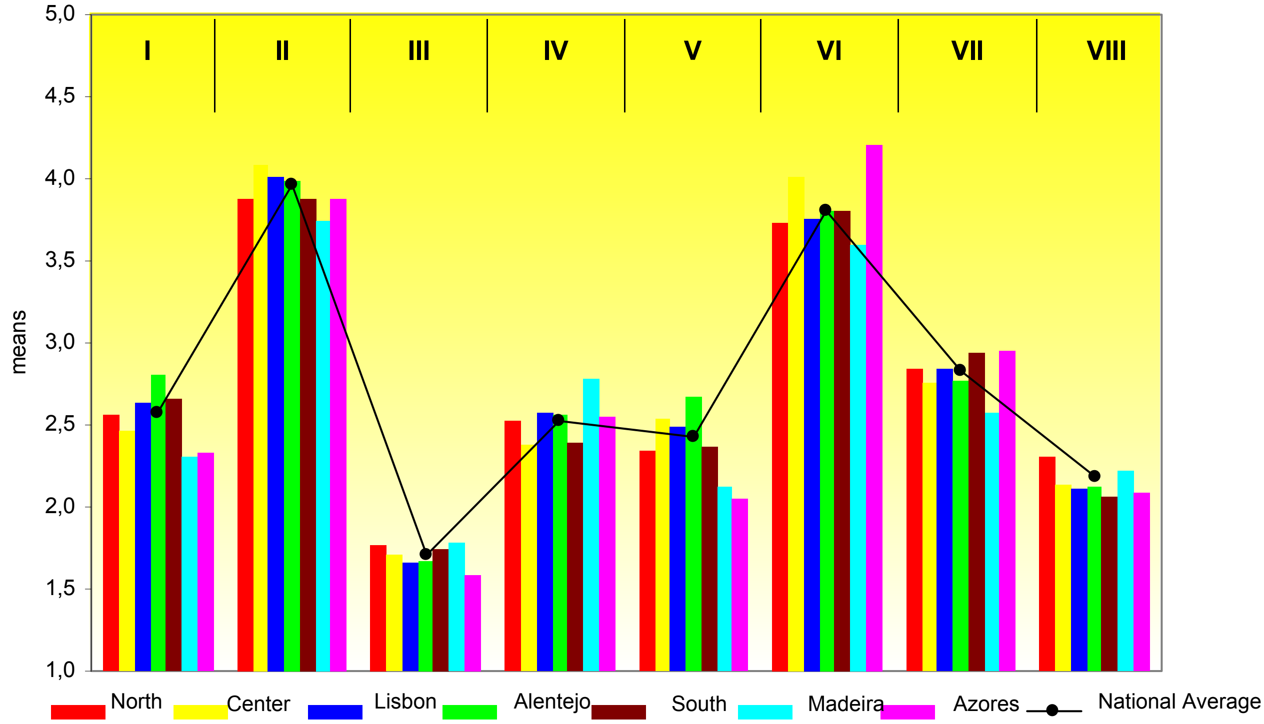


Note: I- Food label provide all the needed information; II- Most goods have light alternatives; III- Nutritional advertising induces wrongly; IV-Difficult to get processed food with low sugar or salt level; V-Difficult to eat healthy food in restaurants; VI- Difficult to get enough mineral and vitamins in modern processed food; VII- No difficult to get the right food to have a well balanced diet; VIII- In general, food nutritional level is quite good.

Source: Consumers survey, 2002

In the attitudes toward the food price, consumers show clearly the higher level of non-satisfaction, they consider that most of the available food is quite expensive (3.96 in Figure 3). They think that a price reduction in some goods will be vital to make possible a well balanced diet (3.80). To validate those attitudes, consumers strongly disagree with the item “When compared with income, food is not so expensive it should be” (1.71). However, it is not clear that consumers consider the prices extremely higher or the income extremely restricted.

Figure 3 - Attitudes to food price

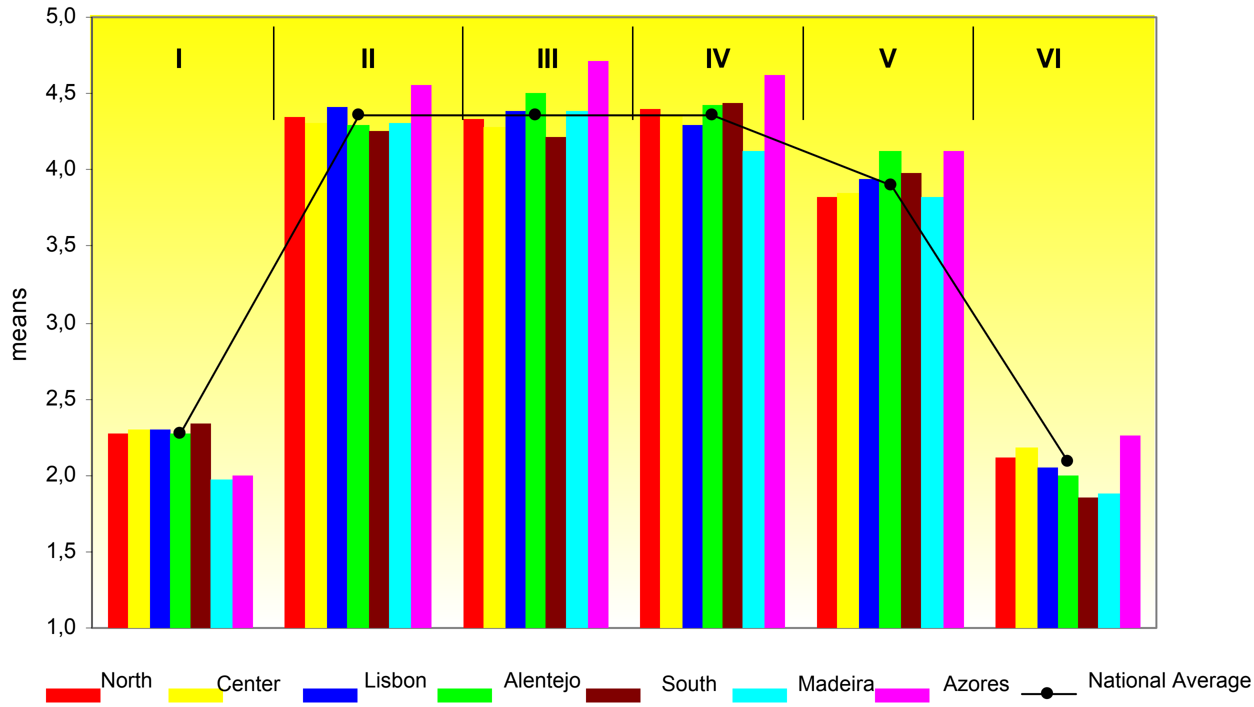


Note: I- In general, higher price means higher quality; II- Most of available food is quite expensive; III- When compared with income, food is not so expensive it should be; IV- Competitiveness in agro-food industry make the price reasonable; V- Retailers empathised quality instead price; VI- Food prices should be less expensive in order to get a well balance diet; VII- Promotional offers aloud to buy cheap food; VIII- In general, food prices are quite good.

Source: Consumers survey, 2002

The results of consumers' attitude towards the food production system and its impact on environment are show in Figure 4. The consumers disagree with the item "food productions processes are no environmental aggressive (2.27) and they strongly agree with "Nowadays, it's possible to improve food packages recycling" (4.35), and with "Organic production increasing will benefit environment" (4.35). They also agree that "New technology environmental influence is not well tested" (3.98).

Figure 4 - Attitudes to food production environmental impact



Note: I- Nowadays, food productions processes are no environmental aggressive; II- Nowadays, it's possible to improve food packages recycling; III- Organic production increasing will benefit environment; IV- It's possible to improve small producers support; V- New technology environmental influence is not well tested; VI- In general, food production environmental impact is quite good.

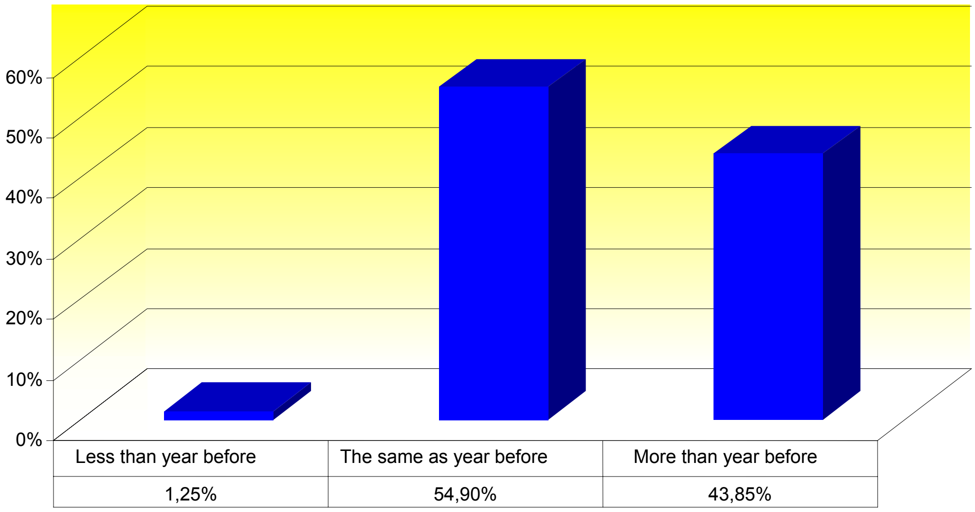
Source: Consumers survey, 2002

3.2 Consumer concerns and communication influence

The consumers are constantly bombarded with messages inducing them to change their attitudes. They may choose to access information in order to learn more about their food buyer options or, persuaded by daily media communication, to be more and more concerned about food safety and consequently be induced to change attitudes.

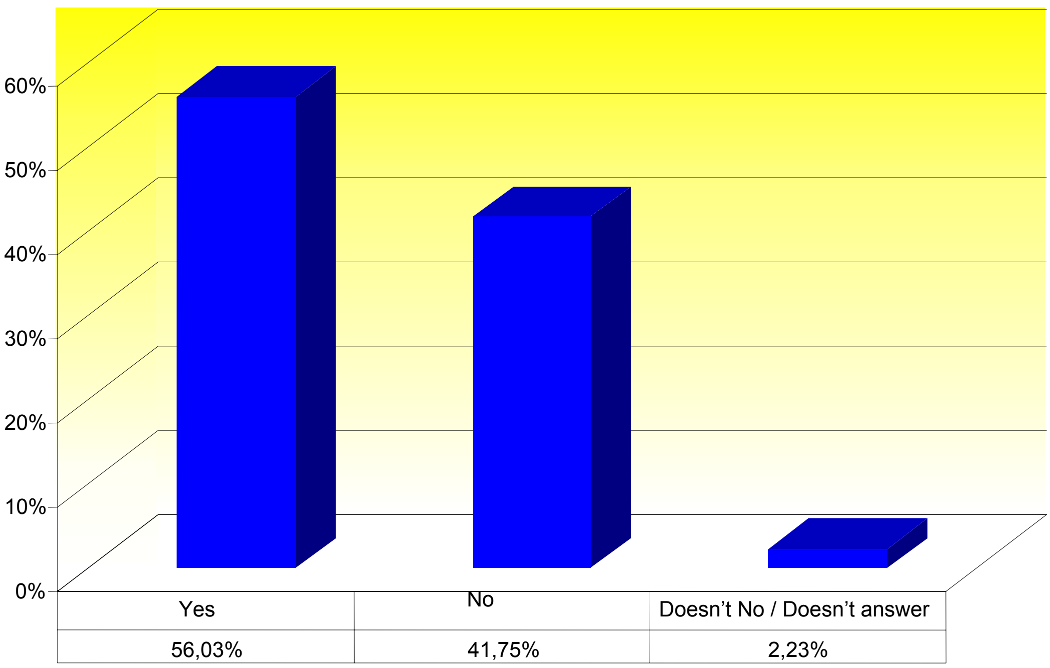
As consequence of the recent food scandals and its great diffusion through the media, the level of confidence on food by Portuguese consumers decreased and their concerns level increased (Figure 5). Compared with the year before, 43,9% of the consumers indicate an increase on their food safety concerns, 54,9% are indifferent and only 1,25% state a decrease on their concern level. Only 56% of those consumers that increased food concerns, really change their attitudes (Figure 6). This is a higher percentage of attitudes changes when compared with a previous study made by the Institute of European Food Studies (IEFS), in 1996, which value was 26%.

Figure 5 – Food safety concern level



Source: Consumers survey, 2002

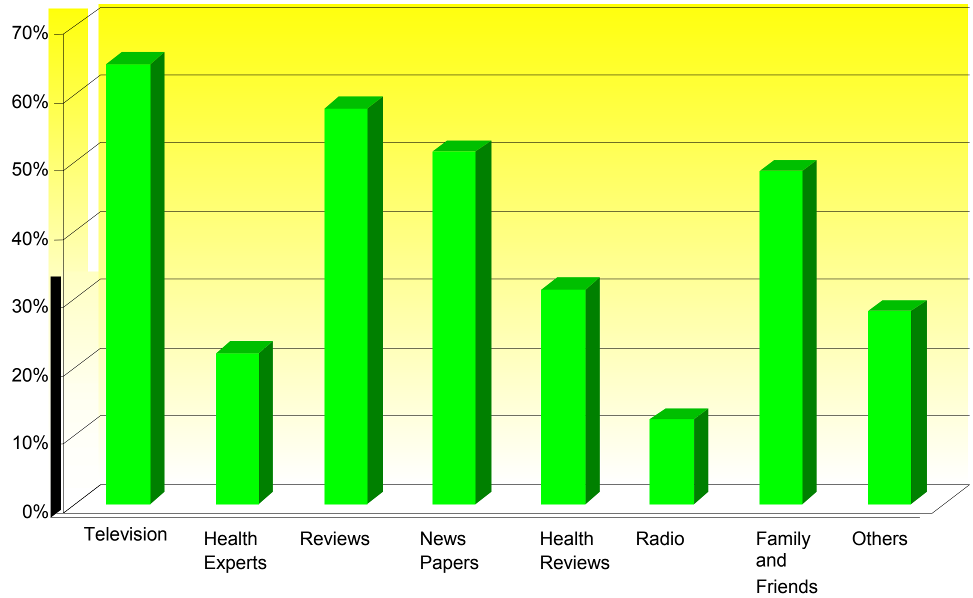
Figure 6 – Consumer attitudes changes as consequence of food crises



Source: Consumers survey, 2002

Regarding the different food safety information sources (Figure 7), the first one is television (64, 55%) and the others, in decreasing order, are reviews (58, 02%), newspapers (51,63%) and family or friends information (48.74%). One negative aspect to reefer is the lower effect of health expertises on consumers' buyer behaviour nowadays (22, 1%). In the IEFS study in the year 1996, these professionals influenced 39% of the consumers and the television effects were only 27%. The results confirm the increasing impact of this communication source on consumer attitudes changes in the last years.

Figure 7 – Food safety information sources

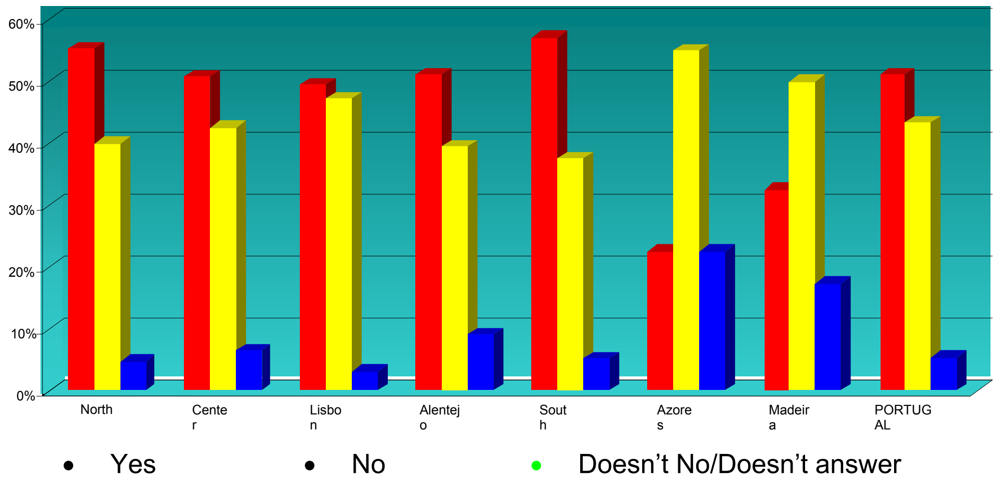


Source: Consumers survey, 2002

The influence of different communication sources on the consumers' food purchaser habits and attitudes changes, at geographical level, is presented on Figure 8. With exception of Madeira and Azores islands, all regions have the national standard answer. In these two regions, the influence of communication sources on food consumer habits is lower with tendency to have no influence. Consumers with higher dependence of communication sources are in the South of Portugal. In Greater

Lisbon region, the consumers are divided between higher influence and no influence of communication sources on food habits purchase.

Figure 8 – Influence of communication sources on consumer buyer behaviour



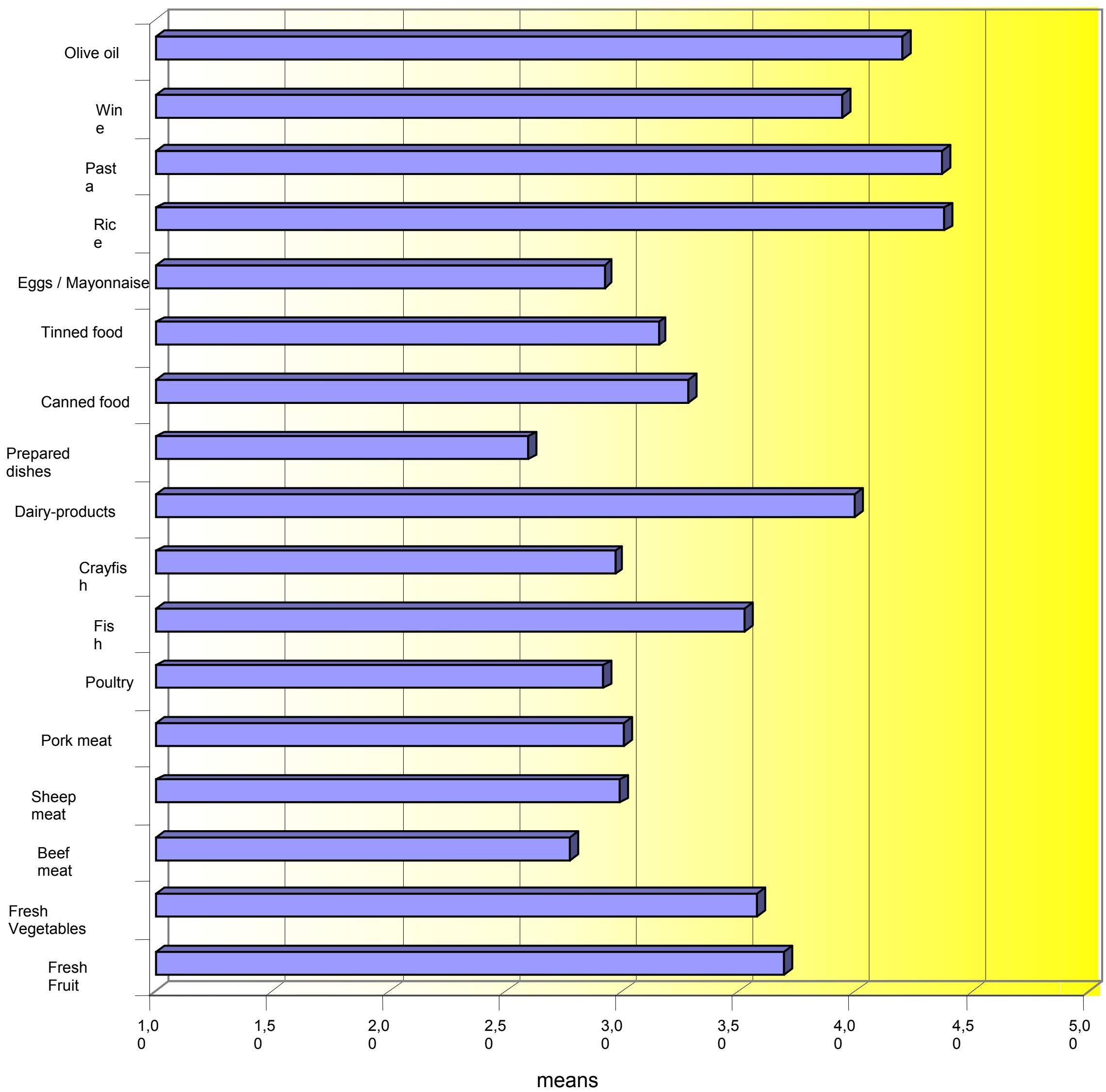
Source: Consumers survey, 2002

3.3 Consumer perceptions

Perception is the process by which physical sensations are selected, organized and interpret. The eventual interpretation of a stimulus allows it to be assigned meaning. Many stimuli compete for consumer attention and the majority are not noticed or comprehended. Every food safety communication message contains a relationship between the product, the sign and the interpretation of meaning. Beyond perception, interpretation of the signs and previous experience with goods are decisive factors in getting meaning. In the case of food scandals, different stimuli have importance in consumer perceptions of food safety. Obviously many consumers are subject to perception distortions caused by numerous food scandals with extensive media emphasis.

The safety level perceived by Portuguese consumers in different products is presented in Figure 9. Fresh fruit (3,7), fresh vegetables (3,58), fish (3,53), milk-food (4,0), rice (4,38), pasta (4,37), wine (3,94) and olive oil (4,21) are considered the more safety foods. Less safety are beef meat (2,78), sheep meat (2,99), pork meat (3,01), poultry meat (2,92), crayfish (2,97), prepared dishes (2,60) and eggs and mayonnaise (2,92). The major differences are in Azores and Madeira islands. In the first one, consumers considered above the national food safety average level, the fresh fruit, the fresh vegetables, the beef, poultry and sheep meat, the fish and crayfish, the milk-products, the prepared dishes, the wine and the olive oil. In Madeira the same occurred with beef, sheep and pork meat, crayfish, tinned food, rice and pasta. In the south, one of the main fish regions in Portugal, consumers perceive fish as a safety food.

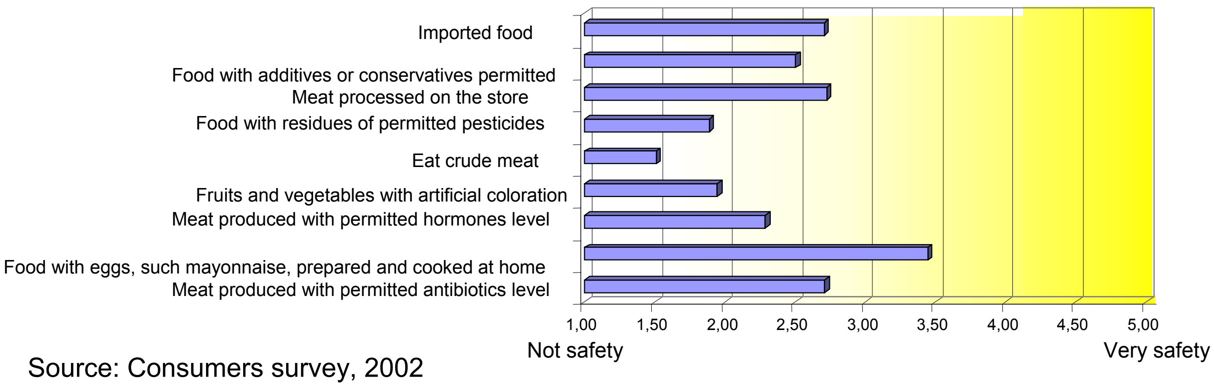
Figure 9 – Consumers food safety perception in different foods



Source: Consumers survey, 2002

Regarding the different products safety level, with respect it wholesomeness, due to production or processed treatments, the results are presented in Figure 10. Consumers show higher confidence level on food prepared and cooked at home (3, 45). The confidence level is lower when consumers evaluate crude meat (1.51), food with residues of permitted pesticides (1.89) and fruits and vegetables with artificial pigments (1,95). In regional terms, the difference is not significant.

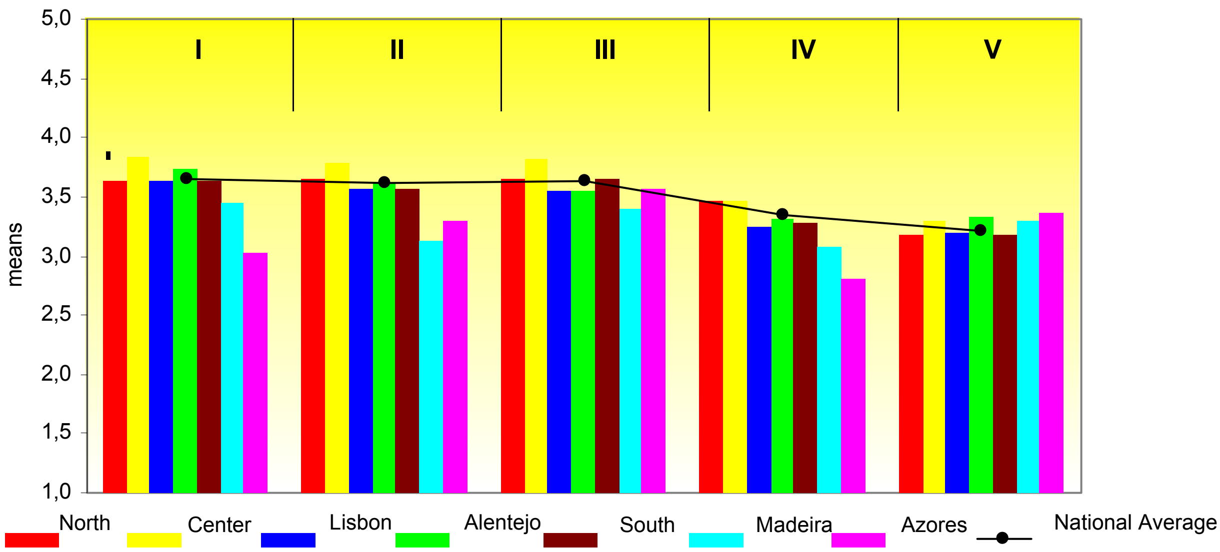
Figure 10 – Food safety perception related to different treatments and processing methods



Source: Consumers survey, 2002

The consumers evaluation of food safety potential risks in different phases of supply chain is show in Figure 11 (1=lower risk/No risk; 5=higher risk). Regarding the food safety risks in the supply chain, consumers show indifference. Nevertheless, it's possible to say that food safety concerns decrease with supply chain progressing. Compared with others regions, Madeira and Azores islands reveal inferior perceived risk in supply chain.

Figure 11 - Food safety perception in supply chain

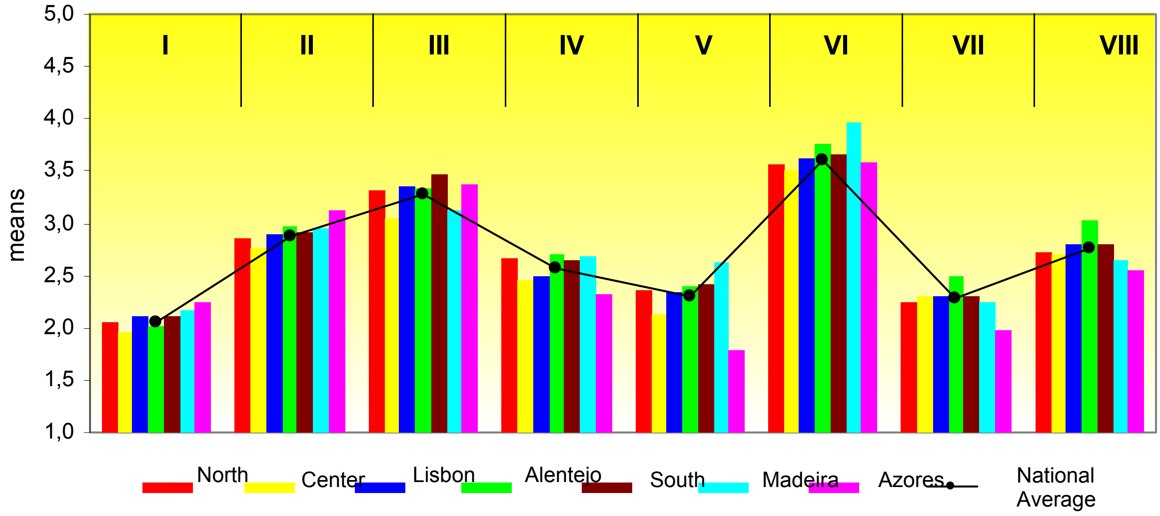


Note: I- Production; II- Transportation; III- Packaging; IV- Supermarket stored; V- Home stored.

Source: Consumers survey, 2002

Figure 12 show the results of perception of food safety retailers (1=not safety; 5=strongly safety). Is visible the higher confidence of fresh product markets to the consumers (3.60). They also considered with higher food safety risk the fast-food (2.06), the restaurants with home service (2.56), the 24 hours shops (2.31), the food sell on street (2.28) and at the coffee shops (2.76).

Figure 12 - Food safety perception in retailers



Note: I- Fast-food; II- Other Restaurants; III- Supermarkets; IV- Restaurants with home delivering; V- 24 hours open stores; VI- Fresh products market; VII- Food sell on street; VIII- Coffee shops/bars

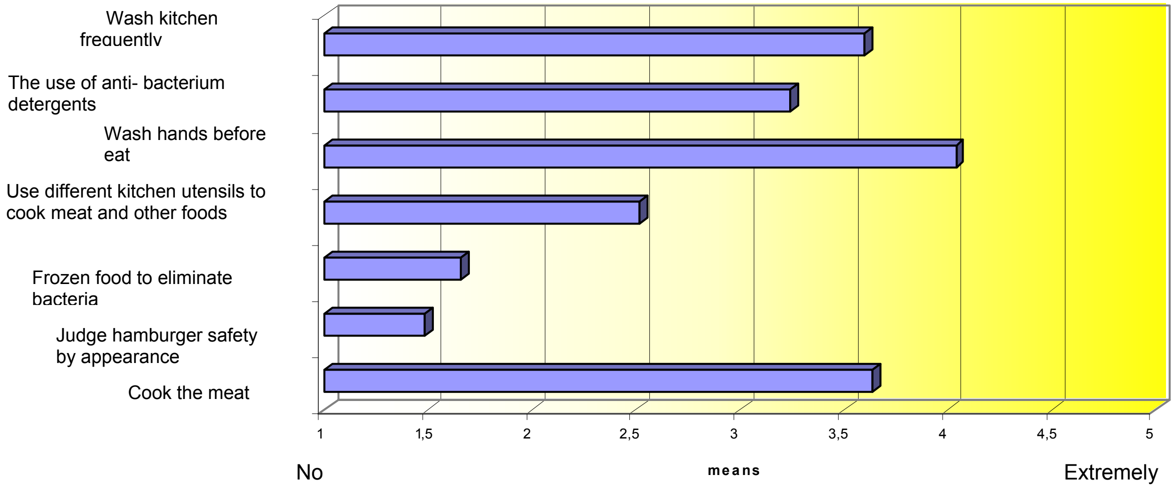
Source: Consumers survey, 2002

The consumer perception of the effectiveness of different practices to reduce food safety risks is presented in Figure 13 (1=No, 5=extremely). As effective food safety practices, Portuguese consumers perceived washing hands (4.04), cooking the meat (3.64), kitchen disinfections (3.60) and the use of detergents again bacteria (3.24). They consider as practices with less contribution to the risks decreasing, the food cooling (1.66) and judge safety by food appearance (1.49). In regional terms there are no differences.

3.4 Consumer relation between food safety and label

Label is an important source of information for consumers' food buyer decision-making. Using label information, consumer can judge, objective and subjective product characteristics, before buy it. When food safety is a general concern, label can be considered by consumers as an important and effective instrument in their valuation on food, namely brand, ingredients, caducity and nutritional values. The results of consumer relation between food safety and label are presented in Figures 14 to 19.

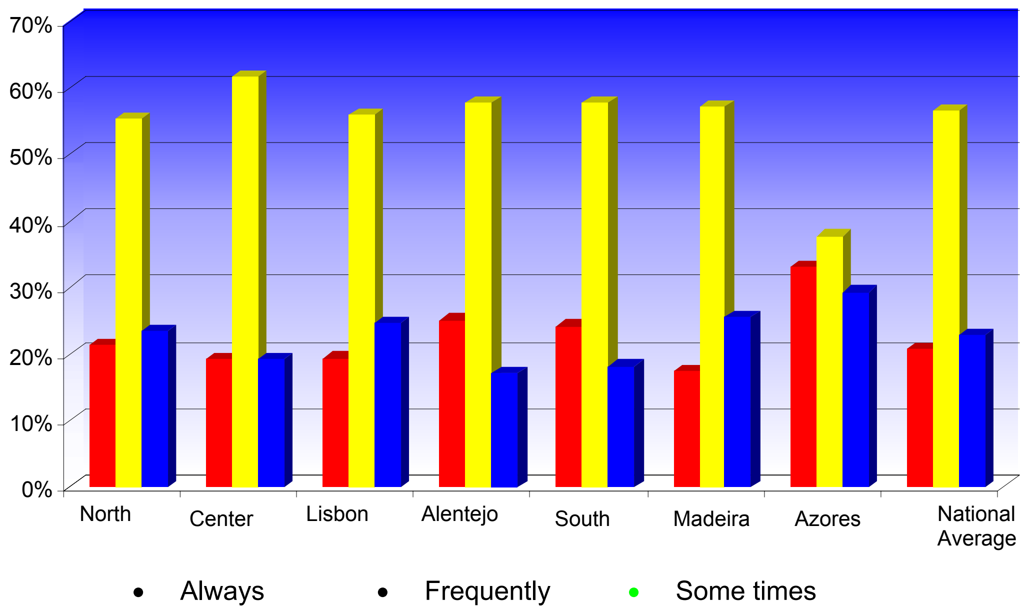
Figure 13 - Perception of different practices to decrease food safety risks



Source: Consumers survey, 2002

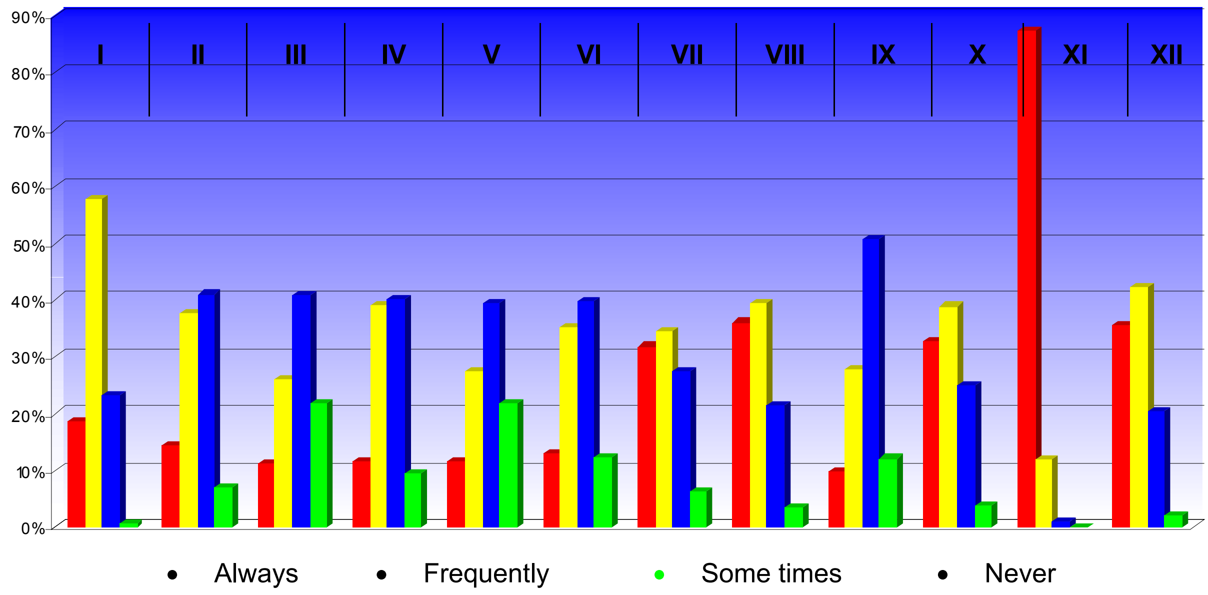
Figures 14, 15 and 16 analyses, respectively, consumers frequency of reading food label information, consumers attention to different label information and, consumers perception of label information quality.

Figure 14 - Consumers frequency of reading information label



Source: Consumers survey, 2002

Figure 15 - Consumers attention to different label information



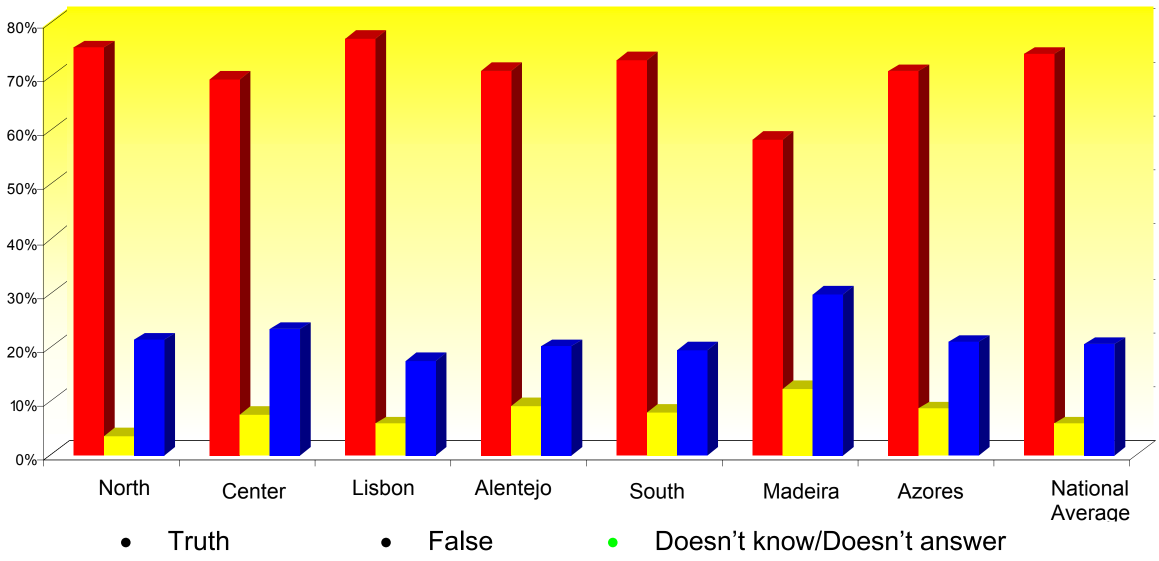
Note: I- Ingredients; II- Health benefits; III- Calories, IV- Vitamins/Minerals contents; V-Cholesterol; VI- Sugar contents; VII- Defrost information; VIII- Cook information; IX-Recipes; X- Store information; XI- Caducity; XII- Origin

Source: Consumers survey, 2002

Analysing Figure 14, it's possible identify a national tendency in all regions, with some exceptions in Alentejo, South and Madeira regions, to consumers read label information frequently. At national level, the number of consumers who read label information some times (22.79%) is higher than consumers who did it always (20.78%). Figure 15, show clearly a higher percentage of consumers who always read caducity label information (87,37%). This result is consistent with other studies done in Europe and Spain (Eurobarómetro 49, 1998, European Commission, 1998, Tamburo, 2001, Gil et al, 2002). Other important information frequently demanded by consumers is ingredients (57, 63%). Some times, their attention is also centred in label information about recipes (50, 50%).

Regarding the consumers perception of the quality of label information, namely veracity, content, and product quality association, 74% of respondents perceive label information as truthful, 5,7% as false and 20% doesn't know or doesn't answer. The more confidantes are in Lisbon (76,9%). In the Azores region, consumers can be distinguished with a higher percentage (30%) of non respondents or non-known persons (Figure 16). This results are superior with reached in other studies (European Commission, 1998, Eurobarómetro, 1998), but similar with achieved by Tamburo (2001) and Gil at al (2002) in Spain.

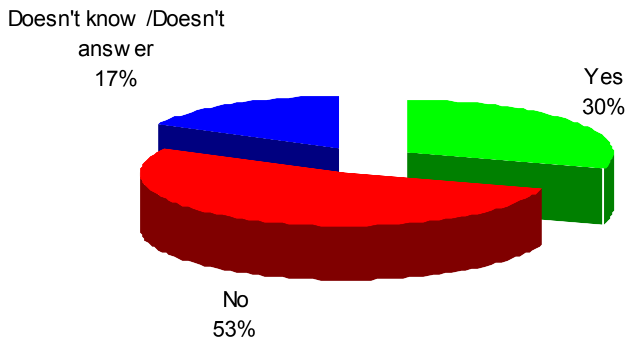
Figure 16 - Consumers perception of label information quality



Source: Consumers survey, 2002

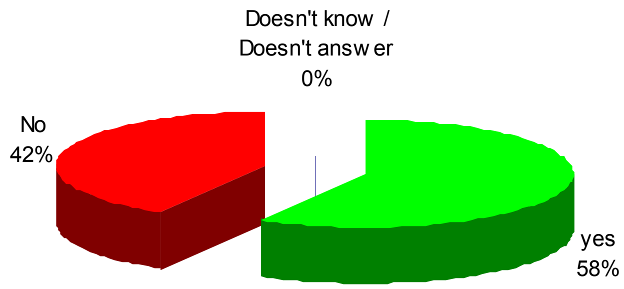
When asked if they get all the information they need in the label, consumers affirm clearly by negative to show their discontentment (53%) (Figure 17). Regarding the consumers comprehension of codes "E", a higher number of consumers (58%) answer yes (Figure 18). This result is also inconsistent with other studies in Europe (European Commission, 1998, Tamburo, 2001; Gil et al, 2002).

Figure 17 - All the Information you needed you find on label?



Source: Consumers survey, 2002

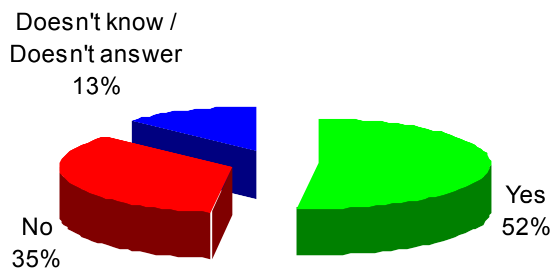
Figure 18 - Consumers comprehension of codes "E"



Source: Consumers survey, 2002

Nevertheless, those consumers who affirm to know the code “E”, really doesn’t know, because, when asked if codes “E” are related to chemical substances only, 52% answer positively, 35% negatively and about 13% un-know the answer(Figure 19).

Figure 19 - Codes "E" are referrer only to chemical substances?



Source: Consumers survey, 2002

4. Concluding remarks

The main objective of this study is to increase knowledge on Portuguese consumer perceptions and attitudes towards food safety. Specially, consumers' level of concern about food crises, their view on the safety of several products throughout the supply chain and the assessment of different practices that may reduce food poisoning risks were analysed. Likewise, the role of labels and the different information channels on purchasing habits were studied. Internet interviews have been used as the main source of information and have been conducted throughout Portugal and addressed to a sample of 1497 persons, representing the different geographic areas and age groups.

Regarding food safety, consumers doesn't thrust about food handle in restaurants and they consider having less information to judge correctly the safety level of a product. Nevertheless, they consider food not so healthy as it should be, they need more nutritional information as they don't find it on food label.

In the consumers attitudes to food price, a clearly discontentment of respondents is the main result. In their opinion a decrease in food price can induce a well balance diet.

In relation to the impact of food production processes on environment, consumers are very concerned and they consider the ordinary production system aggressive to the environment.

Compared with the year before, a higher percentage of consumers changed their attitudes due to the food scandals and television is the first safety information source.

Consumer food confidence is higher in fresh fruit and fresh vegetables, fish, dairy-food, rice, pasta, wine and olive oil then in meat, crayfish, prepared dishes, eggs and mayonnaise. They have also higher confidence level on food prepared and cooked at home and lower confidence level in crude meat, food with residues of permitted pesticides and fruits and vegetables with artificial colorants. Portuguese consumers perceived washing hands, cooking the meat, kitchen disinfections and the use of detergents against bacteria, the practices with higher contribution to the food safety risks decreasing.

Consumers read label information frequently and the date of caducity is the information more consulted by the consumers, leaving of parts other important food safety information and relation diet versus health, such as the instructions of storage and cooking, the nutritional value and the ingredients. Veracity, content, and product quality association, are label information perceive as truthful.

Consumers clearly affirm didn't get all information they needed on food label and consider to have high comprehension of codes "E". Nevertheless, those consumers really doesn't know codes "E".

With exception of the region, the other socio-economic variables play an ever-decreasing role when explaining the consumer food safety behaviour. The factors measuring lifestyle, especially those related to safety, and mainly, consumption experience, seem to be the main aspects explaining Portuguese consumers' perception on food safety.

In order to restore the food confidence lost in most consumers, an effort of diffusion of clear and truthful information is necessary, for beyond the necessity of an efficient coordination throughout all the marketing chain in order to offer food safety products.

5. References

ANACOM - Autoridade Nacional de Comunicações (2003), "Anuário Estatístico 2002-Serviço de Transmissão de Dados/ Acesso à Internet (1º, 2º, 3º e 4º Trimestres)", http://www.anacom.pt/template12.jsp?categoryId=42630;http://www.anacom.pt/template12.jsp?categoryId=49372; http://www.anacom.pt/template12.jsp?categoryId=56750; http://www.anacom.pt/template12.jsp?categoryId=56569.

Alvensleben, R. von (1997), "Consumer Behaviour" in Padberg, D.I., Ritson, C., Albisu, L.M. (editors) *Agro-Food Marketing*, CAB International and CIHEAM, Wallingford, UK.

Azjen, I. and Fishbein, M., (1980). "Understanding attitudes and predicting social behaviour". New Jersey: Printice-Hall International.

Becker, T. (2000), "Quality policy and consumer behaviour in the European Union", Wissenschaftsverlag Vauk Kiel KG, Germany.

Ben Kaabia, M. Angulo, A., Gil, J. M. (2001), "Health information and the demand for meat in Spain", 71st EAAE Seminar – The Food Consumer in the Early 21 st Century, Zaragoza, Spain.

Brown, D. and Schrader, L. F. (1990), "Cholesterol information and shell eggs consumption", *American Journal of Agricultural Economics,* 72, pp 548-555.

Briz, J. Felipe, I. (2000), "Hábitos y percepciones del consumo de carne en España", *Eurocarne,* 88, pp-51-61.

Briz, J., Mahlau, M., and Filipe, I. (2001), "Changes in spanish beef chain", 71st EAAE Seminar – The Food Consumer in the Early 21 st Century, Zaragoza, Spain.

Caswell, J. and Mojduszka, E.M. (1996). Using Informational Labeling to Influence the Market for Quality in Food Products. *American Journal of Agricultural Economic*s, 78, 1248-1253.

Chern, W. and Zuo, J. (1995), "Alternative measures of changing consumer information on fat and cholesterol", *American Agricultural Economics Association Annual Meeting,* Indianapolis, USA.

Commission Européenne, Santé et Protection des Consommateurs (1998), "Enquête sur L'étiquetage des Produits Alimentaires".

Cowan, C. (1998), Irish and European consumer views on food safety, *Journal of Food Safety,* 18:4, pp 275-295.

Doane, D. (2001), *Taking flight: the rapid growth of ethical consumeris*m, New Economics Foundation.

Fearne, A. (2003*), "*The Changing Roles of Government and Industry in the provision of food safety", XIII Portuguese Congress of Animal Science - Producing with quality and safety", Evora, Portugal, October 1-4.

IEFS - Institute of European Food Studies (1996), "Pan-EU Survey of Consumer Attitudes to Food, Nutrition and Health", Trinity College, Dublin.

INE, Instituto Nacional de Estatística (2001), *Censos 2001,* Edições Instituto Nacional de Estatística, Lisboa.

Gil, J. M., Tamburo, L., Sánchez, M. (2002), *Seguridad alimentaria y comportamiento del consumidor en España,* Gobierno de Aragón (eds), Zaragoza.

Henson, S. and Northen, J., (2000). "Consumer assessment of the safety of beef at the point of purchase: A pan-european study." *Journal of Agricultural Economics,* 51 (1), 90-105.

Kinnucan, H., Xiao, H., Hsia, C., Jackson, J. (1997), "Effect of health information and generic advertising on U.S. meat demand, *American Journal of Agricultural Economics,* 79, pp 13-23.

Kim, S. and Chern, W. (1999), "Alternative measures of health information and demands for fats and oils in Japan, *Journal of consumers affairs,* 33, pp 92-109.

Lusk, J. and Fox, J. (2000), "Consumer valuation of beef ribeye steak attributes", *American Agricultural Economics Association Annual Meeting,* Tampa, Florida, USA.

Lucas, M. Raquel e R. Toscano (2003). "Segurança alimentar e comportamento do consumidor em Portugal", XIII Portuguese Congress of Animal Science - Producing with quality and safety", Evora, Portugal, October 1-4.

Ott S.L. (1990). Supermarket shoppers' pesticide concerns and willingness to purchase certified pesticide residue-free fresh produce, *Agribusines*s, 6: 593-602

Mojduszka, E. M., Caswell, J. A. (2001), "Consumer choice of food products and nutrition information", 71st EAAE Seminar – The Food Consumer in the Early 21 st Century, Zaragoza, Spain.

Padberg, D.I., Ritson, C., Albisu, L.M. (editors) (1997), *Agro-Food Marketing*, CAB International and CIHEAM, Wallingford, UK.

Porin, F. and Mainsant, P. (1999), "Quelles stratégies pour les concurrents de la filière bovine dans le contexte de láprés BSE? *Cahiers d'économie et sociologie rurales,* N.º 50, pp 78-103.

Soares, M. Chaveiro (2003),), "Segurança alimentar, saúde e qualidade", XIII Portuguese Congress of Animal Science - Producing with quality and safety", Evora, Portugal, October 1-4.

Steenkamp, J. B. and Van Trijp, C.M. (1989). " A Methodology for estimating the maximum price consumers are willing to pay in relation to perceived quality and consumer characteristics." *Journal of International Food & Agribusiness Marketing.* 1 (2), 7-24.

Stefani, G. and Henson, S. H. (2001), " Assessing the value of labels about food safety attributes", 71st EAAE Seminar – The Food Consumer in the Early 21 st Century, Zaragoza, Spain.

Tamburo, L. G. (2001), "Seguridad alimentaria y comportamiento del consumidor en España", Master tesis, CIHEAM, Zaragoza, Spain.

Thompson G.D., Kidwell J. (1998) Explaining the choice of organic produce: cosmetic defects, prices, and consumer preferences, *American Journal of Agricultural Economic*s, 80: 277-287

Thompson G.D. (1998) Consumer demand for organic foods: what we know and what we need to know, *American Journal of Agricultural Economic*s, 80: 1113-1118

Toscano, R., Lucas, M. R. (2003), "Carnes comercializadas em Portugal: níveis de preocupação com a segurança alimentar e de confiança dos consumidores", XIII Portuguese Congress of Animal Science - Producing with quality and safety", Evora, Portugal, October 1-4

Verbeke, W. and Viaene, J. (1999), "Beliefs, attitude and behaviour towards fresh meat consumption in Belgium: empirical evidence from a consumer survey", *Food Quality and preferences,* 10:6, pp 437-445.

Verbeke, W. and Viaene, J. (2001), "Impact of the dioxin scare on consumer perception of fresh meat in Belgium", 71st EAAE Seminar – The Food Consumer in the Early 21 st Century, Zaragoza, Spain.

Weaver R.D., Evans D.J., Luloff A.E. (1992). Pesticide use in tomato production: consumer concerns and willingness-to-pay, *Agribusines*s, 8: 131-142

Wessells, C. R., Kline, J., Anderson, J. G. (1996), "Seafood safety perceptions and their effects on anticipated consumption under varying information treatments", *Agricultural and Resource Economics Review* 25, pp 12-21.