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# **Analysing Consumer Responses to Food Safety Results of a Survey in the Netherlands**

**Hans Dagevos & Harrie Hansman**

LEI – Wageningen UR, The Hague, the Netherlands  
Social Research Institute (SWB), Hoorn, the Netherlands



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# ANALYSING CONSUMER RESPONSES TO FOOD SAFETY RESULTS OF A SURVEY IN THE NETHERLANDS

Hans Dagevos<sup>1</sup> & Harrie Hansman<sup>2</sup>

1 LEI – Wageningen UR, The Hague, the Netherlands

2 Social Research Institute (SWB), Hoorn, the Netherlands

Consumer confidence in food safety appears to be under pressure as a result of several food scandals and food scares in recent years. Regaining the trust of food consumers in food production and food products is talk of the town in both government buildings and agribusiness offices. Instead of talking about consumers, this article is first and foremost about what consumers themselves think and feel about food safety. The foundation of this research is a survey among nearly 1100 Dutch consumers. Investigation focuses on food safety from the consumer's perspective in which food safety is examined comprehensively. This manifests itself in the *dependent* variables this research takes into consideration. With respect to the *independent* variables, multivariate analysis shows that both classic, socio-economic variables such as age or income, and modern variables of a socio-cultural origin are relevant in analysing and understanding contemporary food consumers.

Keywords: food safety, consumer concerns, risk perception, attitude

## 1 Introduction

Food safety as a point of interest has drawn special attention in the last decade due to several crises in the food chain of European countries. Government policy, media attention and research interest is directed to food in general and food safety in particular as a consequence of BSE, foot-and-mouth disease, dioxine and swine fever. Next to this tragic facts another reason why interest in food issues has risen is the fact that the world of food is a dynamic one. Almost continuously new products and techniques are introduced. Consumers are neither always not automatically willing to accept such innovations of products or production processes. The predictions of many producers that functional foods or genetic modification would rapidly sweep the food market are just two cases in point, not to mention all kinds of new food products which are withdrawn from the market shortly after their introduction. Thus, supply and demand are not easily matched. This is all the more interesting because the food market is eagerly typified as consumer-oriented by governments, food companies and researchers. The consumer takes centre stage, is the mantra.

Closer scrutiny, however, reveals that our understanding of food consumers is anything but complete. This is rather confirmed than denied by the fact that consumers are much-discussed in political circles or in the media. Consumers are often characterized as ignorant, irrational or indifferent. Such statements are neither very flattering descriptions nor are they always based on research. This does not imply that there is no research available. Although scholarly interest into consumer-centred food studies is indeed a relatively young domain of research, it has resulted in various sorts of output. With respect to Dutch examples of empirical explorations, we can refer to Aarts et al., 2001; Eten & genen, 2002; Future of Food, 2001, Stafleu, 1996 or VWA, 2002. Recent examples of theoretical-driven studies on food consumption are, for instance, Beardsworth & Keil, 1997, Frewer et al., 2001, Warde, 1997 and Wierenga et al., 1997.

Our research aims to follow on from such recently established traditions in social scientific research. We are interested in how consumers themselves think or feel about food and food safety, too. That is, rather than talking about consumers without consulting them, we try to get in contact with them by questionnaires in which we ask for their opinions and perceptions. Based upon previous research (see Dagevos & Hansman, 2001; Dagevos et al., 2002), we have conducted an extensive empirical survey on food safety from the consumer's perspective in February 2002 (Dagevos & Hansman, 2003). This was a survey amongst 1332 households who were randomly chosen from an Internet panel of CentERdata, a research institute of the University of Tilburg in the Netherlands. Households with no Internet connection obtained special hardware (a Netbox) to plug into the Internet.

By offering this facility we adjust for over and under sampling of specific consumer groups. In total 1089 households (81.8%) have filled in the questionnaire. The sample results have been weighted on several variables such as sex, household composition, age and education level. By doing so, our sample reflects the Dutch population of persons, age sixteen and older.

It is within the scope of this article to present only a selection of the outcomes of this research. We have chosen to focus on two topics of discussion.

The first one is primarily a matter of methodology. It concerns the discussion about what kind of variables are adjusted best to explain consumers. On the one hand social scientists are familiar to work with exploratory variables such as income, educational level or age. Consumers are analysed and segmented with the help of such classic variables. On the other hand it is shown and stated that modern consumers defy traditional segmentation by age, gender or income. Classical criteria to distinguish different homogeneous groups of consumers with corresponding ideas, intentions or consumption patterns, have lost explanatory power. Hence, consumer behaviour can no longer be understood by “straight” and measurable criteria only. To meet the complexities of modern consumer behaviour, it is proclaimed that we are in need to search for new perspectives. As a result, it is proposed that variables of a socio-cultural origine (e.g. values, lifestyle or self-image) are more suitable to improve our understanding of contemporary consumers than the socio-demographic (e.g. age, gender) or socio-economic (e.g. income, occupation) criteria which are traditionally used. Our stand in this discussion is that both sets of variables are complementary rather than contradictory to one another. As a consequence, we take both classic and modern variables into account in order to find out how much they contribute to our analysis of consumer responses to food safety. This topic is directly related to our discussion of the *independent* variables we take into account.

The second topic is about the way to interpret food safety. Food safety is often defined in rational terms originating in outcomes of scientific research. Frequently, this technological-rational view on food safety dominates in policy-making and research. From this perspective, food safety is about improving the quality of systems of control and inspection, relying on sound scientific evidence and taking institutional and legal measures. It is doubted whether this perspective on food safety corresponds with a consumer’s perspective (see Brom, 2000; Oosterveer & Spaargaren, 2002; MacFarlane, 2002; Yeung & Morris, 2001). The presumption is that consumers have other points of reference in mind than verified facts about the safety of, for instance, gmo’s, a brand or the hygiene in a supermarket, or the correctness of concerns about animal welfare, etc. To meet this subjectivity, it is important to expand the scope of food safety beyond objective facts and figures. We subscribe to the point of view that advocates to look at food safety more comprehensively. A consumer-minded analysis of food safety approaches this object of research accordingly, that is, as a multidimensional phenomenon. This point of discussion is elaborated upon in connection to the *dependent* variables we take into consideration.

## **2 Modelling**

To determine the effect of consumer characteristics on various aspects of food safety, we applied different logistic regression models, in which various independent and dependent variables are modelled simultaneously (see e.g. Fienberg, 1989; Norusis, 1997; Stevens, 1996). Both types of variables are presented in figure 1. We first focus on the dependent variables, following by a brief discussion of the dependent variables.

### *2.1 Independent variables and implementation*

In total, nine independent (or explanatory) variables are included. Seven of these coincide with the more traditional background characteristics: sex, age, education, family composition, degree of urbanization, net monthly household income and religion (see figure 1).

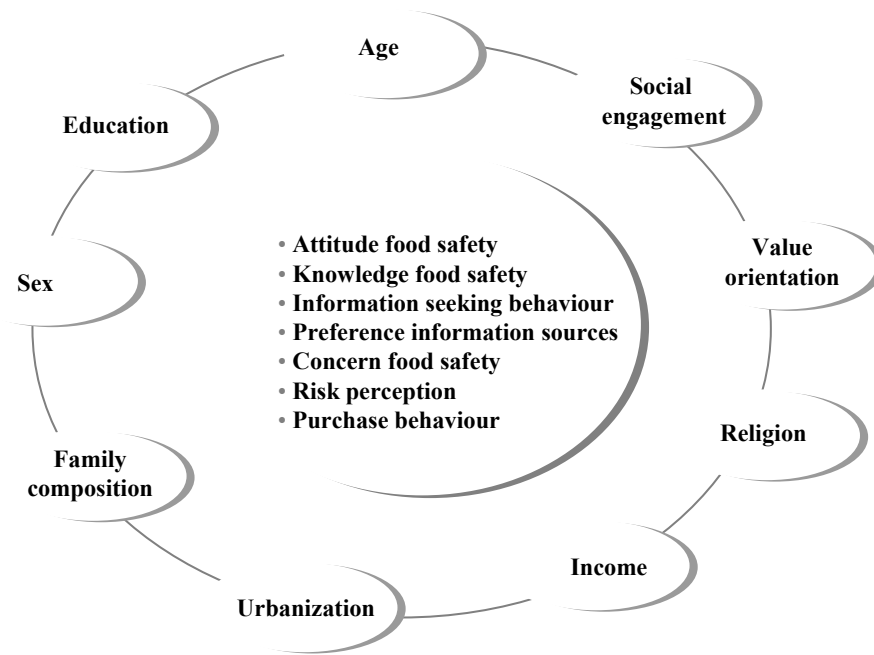


Figure 1 Independent and dependent variables

With respect to age, we chose an implementation with three groups: 16-34 years, 35-54 years and 55+. Education is also divided into three groups: lower, intermediate and higher education. Four groups are distinguished for family composition, namely households in which the youngest child is 11 years old or younger, households in which the youngest child is 12 years old or older, cohabiting or married couples without children, and single persons. There are also four groups distinguished with regard to the varying levels of urbanization: people living in an extremely urban municipality, in a very urban, medium urban or scarcely urban/non-urban. For the net monthly household income, the four groups distinguished are: households with a monthly income of less than € 1090, households with a monthly income of between € 1090 and € 1729, households with a monthly income of between € 1730 and € 2500 and households with a net income of more than € 2500 per month. Religion is divided into five groups: those with no religion ('non-religious'), Catholic/Roman Catholic, Protestant, Reformed and 'other'.

The two remaining explanatory variables are value orientation and social engagement. Two dimensions have been distinguished with regard to value orientation: an individual–collective dimension and a non-materialistic–materialistic dimension. In cases of individual orientation, consumers place more emphasis on aspects like quality and the significance of products within the context of a person's own consumption. In cases of collective orientation, attention is focused on the social and physical consequences of consumption on the environment. A materialistic orientation represents an attitude and actions whereby physical product quality or price dominates, while a non-materialistic orientation represents the significance of emotional, aesthetic or ecological aspects of consumption.

Both dimensions were implemented through the use of 23 Likert scale statements. Each of these was to be answered using a five-point scale, ranging from 'strongly agree' to 'strongly disagree'. On the basis of component and homogeneity analyses (Cronbachs alpha .76 and .61), three groups have been distinguished for each dimension: a group with a position on the left of the continuum, on the right, and in the middle.

Two indicators have been identified for social engagement. The first relates to membership of (or donations to) social lobby groups. Four groups were distinguished on the basis of the number of organizations of which the respondent concerned was a member or donator: one group of respondents who were not members of (or donators to) any of the organizations, one group with one or two

memberships per person, a group with three or four memberships per person, and a group of respondents who were members of (or donators to) more than four organizations (this implementation was inspired by KPMG, 2000).

The second indicator of social engagement was determined through the level of concern regarding a series of social events, incidents and developments, such as air pollution, the extinction of animal species, the bio-industry, violence on television, the greenhouse effect, war, terrorism, chemical crop protection products (pesticides etc), world poverty and famine and food allergies. The level of concern with regard to these topics could be seen as an indicator of the level of social concern and involvement. The homogeneity analysis showed a very strong positive correlation between the items, translating into a high Cronbachs alpha of .86 (see e.g. Swanborn, 1988). The items are combined into one index under the name 'social concern'. Using the total scores in the index, a distinction is made between two groups: one group that has lot of concerns, and another group with few or no concerns.

## *2.2 Dependent variables and implementation*

A total of 31 dependent variables are distinguished. These relate to a range of themes such as information-seeking behaviour, food safety-related knowledge, risk perception, consumer concerns related to food safety, etc. (see also figure 1).

The knowledge level was implemented in two ways: through a number of knowledge questions that could be answered correctly or incorrectly, and through a number of items requiring an indication of the extent to which the individual was familiar with the advantages and disadvantages of subjects relating to food and food safety, such as freezing vegetables, E-numbers, canning food, organic farming, genetic modification and food irradiation. The knowledge questions comprise statements such as 'A battery cage houses four chickens per square metre', 'Every day, around 75,000 pigs are slaughtered in the Netherlands' and 'Fish and shellfish are free of salmonella'.

A score of 1 was awarded for every correct answer to the knowledge questions. The average number of correct answers given by all the respondents was then calculated, and two groups were distinguished: respondents with a score below and above the average. With regard to self-reported knowledge, respondents were awarded a score of 1 if they claimed to know nothing about the topic, and a score of 4 if they indicated that they knew everything about the topic concerned. The individual scores for the six items were then added up, and the average was determined. Once again, the respondents were divided into two groups, with less or more knowledge than the average.

Information-seeking behaviour was implemented in four ways: one variable indicating whether people had looked for information recently, and three variables associated with the questions in the survey concerning food safety. Respondents were able to choose from a total of eleven organizations. On the basis of this, three dummy-variables (1-0) were constructed: ministry, consumer organization and manufacturer/retailer. People who would turn to the Ministry of Agriculture or the Ministry of Health with their questions were awarded a score of 1. Those that would not were given a score of 0. The same was done for the consumer organization variable and the manufacturer/retailer variable.

With regard to consumer concerns about food safety, a direct link was made with the consumption of a distinct product or product group, namely pork, beef, chicken, ready-to-eat meals, crisps, fresh vegetables, genetically modified products and products containing additives. In all cases, the implementation only concerned the consumers of these products. Two groups were distinguished for each of the named product types: one group of consumers who were concerned or very concerned, and another group who were only slightly concerned, or not at all concerned.

In addition to their level of concern, respondents were asked to indicate the level of risk to become ill from eating certain foodstuffs, namely the following: convenience foods, meat and meat products, organic products, chicken and eggs, processed products (sauces, crisps, biscuits), genetically modified products, dairy products and foodstuffs containing additives like vitamin A and calcium. Two groups were distinguished on the basis of factor scores (Cronbachs alpha =.86): one group with more concerns than average, and a group with fewer concerns than average.

In the survey we asked respondents to indicate which factors influence their purchasing behaviour. The following factors were distinguished: colourings, aromas and flavourings, special offers, shelf life, cooking/preparation time, level of service provided by shop staff, certain ingredients, genetic modification, an organic quality mark, irradiation, packaging, brand name, freshness and shop

hygiene. Two groups were once again distinguished for each of these variables: a group of respondents who always or usually consider the factor concerned and a group for whom this does not apply.

Finally, two dependent variables have been constructed about the perception of food safety in the Netherlands and about the importance attached to food. For the first case, two groups were distinguished: a group with the opinion that food in the Netherlands is safe or very safe, and a group believing that the food in the Netherlands is (fairly) unsafe. Two groups were also created for the second question: a group attaching importance to healthy, nutritious food versus a group who did not raise this point.

### **3 Results of Multivariate Analysis**

We have fitted a number of different models with the various dependent variables, mentioned earlier. Every time the same independent variables were part of the modelling. In view of the large number of models fitted we have opted for a simplified description of the modelling. This is done with the aid of tables 1 and 2 (for an overview of all the statistical models and parameter estimates see Dagevos & Hansman, 2003: appendix 4).

Table 1 shows the order in which background characteristics play a role with regard to the various themes. To determine the order we use a 'forward selecting' fitting procedure. The statistical order of the variables is determined by the extent to which they bring about a significant improvement in the fit of the model (which can be read from a significant decline in the -2 Log-Likelihood). On the basis of the individual ranking scores, a total score was calculated for each independent variable. Consequently, we are able to indicate which background characteristics came out best.

Table 2 shows which of the categories of the independent variables are connected with the different research themes. A plus (+) means that there is a significant positive effect; a minus (-) indicates a negative correlation. If we look at the first row of table 2, for example, we see a (-) for the 16-34 year olds and a (+) for people in the lowest income category. This means that, in relation to the average, the number of people aged 16-34 that have concerns about pork is significantly lower and is significantly higher among people in the lowest income group. If there is neither a (+) or a (-), it means that the category concerned does not differ significantly from the average.

#### *3.1 Significance of modern variables*

It can be concluded from table 1 that social engagement and value orientation fulfil a prominent role. Particularly the influence of social engagement and value orientation is very important. In many cases, there appears to be a particular connection between concern about social developments and a material–non-material value orientation on the one hand and differences between consumers on the other, with regard to knowledge and concerns about food safety as well as purchasing behaviour. Both factors fulfil a prominent role. This is reaffirmed by the total score (the sum of the ranking order scores). Amongst other things, this shows that of all the effects, social concern and the material–non-material orientation occupy first and second place respectively on the list of influential variables. Table 2 provides a schematic representation of the direction in which the independent variables relate to the dependent variables as well as the categories for which a significant difference can be seen.

##### *Material and non-material orientation*

With regard to the value orientation, the conclusion can be drawn that people of a non-material persuasion are more knowledgeable about food safety and search more information about food safety than materially-oriented people (table 2). Non-materially-oriented people also have more concerns about the food safety of specific products like pork, beef, chicken, ready-to-eat meals, crisps, fresh vegetables, products containing additives and genetically modified products. Organic products form the exception – these people actually have few concerns about them. The concerns regarding the individual product types are also evident in the way in which people generally view food safety. People think less often that food in the Netherlands is safe and are more convinced that people have a significantly higher risk to become ill by eating those foodstuffs. This does not mean that people are attaching greater importance to nutritious or healthy food. If we look at purchasing behaviour, it is striking that the non-materially-oriented people take ingredients, aromas and flavourings into

consideration more often, check for genetically modified ingredients more, take more account of irradiated food and check more often whether products carry an organic quality mark. This indicates that concerns (attitude) influence purchasing behaviour (actions).

People with a material orientation appear more likely to have a lower than average level of factual knowledge about food safety, are less likely to have looked for information about food safety and have fewer concerns about the safety of particular food products. A prominent detail is that this once again does not apply to organic products. This is where they differ from their counterparts by displaying greater concerns. Additionally, it appears that people are more often think that food in the Netherlands is safe; they consider the risk of food making them ill to be lower; and they attach less importance to healthy eating. Various aspects can also be seen in purchasing behaviour. People pay less attention to the presence of certain ingredients and colourings in foodstuffs, check less frequently whether any ingredients have been genetically modified, and pay less attention to whether or not a product carries an organic quality mark. They do, however, take shop hygiene more into account.

All in all, the results form a clear indication of the significance of values. Values influence the way consumers perceive food safety, form part of the basis of concerns about food safety, and make their mark on purchasing behaviour. This applies particularly to non-material and material values relating to food safety. However, this conclusion cannot be drawn with regard to the second value dimension, or can only be considered true to a limited extent.

#### *Individual-collective orientation*

People with a collective value orientation do seem to differ from people with an individual value orientation, but in a number of situations there is absolutely no difference, while in other cases such differences are less marked. This is also the reason why this variable is ranked in fifth place (see table 1). In a few cases, the results roughly coincide with expectations. For example, table 2 shows that the people with a collective orientation more frequently have concerns about the safety of crisps, are more concerned about genetically modified products and more frequently have concerns about foodstuff containing additives. They also pay more attention to colouring and certain ingredients when shopping, and check more often whether ingredients have been genetically modified.

People with an individual value orientation on the other hand appear to be less concerned about pork, fresh vegetables, genetic modification and products containing additives. In addition, they attach less importance to healthy eating and, when purchasing foodstuffs, they check less frequently whether ingredients have been genetically modified. Furthermore, we see that if they have questions about food safety, they are more likely to turn to the retailer or manufacturer. Although such results largely correspond with what we were expecting on conceptual grounds, the significance remains limited.

#### *Social engagement*

As indicated in section 2.1, social engagement was measured in two ways. In addition to a question regarding membership of (or donating to) social lobby groups, respondents were also asked to indicate the extent to which they had concerns about a range of social developments. The first approach points to “active” concern and involvement to a certain extent, while the second points to “passive” concern and involvement. Both indicators demonstrate that concerns about social developments often correspond with differences in perception, particularly with regard to concerns about the safety of each of the individual products mentioned in this research. In short, general feelings of concern regarding social developments likewise translate into greater concerns at a lower level, i.e. at the individual product level.

The relationship with purchasing behaviour is an extension of what we have already noted above regarding material and non-material value orientation. People who have clearly expressed their concern about social developments also appear to be more aware of aromas, flavourings and colourings, the attitude of shop staff, ingredients, genetic modification, whether a product carries the “EKO” organic quality mark, irradiation and shop hygiene. We also see that the people who are concerned about social developments consider themselves to have above-average levels of knowledge regarding food safety, have looked for food safety information more often during the past year, consider the risk of becoming ill to be higher, and have an increased tendency to turn to the manufacturer with their food safety questions. They are also less likely to believe that food in the Netherlands is safe.



Table 1 Total score and ranking of (significant) variables<sup>1</sup> (logistic regression)

	Sex	Age	Education	Household	Urbanization	Income	Religion	Engagement 1 (Concern)	Engagement 2 (Membership)	Individual/ Collective	Immaterial/ Material
Actual knowledge food safety	10	4	1	5	7	8	2	11	9	6	3
Self reported knowledge food safety	5	11	3	9	8	10	6	1	7	4	2
Information-seeking behaviour	3	6	11	9	4	10	8	2	7	5	1
Ministry preference	2	3	1	4	8	9	6	5	7	10	11
Consumer authority preference	5	7	2	4	8	10	6	3	1	11	9
Retailer/producer preference	6	5	9	4	11	7	3	1	8	2	10
Concern about pork	7	5	10	11	9	4	8	2	3	6	1
Concern about beef	5	4	7	10	6	3	9	2	11	8	1
Concern about chicken	9	3	7	4	10	8	6	2	5	11	1
Concern about instant meals	10	3	4	5	7	6	8	1	9	11	2
Concern about chips	3	4	5	7	8	11	9	1	10	6	2
Concern about fresh vegetables	8	6	5	9	11	3	10	2	4	7	1
Concern about organic products	10	4	3	7	8	11	5	6	9	1	2
Concern about genetic mod. products	6	4	11	8	7	5	9	2	10	3	1
Concern about food additives	11	5	8	9	10	4	7	2	6	3	1
Opinion about food safety in Holland	10	9	3	11	5	2	8	4	7	6	1
Perceived chance of sickness	4	10	11	7	5	8	2	1	9	6	3
Importance of healthy food	8	1	4	9	6	10	7	5	11	3	2
Pays attention to colourings, flavour	4	2	9	6	8	7	10	1	11	5	3
Pays attention to special offers	7	9	11	1	3	2	6	5	4	10	8
Pays attention to shelf life	1	9	5	10	3	2	8	4	7	6	11
Pays attention to preparation time	5	2	1	6	8	10	3	7	4	9	11
Pays attention to level of service	2	1	4	9	10	7	8	3	11	6	5
Pays attention to ingredients	2	9	8	11	10	4	5	1	6	7	3
Pays attention to genetic modified	5	9	8	11	10	3	7	2	6	4	1
Pays attention to organic quality mark	10	11	6	7	9	5	3	4	2	8	1
Pays attention to irradiation	8	2	6	5	11	7	3	4	10	9	1
Pays attention to packaging	7	1	11	10	3	9	2	8	5	4	6
Pays attention to brand name	5	1	9	2	3	8	10	7	11	6	4
Pays attention to freshness	1	5	8	10	3	4	9	2	11	6	7
Pays attention to store hygiene	1	2	9	11	3	6	8	4	7	10	5
Total score* (Ranking)**	180 (4)	157 (3)	200 (6)	231 (11)	222 (9)	203 (8)	201 (7)	105 (1)	228 (10)	199 (5)	120 (2)

<sup>1</sup>Determined by 'forward stepwise selection' and the Likelihood-Ratio (LR) method. The dark-coloured boxes reflect significant effects,  $p$  (enter)  $\leq 0.05$ . The other effects are not significant. Since both, significant and non-significant effects are incorporated in the modelling by applying 'forced forward selection' and  $p$ (enter) of 1, we could determine a complete ranking. \* = sum of ranking scores; \*\* = based on total scores

Table 2 summary results of multivariate analysis, per category of independent variables (logistics regression)<sup>1</sup>

	Sex		Age		Education			Household			Urbanization			Income			Religion				SA 1				SA 2				Imm./Mat.		Coll./Indi.														
	Male	Female	16-34 jr.	35-54 jr.	55+	Low	Medium	High	Child 0-11 jr.	Child 12+	Living togeth.	Single	++	+	+/-	<1090 E	1090-1729 E	1730-2500 E	>2500 E	No	R.Catholic	Protestant	Reformed	Other relig.	(much)concer	Little concern	No member	1-2 mem.sh	3-4 mem.sj.	>4 mem.sh	Immaterial	Neutral	Material	Collective	Neutral	Individual									
Concerned about pork			-												+				+					+	-	-																			
Concerned about beef	-	+		+										-						+					+	-																			
Concerned about chicken			-	+				+	+											+					+	-																			
Concerned about instant meals				+				+	+				-							+					+	-																			
Concerned about chips	-	+																		+					+	-																			
Concerned about fresh vegetables																				+					+	-																			
Concerned about organic products											+									+					+	-																			
Concerned genetic mod. Products			-		+															+					+	-																			
Concerned about food additives																				+					+	-																			
Perceived chance of sickness																				+					+	-																			
Healthy food less important			+																	+					+	-																			
Convinced of food safety								+												+					+	-																			
Below average knowledge: actual			-		+															+					+	-																			
Below average knowledge: self-report.																				+					+	-																			
Not searched for information	-	+																		+					+	-																			
Ministry preference	+	-		+																+					+	-																			
Consumer authority preference																				+					+	-																			
Retailer/producer preference																				+					+	-																			
Pays less attention to colouring matters	+	-																		+					+	-																			
Pays less attention to special offers																				+					+	-																			
Pays less attention to shelf life	+	-																		+					+	-																			
Pays less attention to preparation time	+	-																		+					+	-																			
Pays less attention to level of service	+	-		+																+					+	-																			
Pays less attention to ingredients	+	-																		+					+	-																			
Pays less attention to genetic modified																				+					+	-																			
Pays less attention to organic grow																				+					+	-																			
Pays less attention to irradiation																				+					+	-																			
Pays less attention to packaging																				+					+	-																			
Pays less attention to brand name																				+					+	-																			
Pays less attention to freshness	+	-																		+					+	-																			
Pays less attention to store hygiene	+	-																		+					+	-																			

+ : applies to a larger part of the group; — : applies to a smaller part of the group

The second indicator of social engagement appears to be less successful. Only in a limited number of cases does there appear to be a significant link. For example, we see that people with a low engagement score below average on self-reported knowledge. There also seems to be less confident about consumer organizations for food safety, and they have fewer worries about pork and are more concerned about organic vegetables. Conversely, people who score highly with regard to engagement (members of or donors to more than four organizations) appear to have fewer concerns about fresh vegetables and pay less attention to special offers. On the other hand, they do pay more attention to ingredients and whether or not a product carries an organic quality mark. All this is in line with our expectations. However, the influence of this aspect of social engagement is limited, in view of the number of significant effects. Consequently, it seems justifiable to conclude that membership of and/or donating to an organization is of only minor importance as a gauge of how people perceive food safety.

### *3.2 Significance of classic variables*

The overriding significance of value orientations and social engagement does not mean that the role of classic demographic variables is unimportant. In particular, sex, age, educational background and religion do appear to offer a partial explanation for differences in perception of food safety. In this section, we briefly examine the significance of these so-called classic variables.

#### *Sex*

The differences between men and women manifest themselves in information-seeking behaviour, in preferences for sources of information and in purchasing behaviour. We see that women have sought information about food safety more frequently than men and turn less eager to a ministry with their questions. Furthermore, women are more aware of colourings, shelf life, ingredients, cooking/preparation time, freshness of foodstuffs, the service provided by shop staff and shop hygiene when buying food. Women appear to have more concerns about safety with regard to a couple of food product groups: pork and crisps.

#### *Educational background*

With regard to educational levels, those with a higher education seem to be distinguished by the fact that they have greater self-reported and actual knowledge about food safety as well as preferring to turn to ministries and consumer organizations as sources of information about food safety. Those with a higher education also exhibit a greater level of concern regarding the safety of chicken and ready-to-eat meals. On the other hand, they are less concerned about organic products, and they are more likely to have the opinion that food in the Netherlands is safe. As purchasing behaviour is concerned, they take less account of the service provided by the shop staff, take more notice of whether a product carries an “EKO” quality mark, and have a greater tendency to put up with less convenient cooking/preparation times.

Those with a lower education have less self-reported and actual knowledge about food safety, a less marked preference for ministries and consumer organizations as sources of information, and fewer concerns about ready-to-eat meals and crisps. In addition, they take less account of the cooking/preparation time and the use of certain ingredients.

#### *Age*

As shown by the research, age continues to be an important factor to take into account. The differences are the greatest between the youngest and oldest age categories. The youngest age group (16-34 years old) in particular appears to have more actual knowledge about food safety, has fewer concerns about the safety of pork, chicken, crisps and genetically modified products, and attaches less importance to nutritious or healthy food. They pay less attention to colourings, shop hygiene and the service provided by the shop staff. They do, however, take more notice of the cooking/preparation time and the packaging when purchasing food.

The oldest age group (age 55+) appears to have less actual knowledge about food safety, has more concerns about genetically modified products and products containing additives, and takes more account of colourings in foodstuffs, irradiation, brand names, the service provided by the staff and shop hygiene.

The middle age group (35-54 year olds) shows evidence of a greater tendency to consult ministries for information about food safety. They are more concerned about the consumption of beef, chicken and ready-to-eat meals.

#### *Religious denomination*

The last of the demographic variables discussed here is religious denomination. Five groups were distinguished: non-religious, Catholic/Roman Catholic, Reformed Church, Reformed (Calvinist) and the category 'other', consisting of people whose religion did not fit into one of the other religious categories. The influence of a person's religious background on their perception is admittedly less pronounced, yet it has proved to be an 'explanatory' factor in various models (see tables 1 and 2). The members of the non-religious group have an above-average level of knowledge, are less likely to turn to a manufacturer or producer with their questions about food safety, have more concerns about pork and chicken but are less concerned about organic products; they attach less importance to nutrition and healthy eating, and less importance to special offers. The Catholics/Roman Catholics have a greater tendency to consult consumer organizations, pay less attention to special offers, ingredients, irradiation and whether the product carries an "EKO" organic quality mark when buying food. However, they pay more attention to packaging and are more influenced by the level of service provided by shop staff. In addition, they consider the risk of becoming ill from the food they eat to be lower. The people in the Calvinist Reformed group have a greater preference for ministries as a source of information, have fewer concerns about ready-to-eat meals, and take more account of cooking/preparation times. Lastly, the members of the Reformed Church group consider the risk of being made ill by their food to be lower and, when buying food, take more account of special offers, cooking/preparations times and whether ingredients have been genetically modified when purchasing products.

The factors of age, sex, educational background and religious denomination underline the importance of including classic variables as well as value-oriented variables in explanatory models. However, this is far less relevant for the other three traditional variables (income, urbanization and family composition). Therefore their role will not be discussed here.

## **4 Conclusion**

The general picture that has emerged from this empirical research is that of a differentiated consuming public. Food consumers are modern people who view food and food safety in various different ways, according to their responses to the questions included in the survey. Some of the respondents have little idea about aspects connected to food production and food consumption, while others have considerable intuitive or actual knowledge about such things. Many Dutch people have complete confidence in the food they buy and consume, even though they have concerns about the safety of certain products or production methods to a greater or lesser extent. In principle, approaching food and food safety from a consumer's perspective also requires the subject matter to be tackled by means of varied questions. Thus insight can be gained into the different ways in which consumers view food and food safety. For one individual, food safety is determined by the hygiene and cleanliness of the shop, while another individual it is determined by the freshness of the product, and yet another individual assesses food safety in terms of the way in which the product was produced. The importance of a multidimensional approach to food safety has proven to be worthwhile. Consumers respond differently to the issue of food safety with respect to different products. Their perceptions as well as the levels of consumer confidence and concerns vary depending on the generality or specificity of the questions raised – and differently than one might logically expect. All this subscribes to the idea that it is instructive to focus on a broad array of questions at several levels of analysis. In other words, we argue the necessity of broadening the scope of *dependent* variables in consumer-oriented food safety analysis.

Also with respect to our methodological point of discussion, our conclusion is that it is worth seeking to broaden or deepen consumer research. Aware of the fact that we now live in a consumer society in which consumption and consumer goods form important parts of people's personal and social lives, we attempted to incorporate that social imbedding in the survey by including questions focusing on people's perceptions about developments in today's world. Those perceptions are also related to aspects concerning food and food safety. It emerged that it is worth including social engagement and value orientation in consumer research. People's vision of their own private and/or social lives can also be seen in the way in

which they view food and food safety. Broadening the context in which empirical consumer research is placed, as well as the inclusion of socio-cultural variables in the research, in no way means that such “soft” factors nullify the relevance of variables such as age or sex. The position outlined in the introduction that it is worth doing consumer research that incorporates both classic and modern *independent* variables and consider them complementary, has proven to be valuable. This research confirms that both classic and modern research instruments should be applied in consumer research. Moreover, consumer responses have shown that consumers are varied, dynamic and complex creatures. All tools that can help us understand food consumers as fickle persons (“the butterfly consumer”) should therefore be cherished until otherwise proven to be the case and thanked for services rendered.

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