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Consumer perception of food safety: role and influencing factors

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Introduction

Food production and consumption have been under heavy criticism during the last decade. Many organizations including consumers, industry, producers and governments, as well as scientists from a plethora of disciplines, have recently been involved in debates that were initiated by numerous food-safety crises. From all debated food items, meat is referred to as the food item in which consumer confidence decreased most during the last decade (Richardson, MacFie and Shepherd 1994; Issanchou 1996; Becker, Benner and Glitsch 1998). Therefore, research into consumer decision-making towards fresh-meat consumption is chosen as the showcase to discuss food-safety issues from the perspective of the demand side of the food chain, i.e., the consumer.

The relevance of meat issues and a better understanding of consumer decision-making towards meat became paramount due to distinct changes at the consumer level. Along with increasing importance of quality, organoleptic and sensory properties of food, issues relating to food safety, human health and wellbeing have gained attention, especially with respect to fresh-meat production and consumption. Meat has traditionally constituted a substantial part of the West-European diet. Increasing economic and social welfare since the 1950s resulted in increasing amounts of animal-protein intake. Top meat consumption levels were noticed during the first half of the nineties in most of the EU countries, but ever since, fresh-meat consumption levels decreased.

This paper focuses on potential contributions from behavioral sciences (consumer behavior and marketing) to issues related to food safety. The objectives of this paper are to review insights in consumer decision-making towards fresh-meat consumption in situations with uncertainty and risk. This paper summarizes findings from empirical research implemented in Belgium during the period 1996-2002, which were fully presented in several publications. Readers are referred to the original publications for the details of the methodological approaches, empirical analyses, tables and graphs.

Economic impact assessment

The economic impact of food-safety crises is hard to assess. If, for example, the BSE crisis is considered, the direct cost of the obligatory BSE-testing scheme for bovine animals aged beyond 30 months, which has been operational since January 2001, is estimated at € 100 per test. For the specific case of Belgium, it is estimated that about 300,000 of those tests are to be performed every year, which yields a total

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direct cost of € 30 million per year. Furthermore, as a result of several EU feed bans (e.g. the bans on feed containing meat-and-bone meal and serious-risk material), some 600,000 tons of hazardous material has to be destroyed every year. This can be realized at a cost of about € 0.15 – € 0.20 per kg, leading to a total cost of about € 100 million per year.

To pass the direct testing costs and the costs resulting from the new legislation on to the consumer, meat prices would have to rise by 1.25% to 1.75% at the retail level (Verbeke 2001b). Combined with an inelastic price-elasticity coefficient for beef of approximately -0.5 (Verbeke and Ward 2001), such a price increase would result in a decrease of beef demand by less than 1%. This decrease does not match with the actual 4-5% decrease in beef demand, which the industry has faced every year since the BSE crisis. This case exemplifies the decreasing power of neo-classical economic theory to explain contemporary changes in consumer behavior, as has already been shown by Bansback (Bansback 1995). When analysing factors influencing meat demand, Bansback (Bansback 1995) concluded that economic factors explained 60% of the changes in meat demand during the period 1975-1994, while that share amounted to almost 90% for the period 1955-1974. Emerging factors include changing taste and preference patterns and consumer confidence. The issue of consumer confidence should also be considered as a major cost item, though one that is extremely difficult to quantify in economic terms. Studies of consumer behavior from a sociological or marketing perspective can shed light on the role and importance of consumer confidence related to food, safety and health.

Meat consumption behavior

The evolution of meat consumption in Belgium since 1955 reveals that distinct long-term changes have taken place. Animal-protein and fat intake have risen along with increasing wealth in the West-European society. Over time, a gradual shift away from red to white meat types was observed. Top meat-consumption levels were reached during the first half of the nineties, with considerable consumption decreases being noticed since, especially when considering per capita at-home meat intake. Over a period of seven years (1995-2001) Belgian at-home fresh beef and veal consumption fell more than 30%, while pork and poultry consumption decreased by about 8% and 5%, respectively. Out-of-home meat consumption may have increased but figures are not readily available. Nevertheless, available data from supply balance sheets and household panels systematically point towards recent significant consumption declines, which exemplifies a general “malaise” against fresh meat.

With respect to fresh-meat consumption frequency, it was found that daily fresh-meat consumers were the least inclined to reduce their consumption level as compared to less frequent consumers. Heavy meat consumers showed the strongest intentions to maintain their consumption levels, while less frequent consumers intended to decrease their fresh-meat consumption frequency further, herewith moving away from consuming fresh meat daily to several times a week or a lower frequency (Verbeke, Ward and Viaene 2000). Furthermore, the group of low-frequent meat consumers who show the strongest intentions to cut consumption further is gradually growing over time.

Consumer attitude: perception of fresh meat

In the consumer psychology and behavior disciplines, it is widely recognized that there exists a distinct filter or gap between the external (objective) and the internal (subjective) world of consumers (Risvik 2001). This filter, also called a perception filter, accounts for the difference between scientific objectivity and human subjectivity. The paramount importance of human subjectivity or perception lies in the fact that exactly perception – and not necessarily scientific facts – determines preference and choice. Therefore, this perception should be of interest to health and nutrition policymakers, and is definitely of interest to the food industry.

The importance of consumer perception has been assessed during two consumer surveys (1998 and 2000). Attribute-rating profiles of April 1998 reveal that problems of the beef image pertained to safety and trustworthiness. Pork was characterized as the most fat, the worst tasting, the least healthy and the overall lowest-quality meat (Verbeke and Viaene 1999a). Poultry received the best overall perception scores.

The same measurement was repeated two years later, in April 2000, after the occurrence of the Belgian dioxin crisis. Like the previous meat-safety crises (hormone abuses, antibiotic residues, BSE), the dioxin scare received considerable attention from the mass media, which brought the issue to the public's attention in May 1999. Pork and especially poultry were affected by the dioxin crisis, which was clearly reflected in their perceptual profiles. This led to significant shifts towards the "with hormones" pole of the semantic differential scale (or stronger associations with containing potentially harmful substances) for the perception of both meats types. Additionally, perception of poultry on "quality", "trustworthiness" and "safety" significantly worsened after the dioxin crisis. No other shifts of the pork and poultry perception profiles were formed, which is reasonable in the absence of substantial changes in sensory, price, convenience or animal-welfare issues during the considered time interval (Verbeke 2001a). Reversibly, beef perception improved on safety attributes. Remarkably, beef consumption continued to decrease whereas pork and poultry consumption stabilized. Furthermore, about 25-30% of the consumers reported high concerns about BSE in poultry or dioxins in beef, which is in direct contrast with scientific evidence.

Considerable bias was discovered between meat facts or scientific-indicator criteria and consumer perception of these facts. This phenomenon has specifically been addressed related to health, leanness and sensory characteristics of pork (Verbeke et al. 1999), but was also related to meat-quality labels (Verbeke and Viaene 1999b). Pork perception was found to be worst as compared to beef and poultry on "leanness", "healthiness", and attributes that relate to eating or sensory quality, i.e. "taste" and "tenderness". On the contrary, it was scientifically shown that pork can be low in fat and cholesterol, or excelling in taste and tenderness, depending on the specific cut and handling throughout the meat chain. Similar conclusions were drawn related to the perception of quality labels. A considerable part of the interviewed consumers claimed to buy labeled meat but failed to recall any label unaided. Additionally, features and benefits are assigned to quality-labeled meat that do not correspond to the actual performance of the label.

Impact of communication

The gap between scientific facts and their perception by consumers is largely shaped by communication. Claimed attention to mass-media publicity was found to have a strongly negative influence on consumer behavior and decision-making processes towards fresh meat. Consumers, who attended mass-media coverage of fresh-meat issues, reported significantly higher meat-consumption decreases with reference to the past as well as stronger intentions for decrease in the future. It was also found that consumers who pay a high level of attention to media reports, express higher health consciousness, more misperception of health risks and higher levels of concern about potential health hazards that were frequently reported in mass media. While the impact of attention to mass-media publicity was shown to be very significant, high levels of attention to personal communication from butchers or to advertising were found to have some but far more limited impact. Meat consumers who pay high levels of attention to information from butchers reported more positive meat-attribute perception scores, but this did not translate into associations with health concern, claimed behavior or behavioral intention (Verbeke, Viaene and Guiot 1999).

The negative impact of television publicity was confirmed through econometric cross-sectional and time-series analyses. Probabilities to cut fresh-meat consumption were boosted as consumers reported to have paid high attention to television coverage of meat issues (Verbeke, Ward and Viaene 2000). Similarly, parameters of television coverage indices were largely significant and negative in an Almost Ideal Demand System for fresh meat, contrary to the estimates of the advertising-expenditure variables, which were insignificant. In case of beef in Belgium during the second half of the nineties, a negative press over advertising impact ratio of five to one was found (Verbeke and Ward 2001). It means that five units of positive news are needed to offset the impact of one similar negative message.

Potential from labeling and traceability

It has been indicated that a label can serve as an important extrinsic product-quality cue in the evaluation process (Caswell 1992; Issanchou 1996). Furthermore, meat labeling has been reported as a promising strategy to regain consumer confidence (Wagner and Beimdick 1997; Wit et al. 1998). In line with these empirical findings, the Commission of the European Communities enacted regulations concerning the establishment of a system of identification and registration of bovine animals, as well as the compulsory labeling of fresh and frozen beef and beef products. This system has been fully operational since January 2002 and makes beef labeling possible, including a traceability reference number, slaughterhouse and cutting-unit license numbers, and name of country in which the animal was born, raised and slaughtered. Despite numerous labeling efforts by industry and government, knowledge and perception of labels were discovered to contrast with exact labeled-product features, but over time the situation seems to improve. Consumers who experienced (bought) meat with a quality label reported a more favorable attitude towards and a better knowledge of labeled meat (Verbeke and Viaene 1999b).

The rational support that consumers seek when making meat-purchasing decisions can be delivered through the establishment of a waterproof system of identification, traceability and control, eventually sealed with a label for recognition

and additional assurance. Traceability, labeling and assurance schemes are established to allay consumer concerns, but the standards and realizations are difficult to communicate and at risk of being perceived by consumers as insufficient or meaningless. Intrinsic opportunities such as the ability to organize the chain more efficiently, monitor the chain, and assess individual responsibilities, are broadly supported by consumers and therefore also an issue of public policy and regulation. Extensions with respect to process attributes, such as alternative production methods, origin and labeling, are less relevant to the broad public and only of interest to specific market segments (niches). Therefore, intervention on the process attribute side is most appropriate for private initiatives and embraces opportunities for product differentiation and competitive advantage in well-defined markets (Gellynck and Verbeke 2001; Verbeke 2001c).

Conclusions

Several years of consumer research on meat consumption in Belgium yielded a comprehensive picture of the impact of meat-safety issues. There is no doubt about the existence of considerable misperception by consumers, lack of knowledge and bias between perception and scientific-indicator criteria related to health and safety characteristics of meat. Generally, mass-media publicity – following problems or abuses throughout the food chain – is found to have significantly and negatively affected decision-making on fresh-meat consumption. On the contrary, little evidence of effects of positive communication could be shown.

As the starting point of the meat chain, livestock farming urgently needs to be reoriented towards quality in a broad sense instead of quantity-oriented mass production. This includes product and process quality, animal welfare and environment preservation. Quality, health, convenience and variety-seeking trends at the consumer level urge for product and process innovation, as well as for the adoption of new technologies and quality control at the meat-industry level. Finally, the role of the government is twofold. First, it consists of protecting the consumers through guarding the information spreading and through providing extension related to potential health risks and benefits. Second, it pertains to provide clear and unambiguous legal frameworks, including both the establishment and control of production and product standards. The establishment of regulated traceability systems is a big leap forward, although it remains an issue of debate whether something is gained in terms of intrinsic food safety. Definitely, traceability yields opportunities to gain in terms of consumer confidence and food-safety perception.

Taking away any basis for negative press should be a priority for the food sector. This can be realized through producing safe and sound products, through acceptable production methods with respect to animal welfare and the environment, and through practical applications of comprehensive quality and chain-monitoring systems. Finally, correct products have to be accompanied by trustworthy communication. This communication challenge is probably harder to realize than the product-safety challenge, but the reward in terms of consumer trust and product acceptance is definitely worth striving for.

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