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U.S. Patent No. 9,943,096

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WIM A. J. VERBEKE and JACQUES VIAENE

ETHICAL CHALLENGES FOR LIVESTOCK PRODUCTION: MEETING CONSUMER CONCERNS ABOUT MEAT SAFETY AND ANIMAL WELFARE

(Accepted November 2, 1999)

ABSTRACT. Livestock production today faces the difficult task of effectively meeting emerging consumer concerns while remaining competitive on major target markets. Meeting consumer concerns about product safety and animal welfare are identified as key attention points for future livestock production. The relevance of these issues pertains to production efficiency and economic benefits and to re-establishing meat sector image and consumer trust. The current paper analyses consumer concerns about the ethical issues of meat safety and animal welfare from current livestock production. The research methodology is based on literature review, secondary data sources, and primary research through focus group discussions and a survey of 320 meat consumers in Belgium. Objectives were to assess importance attached by consumers to product safety and animal welfare as ethical issues in commercial livestock production, and to evaluate consumer perception of these issues for beef, pork, and poultry. Significant differences in issue importance and perception are identified among consumer groups based on socio-demographic and behavioral characteristics. From the analysis, meat safety emerges as an absolute but minimum requirement for future success of livestock and meat production. Additionally, animal welfare can be expected to become a critical theme especially for pork and poultry acceptance.

KEY WORDS: Animal welfare, Belgium, consumer behavior, meat, meat safety, survey

INTRODUCTION

Consumer concerns about food-related hazards, food safety risks, and the impact of food consumption on human health have continuously increased during the last decade (Kramer, 1990; Sparks and Shepherd, 1994; Hughes, 1997; Kafka and von Alvensleben, 1998). Specifically with respect to food from animal origin, consumer concerns extend beyond intrinsic food safety alone. Related and emerging issues include animal welfare and environmental effects from today's common livestock production methods (Demeyer, 1993; Den Ouden, 1996; Verbeke and Viaene, 1999; Verbeke, Van Oeckel et al., 1999).

Consumption of fresh meat heavily declined during the nineties in most European countries, including Belgium. Explanations for this decline

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are increasingly sought and found in factors other than the traditional economic ones, including increasing health concerns, risk perception, communication impact, and changing taste and preference patterns (Bansback, 1995; von Alvensleben, 1995; Strak et al., 1997; Frewer et al., 1998; Verbeke, 1999). In the current era of information overload, consumers receive conflicting signals regarding nutritional qualities and safety characteristics of food, neither of which can easily be detected throughout the different stages of the classical consumer decision making process. Relevance and importance of understanding consumer concerns to public policy and industry have been recognized (Hughes, 1995) and have gained attention as areas of scientific research. Specifically following Blanford and Fulponi (1999), the aforementioned issues of product safety and animal welfare are extremely relevant for public policy in aiming at determining social objectives and how these can be achieved.

In this paper, the focus is on consumer perception of fresh meat safety and animal welfare associated with the production of livestock for human consumption. Reference is made to the premise that consumers generally accept that animal welfare is an ethical value, but that this value is weighed and compromised by other values like human health in real-life situations (Ödberg, 1998). The objectives of this paper are, first, to assess the relative importance attached by consumers to product safety and animal welfare in today's commercial livestock production, and second, to evaluate consumer perception of safety and welfare attributes for beef, pork, and poultry. Additionally, significant differences in perception and attitude among consumer groups based on socio-demographic or behavioral characteristics are investigated. It is reasonable to suggest that a better understanding of consumer decision making and evaluation of safety and welfare attributes will contribute to the achievement of adequate public policy measures. Additionally, from the viewpoint of the livestock production sector, supplying products that satisfy emerging consumer concerns demands at first a better understanding of these issues and related concern levels. Hence, the present research aims at contributing to bridging the gap that resulted from the growing physical and mental distance between producer and consumer (Brom, 2000).

The following section introduces the materials and methods of the research. Consecutively, results are presented. Finally, challenges for today's livestock production that emerge from our findings are discussed.

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MATERIALS AND METHOD

The empirical research is based on market research with meat consumers in Belgium. Both exploratory and conclusive research were conducted. Exploratory research was organized in March, 1997 through ten focus group discussions. Each focus group consisted of six to eight participants. Participant gender and age categories were homogeneous within, but heterogeneous between separate focus groups. The focus group discussions provided qualitative insights into consumer decision making and attitude towards meat. They also served as basic input for further quantitative data gathering by means of conclusive research consisting of a survey with 320 meat consumers (138 men and 182 women) in Belgium in April, 1998.

After editing and coding, 303 questionnaires (129 men and 174 women) were fitted for analysis. Women were slightly over-sampled, which was judged to be reasonable in food-related research, since they constitute the larger part of persons responsible for food purchases. Age of participants varied from 20 to 75 years, mean age was 41.2 years (standard deviation = 13.2 years). The sample was almost equally spread over four age categories and further included respondents of different educational levels, household size, and place of living. All participants were fresh meat consumers. Almost half of the participants (48%) indicated that they ate fresh meat every day, 46% several times a week, and 6% once a week or less.

First, claimed past behavior and behavioral intentions were measured on a nominal scale with answering categories indicating whether or not the participant has decreased fresh meat consumption from the past and whether or not he/she intends to do so in the near future. Second, a list of 16 attributes that originated from literature review and exploratory research was presented to the respondents. Respondents were asked to indicate the importance of these attributes through ranking their top five important attributes. Third, fresh beef, pork, and poultry attribute perception was measured on a seven-point semantic differential scale (Osgood et al., 1957) ranging from '–3' to '+3.' The scale required the participants to position their responses between two opposite poles having a semantic meaning. Within the scope of this paper, the focus is specifically on four attributes, namely the perception of "healthiness," "leanness," "animal friendly production," and "free of harmful substances."

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RESULTS

Focus Group Discussions

Focus group discussions revealed relevant attributes for consumer decision making towards fresh meat consumption in Belgium. Top-of-mind attributes were "healthiness," "naturalness," and "free of harmful substances." From the qualitative interviews, it appeared that respondents associated pathogenic organisms and residues from preventive or curative medicine or hormone treatments as the main harmful substances in fresh meat. Discussion group participants sporadically referred to environmental and animal welfare problems from livestock production. When mentioned, concerns about animal welfare were specifically associated with pig and poultry production. From this finding, the hypothesis is set forth that animal welfare concerns are of secondary importance as compared to human health concerns. Results from the exploratory research are reported in more detail in Verbeke and Viaene (1998a; 1998b).

Survey Results

More than one quarter (26%) of the respondents claimed to have decreased their total meat consumption as compared to the same period of the year previous to the data collection. About 23% of the sample indicated that they have substituted fresh meat types. In 63% of the cases where consumption of a specific fresh meat type was named to have decreased, beef was concerned. Pork was mentioned in 20% of the cases. On the other hand, poultry meat was mentioned in 69% of the cases as the fresh meat that appeared on the menu in favor of beef or pork. With respect to the future, one third (32%) of the respondents indicated an intention to decrease their total meat consumption during the coming year (April, 1998 as reference period). About 16% of the total sample of respondents reported their intention to substitute fresh meat. Beef was mentioned in 55% and pork in 27% of the cases as the fresh meat that will be subject to decreased consumption in the near future. Poultry was named in 58% of the cases as the meat type of which the respondent intends to increase his/her consumption.

First, attribute importance was assessed for "healthiness," "leanness," "animal friendly production," and "free of harmful substances" as attributes that determine consumer decision making towards meat. "Healthiness" was ranked among the top 5 important attributes by 45% of the respondents. "Leanness" and "free of harmful substances" were both ranked among the top 5 by 32% of the respondents. A small group of 8% of the respondents ranked "animal friendly production" among their

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top important attributes when making meat-purchasing decisions. Only the attributes "fits with a lot of dishes" and "widely available" were perceived by a lower amount of respondents as important attributes.

Second, associations between attribute importance and socio-demographic variables were analyzed through cross-tabulations and chi-square test statistics. Male meat consumers attached more importance to the attribute "animal friendly production" ($p = 0.04$), while "leanness" was significantly more important to female meat consumers ($p = 0.03$). The below 30 age group attached significantly less importance to "free of harmful substances" ($p = 0.002$) as compared to the older consumer categories. Although only marginally significant ($p = 0.085$), a tendency was found that urban consumers attached more importance to the attribute "free of harmful substances" than consumers living in rural areas did.

Third, consumer perception of beef, pork, and poultry on the considered meat attributes was analyzed (Figure 1). Beef and pork were clearly perceived as less healthy, as containing more harmful substances and less lean than poultry. Beef and pork were almost similarly perceived on "healthiness." Distinct differences between pork and beef were noticed on the perception of "leanness" and "harmful substances": pork was considered as the fat meat alternative while beef was much stronger than pork perceived as containing "harmful substances." The perception profiles of all fresh meat types on "animal welfare" are clearly skewed to the left, indicating a large amount of negative perception scores on this attribute. It is further noticed that poultry scored significantly worse on perceived "animal friendly production" both as compared to pork and beef. Animal welfare was herewith the only attribute out of the list of 16 on which poultry was perceived as worse than beef and pork.

Fourth, differences in perception between consumer groups based on socio-demographic characteristics and consumption frequency levels were investigated through cross-tabulations and chi-square test statistics. Consumers aged below 40 significantly more than older consumers associated poultry with "not animal friendly" production methods ($p = 0.024$). Consumers living in urban neighborhoods significantly more than rural consumers considered pork as "not healthy" ($p = 0.025$). Male consumers significantly more than female indicated that they perceived beef as meat that contains "harmful substances" ($p = 0.000$). No further significant associations between perception and socio-demographic consumer characteristics were discovered.

Fifth, consumers who do not eat fresh meat on a daily basis perceived both beef ($p = 0.009$) and pork ($p = 0.023$) production methods as less "animal friendly" than daily fresh meat consumers. Additionally, less

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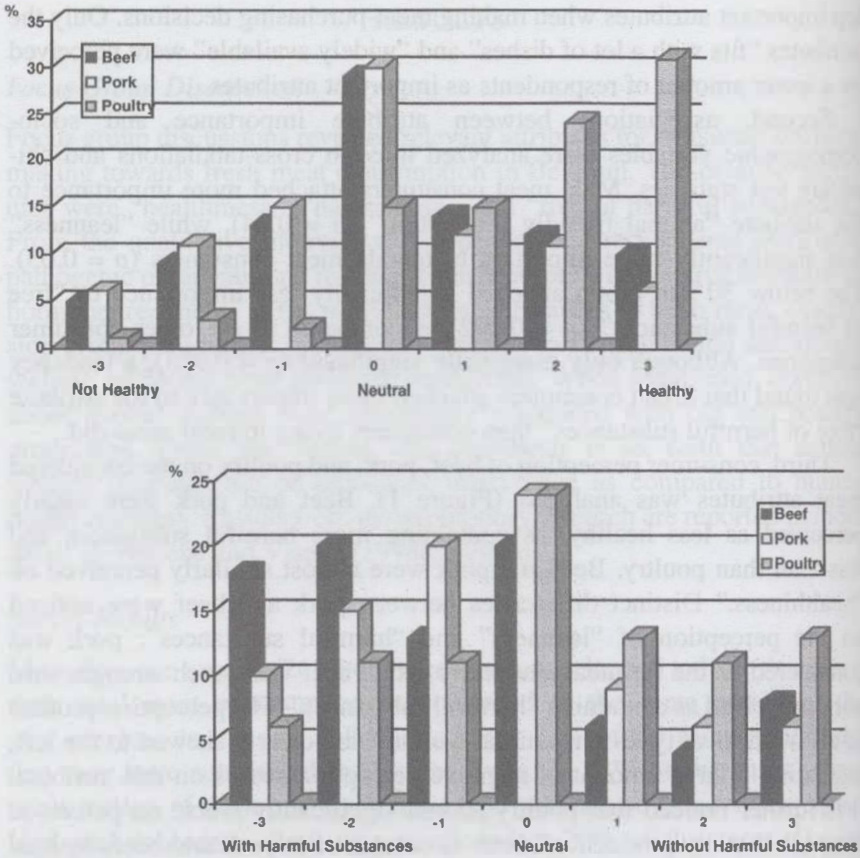

Figure 1a. Perception of fresh beef, pork and poultry on 7-point semantic differential scale, % of respondents (April, 1998 survey, n = 303)

frequent meat consumers associated beef more with containing "harmful substances" (p = 0.009). No further significant associations between perception and consumption frequency level were found.

Sixth, significant associations between attribute ratings and claimed and future behavior were assessed through independent sample t-tests for comparison of means. Results are presented in Table 1. The less consumers perceive beef as "healthy," "free of harmful substances," "lean," and "animal friendly" produced, the more they claim to have decreased fresh meat consumption from the past. A similar conclusion can be drawn related to the perception of pork healthiness and animal friendliness. Meat consumption intentions for the future were significantly associated with the perception of each meat type on "animal friendly" production method. The less production methods of beef, pork, and poultry are perceived as

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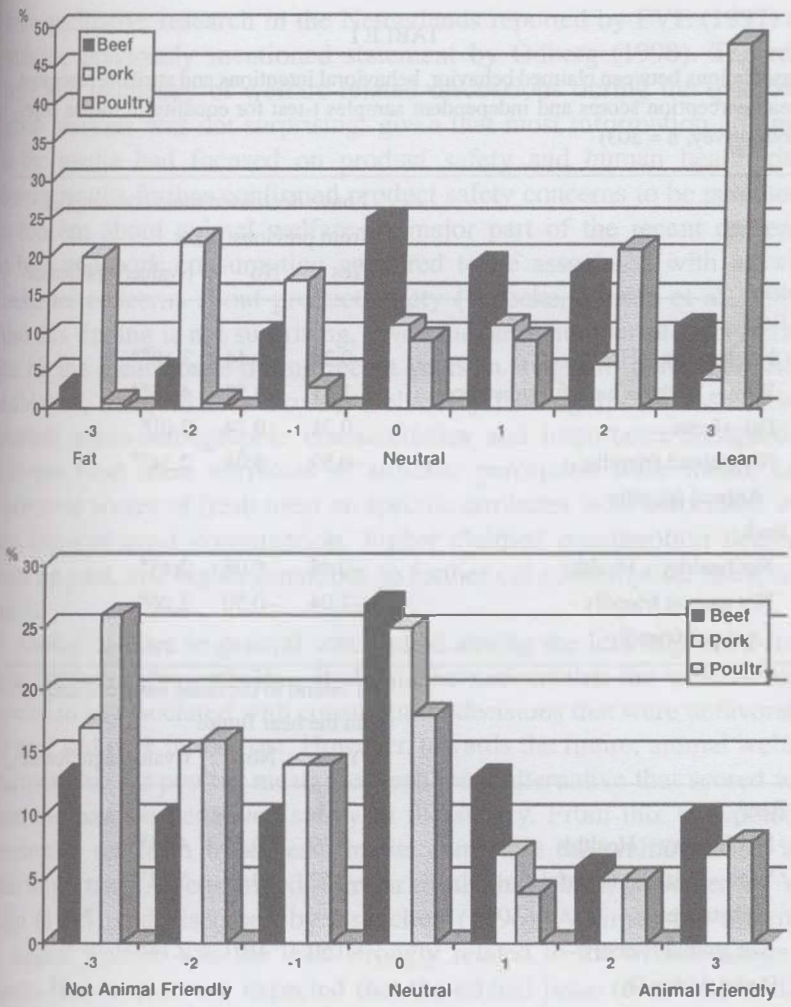

Figure 1b.

"animal friendly," the more consumers intend to cut fresh meat consumption in the near future. Higher intentions to cut meat consumption were also noticed for consumers who perceive beef and poultry as less healthy, as well as for consumers who associate beef and pork with containing "harmful substances."

DISCUSSION AND CONCLUSION

Consumer demand for fresh meat appears to be primarily individual and human health focused. This finding corroborates with conclusions

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TABLE I

Associations between claimed behavior, behavioral intentions and attribute perception, mean perception scores and independent samples t-test for equality of means (April, 1998 survey, n = 303)

	I have decreased meat consumption from previous years		
	Yes	No	t-value/significance
Beef			
Not healthy – Healthy	–0.28	0.44	3.18**
With – Without harmful substances	–1.51	–0.52	4.26**
Fat – Lean	0.31	0.74	2.01*
Not animal friendly – Animal friendly	–0.59	–0.01	2.34**
Pork			
Not healthy – Healthy	–0.45	0.08	2.45*
Not animal friendly – Animal friendly	–1.04	–0.50	2.26*
	I intend to decrease meat consumption in the near future		
	Yes	No	t-value/significance
Beef			
Not healthy – Healthy	–0.39	0.55	4.64**
With – Without harmful substances	–1.52	–0.42	5.12**
Not animal friendly – Animal friendly	–0.50	0.01	2.14*
Pork			
With – Without harmful substances	–0.83	–0.28	2.60**
Fat – Lean	–1.26	–0.80	2.18*
Not animal friendly – Animal friendly	–0.99	–0.47	2.28*
Poultry			
Not healthy – Healthy	1.31	1.72	2.20*
Not animal friendly – Animal friendly	–1.33	–0.82	2.29*

Significance levels: * = $p < 0.05$; ** = $p < 0.01$

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from qualitative research in the Netherlands reported by PVE (1997) and with the previously mentioned statement by Ödberg (1998). The relatively low frequency of welfare-related discussions during the qualitative group sessions was not surprising, given that most information and news in the media had focused on product safety and human health risks. Survey results further confirmed product safety concerns to be paramount to concern about animal welfare. A major part of the recent decreases in beef and pork consumption appeared to be associated with growing consumer concerns about product safety (Verbeke, Viaene et al., 1999). Also this finding is not surprising, given the large number of safety-crises that hit the meat image during recent years in Belgium (hormones, BSE, antibiotics, tranquilizers, dioxin). Relatively few significant associations between socio-demographic characteristics and importance assigned to different fresh meat attributes or attribute perception were found. Low perception scores of fresh meat on specific attributes were associated with less frequent meat consumption, higher claimed consumption decrease from the past, and higher intentions to further cut consumption in the near future.

Animal welfare in general was ranked among the less important fresh meat attributes. Nevertheless, it should be noticed that the welfare issue appears to be associated with consumption decisions that were unfavorable for beef and pork in the past. However, towards the future, animal welfare emerges also for poultry meat; the fresh meat alternative that scored well from the past on perceived safety in the survey. From this viewpoint, a previously set forth hypothesis in literature that the welfare issue will gain importance, is confirmed. Similar results have been presented by Van Trijp (1995) and discussed by Issanchou (1996). A dimension referring to animal welfare was the least strongly related to the overall image of meats. However, it was expected that the ethical issue of animal welfare concern would gain importance in the near future. Also, while other dimensions appeared to be still preponderant for consumer decision making, increased doubt related to animal welfare was announced as a forewarning of possible future behavioral changes at consumer level.

Following the typology set forth by Brom (2000), the focus in this research clearly was on general consumer concerns or public concerns, i.e., concerns that relate to ideas about a good society. Hence, abstraction was made of concerns that result from personal value systems of specific minority consumer groups.

From the research, key attention points are identified for the livestock sector and public policy in aiming at re-establishing consumer trust in meat and delivering products that meet emerging consumer demands. The major

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challenge lies primarily in delivering good quality and safe food products, and second in communicating this effectively and efficiently to the final consumer. Specifically with respect to the attribute "animal welfare," a growing importance is to be expected in the near future. This issue is particularly challenging since both the establishment of real market value, as well as scientific measurement of animal welfare, are difficult and often fuzzy.

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Ghent University
Department Agricultural Economics
Coupure Links 653
B-9000 Gent, Belgium
E-mail: wim.verbeke@rug.ac.be

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