Factors influencing intention to purchase beef in the Irish market

M. McCarthy*, M. de Boer, S. O’Reilly, L. Cotter

Department of Food Business and Development, University College Cork, Cork, Ireland

Received 9 September 2002; received in revised form 18 November 2002; accepted 30 November 2002

Abstract
This paper reports on the findings of a study into consumer perceptions towards beef and the influence of these perceptions on consumption. Fishbein and Ajzen’s [Belief, attitude, intention and behaviour. An introduction to theory and research (1995) Reading, MA: Addison-Wesley] Theory of Reasoned Action (TRA) provided a useful framework for this analysis. The influence of attitudes and important others (subjective norm) on intention to consume beef were explored. The findings support the usefulness of this model in understanding behaviour towards beef. In this study both attitude and the subjective norm influenced intention to consume beef, but it was attitude that was of greater importance. Health, eating enjoyment and safety were most important determinants of attitude with price, environment and animal welfare less so. An evaluation of the impact of the introduction of new information which related to one belief (health) was also conducted. Those indicating that they would consider increasing their consumption of beef had a more positive attitude towards beef and had more positive health and eating enjoyment beliefs about beef than the ‘no’ group who had significantly higher safety concerns.

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Keywords: Consumer attitudes and beliefs; Beef consumption behaviour; Irish market

1. Introduction

In recent years the demand for beef in the Irish market has fluctuated dramatically, the slow decline in consumption in the early 1990s was followed by a rapid decline in consumption in 1996 (due to the BSE crisis), which was then followed by an increase in consumption during the late 1990s. Clearly a number of factors influenced these changes not least of which was the BSE crisis. However, given the increased consumption post-BSE, it is also very apparent that other factors are influencing consumption behaviour. Consumer perceptions of beef and the influence that these perceptions have on behavioural intention and consumption are explored. Researchers have highlighted a number of phenomena that have resulted in changed behaviour, some of which are generally equated to food and others that are specific to meat. Verbeke and Viaene (1999) succinctly summarise the influences as: health, safety, taste and environmental and animal welfare concerns.

They also note that the number of scandals surrounding the meat industry has further compounded a difficult market environment. The Theory of Reasoned Action provided a conceptual framework for this research and the main factors were investigated to assess the degree to which they influence attitude towards beef and thus behaviour.

This paper is structured as follows: the next section briefly reviews the main factors influencing beef consumption behaviour. The conceptual framework, hypotheses and methodology are then presented and this is followed by an analysis and findings section. The final section presents main conclusions and implications.

2. Irish beef consumption trends

During the mid-1990s EU beef consumption was declining by an average of one percent per annum. Irish beef consumption followed a similar trend, for example consumption had dropped from 19.1 kg per capita in 1989 to 16.8 kg at the end of 1993. This behaviour has been attributed to a long-term consumer trend away
from red meat consumption (Glitsch, 2000). He reported that during the early 1990s Irish people began to consume less red meat in favour of white meat due to the supposed health benefits of the latter. This trend towards reduced beef consumption continued during 1994 and 1995, approximately 1.2 kg per capita for each year. Beef consumption decreased by 8% per capita in 1996 compared to 1995 figures (GIRA, 2000). This drop was primarily attributed to the BSE crisis. However, by 1999, consumption was the same as 1994 at 16.8 kg per capita, which was somewhat unexpected as beef consumption was in decline at a rate of 1% per annum prior to BSE. A major information campaign was launched by the state food promotion agency (Bord Bia) in association with the trade during the latter half of the 1990s re-assuring consumers of the safety of beef and highlighting traceability and quality assurance programmes. The price of beef in retail outlets also fell during this period. However, the most recent BSE scare (2000) has further dented consumer confidence and increased the perceived risk associated with beef consumption, with a slight reduction in beef consumption to 16.4 kg per capita in 2000. A number of drivers or factors influenced beef consumption, in addition to health and safety considerations, factors such as taste and eating enjoyment, convenience, price, information campaigns, ethical and animal welfare issues all combine to influence consumption behaviour.

2.1. Taste and ‘eating enjoyment’

Taste, preference, appearance and sensory attributes all contribute to an individual’s level of ‘eating enjoyment’ for each type of meat. MacBean (1996) suggested that the changing preferences of consumers towards convenience and food safety over taste were at the expense of meat more than any other product. Grunert (1997) found that taste through experience was still the most important attribute for European consumers when purchasing meat. Researchers have also found that an individual’s sense of taste changes as they get older. Elsner (2002) claimed that many sensory systems decline with ageing and thus influence food choice and acceptability. This relationship between changing taste and the ageing process is used in part to explain human consumption behaviour. The European population is ageing and this has implications in relation to diet. This has direct implications for beef consumption as the older generation have reduced red meat intake. In addition, the younger generation, in many cases, are also eating less beef and display a preference for chicken. McIntyre (1998) found that while Irish adolescents enjoyed beef almost 80% of those surveyed had a preference for chicken. The Irish adolescents were also concerned about animal welfare issues and more than one in three were eating less beef as a result of these concerns.

V. Alvensleben (1996) also noted a similar trend among younger German consumers as this group expressed the lowest level of confidence in the meat system. Lister (1996) concluded, ‘...that awareness of the possible hazard of eating so-called unhealthy diets has caused consumers to question the place of meat in their’s’ (p. 194) and he later expands on this by arguing, ‘meat is eaten to be enjoyed not just for any nutrition value it might have’ (p. 195).

2.2. Safety issues

Safety issues and beef have come into clear focus in the last few years with the number of food scares associated with beef increasing, in particular the 1996 BSE scare and issues relating to hormones. Cowan (1997) found that over 70% of Irish consumers were very concerned about hormones and BSE when purchasing beef while 68% of consumers were very concerned about antibiotics when purchasing pork. McCarthy and Barton (1998) found that a year and 4 months after this BSE scare 43% of Irish consumers still expressed concern. They also noted that those expressing concern in relation to BSE tended to eat beef less frequently. Henson, Northen and Tonti (1998) found that the beef safety issues of greatest concern to Irish consumers were hormones, salmonella and other bacteria, antibiotics and BSE. They also found that 40% of respondents had reduced their intake of beef in the previous 5 years (the survey was conducted in March 1997). McCarthy and Barton (1998) linked reduced consumption of beef to concern about BSE and suggested that it was the reason why a number of consumers ceased eating beef or eliminating certain cuts from their diet. They found that the risk perception for specific beef cuts was significantly associated to behavioural change. These safety concerns are not just an Irish consumer phenomenon. Cowan (1997) found that for five EU countries over 50% of consumers were very concerned about BSE. Verbeke and Viana (1999) also highlighted that health and safety concerns were important motives in changing consumer attitudes towards meat.

2.3. Environmental, ethical and animal welfare motives

Environmental concern and animal welfare issues have also been responsible for decreasing red meat consumption both in Ireland and the EU. Mintel (1999) commented that conventional farming methods are associated with environmental damage and the poor treatment of animals. Yet Harrington (1991) claimed that the majority of consumers considered meat eating as common practice, and were largely unconcerned about methods employed by farmers and factories in production. However, he also found that the minorities who were interested in the practices employed were
growing in number. Issanchou (1996) presented similar results, arguing that animal welfare was one of the weakest attributes influencing meat choice but one that would gain greater importance in the near future. Curnett (1997) provided a more ethical, ecological and philosophical approach to the reasoning behind changing meat consumption habits. He noted that it was vegetarians’ moral beliefs that changed them to non-meat eaters and not factors such as taste and health. Curnett argued that moral issues override any other factor in the practice of vegetarianism. Verbeke and Viaene (1999) noted that animal welfare could be expected to become a critical theme in the future. Lindeman and Vaananen (2000) stressed, that while relatively small, ecological welfare was certainly an influencing factor behind people’s meat consumption behaviour. However, it should be noted McIlveen, Abraham, and Armstrong (1999) argued that, in the case of non-meat eaters, many were not driven by ethical motives but a growing number were influenced by healthy eating, food safety scares and weight reduction.

2.4. Income and price changes

Traditionally beef has been presented as a luxury product and increased consumption has been linked to increased income (Ritson & Hutchins, 1991; Spitters, Hoffman, de Schutter, & Leijh, 1998). However, notwithstanding an improvement in Irish incomes during the early 1990s beef was commonly perceived as ‘expensive’ or poor value for money compared to its near substitutes—white meats such as chicken and pork. This ‘poor rating’ was compounded by the negative publicity surrounding the health debate (e.g. red vs white meat) and safety issues—as referred to above. During the latter half of the 1990s the Irish retail price of beef market dropped considerably, this improved its competitive position with respect to other meats and is believed to have contributed to the increase in consumption during this period. Fig. 1 illustrates these trends during the 1990s. For example, the retail price of round steak in February 1995 was 8.842 p/kg compared to 7.066 p/kg in 1998—a 20% reduction. Becker, Benner, and Glitsch (2000) observed a similar pattern in Germany, where the price of beef had increased and consumption had decreased. Becker et al. (2000) stated that this long-term quantity-price equilibrium path seems to have been caused by movements on the demand curve and shifts in the supply curve and not by shifts in the demand curve. However, the relationship between income and beef consumption should be interpreted with some caution. Bansback (1995) noted in his longitudinal study of EU meat consumption trends that the percent contribution of price and income to change in beef and veal consumption had reduced from 95% for the period 1955–1979 to 68% for the period 1975–1995. Bansback believes that the non-price income issues of increasing importance are health issues, lack of convenience and quality issues. Similarly, Becker et al. (2000) believe that while price is important it alone...
cannot explain changes in meat consumption. Mannion, Cowan and Gannon (2000), note that surveys over the last forty years have shown that health and price affects are the issues of most importance to consumers who reduced red meat consumption prior to 1990. Since 1990 other factors such as food safety, animal welfare, taste, changing lifestyles and convenience have become more important in the decision making process. Other factors such as the influence of peers can be broadly described as social influences.

2.5. The affect of social influences on changing meat consumption behaviour

Opinions voiced by family members and/or peers and doctors/dieticians can often influence an individual’s consumption behaviour. Lindeman and Stark’s (1999) research into the meat eating habits of women found that food choice was the result of multiple motives rather than single motives such as ethical beliefs. Psychological factors were linked to non-meat consumption, these included motives such as ethics, politics, culture and taste. They found, especially with vegetarians, that this aversion to meat often filled just a part of a psychological need and often did not have anything to do with their health. Non-meat consumption was driven by a desire to be part of a social group more than any other reason. Tilston, Sear, Neale, and Gregson (1992) argued that the reduction in red meat consumption can in part be attributed to doctors/dieticians and other sources of information that viewed white meats as healthier alternatives. Willet (1999) noted that the convergence of philosophy and science in affluent areas promoted greater health benefits for vegetarians. He believed that those socio-economic groupings that are interested in health benefits are more likely to consume white meats because they have a wider understanding beyond just that of ethical beliefs. Willet (1999), similar to Lindeman and Stark (1999), believed that for certain people there was a combination of different motives behind reduced or non-meat consumption opposed to any single motive.

It is clear from the brief review presented above that a number of varied factors could influence consumption of beef. The salient beliefs highlighted above were: price, safety, taste, animal welfare and environmental concerns. In addition health emerges as an important issue across all factors reviewed above. Furthermore, the influence of ‘important others’ may also be a motivating variable.

3. Information and attitudes

As discussed earlier consumer attitudes and beliefs affect behaviour intention toward food products. Attitudes can be formed or altered as a result of information (communications) and communicators. Clearly the credibility of the information source impacts on the acceptance of the information. Grewal, Gotlieb, and Marmorstein, (1994), note that where source credibility is low consumers will disregard the message. Frewer and Shepherd, (1994) noted that source credibility did not influence attitudes in the case of genetic engineering of food. However, Frewer, Howard, and Shepherd (1998) concluded that the trust in source is important in situations where attitudes have not yet crystallised as this may influence the direction of attitude change. O’Keeffe and McCarthy (2001) found that Irish consumer trust in supply chain factors differed with greater trust in safety information1 from government than processors or retailers. Kafka and v. Alvensleben’s (1998) study of German consumers suggest that the underlying confidence in the system and individuals’ attitudes and beliefs are closely related. The lower the confidence the less likely the consumer will have confidence in information from external bodies. Similarly, Irish consumers who lacked confidence in the government also had the poorest perception of meat safety and those with greater levels of concerns about meat made most use of written information (labels, quality marks and information brochures) (McCarthy, 2000).

Message content is also important. In the context of neutral to positive information, attitudes may not change. Frewer et al. (1998) noted that this was very much the case for positive information about genetic modification where positive information did not result in a more positive attitude but rather increased distrust in the information source. Furthermore the provision of information may activate already held attitudes about the product and this may in turn result in a strategic behavioural response (Frewer et al., 1998). Thus the attitudes towards behaviour can impact on the response to new information.

The role and dissemination of information is of particular interest, as if one can better understand consumer behaviour through the investigation of their attitudes and beliefs then one may be able to influence beliefs and ultimately behaviour through the provision of information. This paper first examines the factors (beliefs, attitudes and subjective norms) that influence consumer behaviour towards beef and then evaluates the impact of these factors when responding to new scientific information. The new information presented related to a potential health benefit. The source of this message was not specified, rather it was attributed to the general scientific community so as to minimise the influence of information source credibility on acceptance.

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1 Trust in safety information ranged from: 20–32% for retailers (depending on whether it related to bacteriological or technological hazards); 16–24% for processors and 29–56% for government.
4. A conceptual framework: the theory of reasoned action

Fishbein and Ajzen’s (1975) Theory of Reasoned Action (TRA) provides a useful framework for the analysis of consumer behaviour. The TRA has been widely applied to many issues in social psychology (Ajzen and Fishbein, 1980; Tesser and Schaffer, 1990), and more recently it has also been successfully applied to food choice studies (Axelson, Bringberg, & Durand, 1983; Shepherd, 1988, 1989; Tuorila, 1987). The Theory of Reasoned Action seeks to explain rational behaviour that is under the control of the individual, i.e. volitional behaviour. With volitional behaviours it is argued that intention to perform a behaviour (BI) is the best predictor of behaviour (B) (Shepherd and Raats, 1996).

Behaviour = Behavioural Intention

In turn, in the case of food, many of the influences on food choice (i.e. behavioural intention) may be mediated by people’s beliefs and attitudes (Shepherd, 1985), but also by perceived social pressure. Intention is therefore predicted by two components: the person’s own attitude (Aₗ) and the perceived social pressure to behave in this way, i.e. the subjective norm (Sn):

Behavioural Intention = w₁ × Attitude

+ w₂ × Subjective norm

The relative weightings (w₁ and w₂) of attitudes and subjective norm are resultant from a multiple regression on these variables against the dependent variable BI (Shepherd & Sparks, 1994).

Attitudes could be formed by the beliefs people have about certain aspects of the product, such as the quality, nutritional value, health value or price. Attitude is predicted by the sum of products of beliefs about outcomes of the behaviour (bᵢ) and the person’s evaluations of these outcomes as good or bad (eᵢ):

Attitude = Σbᵢ × eᵢ

Social pressure (termed the subjective norm) is the perceived pressure to perform the behaviour in question from people that are important to the person (normative beliefs) and the motivation to comply with the wishes of these people. Therefore, the subjective norm is predicted by the sum of products of the normative beliefs (Nbᵢ) and the person’s motivation to comply with these wishes (Mcᵢ):

Subjective norm = ΣNbᵢ × Mcᵢ

In addition, influences other than beliefs, attitudes and social pressure should act through these variables. Hence age, sex or social class should only influence behaviour through the model variables and should not act as independent influences on consumer behaviour.

Correlation and regression analysis are used to determine the usefulness of the TRA model. Significant correlations between the model components demonstrate support for the TRA and its application to food choice behaviour. Regression analysis determines which beliefs are most important in the prediction of attitude and subjective norm, and whether attitude or subjective norm is more important in the prediction of behavioural intention.

As stated earlier, the TRA model has been applied to many food choice studies (Axelson et al. 1983; Shepherd, 1988, 1989; Shepherd and Farleigh, 1986; Tuorila, 1987). In general the TRA model was found very useful in the prediction of behavioural intention from the components of the model. In most studies attitude was found to be more important in predicting behavioural intention than the subjective norm. With respect to meat and beef studies, a TRA study on meat and meat products (Shepherd & Stockley, 1987) showed significant correlations between all the model components and identified taste and health as the most important predictors of the attitude. Guseman, Sapp, and McIntosh (1984) and Guseman, Sapp, and McIntosh (1986) examined the links between nutrition, health, social acceptability, attitudes, and beef consumption intentions. Consumers who were worried about possible negative nutritional and health consequences of consuming beef reported eating less beef in the past year as well as intentions to eat less beef in the future. In a TRA study on social acceptability and intentions to eat beef (Sapp & Harrod, 1989), important others had a significant impact on the intention to eat beef and the actual eating of beef. Zey and McIntosh (1992) carried out a study in which the TRA model was used to assess the intent to consume beef among a stratified random sample of 400 Texas women. Correlations between the model components were all significant. With respect to the regression results, the subjective norm predicted intent to consume beef while attitude, which was significantly affected by health and appetite, did not. An explanation for the subjective norm being more important than the attitude was these women’s desire to comply with the husband’s food demands. In addition, intention to behaviour was measured by asking for intention to behavioural change in a year’s time. A study on restaurant beef steak consumption (Crockett, 1997), concluded that for both men and women attitude was much more important than subjective norm on behavioural intention.

Although the TRA has proven successful in many food choice studies, an extension of the model was proposed (Ajzen, 1985) to deal with non-volitional behaviour. Ajzen (1985) included a perceived control component to complement attitude and subjective
norm in the prediction of behavioural intentions (Shepherd & Raats, 1994). The resulting Theory of Planned Behaviour takes into account the amount of control that the individual perceives him/herself to have over the behaviour in question (Conner, 1993). Control factors include both internal control (information, personal deficiencies, skills, abilities, emotions) and external control (opportunities, dependence on others, barriers) (Conner, 1993). In food choice research, the control component would mainly be important in predicting the choice of tempting foods, such as chips, chocolate or biscuits. These types of foods would have negative consequences associated with their consumption (Conner, 1993). In our view, beef is not considered as a tempting food and did not have negative consequences associated with its consumption at the time of this study in summer 2001. In addition, respondents in the current beef study needed to be the primary purchaser and meal preparer in the household. One would assume that these consumers would not perceive a lack of control with preparing a traditional food product like beef. For these reasons, and because the TRA model appears to work well in the prediction of behaviour through the use of behavioural intention measures, it was considered prudent that the Theory of Reasoned Action would provide a good framework for assessing the influence of attitudes and subjective norms on behavioural intention towards beef. Fig. 2 shows a schematic representation of the TRA model as it was applied to the present beef study.

5. Research hypotheses and methods

Based on the review it was hypothesised that the six identified belief×outcome evaluation items (bi×ei) (presented in Fig. 2) will significantly contribute to attitude towards beef. Furthermore the normative beliefs×motivation to comply items (Nbj×Mcj) will contribute significantly to the subjective norm. Finally, it was hypothesised that attitude towards beef and the subjective norm both significantly contribute toward intention to consume beef but that the attitude towards beef will contribute to the greatest extent.

Three hundred respondents, over the age of 18 were recruited, using a stratified random recruitment procedure. The sample was representative of the Irish adult population according to social and age classes. Respondents were also the primary purchasers and meal preparers in the household. As the theory of reasoned action model consists of six components; behavioural beliefs, normative beliefs, attitude, subjective norm, behaviour intention and behaviour, the questionnaire included all of these components. The measures used for these components are discussed briefly below.

5.1. Beliefs about beef and outcome evaluation constructs

Three statements for each belief construct and three statements for each evaluation outcome construct were included. The statements employed to represent underlying outcomes were drawn from the work of
authors such as Towler and Shepherd (1992) and Axelson et al. (1983).

5.1.1. Outcome evaluations constructs \( (e_i) \)

Each of the six outcome evaluations (health, safety, animal welfare, environmental, eating enjoyment and price consciousness), were measured by statements using a seven point Likert scale ranging from ‘very strongly disagree’ \((=1)\) to ‘very strongly agree’ \((=7)\). These outcome evaluation statements, presented in Table 1, were adopted from the research of a number of authors. Factor analysis was performed to assess the uni-dimensionality of the constructs. All constructs were found to be uni-dimensional (Table 1). The reliability was measured using Cronbach’s alpha, which varies between 0 and 1, with the higher coefficients showing greater reliability. In general all measures displayed good reliability (Table 2).

5.1.2. Belief constructs \( (b_i) \)

Three statements were used to measure each belief about beef (health, safety, animal welfare, environmental, eating enjoyment and price consciousness). Statements using a seven point Likert scale ranging from ‘very strongly disagree’ \((=1)\) to ‘very strongly agree’ \((=7)\) measured the belief constructs. The statements for price were as follows and represent an example of the types of statements used: ‘beef is too expensive’, ‘beef should be cheaper’ and ‘beef is good value for money’. Reliability analysis was conducted on the belief items of each construct and results were very good with high Cronbach’s alpha coefficients being recorded (Table 2).

5.2. Normative beliefs \( (N_b) \), Motivation to comply \( (M_c) \) Attitude \( (\Sigma A_j) \) and Subjective norm \( (S_n) \)

Normative beliefs and motivation to comply were both measured by two statements each, drawn from the work of Towler and Shepherd (1992). To measure attitude, respondents indicating their level of agreement that eating beef was ‘good’, ‘beneficial’ and ‘pleasant’. These three attitudinal statements were summed to give a total attitude score \((\Sigma A_j)\). One statement was used to measure the subjective norm \((S_n)\). Respondents were asked to indicate their level of agreement with the statement “The people that matter to me most think I should eat beef”.

5.3. Behavioural intention \( (B_I) \) and Behaviour \( (B) \)

The measures for behaviour and behavioural intention were similar to those used by Towler and Shepherd (1992). The statement “I intend to eat beef within the next week” measured behavioural intention. Again responses were on a seven-point scale, ranging from strongly disagree \((=1)\) to strongly agree \((=7)\). Behaviour was not measured directly but by means of frequency of consumption by asking respondents ‘how often do you consume beef?’ Respondents could indicate their frequency of consumption using a 7-point frequency scale, ranging from ‘never’ \((=1)\) to 4 or more times a week \((=7)\).

<table>
<thead>
<tr>
<th>Outcome evaluation constructs ( (e_i) )</th>
<th>Statements</th>
<th>Factor Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Adapted from Kyriakopoulos and van Dijk (1997)</td>
<td>I consider myself to be very health conscious</td>
<td>0.837</td>
</tr>
<tr>
<td></td>
<td>It is important to know how to eat healthy</td>
<td>0.737</td>
</tr>
<tr>
<td></td>
<td>I live a very healthy lifestyle</td>
<td>0.811</td>
</tr>
<tr>
<td>Safety Concern</td>
<td>I consider myself to be very safety conscious when it comes to food</td>
<td>0.740</td>
</tr>
<tr>
<td></td>
<td>I think it is important to know what I eat is extremely safe</td>
<td>0.853</td>
</tr>
<tr>
<td></td>
<td>I think it is important to know what all the safety risks associated with food are</td>
<td>0.837</td>
</tr>
<tr>
<td>Environmental Concern Adapted from Kyriakopoulos and van Dijk (1997)</td>
<td>When I think about the way food processors and industries are polluting</td>
<td>0.781</td>
</tr>
<tr>
<td></td>
<td>I get very angry</td>
<td>0.783</td>
</tr>
<tr>
<td></td>
<td>I would be willing to stop buying products from companies guilty of polluting the environment</td>
<td>0.783</td>
</tr>
<tr>
<td></td>
<td>I would never think of joining an environmental concern agency</td>
<td>0.747</td>
</tr>
<tr>
<td>Animal Welfare Adapted from v. Alvensleben (1996)</td>
<td>Animals suffer too much stress on farms</td>
<td>0.851</td>
</tr>
<tr>
<td></td>
<td>Animal herds in meat production are too big</td>
<td>0.738</td>
</tr>
<tr>
<td></td>
<td>People tend to exaggerate stories about bad farm conditions</td>
<td>0.806</td>
</tr>
<tr>
<td>Eating Enjoyment</td>
<td>Eating is a source of enjoyment for me</td>
<td>0.841</td>
</tr>
<tr>
<td></td>
<td>Taste does not matter to me that much</td>
<td>0.450</td>
</tr>
<tr>
<td></td>
<td>Enjoying a meal is the most important thing for me</td>
<td>0.779</td>
</tr>
<tr>
<td>Price Sensitivity Axelson et al. (1983)</td>
<td>I am very price consciousness</td>
<td>0.837</td>
</tr>
<tr>
<td></td>
<td>Price is not the most important factor for me when I am shopping</td>
<td>0.721</td>
</tr>
<tr>
<td></td>
<td>Price tends to influence my choice a lot</td>
<td>0.880</td>
</tr>
</tbody>
</table>
6. Results

Statistical analysis was carried out using SPSS version 10 (SPSS Inc. Chicago, IL, USA).

6.1. Beef consumption (B)

Ninety-three percent of respondents consumed beef of which 47% were frequent consumers (consumed beef at least twice a week). Seven percent of respondents reported very frequent consumption—four times or more a week. However, at the other extreme, 41% consumed beef once a fortnight or less and a further 5% only consumed once a month or less.

Data were analysed according to the Ajzen and Fishbeins’ Theory of Reasoned Action model (Fig. 1). Table 2 shows mean scores for all components of the model.

As is clear from the mean scores getting enjoyment from eating is very important to respondents, while respondents indicated that they were very safety and health conscious. Respondents did not report to be overly concerned about animal welfare or the environment and were not too price sensitive. In their evaluation, beef was considered healthy and enjoyable to eat.

7. TRA model of Irish beef consumption

To obtain an overall belief-evaluation score, each belief response ($b_i$) was multiplied by the appropriate evaluation response ($e_i$) and the products were summed ($\sum b_ie_i$). The attitude components were summed to give a total attitude score ($\sum A_j$). The normative belief score was calculated by multiplying the normative belief responses ($N_b$) by the corresponding motivation to comply responses ($M_c$) and the scores were summed ($\sum N_bM_c$). Linear multiple regressions and simple correlations (Pearson correlation coefficients) were used to assess the degree of association between the components.

7.1. Linear multiple regressions

Outliers were removed from the data set, reducing the number of valid cases for the regression analysis to 259. Data were also screened on multicollinearity using the Variance Inflation Factor (VIF) criteria. No VIF measurements exceeded the limit of 4, indicating no serious multicollinearity problems.

Three separate linear multiple regressions were performed on the model (Table 3 presents the results). The first regression with attitude and subjective norm against intention ($R^2=0.69$, $P \leq 0.01$) showed a greater impact of attitude ($b = 0.77$, $P \leq 0.01$) than subjective norm ($b = 0.09$, $P \leq 0.10$) on the behavioural intention.

The second regression analysis examined the effect of the belief-evaluation scores on the attitude ($R^2=0.80$, $P \leq 0.01$). The health belief-evaluation ($b = 0.44$, $P \leq 0.01$) and the eating enjoyment belief-evaluation ($b = 0.36$, $P \leq 0.01$) were found to be positively contributing to the attitude. The safety belief-evaluation ($b = -0.32$, $P \leq 0.01$) was found to be negatively contributing to the attitude.

The extent to which compliance with doctors and dieticians explain the subjective norm was examined by the third regression analysis. It was found that 13% of the variance was explained by doctors and dieticians in the subjective norm ($R^2=0.13$, $P \leq 0.01$). The compliance with doctors was slightly more important ($b = 0.21$, $P \leq 0.01$) than the compliance with dieticians ($b = 0.19$, $P \leq 0.01$). An overview of all regression results is given in Fig. 3.

7.2. Correlation analysis

The sum of the three significant belief-evaluation products (as determined by regression) correlated significantly with the attitude measure ($r=0.59$, $P \leq 0.01$). The attitude measure correlated significantly with the intention to consume beef within the next week.
Table 3

Multiple linear regression results

<table>
<thead>
<tr>
<th>Beef</th>
<th>Beta</th>
<th>t</th>
<th>R</th>
<th>df</th>
<th>F-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavioural intention on</td>
<td>0.688 (2, 256) 282.5***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude</td>
<td>0.766 15.957***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subjective norm</td>
<td>0.088 1.842*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude on</td>
<td>0.801 (2,252) 168.9***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health</td>
<td>0.441 11.863***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety</td>
<td>−0.324 −9.106***</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Environment</td>
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<td>Animal welfare</td>
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<td>Eating enjoyment</td>
<td>0.357 9.275***</td>
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<td>Subjective norm on</td>
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<tr>
<td>Doctors</td>
<td>0.211 2.907**</td>
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<td>Dietitians</td>
<td>0.192 2.655**</td>
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* P ≤ 0.1.
** P ≤ 0.05.
*** P ≤ 0.01.

(r = 0.83, P ≤ 0.01). The Σ(NbMe) measurement correlated significantly with the subjective norm measurement (r = 0.36, P ≤ 0.01). Subjective norm correlated significantly with the intention to consume beef within the next week (r = 0.62 P ≤ 0.01). The behavioural intention measurement correlated significantly with the behaviour measurement (r = 0.76, P ≤ 0.01). These findings support the basic structure of the TRA model. The correlations between the components of the TRA model are shown in Fig. 4.

7.3. The impact of new information on beliefs and behaviour

It is clear from this analysis that beliefs about healthy eating and evaluation of beef as a healthy product are fundamentally important determinants of attitude towards beef and thus behavioural intention. It is therefore argued that new positive information relating to the healthiness of beef should increase consumption of beef, particularly for those who already have a positive attitude towards the healthiness of beef. Recent research has found that Conjugated Linoleic Acid (CLA), a natural derivative of linoleic acid, present in beef has shown properties that are anti-arthritic, cancer preventing, growth promoting, lean body mass enhancing and anti-diabetic. A scientific statement on CLA was presented to respondents and they were asked if they would be willing to increase their consumption of beef due to the benefits of CLA. The information on CLA presented to respondents is reported in Box 1.

It was hypothesised that this new information would increase respondents’ willingness to consume beef and that those who already had a positive attitude toward the healthiness of beef would be most willing to consider consuming more beef.

Given the scientific nature of this statement respondents were asked if they comprehended the content of the statement. Sixteen percent of respondents indicated that the information was incomprehensible to them therefore they were excluded from further analysis. Some seventy-seven percent of respondents who understood the statement also indicated that they found this information interesting, while 75% indicated that the information was relevant to them.

Sixty-five percent of respondents for whom the information was comprehensible indicated that this positive piece of information would result in their considering increasing their intake of beef. Separate linear regression analyses for the models presented earlier were run for the people that answered ‘yes’ (n = 141) and for those that said that they would not (n = 77) consider increasing their consumption of beef. This found that the key determinants of behaviour intention were similar for both groups; health, safety and eating enjoyment. But it was interesting to establish if beliefs and attitudes differed based on the positive and negative responses. In order to achieve this objective the mean scores on buying intention, attitude, subjective norm, and the (b_i × e_i) scores on health, eating enjoyment and safety concerns were compared between the two groups using independent sample t-tests (see Table 4). People that were willing to increase their consumption of beef due to the benefits of CLA (i.e. the ‘yes’ group) had a significantly higher buying intention for beef even before the health benefit was communicated compared to the people that were not willing to increase their consumption of beef due to the benefits of CLA, the ‘no’ group. The ‘yes’ group also had a significantly more positive attitude toward beef consumption than the ‘no’ group and also

**Box 1: Statement on CLA.**

Conjugated Linoleic Acid (CLA) is a natural derivative of the fatty acid linoleic acid. It is a naturally occurring acid in food from animal sources. From tests carried out, it was found that beef showed the highest level of this fatty acid. In studies CLA has shown properties that are anti-arthritic, cancer preventing, growth promoting, lean body mass enhancing and anti-diabetic. Scientists have also proved that cattle fed on a grass diet have resulted in a threefold increase of CLA. In addition there is evidence that CLA levels further increase in foods that are cooked or otherwise processed.
**Fig. 3.** Model overview of all regression results.

**Fig. 4.** Simple correlations between the components of the Theory of Reasoned Action model.

*** Significant at the 0.01 level  
** Significant at the 0.05 level  
* Significant at the 0.10 level

** correlation is significant at the 0.01 level (2-tailed)
felt significantly more social pressure (subjective norm) than the ‘no’ group.

Furthermore, compared to the ‘no’ group, the ‘yes’ group had significantly higher scores on health and eating enjoyment and a significant lower score on safety concerns.

As attitude is positively affected by health and eating enjoyment beliefs and negatively affected by safety concerns, the ‘yes’ group has a more favourable mix of these drivers of attitude than the ‘no’ group. The ‘no’ group had significantly lower health and eating enjoyment beliefs about beef than the ‘yes’ group and significantly higher safety concerns.

A possible explanation for the ‘no’ group’s lack of willingness to increase consumption of beef in response to a suggested health benefit may be their lower level of concern for health related issues and their higher level of concern for safety aspects. Given that the ‘no’ group already have a lower buying intention than the ‘yes’ group, it is this group that provide an interesting marketing opportunity. It would appear that an integrated strategy, which addresses the three most important determinants of attitude towards beef, is required to improve their overall attitude. Highlighting the health aspects in the absence of a proven safety record and consistent sensory quality may not affect substantial behavioural change, but highlighting the health benefits as part of a bundle of attributes could increase consumption.

8. Conclusions

It is clear from this analysis that attitude toward beef has a very significant influence on consumption behaviour. Furthermore, it is the belief-evaluation for health, safety and taste that are the most significant determinants of attitude. Animal welfare and environment considerations were not significant determinants of attitude, this is not surprising given that grassland production is a prominent feature of Irish beef production. It was also interesting that price related issues were not a significant determinant of attitude. This may reflect recent improvement in price competitiveness of beef, but may also reflect the findings of other studies (Bansback, 1995; Becker et al., 2000; Mannion et al., 2000) that price is not as important as it was pre-1990s. Clearly food scares over recent years have had an impact on attitude and given the significant negative contribution safety concerns have on attitude it is apparent that to maintain present consumption levels beef producers and processors must maintain the highest standards. Positive health and taste perceptions resulted in positive attitudes towards beef, thus highlighting the health benefits and concentrating on ensuring a positive eating experience could also improve consumer demand. Furthermore, the majority (65%) of respondents indicated that they would increase consumption in response to a positive health message. However, it was those that were already positive toward beef that would consider increasing their consumption thus highlighting the importance of attitudes on behavioural response. While animal welfare and environmental issues were less important determinants of attitude towards beef presently, it would be remiss not to acknowledge that these issues are increasing in importance and as Verbeke and Viaene (1999) note it can be expected to become a critical feature in the future.

The views of other people also significantly contributed to behavioural intention towards beef consumption. The level of influence was not as great as for attitude but was significant, at the 10% level. Clearly, the advice from doctors and dieticians are integrated into consumers’ assessment for beef and thus influences consumptions.

Acknowledgements

The authors are grateful to the Higher Education Authority of Ireland for their financial support for this research.

References


