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Choice of organic foods is related to perceived consequences for human health and to environmentally friendly behaviour

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Abstract

We designed a questionnaire concerned with attitudes and behaviour towards organic foods, environmentally friendly behaviour (EFB), and perceived consequences of organic food choice in terms of human health, the environment and animal welfare. It was mailed in 1998 to a random nation-wide sample of 2000 Swedish citizens, ages 18–65 years, and 1154 (58%) responded. Self-reported purchase of organic foods was most strongly related to perceived benefit for human health. Performance of EFBs such as refraining from car driving was also a good predictor of purchase frequency. The results indicate that egoistic motives are better predictors of the purchase of organic foods than are altruistic motives.

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Keywords:

Introduction

Several studies have provided evidence that consumers consider the sensed characteristics of food to be the most important factors in their choice of food (e.g. Magnusson, Arvola, Koivisto Hursti, Åberg, & Sjöden, 2001; Torjusen, Lieblein, Wandel, & Francis, 2001; Wandel & Bugge, 1997). However, it appears that non-sensory attributes of foods are becoming increasingly important (Torjusen et al., 2001; Wandel, 1994). Among the most notable are the absence of food additives, preservatives and residues (Wandel, 1994; Wilkins & Hillers, 1994), nutritional value (Jolly, 1991; Torjusen et al., 2001; Wandel, 1994; Wandel & Bugge, 1997), and how the food was produced (Land, 1998; Torjusen et al., 2001). Examples of concerns about food production are animal welfare and the specific production system used (e.g. conventional vs organic production). A majority (61%) of Norwegians consider animal welfare in food production to be an important aspect of the quality of foods (Torjusen et al., 2001). More than 30% state that they are willing to pay 10% more for meat

produced in accordance with ethical animal care principles (Wandel & Bugge, 1997).

Consumers also express interest in issues relating food to health (Fagerli & Wandel, 1999; Rozin, Fischler, Imada, Sarubin, & Wrzesniewski, 1999; Wandel, 1994). Healthiness is an important criterion for purchase and a parameter of quality for many consumers (Land, 1998; Magnusson et al., 2001; Wandel & Bugge, 1997). Although there is no unambiguous evidence that organic foods are healthier than conventional foods (Torjusen, Nyberg, & Wandel, 1999), consumers perceive foods labelled as organic to be healthier than conventional foods (Grankvist & Biel, 2001; Magnusson et al., 2001; Torjusen et al., 1999). Concern for the environment is another reason for purchasing organic foods (e.g. Schifferstein & Oude Ophuis, 1998). Thus, concerns for one's health and for the environment are the two most commonly stated motives for purchasing organic foods (Wandel & Bugge, 1997) with personal health being more important than concerns for the environment (Tregear, Dent, & McGregor, 1994; Wandel & Bugge, 1997).

Health and environmental motives differ in the sense that concern about health can be regarded as egoistic (benefits the individual or his/her family) while consideration for the environment and animal welfare are more altruistic (benefits

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society rather than the individual). Altruistic considerations often carry personal behavioural or even economic costs (Antonides & van Raaij, 1998) and the majority of consumers are unwilling to forego much personal benefit in order to contribute to the benefit of the community (The Hartman Group, 1997; Wandel & Bugge, 1997).

Several studies of environmental concerns and activities have found rather weak correlations between attitudes and behaviour (Ebreo, Hershey, & Vining, 1999; Grankvist & Biel, 2001; Tracy & Oskamp, 1983). For example, Ebreo and co-workers (1999) found weak correlations (0.22–0.32) between on the one hand the frequency of recycling of several materials (e.g. cardboard and plastic containers), and on the other concerns about product attributes related to the conservation of nature (e.g. ‘made from recyclable materials’ and ‘energy conserving’). However, there is evidence that relationships between items of behaviour within the same domain are stronger than between behaviours across domains. Grankvist (2001) found stronger correlations between the self-reported frequency of purchase of different eco-labelled foods ($r = 0.30$ – 0.56) than between the purchase of eco-labelled foods and recycling of several fractions (e.g. bottles, batteries, packages etc.) ($r = 0.14$ – 0.28). Few studies have investigated to what extent environmentally friendly behaviours (EFBs) relate to attitudes to and the purchase of organic foods. Since organic foods are marketed as being environmentally friendly, it is of interest to investigate the relationships between EFB and attitudes/behaviour towards organic foods. The present study includes an attempt to investigate these relationships.

The overall objective of the present study is to investigate the importance of perceived environmental, animal welfare and human health consequences of organic food purchase for consumer attitudes and self-reported purchase of organic foods. More specifically, the aims are to investigate: (1) consumer perceptions of the likelihood of occurrence and importance of three types of consequences of organic food choice: environmental, human health consequences, and the well-being of farm animals; (2) the possibility to predict consumer attitudes to and purchase of organic foods on the basis of such perceptions; and (3) on the basis of self-reported recycling and other EFBs. In addition, the role of demographic variables will be explored. The third aim concerns the extent to which recycling and other EFBs covary with attitudes to and the purchase of organic food.

Methods

Respondents

Two thousand addresses ages 18–65 years (60% of the Swedish population is in this age-range) were selected randomly from the national population register (Sema InfoData, 1998). Questionnaires were mailed to them

during the spring of 1998, and those not responding were sent two reminders. Below, the most recent data available for the entire Swedish population (Statistics Sweden, 2001a,b) are given after the abbreviation Pop. The total number of respondents was 1154 (58%). Forty-six percent of those were men (Pop 49%), and 54% women (Pop 51%). Mean age (S.D.) was 40.6 (13.2) years (Pop 40.2 years). There were three educational-level response options: elementary school or nine-year compulsory education (21%, Pop 27%); a degree from folk high-school (post compulsory education for adults), or two or three years of upper secondary school (52%, Pop 45%); and university or university college education (27%, Pop 26%). Respondents were offered a lottery ticket (value approximately US \$2.5) if they completed the questionnaire or could donate the same amount to charities (Swedish Save the Children, or the Swedish Children’s Cancer Foundation).

Questionnaire

Since the organic food group contains a large variety of products, we decided to focus most questions on a few types instead of organic foods in general. Four foods were selected as targets of questions; milk, meat, potatoes and bread, to provide examples of organic foods of differing types, prices and availability. They are all staple foods in the Swedish diet. At the time of the study, milk was the most widely available organic food, and potatoes were almost equally available. Organic bread and meat had just begun to become available in supermarkets. However, their prices were much higher than those of conventionally produced counterparts. A majority of questions concerned the organic varieties of the four target foods and were focused on buying rather than on consumption.

The questionnaire consisted of two sections. The first section (see Magnusson et al., 2001 for details) comprised questions about the frequency of purchase of organic milk, meat, potatoes, and bread, general attitudes towards and perceived availability of these products, and beliefs about their characteristics relative to their conventionally produced alternatives. There were two versions of this first part of the questionnaire. In one, the questions concerned organic milk and meat and, in the other, organic potatoes and bread. Half of the sample ($n = 1000$) received the milk and meat version (52% response rate), and the other half ($n = 1000$) the potatoes and bread version (48%). Descriptive data and demographic comparisons for the questions of the first section have been reported earlier (Magnusson et al., 2001).

The second section asked about the likelihood and importance of 17 possible consequences of buying organic foods in general. These questions did not deal with specific foods since they were intended to assess beliefs about the possible consequences of the use of organic methods of food production. Respondents were also asked about the frequency of their performance of several EFBs.

Questions

Attitudes towards buying organic foods. Respondents were asked to rate how good, important, and wise they think it is to buy organic milk, meat, potatoes and bread. Five-point bipolar scales were used, ranging from ‘very bad’ (1) to ‘very good’ (5), ‘very unimportant’ to ‘very important’, and from ‘very foolish’ to ‘very wise’. Attitude ratings were computed as means of these three items.

Perceived importance of ‘organic’ as a purchase criterion. Respondents were asked to estimate the importance of the purchase criterion ‘organically produced’ for milk, meat, potatoes and bread. Response formats were: ‘not at all important’ (1), ‘somewhat important’, ‘rather important’, ‘important’, and ‘very important’ (5). This variable will be referred to as ‘organically produced’.

Intention to buy organic. The intention to buy organic milk, meat, potatoes and bread was assessed on five-point unipolar scales ranging from ‘not at all likely’ (1) to ‘very likely’ (5), and the question asked was ‘*The next time you buy..., how likely is it that you will choose organic...?*’ This variable is termed ‘purchase intention’.

Purchase frequency. Purchase frequency of the organic foods was assessed by the question ‘*When you buy milk/meat/potatoes/bread, how often do you buy organic milk/meat/potatoes/bread?*’ Seven-point unipolar scales were used, ranging from ‘never’ (1) to ‘always’ (7). This variable is referred to as ‘purchase frequency’.

Perceived consequences of buying organic foods in general. Respondents were asked to estimate how likely, and how important they think it is that specific consequences result/would result from their purchase of organic foods. The questions asked were ‘*By purchasing organic foods, I help/would help to...*’, and ‘*When/if you purchase/would purchase organic foods, how important is it to you that this helps to...*’. The same 17 types of consequences were listed for likelihood and importance judgements. Responses were given on five-point unipolar scales ranging from ‘not at all likely/important’ (= 1) to ‘very likely/important’ (= 5). A sixth response option was ‘undecided’. In the analyses, this option has been regarded as neither positive nor negative and has, therefore, been assigned a value corresponding to the central value of the scale (= 3). The consequences described were ‘improve the general state of the environment’, ‘improve circumstances and health of the farm animals’, ‘improve my own or my family’s health’, ‘give myself a good conscience’, ‘avoid risks that may be associated with eating non-organic foods’, ‘reduce the use of artificial fertilisers in agriculture’, ‘reduce the eutrophication of lakes and watercourses’, ‘reduce the pollution of the soil’, ‘reduce the transportation of foods’, ‘reduce the use of petrol and other non-renewable sources of energy’, ‘reduce the amount of waste’, ‘reduce the ozone-hole in the atmosphere’, ‘preserve biodiversity in nature’, ‘reduce the use of herbicides and pesticides in agriculture’, ‘reduce the medication of farm animals’, ‘give

my children better food’, and ‘reduce the risk for illness in my family’.

Self-reported recycling and other EFBs. Respondents were asked how frequently they recycled glass, paper/plastic/metal packages, newspapers/paper, and batteries, and how often they performed eight other EFBs: ‘avoid purchasing products in environmentally non-friendly packages’, ‘purchase environment-friendly labelled products’, ‘save electricity’, ‘donate money to environmental organisations’, ‘discuss environmental problems with my friends or family’, ‘refrain from car driving to spare the environment’, ‘avoid purchasing new products to spare the environment’, and ‘compost or leave domestic refuse for composting’. The questions asked were ‘*When you are about to dispose of the following items, how often do you leave them to be recycled?*’ and ‘*How often do you perform the following actions?*’ Responses were given on five-point unipolar scales ranging from ‘never’ (1) to ‘always/very often’ (5).

Statistical methods

Descriptive statistics, factor analysis, bivariate correlations, multiple regression analysis and independent *t*-tests were used. For all analyses, the level of significance was set to <0.01. Separate exploratory factor analyses (principal component, varimax rotation, oblique solution, factor scores ≥ 0.50) were performed on the items concerned with possible consequences of buying organic foods, the recycling frequency of glass/packages/batteries, and the performance of other EFBs.

Factor analyses

Perceived consequences of buying organic foods. The ratings of likelihood and importance of consequences of buying organic foods in general were subjected to separate principal component analyses (PCA). The solution for the importance ratings did not conform to a logical pattern. The solution for the likelihood ratings had five interpretable factors. The three likelihood factors with Eigenvalues > 1 gave the best interpretation using an oblique rotation. The first factor (environment) reflected environmental pollution, the second (Transportation/Waste) transportation and waste handling, and the third (Health) perceived health aspects (Table 1). Each factor showed good homogeneity (Cronbach’s α -coefficients; Table 1). The intercorrelations between the factors were 0.44 (Environment and Transportation/Waste), 0.56 (Environment and Health) and 0.43 (Transportation/Waste and Health), respectively.

The two statements regarding animal welfare did not load highly on any of the mentioned factors nor did they form a separate factor. Thus, further study of the significance of animal welfare concerns was made impossible.

Self-reported EFBs and recycling. PCA yielded three factors (Table 2), and an oblique rotation resulted in the best

Table 1
Principal component analysis of the rated likelihood of perceived consequences of organic food purchase

Factor name	% ^a	α	Items	Loading
Environment	51	0.90	Improve the state of the environment	0.63
			Reduce the use of artificial fertilisers in agriculture	0.97
			Reduce the eutrophication of lakes and watercourses	0.93
			Reduce the pollution of the soil	0.75
			Reduce the use of herbicides and pesticides in agriculture	0.65
Transportation/Waste	10	0.88	Reduce the transportation of foods	0.92
			Reduce the use of petrol and other non-renewable sources of energy	0.90
			Reduce the amount of waste	0.54
Health	7	0.89	Improve my own or my family's health	0.78
			Give myself a good conscience	0.74
			Avoid risks that may be associated with eating non-organic foods	0.80
			Give my children better food	0.68
			Reduce the risk for illness in my family	0.63

^a % of explained variance.

solution. The first factor, EFB was based on performance of EFBs. The Easy Recycling factor included the recycling of items disposable at easily available collection points, and Advanced Recycling involved the recycling of items that require more effort on the part of the consumer (e.g. fewer collection points). The intercorrelations between the factors were 0.32 (EFB and Easy Recycling), 0.39 (EFB and Advanced Recycling) and 0.43 (Easy and Advanced Recycling), respectively. The reliability of the factors was examined in terms of homogeneity (Cronbach's α -coefficients; Table 2). All coefficients were between 0.69 and 0.75, which indicates good homogeneity.

Bivariate correlations

Correlations were computed between, on the one hand, each of the three factors concerned with the consequences of organic food purchase, and on the other, the variables

attitude, the importance of the purchase criterion 'organically produced', purchase intention, and reported purchase frequency of organic foods. All correlations were significant at $p < 0.0001$ ($r = 0.17$ – 0.57) except those between Transportation/Waste, and purchase intention/purchase frequency of organic milk (detailed data not shown). Correlations were also computed between each of the three factors concerned with EFB, and the four variables regarding attitude/behaviour for each food (Table 3). All correlations involving EFB, and most of those concerned with Advanced Recycling were significant at $p < 0.0001$. However, only a minority of the correlations with Easy Recycling were significant at $p < 0.0001$ most likely because these behaviours were reported to be performed very often by most respondents resulting in a reduction of variance. Since the majority of factors were significantly related to the attitude/behaviour variables, all were entered in the multiple regression analyses.

Table 2
Principal component analysis of self-reported EFBs and recycling

Factor name	% ^a	α	Items	Loading
EFB behaviour	31	0.75	Avoid purchasing products in non-environmentally friendly packages	0.68
			Purchase environmentally friendly labelled products	0.70
			Save electricity	0.49
			Donate money to environment organisations	0.58
			Discuss environmental problems with my friends or family	0.67
			Refrain from car driving to spare the environment	0.68
			Avoid purchasing new products to spare the environment	0.69
Easy recycling	12	0.69	Recycle glass	0.76
			Recycle paper-packages	0.65
			Recycle newspapers and paper	0.87
			Recycle batteries	0.53
Advanced recycling	8	0.72	Recycle plastic packages	0.87
			Recycle metal packages	0.89
			Compost or leave domestic refuse for composting	0.57

^a % of explained variance.

Table 3

Bivariate correlations between, on the one hand factors EFB behaviour, Easy Recycling and Advanced Recycling and, on the other attitude, perceived importance of the purchase criterion organically produced (organic), purchase intention (intention), and purchase frequency (purchase) of organic milk, meat, potatoes, and bread

	EFB behaviour	Easy recycling	Advanced recycling
Attitude—milk	0.39***	0.17***	0.18***
Attitude—meat	0.35***	0.13*	0.14**
Attitude—potatoes	0.40***	0.18***	0.22***
Attitude—bread	0.36***	0.15**	0.18***
Organic—milk	0.36***	0.13*	0.17***
Organic—meat	0.44***	0.18***	0.20***
Organic—potatoes	0.44***	0.12	0.23***
Organic—bread	0.45***	0.16**	0.27***
Intention—milk	0.40***	0.10	0.19***
Intention—meat	0.40***	0.16**	0.19***
Intention—potatoes	0.41***	0.11	0.20***
Intention—bread	0.37***	0.15**	0.22***
Purchase—milk	0.37***	0.12*	0.17***
Purchase—meat	0.39***	0.15**	0.16**
Purchase—potatoes	0.44***	0.16**	0.26***
Purchase—bread	0.40***	0.17**	0.26***

* $p < 0.01$, ** $p < 0.001$, *** $p < 0.0001$.

Results

Likelihood and importance of consequences

For most items, a majority of respondents perceived it to be quite or very likely and important that the stated environmental, health and animal well being consequences will be influenced by their choice of organic foods (Table 4). Only a minority (1–11%) stated that it is not at all likely or

important that the given consequences will result from their purchase of organic foods.

Frequency of recycling and other environmental behaviours

The majority of the consumers reported recycling all the given items regularly. Almost all stated that they often or always recycle glass (95%), newspapers/paper (90%), and batteries (89%). Corresponding figures for paper/plastic/metal packages were 74, 47 and 52%. The EFBs that most respondents performed often or very often were save electricity (54%), purchase environmentally friendly products (46%) and compost or leave domestic refuse for composting (42%). Only a minority declared that they often or very often donate money to environmental organisations (6%) and avoid purchasing new products to spare the environment (10%).

Perceived consequences and EFBs vs attitudes and behaviour towards organic foods

Multiple regression analyses were performed for each of the four organic foods separately to investigate the predictability of the variables attitude, 'organically produced', purchase intention and purchase frequency, on the basis of the demographic variables (age, gender (man = 0, women = 1) and education) and the factor-analytically derived factors. The three education-level responses were converted into a dichotomous variable (without university education = 0, with university education = 1). The six factors and the demographic variables explained between 21

Table 4

Perceived consequences: percent of respondents who stated that it is rather or very likely/important and not at all likely/important that their choice of organic foods will result in the listed consequences, mean scores and S.D.

Consequence	Very/rather likely	Not at all likely	Mean score	S.D.	Very/rather important	Not at all important	Mean score	S.D.
Reduce the use of herbicides and pesticides in agriculture	76	2	4.1	0.99	85	1	4.4	0.82
Reduce the use of artificial fertilisers in agriculture	72	2	4.1	1.03	79	1	4.2	0.90
Improve the general state of the environment	72	2	4.0	0.97	82	1	4.3	0.86
Improve circumstances and health of the domestic animals	72	2	4.0	1.03	83	1	4.3	0.88
Reduce the eutrophication of lakes and watercourses	71	2	4.1	1.04	83	1	4.3	0.86
Reduce the medication of domestic animals	66	2	3.9	1.05	83	1	4.3	0.87
Give my children better food	66	3	3.9	1.08	80	1	4.3	0.92
Reduce the pollution of the soil	65	2	3.9	1.01	82	1	4.3	0.88
Avoid risks that may be associated with eating non-organic foods	56	4	3.7	1.13	62	3	3.8	1.04
Give myself a good conscience	56	7	3.6	1.27	53	7	3.6	1.23
Improve my own or my family's health	52	3	3.6	1.10	79	1	4.2	0.94
Preserve biodiversity in nature	51	4	3.6	1.11	75	1	4.1	0.89
Reduce the risk for illness in my family	46	4	3.4	1.15	79	2	4.3	0.96
Reduce the transportation of foods	36	10	3.1	1.23	67	3	3.9	1.07
Reduce the amount of waste	35	8	3.1	1.17	70	2	4.0	1.00
Reduce the ozone-hole in the atmosphere	33	11	3.0	1.19	70	3	4.1	1.06
Reduce the use of petrol and other non-renewable sources of energy	32	10	3.0	1.21	67	3	3.9	1.06

Table 5
Results of multiple regression analysis (standardised beta coefficients, unless otherwise indicated)

	Milk				Meat			
	Attitude	Organic	Intention	Purchase	Attitude	Organic	Intention	Purchase
<i>R</i> ²	<i>n</i> = 528	<i>n</i> = 481	<i>n</i> = 534	<i>n</i> = 509	<i>n</i> = 533	<i>n</i> = 483	<i>n</i> = 528	<i>n</i> = 489
<i>F</i> (df)	0.32	0.22	0.26	0.21	0.32	0.38	0.28	0.23
Age	26.9 (9, 518)	15.0 (9, 471)	20.6 (9, 524)	14.4 (9, 499)	27.5 (9, 523)	32.5 (9, 473)	22.4 (9, 518)	16.1 (9, 479)
Gender	−0.21*** (0.04)	–	–	–	−0.12* (0.01)	–	–	–
Education	–	–	–	0.14** (0.02)	–	–	–	–
EFB	0.21*** (0.03)	0.23*** (0.03)	0.28*** (0.05)	0.28*** (0.05)	0.15* (0.01)	0.23*** (0.03)	0.20*** (0.02)	0.23*** (0.03)
Easy recycling	–	–	–	–	–	–	–	–
Advanced recycling	–	–	–	–	–	–	–	–
Environment	0.20*** (0.02)	–	–	–	0.14* (0.01)	–	–	–
Transportation/Waste	−0.16* (0.02)	–	−0.16** (0.02)	–	−0.13* (0.01)	–	–	–
Health	0.33*** (0.05)	0.37*** (0.06)	0.35*** (0.06)	0.23*** (0.03)	0.45*** (0.09)	0.52*** (0.12)	0.40*** (0.07)	0.26*** (0.03)
	Potatoes				Bread			
	Attitude	Organic	Intention	Purchase	Attitude	Organic	Intention	Purchase
<i>R</i> ²	<i>n</i> = 486	<i>n</i> = 411	<i>n</i> = 485	<i>n</i> = 432	<i>n</i> = 480	<i>n</i> = 463	<i>n</i> = 483	<i>n</i> = 464
<i>F</i> (df)	0.41	0.33	0.31	0.28	0.39	0.38	0.31	0.24
Age	37.3 (9, 476)	21.4 (9, 401)	23.2 (9, 475)	18.2 (9, 422)	34.0 (9, 470)	30.7 (9, 453)	23.9 (9, 473)	16.3 (9, 454)
Gender	−0.23*** (0.05)	−0.11* (0.01)	−0.18*** (0.03)	−0.11* (0.01)	−0.20*** (0.04)	–	−0.16*** (0.03)	–
Education	0.10* (0.01)	–	–	–	–	–	–	–
EFB	–	–	–	–	–	–	–	–
Easy recycling	0.15** (0.01)	0.28*** (0.05)	0.23*** (0.04)	0.27*** (0.05)	0.12* (0.01)	0.21*** (0.03)	0.19*** (0.02)	0.22*** (0.03)
Advanced recycling	–	–	–	–	–	–	–	–
Environment	–	–	–	0.14* (0.01)	–	–	–	–
Transportation/Waste	0.18** (0.02)	–	–	–	0.21*** (0.02)	–	–	–
Health	–	–	–	–	–	–	–	–
	0.36*** (0.05)	0.37*** (0.06)	0.34*** (0.05)	0.30*** (0.04)	0.35*** (0.05)	0.40*** (0.07)	0.37*** (0.06)	0.19* (0.02)

p* < 0.01, *p* < 0.001, ****p* < 0.0001. Significant contributions by demographic variables, self-reported behaviour and perceived consequences to the prediction of attitudes, perceived importance of the purchase criterion organically produced (organic), purchase intention (intention) and purchase frequency (purchase). (Squared semipartial correlations).

and 41% of the variance. Health was the most important predictor of attitudes, 'organically produced', and purchase intention for the four foods (Table 5). The health factor was also an important predictor of the purchase frequency of the four target foods (Table 5). However, Health and EFB appeared to be equally important predictors of purchase frequency (Table 5). EFB was the second most important predictor of attitudes (only meat), 'organically produced' (all four foods), and purchase intention (all four foods). Age was a significant predictor of attitudes (all four foods), 'organically produced' (potatoes), purchase intention (potatoes, bread), and purchase frequency (potatoes). The younger the respondents the more likely they were to be positive towards organic foods. The factor Environment contributed to the prediction of attitude for all four foods. In a few cases, gender (attitude, potatoes), education (purchase, milk), Transportation/Waste (intention, milk; attitude, milk and meat), and Advanced Recycling (purchase, potatoes) made significant contributions (Table 5).

Comparisons between groups with strong vs weak intentions to buy organic foods

Since the factor analysis of importance ratings regarding the perceived consequences of buying organic foods did not conform to a logical pattern, no consistent factors could be found. Instead, respondents with strong vs weak intentions to purchase each of the four organic foods were compared with regard to their likelihood and importance ratings of the environmental, human health and animal welfare consequences. This was done to make possible comparisons between the two types of ratings. Those who had intention ratings above the median value (three for milk; four for meat, potatoes, bread) were classified as having a 'strong' intention, and those with ratings below as having a 'weak' intention. Overall, those having a strong intention perceived it more likely and stated that it was more important that the environmental, human health and animal welfare consequences would result from their choice of organic foods compared to those with a weak intention. Nearly all of the likelihood ratings for the four target foods (62 of 68, $t(541-590) = 3.6-9.6$, $p < 0.0001$) and most of the importance ratings for organic milk, meat and potatoes differed significantly between the two groups (42 of 51, $t(541-590) = 4.0-7.2$, $p < 0.0001$). However, only five differences of seventeen possible for importance ratings were statistically significant between the groups with strong and weak intentions to purchase organic bread. These findings indicate that the likelihood and importance ratings yielded a similar pattern of results.

Discussion

Concern for one's own or family health was the strongest predictor of attitudes, the importance of the criterion

'organically produced', and purchase intention for the investigated organic foods. Further, health was an important predictor of purchase frequency. In regression analyses including only the three factors based on the likelihood ratings of perceived consequences of buying organic foods (Health, Environment, Transportation/Waste), Health was the strongest predictor of attitudes, purchase intention and purchase frequency (data not shown). This finding corresponds with results from previous research. Grankvist and Biel (2001) demonstrated that the belief that eco-labelled foods are better than conventional foods for one's own health was positively correlated with purchase frequency for eco-labelled milk, meat, potatoes and bread.

Environmental concern is another often stated motive for purchasing organic foods. In the present study, EFB was a predictor of attitudes, the importance of the criterion 'organically produced', purchase intention, and appeared to be equally important as health for purchase frequency. This latter finding may at least partly be a reflection of the fact that both variables concern self-reported behaviour. Our results are in accordance with findings from another recent Swedish study (Grankvist & Biel, 2001) that found a positive and moderately strong correlation between the purchase frequency of eco-labelled foods and the perceived importance of environmental consequences as a purchase criterion.

In the present study, age was also a significant contributor primarily to the prediction of attitudes, but also to the prediction of the importance of the purchase criterion 'organically produced', purchase intention, and purchase frequency. These results suggest that younger respondents are more likely to be positive towards organic foods.

Respondents with a strong intention to purchase organic foods gave higher likelihood and importance ratings for perceived positive environmental, human health and animal welfare consequences than did those with weaker intentions. This indicates that those with strong intentions perceive more benefits from purchasing organic foods than do those with weak intentions.

Our finding that health concern is a better predictor than concern for the environment indicate that egoistic motives seem to be stronger than altruistic motives. Uusitalo (1990) argues that activities in favour of environmental protection generally increase if a person can achieve some private side-benefits from the activity at the same time that (s)he is contributing to the collective goal. The importance of the egoistic (health) motives may be due to their perceived individual benefit. Consumers believing that organic foods are healthier than conventional foods may perceive short-term health consequences when consuming organic foods. On the contrary, the effects of performing more EFBs are mostly of a long-term character and the individual may not even benefit from them during his/her lifetime. Further, egoistic (health) benefits can be achieved by the individual him/

herself, whereas the goal of improving the environment presupposes a collective effort.

A majority of the respondents reported frequent recycling of packages, newspapers/papers and batteries. However, we have previously reported that only a relatively small proportion (8–13%) reported purchasing organic foods frequently (Magnusson et al., 2001). Thus, consumers appear to be more willing to perform altruistic behaviours in the area of recycling than in the area of food choice. This finding is in accordance with results from another Swedish survey (Grankvist, 2001). There are some obvious differences between these categories of behaviour that may explain the demonstrated discrepancy. Recycling implies negligible economic and only small behavioural costs and the alternative to recycling (leaving everything in the garbage) may appear morally unacceptable. Also, in Sweden, money is refunded at the return of glass/PET bottles and aluminium cans. Organic foods may have premium prices and may not be readily available, and alternative behaviours represent established purchase and consumption habits. We have previously demonstrated that ‘organically produced’ was stated to be the least important criterion for the purchase of milk, meat, potatoes and bread, and that the most important purchase criteria (‘good taste’, ‘long shelf-life’, and ‘healthy’) do not match the most common beliefs about organic foods (‘more expensive’ and ‘healthy’) very well (Magnusson et al., 2001). Thus, it is not likely that a majority of consumers are willing to pay more for foods they do not think taste better. Other factors that may help explain the discrepancy between recycling and food choice are that eating implies incorporation of material into our bodies and that eating is strongly influenced by affective factors. Rozin (1990) has pointed out that eating is a highly personal, potentially threatening activity since it involves incorporation of material from the outside world into our bodies. Birch (1981) argues that eating behaviour is very resistant to change because it is characterised by powerful affective, apparently non-cognitive components that are not easily influenced by information, not even information about contingencies or consequences. Thus, establishment of ‘environmental concerns’ as a purchase motive in the food sector is made difficult by the fact that food-related behaviours differ in fundamental respects from e.g. recycling behaviour.

The same methodology (length of questionnaire, reminders, incentive) in other studies of random samples of the Swedish population has resulted in a 12–15% higher response rate (unpublished data). One reason for the lower response rate in the present study may be that a large proportion of people are not particularly interested in or have limited knowledge of organic foods. In previous studies, the themes have dealt with more familiar topics (e.g. attitudes to milk).

In conclusion, perceived health benefits were demonstrated to be more strongly related to attitudes and behaviour

towards organic foods than were perceived environmental benefits. This supports the notion that egoistic motives are better predictors of the purchase of foods than are altruistic motives. However, the frequency of performance of EFBs also contributed to the prediction of purchase of organic foods. Thus, behaviour–behaviour correlations seem to be stronger than ‘belief’-behaviour correlations in the context of environmental concerns.

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