© OECD 2014

Chapter 6

Household behaviour and food consumption

by
Katrin Millock *and* Céline Nauges*

This chapter looks at the impact of instruments directly targeting consumers' choices concerning food consumption, such as organic labelling and raising awareness through public information campaigns. It provides a better understanding of the main determinants for consuming organic food and products that take animal welfare into account, and examines how much more households are willing to pay for these products.

* CNRS-Centre d'Économie de la Sorbonne and Paris School of Economics, France, and Céline Nauges, The University of Queensland, Australia.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

1. Introduction

In a context of growing population, rising incomes and lifestyle changes in large, densely populated countries, food production and consumption exert a growing pressure on the environment. At the same time, a number of food scares following outbreaks of BSE (mad-cow disease), dioxin-contaminated chicken, listeria and salmonella contamination have raised consumers' concern about food quality. Concerns about the environment and about product safety and health have induced some people to change their consumption patterns towards more environment-friendly products, including organic food.

Whereas some characteristics of organic food are recognised through experience (such as freshness and taste), environment-friendliness or health benefits are credence attributes in the sense that they cannot be ascertained directly by the customer who must instead rely only on certification or labelling. Consumers' socio-economic characteristics as well as attitudes are also known to influence organic food purchase.

A better understanding of the main determinants of consumers' behaviour with respect to certain food attributes is important when designing policies to raise consumer awareness through organic food labelling or the provision of public information and education campaigns. This chapter examines what drives organic food consumption and also some insights into household attitudes towards products taking animal welfare into account.

Drawing upon observations from over 12 000 households in eleven countries, the OECD Survey on Environmental Policy and Individual Behaviour Change (EPIC) provides insights into key issues related to the role of policy contexts, including:

- What encourages consumption of organic foods and are there significant differences across different household groups?
- To what extent do general households' attitudes towards the environment affect organic food consumption and consumption of food that takes animal welfare into account?
- What factors affect other aspects of food consumption such as the generation of food waste and "food miles"?
- How much are households willing to pay as a price premium to purchase organic foods? Does willingness-to-pay (WTP) vary significantly across household groups?

- How effective is labelling for organic food? For which type of household? Which labels are the more effective at inducing organic food consumption?

The following sections will analyse successively organic food consumption and its main determinants; the factors that encourage consumption; the associated impacts of food consumption such as food waste and food miles; the role of labelling; the willingness to pay a premium for organic food and for meat and poultry taking animal welfare into account. The last section is a summary of the main conclusions.

A summary of key findings on food consumption is provided in Box 6.1.

Box 6.1. **Residential food consumption: key findings**

Findings from descriptive analysis suggest that:

- Households' stated mean expenditure for organic fresh fruit and vegetables varies across countries and ranges from 13% to 35% of total expenditure on these products (organic and "conventional"). Environmental attitudes and norms seem to be the main determinants of expenditure on organic fruit and vegetables, and meat and poultry that take animal welfare into account. The data suggest a limited impact of socio-economic and demographic factors on mean expenditure for organic food.
- There is wide variation across countries in terms of the levels of recognition and trust in labels. For example, trust in the new EU organic food label varies from 47% in Sweden to 83% in the Netherlands among respondents who recognised it. Since there is a close link between reported expenditures and label recognition and trust, this has implications for policy makers.
- The median willingness-to-pay for organic fruit and vegetables varies from a 5% price increase in Australia and Canada, to a 23% price increase in Korea. The reported median willingness-to-pay for meat and poultry that takes animal welfare into account varies from 10% to 20%.
- Overall, respondents report that approximately 10% of food is thrown away. There is significant cross-country variation, with the median ranging from 6% in France to 14% in Israel and 15% in Korea. Younger respondents report higher levels of food waste. Those concerned with natural resource depletion are less likely to throw food away.

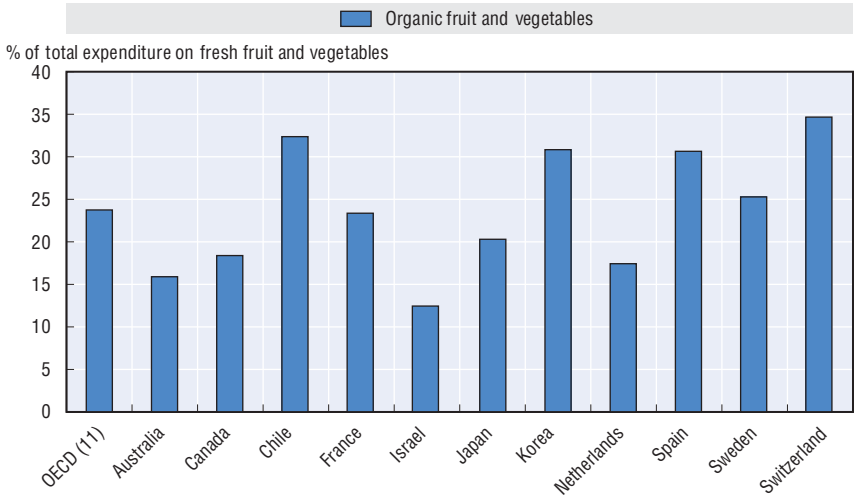
2. Organic food consumption

Respondents were asked to consider their overall expenditures on fresh fruits and vegetables, and provide estimates of the percentage of these expenditures that involved products labelled as organic. These percentages have to be discussed with caution though, since they are stated by the respondents and not measured using scanner-based data.

Simple statistics on mean expenditure

The percentage of households' stated expenditure for organic fruit and vegetables appears to be significantly higher than what the literature generally cites.[1] The results show variation across countries with a mean expenditure ranging between 13% in Israel and 35% in Switzerland (Figure 6.1). Expenditure shares for separate products depend to a large extent on food categories and on the country in question. In the most developed organic food markets in Europe, like Denmark's, budget shares are found to be very low for meat while the highest budget share is recorded for eggs (23%).[2] The expenditure figures in the OECD survey are probably overestimated as a consequence of the use of stated behaviour techniques, or simply as a result of the respondent's confusion of what constitutes an organic label.

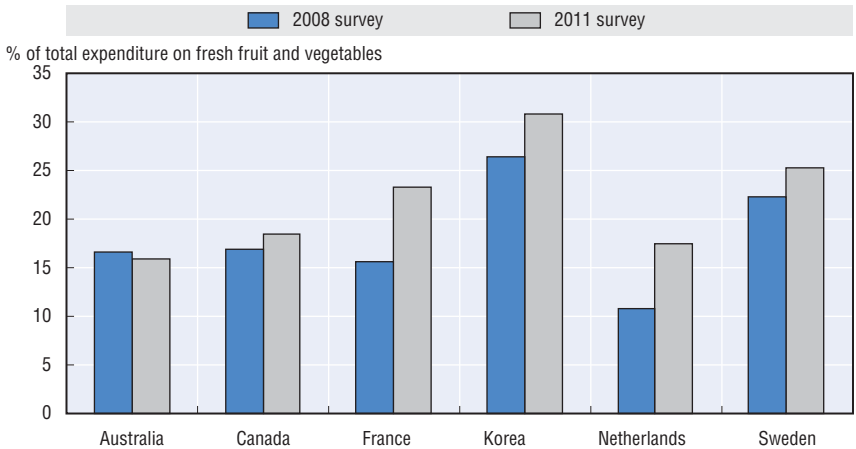
Figure 6.1. **Mean percentage expenditure for organic fruit and vegetables, by country**



In France, the share of total consumption that was estimated to be organic – by means of a survey of stated consumption behaviour – was 24% (Agence Bio, 2009). This is in terms of physical quantities, not expenditure, but it is close to the mean expenditure share found in the 2011 EPIC Survey (23%).

Six of the eleven countries took part in the two rounds of the survey (2008 and 2011). A comparison of expenditure shares can be made with mean expenditure stated by respondents from Australia, Canada, France, Korea, the Netherlands and Sweden in 2008 (Figure 6.2)[3] with some caution as the structure of the question differed.[4] Mean expenditure calculated from the 2008 and 2011 surveys are of the same magnitude in Australia, Canada and Sweden. Reported mean expenditure is higher in 2011 than in 2008 for all

Figure 6.2. **Organic fruit and vegetables: Comparing mean expenditure in the 2008 and 2011 surveys**



countries except Australia and the results suggest that the largest increases over that period of time have occurred in France, the Netherlands and Korea.

In the 2011 survey, respondents were also asked what percentage of their household's expenditure for meat and poultry took animal welfare into account.[5] The stated expenditure share is relatively high and varies from 23% in Japan and Korea to 53% in Switzerland and may be explained by the proliferation of private labels for meat and poultry welfare.

Statistics that may corroborate the stated expenditure shares on meat and poultry that take animal welfare into account are difficult to find. For France, Agence Bio (2009) estimates that the part of consumption that is totally *organic* is 44% for beef, 40% for poultry and 37% for other meat products (these are in terms of total consumption, not expenditure shares). In the EPIC Survey the corresponding mean for France is 34% of expenditure on meat and poultry. Respondents may indeed consider that *organic* also reflects "taking animal welfare into account".

Consumption according to respondents' characteristics

This sub-section identifies how the consumption of organic fruit and vegetables can be related to respondents' and households' socio-economic status and demographic characteristics.

Despite high price premiums for organic food, no significant pattern is found between income and expenditure neither for organic fruit and vegetables nor for meat and poultry labelled as taking animal welfare into account. The same result was obtained by Li and Zepeda (2007) and Monier et al. (2009). Some

studies however found a significant relationship with income: for example, income has a positive impact in Bellows et al. (2008), and in Allender and Richards's (2010) study on animal welfare in the California poultry industry, respondents in the lower income brackets were never willing to pay the price premium for the cage-free attribute. The analysis of the OECD survey does not show any significant relationship between age and the two types of food expenditure, as in Monier et al. for France. This is in contrast with Li and Zepeda who found that younger respondents were more likely to buy organic in a survey of food shoppers in the United States.

Respondents who have completed one or more years of education after high school are not found to have different expenditure patterns. This is not surprising since we are looking across different countries and since the existing literature has produced very mixed findings. More years of education are found to be positively correlated with buying organic in Li and Zepeda (2007), Bellows et al. (2008), Epperson et al. (2008), Monier et al. (2009), but graduate studies tend to indicate a lower probability to buy organic food compared to undergraduate studies in Kidwell and Thompson (1998) and Durham (2007). There are two effects that may explain the mixed findings: further education may be linked to higher environmental awareness and hence to the purchase of organic produce; but higher education levels may also make the consumer more sceptical about the actual environmental benefits of organic farming. For example, better knowledge about agricultural production has been found to decrease willingness to pay both for organic and locally grown products (James, Rickard and Rossman, 2009). Briz and Ward (2009) confirm that higher education increases awareness of organic food and that awareness in turn increases consumption, but only at low-income and education levels.

There is no significant pattern between expenditure shares and household size and composition (presence of children under 5 years old), while the literature has found evidence of a significant relationship in some countries: the presence of children under 18 in the household positively affects the likelihood that a consumer buys an organic product in the United States (Kidwell and Thompson, 1998; Loureiro, McCluskey and Mittelhammer, 2001). The presence of children under six years of age increases the probability to buy organic milk in a study on US scanner data (Kiesel and Villas-Boas, 2007).

The absence of a relationship between having young children and mean expenditure on meat and poultry taking animal welfare into account can be observed.[6] This is not so surprising since animal welfare has more of a "public good" characteristic, while organic food has private good attributes: families with young children may increase expenditure on organic food because of food safety and health concerns. However, this could be offset by a budget effect.

Within the group of respondents who are frequently involved in purchasing decisions, women spend more on average than men for meat and poultry labelled as taking animal welfare into account. This pattern is observed in all the countries surveyed, with less marked differences in Chile, Japan and Korea. Interestingly, this is not the case for expenditure on organic fruit and vegetables. Finally, no significant expenditure pattern based on a household's location in urban (or suburban) areas versus rural areas has been observed.

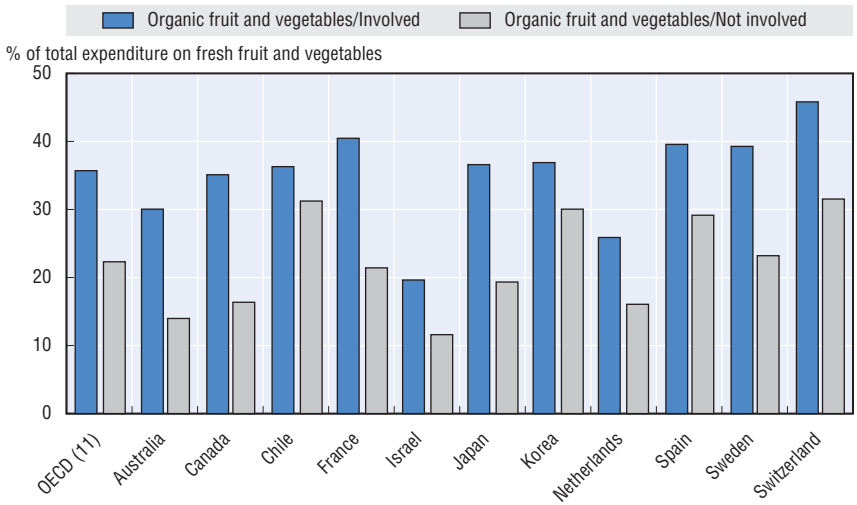
The role of attitudes and values

The impacts of respondents' attitudes and opinions on food expenditure are analysed here. Environmental and health attitudes are known determinants for buying organic (Grunert and Juhl, 1995). On the one hand, Gracia and de Magistris (2008) found that Italian respondents' organic food purchasing behaviour depended more on attitudes towards the healthiness of organic produce rather than its environment-friendliness. This result is similar to those based on scanner data research revealing actual market behaviour; consumers tend to state that they value the public good aspects in a survey, but actually purchase organic food because of its private good attribute – perceived food safety and health benefit (Andersen, Millock and Wier, 2005; Griffith and Nesheim, 2008). On the other hand, Gracia and de Magistris found that the intensity of buying organic increased with environmental attitudes, but did not vary significantly with the attitudes towards the healthiness of organic produce. A similar result was found by Durham (2007) in a survey of shoppers in the Portland, Oregon, area.

Verhoef (2005) is one of the few studies that test several psychological factors on organic meat demand. In a survey of Dutch consumers, he did not find environmental *concern* to be significant in explaining stated purchase behaviour. On the other hand, *green behaviour* affected stated purchase behaviour, and perceived consumer effectiveness had a statistically significant effect both on purchase behaviour and intensity. Emotions, such as guilt, fear and empathy, affected either stated purchase behaviour or the intensity of purchase. In the Dutch study, the importance of the effects was small, though, compared to price and household socio-demographic variables. In a study of German consumers, Kuhling and Welsch (2009) also found a positive significant impact of environmental attitudes together with the behaviour of reference persons (social norms) on the consumption of organic food. The results show a positive correlation between the level of life satisfaction (measured on a 0- to 10-point scale) and mean expenditure for both organic fruit and vegetables, and meat and poultry, taking animal welfare into account. The correlation coefficient is statistically different from 0 but very small in magnitude (around 0.05).

Respondents who have supported or participated in the activities of an organisation of some sort are found to spend more on average for organic fruit and vegetables and for meat and poultry taking animal welfare into account in all countries. This includes but is not restricted to parent-teacher association, environmental organisation, local community association, charitable organisation. Israel stands as an exception for meat and poultry. When considering involvement in an environmental organisation, the same pattern is observed and so are the differences in mean expenditures between those who are involved and those who are not (Figure 6.3).

Figure 6.3. **Mean expenditure on organic fruit and vegetables and involvement in an environmental organisation**

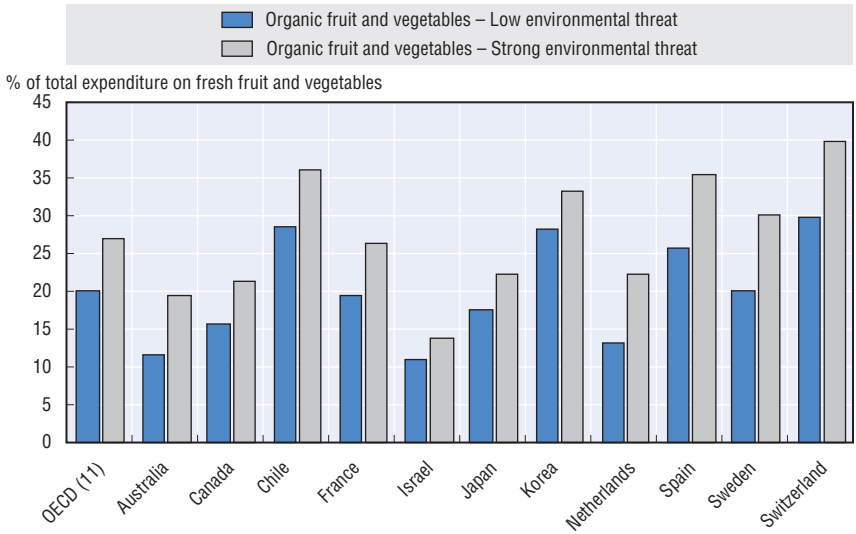


Respondents were asked to indicate what, in their view, are the most serious issues facing the world today.[7] The results suggest that, in general, mean expenditure for organic fruit and vegetables and for meat and poultry taking animal welfare into account is higher for those who view the environment as one of the most serious issues facing the world. No similar patterns can be observed between mean expenditure and the seriousness of health as a global concern. This is not really surprising for animal welfare given that it has more of a "public good" characteristic, but some relationship might have been expected for organic food because its private dimension is reflected in factors such as health benefits. Hammitt and Williams (2001), among others, show that less pesticide residue seems to be the main reason why consumers perceive organic produce as safer.

Respondents were then asked to state the degree of seriousness they attribute to a range of environmental issues[8] and, for each respondent, the index of "seriousness" was constructed.[9] Figure 6.4 shows the mean expenditure for organic fruit and vegetables separately for respondents with a "low environmental threat" perception and those with a "strong environmental threat" perception. For respondents in the "low threat" group, the index of "seriousness" is lower than the index of the median respondent in the country, while it is higher for respondents in the "strong threat" group. Both groups have an equal number of respondents.

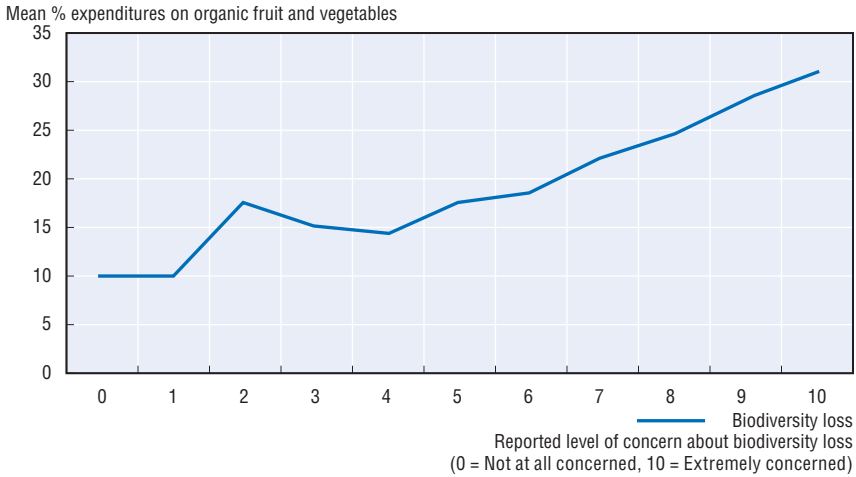
In all countries, respondents who consider that the six environmental issues are "more serious" on average ("strong environmental threat" group) have higher mean expenditure on organic fruit and vegetables. The same patterns can be observed for mean expenditures on meat and poultry taking animal welfare into account.

Figure 6.4. **Mean expenditure for organic fruit and vegetables and seriousness of environmental issues**



Looking more closely at the environmental concerns most directly related to consumption of organic food, one can see that the reported mean percentage of expenditures on fruit and vegetables which are organic increases with the level of reported concern about biodiversity loss (Figure 6.5). However, the relationship with concern about resource depletion is less evident, with those expressing little concern having relatively high expenditures.

Figure 6.5. **Mean expenditure for organic food and level of concern with environmental issues**



The above findings are reinforced when studying respondents' opinion about the following statements (Q26):

- I am not willing to do anything about the environment if others don't do the same.
- Environmental impacts are frequently overstated.
- Environmental issues should be dealt with primarily by future generations.
- I am willing to make compromises in my current lifestyle for the benefit of the environment.
- Policies introduced by the government to address environmental issues should not cost me extra money.
- Environmental issues will be resolved in any case through technological progress.
- Protecting the environment is a means of stimulating economic growth.

In general, more concerned respondents have higher mean expenditure than less concerned respondents, but the effect is less pronounced than is the case for the environmental index described previously. The same type of pattern is found regarding satisfaction with the local environment: those respondents who are more satisfied on average with their local environment have lower expenditure on organic fruit and vegetables. There is no significant relationship as far as expenditure for meat and poultry is concerned, though.

3. Factors that would encourage consumption of organic food

All respondents (including those who did not report that they consume organic food) were requested to indicate how important different factors were in their food shopping choices. The correlation coefficient of the expenditure on organic fruit and vegetables and ranking of these factors in food shopping choices is as follows, all of which are statistically significant:

- Personal health: 0.22
- Freshness and taste: 0.12
- Seasonal and locally produced: 0.26
- Price: -0.06
- Environmental aspects: 0.34
- Familiarity and preferred brands: 0.07

Without much surprise, those respondents ranking health, freshness and taste, seasonal and locally produced food, and environmental aspects as relatively more important factors have higher expenditures on organic fruit and vegetables. The strongest correlations are observed with "environmental aspects" and "seasonal and locally produced". Respondents ranking price as more important have lower expenditure on organic fruit and vegetables (in percentage terms).

More directly, respondents were also asked how important the following factors would be in encouraging them to increase their consumption of organic food (Q90):

- Better availability of organic products *availa*
- Lower price of organic products *price*
- Better appearance of the food *appear*
- Easier identification of organic products *identif*
- More trust in health benefits of organic products *trusthealth*
- More trust in environmental benefits of organic products *trustenvir*
- More trust in certification and labelling of organic products *trustcertif*

In Table 6.1 the factors are ordered from the most important to the least important. In all countries, lower prices would encourage respondents to buy more organic food. Among the factors that would encourage consumption of organic food, the second most important factor relates to trust: higher trust in certification and labelling (in seven countries); higher trust in health benefits (in three countries), and higher trust in environmental benefits in Korea. Trust in health benefits would more strongly encourage consumption of organic food than trust in environmental benefits in Australia, Canada, Israel, Japan,

Table 6.1. **Factors that would encourage consumption of organic food (2011 survey)**

	1 (most important)	2	3	4	5	6	7 (least important)
Australia	price	trustcertif	trusthealth	identify	trustenvir	appear	availa
Canada	price	trustcertif	trusthealth	trustenvir	identif	appear	availa
Chile	price	trustcertif	trustenvir	identify	trusthealth	availa	appear
France	price	trustcertif	trustenvir	trusthealth	identif	availa	appear
Israel	price	trusthealth	trustcertif	trustenvir	appear	identif	availa
Japan	price	trusthealth	trustenvir	trustcertif	identif	availa	appear
Korea	price	trustenvir	trustcertif	trusthealth	identif	availa	appear
Netherlands	price	trusthealth	trustenvir	trustcertif	appear	identif	availa
Spain	price	trustcertif	identif	trusthealth	trustenvir	availa	appear
Sweden	price	trustcertif	trustenvir	trusthealth	identif	appear	availa
Switzerland	price	trustcertif	trustenvir	trusthealth	identif	availa	appear

the Netherlands and Spain. In the other countries (Chile, France, Korea, Sweden and Switzerland), trust in environmental benefits is considered more important than trust in health benefits.

Availability is not considered to be very important by the respondents since it is classified as the least important factor in five countries and as the second least important factor in the other six countries. It is important to bear in mind that respondents are asked about organic food consumption in general, though. Previous studies have established supply problems for organic meat, in particular. Respondents in the survey do not seem to give much importance to this factor.

The results on the most important factors to motivate organic food consumption are very similar to the results of the 2008 OECD Household Survey. Table 6.2 shows the share of respondents who classified each factor as "very important" in 2008.

Price was the most important factor already in 2008, followed by trust in certification and trust in the health benefits provided by organic food. Availability and appearance rank last, just as in the 2011 survey. Price has been the main economic attribute studied in the literature. Some studies find that organic food buyers are less sensitive to price than conventional buyers (Hammitt and Williams, 2000). Scanner data studies of actual purchases find high price elasticities, implying that a 10% increase in price causes a more than 10% decrease in demand (Glaser and Thompson, 2000; Smed and Wier, 2000). On the other hand, a policy experiment in the Netherlands showed very low responsiveness to a reduction in the price of organic food (Bunte et al. 2010), mainly because shoppers who do not buy organic were not well informed about the reduction in price.

Table 6.2. **Factors that would encourage consumption of organic food (2008 survey)**

%

	Better availability of organic products	Lower price of organic products	Better appearance of the food	More trust in health benefits of organic products	More trust in environmental benefits of organic products	More trust in certification and labelling of organic products
Australia	21	55	19	29	28	38
Canada	23	58	20	34	31	42
France	19	68	18	31	31	42
Korea	7	36	7	35	22	18
Netherlands	12	48	16	19	18	22
Sweden	23	55	24	32	34	39

This echoes the result for France in Monier et al. (2009) that shows that marginal price decreases have no effect on the decision to buy organic rather than conventional products, whereas the demand for eggs among organic food consumers was price-elastic as in the Danish and US studies. However, the demand for organic milk was relatively price-inelastic. Organic food is also a substitute for conventionally produced food (Glaser and Thompson, 2000),[10] and sometimes for other eco-labelled food. Loureiro, McCluskey and Mittelhammer (2001) found that eco-labelled produce and organic produce are competing for consumers with similar attitudes towards food safety and that this type of consumer would prefer to buy organic at equal prices.

Respondents in the 2011 survey were also asked how useful information on animal welfare would be on a product label (on a scale from 0: not useful, to 10: very useful). Table 6.3 reports the average score in each country.

Table 6.3. **Usefulness of information on animal welfare**

	Average score (0 to 10)
Australia	7.1
Canada	7.3
Chile	8.2
France	7.0
Israel	7.1
Japan	6.0
Korea	6.1
Netherlands	6.8
Spain	7.4
Sweden	7.4
Switzerland	7.9

No significant correlation was found between the above scores and demographics (age, income). The countries where the information is considered the most useful, on average, are also those with the highest average willingness-to-pay for meat and poultry that take animal welfare into account (Chile and Switzerland).

4. Food waste, food "miles" and animal welfare

Respondents were asked to state whether they agree or disagree with the following statements (see Table 6.4):

a) Consuming meat and other animal products has significant negative environmental consequences.

b) Importing food from distant areas has significant negative environmental consequences.

c) Food waste has significant negative environmental consequences.

The answers have been recoded so that a negative score indicates disagreement (a maximum of 2) and a positive score agreement (a maximum of +2).

Table 6.4. **Opinions on relationship between food consumption and environment**

	Consuming meat, etc.	Importing food	Food waste	Awareness index
Australia	-0.36	0.65	0.56	0.28
Canada	-0.29	0.54	0.61	0.29
Chile	-0.43	-0.04	0.18	-0.10
France	-0.20	1.09	1.19	0.69
Israel	-0.26	0.11	0.72	0.19
Japan	0.03	0.55	0.46	0.35
Korea	0.13	0.21	1.05	0.47
Netherlands	-0.23	0.49	0.89	0.38
Spain	-0.60	0.29	0.10	-0.07
Sweden	-0.18	1.12	1.28	0.74
Switzerland	-0.32	0.96	0.96	0.53

Apart from Korea and Japan, respondents in all countries do not agree that meat consumption has negative environmental consequences. With the exception of Chile (where there is a neutral stance), respondents in all countries agree that importing food from distant areas has significant negative environmental consequences. On average, there is also slight agreement with the statement that food waste has negative environmental consequences. A positive, but not very strong, correlation (0.11-0.13) can be

observed between the aggregated "awareness index" and expenditure on both organic food and meat and poultry that take animal welfare into account.

Food waste can represent a high proportion of household waste and raises particular concerns in some countries like Israel and Korea. In order to provide some insights on this issue, in the 2011 survey, respondents were also asked to estimate the percentage of food bought by their household which was thrown away. While in most of the countries surveyed the median value[11] is 10%, the results presented in Table 6.5 show significant variations with the median ranging from 6% in France to up to 14% in Israel and 15% in Korea.

Table 6.5. **Median percentage of food that is thrown away**

	Median (%)
Australia	10
Canada	10
Chile	11
France	6
Israel	14
Japan	10
Korea	15
Netherlands	10
Spain	10
Sweden	10
Switzerland	7

Environmental concerns are not found to have a significant impact on the proportion of food thrown away by households. Also, there is no significant relationship between food waste and a household's decision to compost its food waste.

The results however suggest that young generations tend to waste more food, as Figure 6.6 illustrates. There is also a positive and significant correlation between food waste and household size, which may reflect the difficulty of planning food consumption over time as household size increases. However, the correlation is generally quite small and is only statistically significant in six of eleven countries.

In general, there is a positive correlation between food waste and expenditure on organic fruit and vegetables. The largest correlation coefficient is for Korea (0.34). In only one case (Switzerland) is the correlation statistically insignificant (see Table 6.6).

Is the generation of food waste related to concern for the environment? In Figure 6.7 the mean percentage food waste is compared with the rank given to environmental issues relative to five other public concerns. Although there

Figure 6.6. **Food waste by age group, OECD(11)**

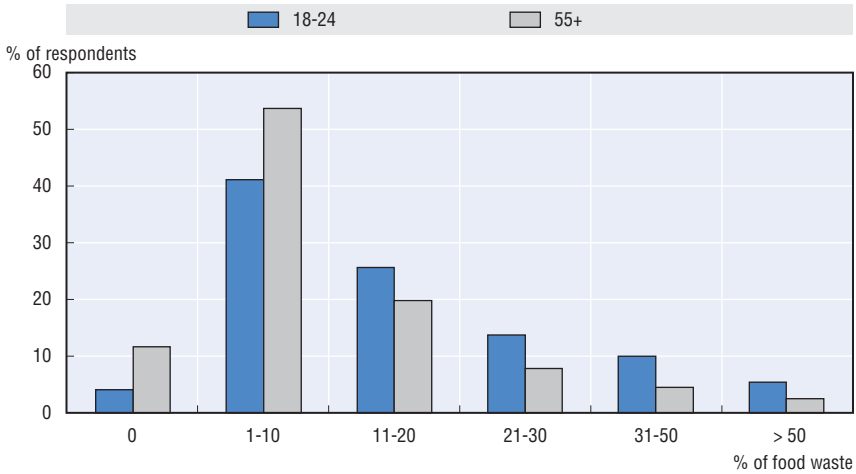


Table 6.6. **Food waste and organic food consumption**

	Correlation coefficient between food waste and expenditure on organic fruit and vegetables
Australia	0.23
Canada	0.18
Chile	0.24
France	0.14
Israel	0.25
Japan	0.17
Korea	0.34
Netherlands	0.14
Spain	0.25
Sweden	0.09
Switzerland	0.05

Note: All significant at 5% level, except for Switzerland.

is a slight upward trend, with those ranking environmental issues relatively low (fourth to sixth) having higher levels of food waste, the differences are not highly significant.

Figure 6.8 compares food waste generation with reported concern for solid waste in general, as well as with natural resource depletion. The only apparent relationship relates to those with a low level of concern for natural resource depletion having significantly higher rates of food waste.

Figure 6.7. **Percentage of food that is thrown away and rank of environmental concerns**

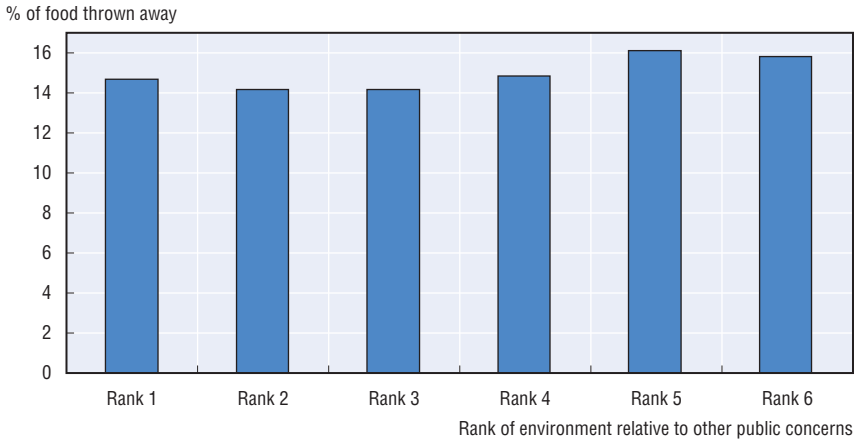
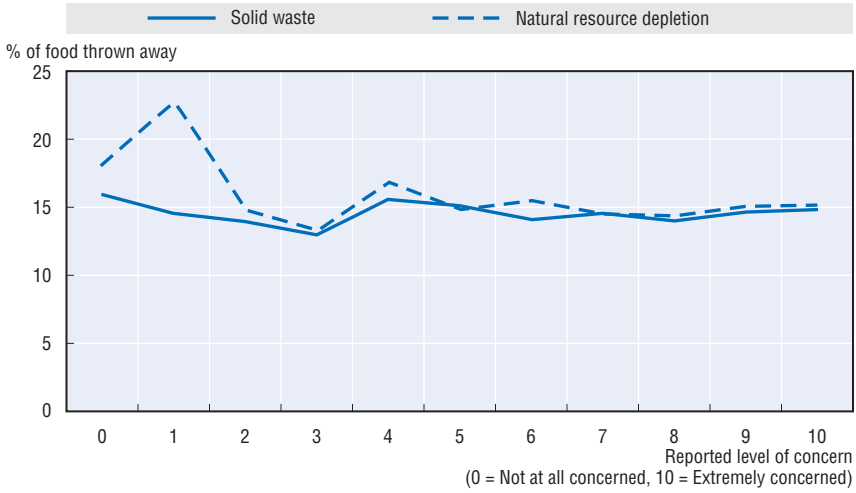


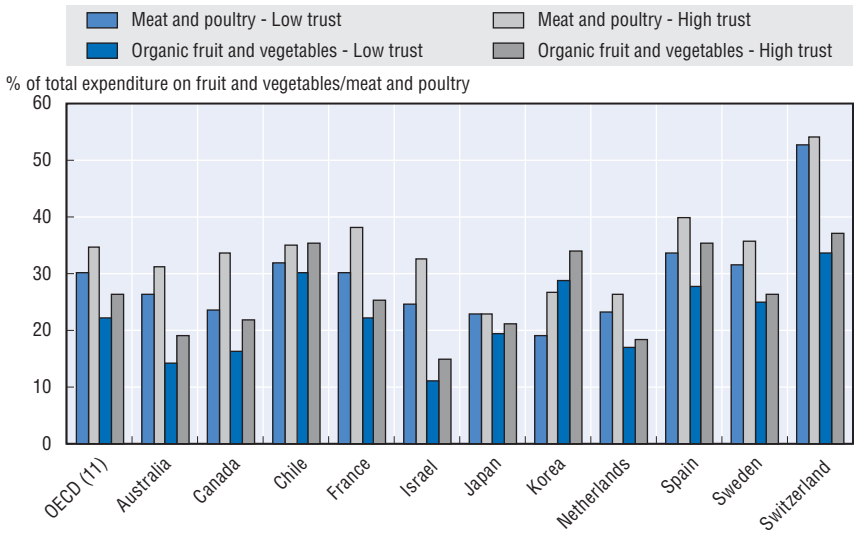
Figure 6.8. **Percentage of food that is thrown away and stated concern for selected environmental issues**



5. Environmental labelling and trust

Respondents were asked how trustworthy they consider a number of sources with regard to information on claims about the environmental impacts of products. In general, respondents indicating higher trust also have higher mean expenditure. Figure 6.9 shows separately the mean percentage expenditure for meat and poultry and organic fruit and vegetables for two groups of respondents: those in the "low trust" group have lower trust in

Figure 6.9. **Mean percentage expenditure and trust in manufacturers and retailers**



manufacturers and retailers than the median respondent in the country, while those in the "high trust" group trust manufacturers and retailers more than the median respondent. In all countries respondents who consider manufacturers and retailers as "more" trustworthy have higher mean expenditure for organic fruit and vegetables as well as for meat and poultry taking animal welfare into account.

Lack of trust in the certification and labelling process is often claimed to be one of the most important barriers to the diffusion of organic food (Giannakas, 2002). For instance, a study on Swedish consumers found that animal welfare concern did not translate into the belief that organic pork is produced under more animal-friendly conditions (Liljenstolpe, 2011). When measuring specific trust in the food production system and trust in the regulatory agencies on a sample of consumers in the Boston area, United States, Hammitt and Williams (2000) found that a low value of the index measuring trust made the individual more likely to be an organic food buyer.

Australia is the only country in which two different national logos for organic food have been displayed. The European Union (EU) food labels (old and new) have been shown to respondents from the four European countries: France, the Netherlands, Spain and Sweden. The Netherlands and Switzerland are the only countries in which there is an official logo for food produced according to animal welfare principles. Hence, the forthcoming analysis is

based on the set of logos that have been displayed at the time the survey took place. Some other organic food labels exist in most countries but have not been presented on-screen to the respondents.

In France and Sweden, more than 90% of the respondents recognise the national organic food label (Table 6.7). This percentage is also quite high in Switzerland (82%). On the contrary, in Australia, Canada, Israel, Japan and Spain, less than 30% of the respondents recognise the national organic food logo.

Table 6.7. **Organic food and animal welfare labels**

	Definition	Logo is recognised	For those who recognised the logo		
			Label is understood	Label is trusted	Label is used
Australia	National organic label (Australian Certified Organic)	28%	96%	81%	52%
Australia	National organic label (NASAA Certified Organic)	11%	89%	83%	61%
Canada	National organic label	29%	96%	79%	51%
Chile	National organic label	32%	96%	92%	70%
France	National organic label	93%	99%	78%	53%
France	EU old organic label	32%	91%	77%	53%
France	EU new organic label	19%	56%	65%	38%
Israel	National organic label	29%	88%	73%	38%
Japan	National organic label	24%	66%	75%	43%
Korea	National organic label	60%	99%	74%	76%
Netherlands	National organic label	64%	84%	85%	46%
Netherlands	Animal welfare label (Beter Leven)	38%	96%	90%	60%
Netherlands	EU old organic label	13%	96%	76%	53%
Netherlands	EU new organic label	8%	55%	83%	41%
Spain	National organic label	28%	96%	88%	66%
Spain	EU old organic label	32%	97%	88%	65%
Spain	EU new organic label	10%	60%	73%	48%
Sweden	National organic label (KRAV)	97%	96%	80%	54%
Sweden	EU old organic label	23%	92%	78%	40%
Sweden	EU new organic label	13%	45%	47%	16%
Switzerland[1]	Nationwide organic label	82%	97%	80%	50%

1. Note that the BioSuisse label is not a government-sponsored label, and that many other organic food labels are used in Switzerland. For example, many grocery store chains in that country use their own organic label.

In the four European countries (France, the Netherlands, Spain and Sweden), the old EU organic food label (that was used on a voluntary basis) is better known than the new one, that was made compulsory for all

pre-packaged organic food products on 1 July 2010. It had been in use only for little more than half a year when the survey was undertaken. Indeed, maybe for reasons of novelty, just as fewer respondents recognise and understand the new label, it is also less trusted than the old one on average. The only exception occurs in the Netherlands, where respondents are more likely to trust the new label than the old one (although fewer respondents state that they understand it). It should also be noted that more respondents trust the new label than claim that they understand it. Incidentally, this is also the case for the Japanese national organic label.

In France, the Netherlands and Sweden, respondents are found to be much more aware of the national organic food labels than of the EU ones. In all countries except Japan, between 84% and 99% of the respondents who recognised the national label were also able to understand it. In general, there are also many respondents who recognised a label and who also trusted it. On average across all countries, about half of the respondents who recognised a logo also used it.

To corroborate the figures on recognition of labels, Agence Bio (2009) estimates that 87% of the French recognise the label AB, and that 39% recognise the old European label. Among consumers of organic food, recognition of the label is 98% for the AB label and 58% for the European label. The figures in the OECD 2011 survey were 93% and 32% of the French sample, respectively.

In some of the countries that have the lowest percentage recognition of labels, consumers may be confused by a multitude of different competing labels. In Australia, for instance, there are as many as six different labels for organic food and the market share of each label varies across the different states.

As in the previous round of the OECD survey, Sweden and France have the highest level of recognition of the national label (97% and 87% respectively in 2008). The level of recognition of the Canadian national organic label has increased to 29% compared to 18% in the 2008 survey (OECD, 2011) while the figures seem to be stable for Australia.

Some simple statistics show that older respondents (55+) are more likely to recognise the national organic label than younger respondents (18 to 34 age group). Respondents aged 35 to 44 are the most likely to use the label in their purchasing decisions. Wealthier respondents are more likely to consider the organic food label in their purchasing decisions, compared to poorer respondents. No correlation was found between the use of organic labels and respondents' level of education.

Dutch respondents were the only group in the survey to whom their country's animal welfare label was shown and questioned about.[12] In the Netherlands, respondents who recognise the national animal welfare label estimate at 34% their household's food expenditures for meat and

poultry labelled as taking animal welfare into account, while the average expenditure share is 18% for respondents who do not recognise the national label. The same magnitude in expenditure shares is observed between respondents who trust the national label (37%) and those who do not (18%).

As far as organic fruit and vegetables are concerned, respondents who recognised the national organic label and those who trust it have higher mean expenditures (Figure 6.10).

Figure 6.10. **Mean percentage expenditure on fruit and vegetables labelled as organic and national organic label recognition and trust**

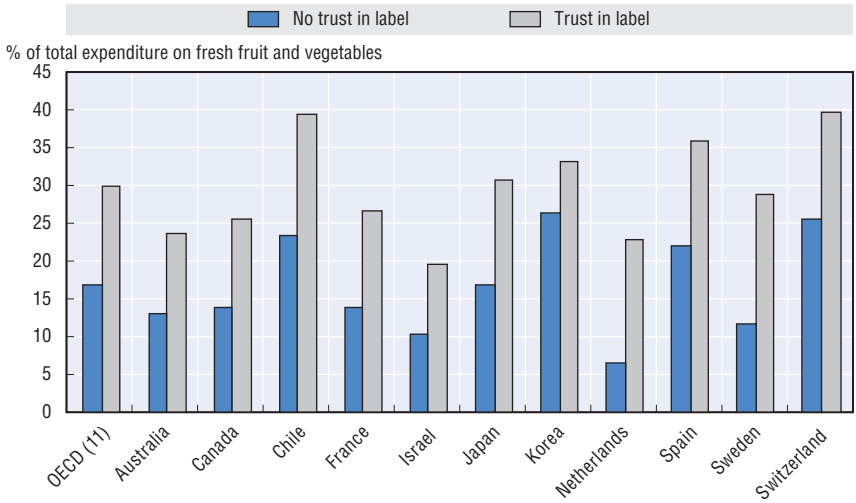


Table 6.8 shows that a similar pattern exists for the European old and new labels.

Table 6.8. **Mean percentage expenditure and European label recognition and trust**

%

	No label recognition	Label recognition	No trust in label	Trust in label
France	19	29	23	32
Netherlands	15	26	18	30
Spain	29	33	24	37
Sweden	22	33	26	37

These findings confirm those found in the literature and in particular that households buying organic food are generally more knowledgeable about organic foods (Chang et al., 2006) and are more likely than conventional

buyers to rate organic food labels as important (Briz and Ward, 2009; Hammitt and Williams 2000). Some studies show that the coexistence of several different labels confuses consumers (Abrams et al., 2010); in the United States claims as to "all-natural" products were seen as less trustworthy and induced some confusion with the organic label.

Respondents from all countries except Chile and Korea were also surveyed about recognition, understanding, trust and use of the Marine Stewardship Council's (MSC) label for seafood from sustainable fisheries (Table 6.9). Those respondents who recognise the MSC label are more likely to choose fish certified as sustainable over other types of fish (the correlation coefficient of 0.22 is highly significant). As expected, the correlation is stronger (0.49) between the decision to buy certified fish and use of the certified fish label. It was also noted that those respondents who recognise the organic label are also more likely to recognise the MSC label (correlation coefficient of 0.21).

Table 6.9. **The Marine Stewardship Council label (MSC) for seafood from sustainable fisheries**

Percent

	Logo is recognised	For those who recognised the logo		
		Label is understood	Label is trusted	Label is used
Australia	6	91	76	59
Canada	8	96	92	72
France	3	73	68	52
Israel	4	69	85	43
Japan	6	86	86	70
Netherlands	13	89	82	65
Spain	10	86	85	67
Sweden	20	91	83	62
Switzerland	30	93	88	71

MSC reports that its own commissioned marketing survey on consumers in the United Kingdom, the United States, Germany, Japan, Canada and France found that 23% of the adult population recognise the MSC label, compared to 8% in 2008.

6. Willingness-to-pay (WTP) for organic produce and animal welfare

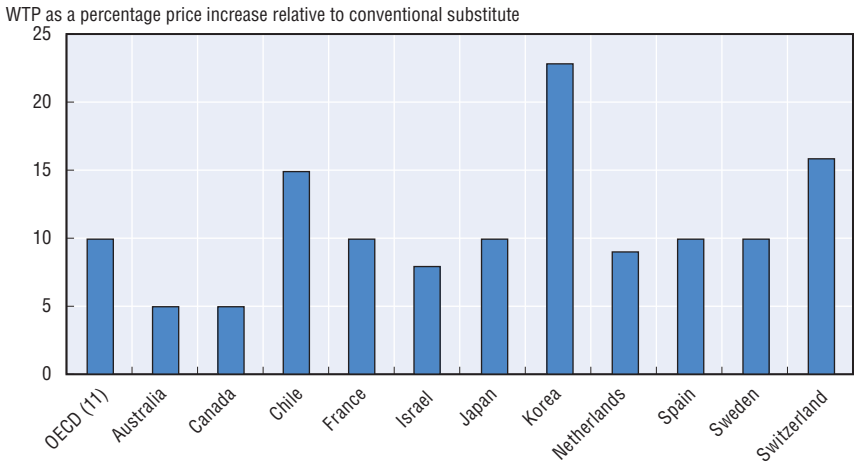
Respondents were asked to state the maximum percentage price increase they would be willing to pay for organic food compared to a conventional substitute. The question was asked only for one food category[13] "fresh fruit and vegetables" as findings in the 2008 round of the survey indicated that

willingness-to-pay was consistent across food groups in the countries surveyed. In the 2011 survey, a similar question was also introduced to analyse the stated willingness-to-pay for meat and poultry labelled as taking animal welfare into account.

Level of willingness-to-pay

The results suggest variations in WTP for fresh fruit and vegetables among countries. Figure 6.11 shows that the median WTP[14] varies from a 5% price increase in Australia and Canada, to a 23% price increase in Korea. The mean WTP varies from 16% in Australia and the Netherlands to 34% in Korea.

Figure 6.11. **Median willingness-to-pay for fresh fruit and vegetables labelled as organic**



For the six countries where both rounds of the survey were implemented (Australia, Canada, France, Korea, the Netherlands and Sweden), some form of comparison can be made with the 2008 results, bearing in mind that the structure of the response format differed in the two rounds.[15]

The share of respondents who are not willing to pay any extra money for organic food is more or less the same between 2008 and 2011, except in the Netherlands where there are fewer respondents not willing to pay extra in 2011. In all countries, respondents are willing to pay more, on average, in 2011 than in 2008 but, again, this may be explained partly by the way answers could be formulated.

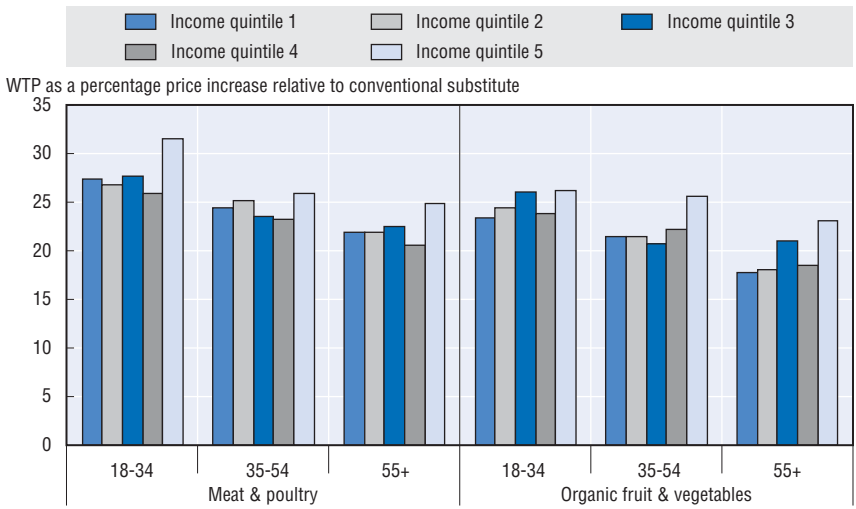
Willingness-to-pay and households' characteristics

The results show no general pattern between income and WTP, except that respondents in the highest income quintile report having a higher WTP

for meat and poultry taking animal welfare into account in all countries except Chile (the second quintile has the highest WTP), Korea (first quintile) and Sweden (second quintile). The wealthiest households state a higher WTP for organic fruit and vegetables in six countries: Canada, Israel, Japan, Korea, the Netherlands and Switzerland.

Figure 6.12 shows some pattern in terms of WTP for different income and age groups for the sample as a whole. Older respondents are willing to pay less in general for animal welfare and organic produce than younger respondents (as in Govindasamy and Italia, 1999). Among each age group, respondents in the fifth quintile have the highest WTP.

Figure 6.12. **Mean willingness-to-pay by age group and income quintile, OECD(11)**

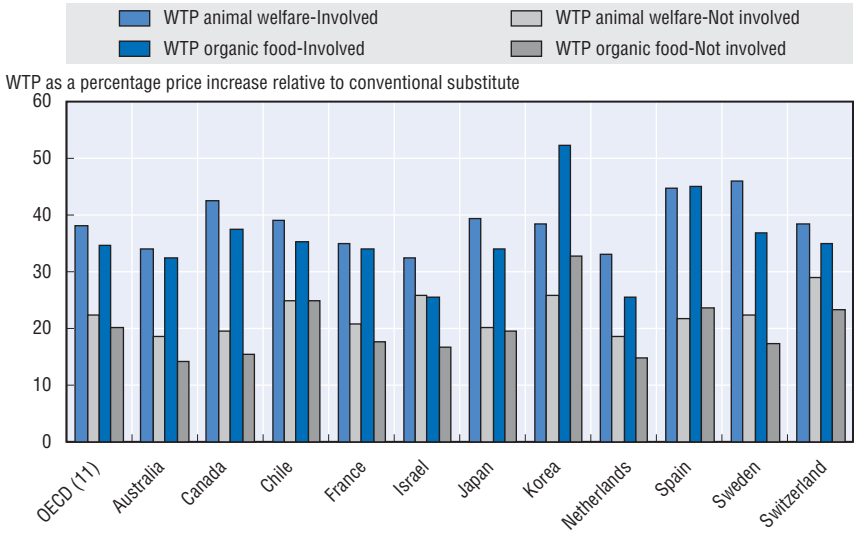


Respondents with at least one year of post high school education have a higher WTP in general, with the exception of Chile and Korea for both meat and poultry and organic fruit and vegetables. As was the case for mean expenditure, there is no significant relationship between household size and composition (presence of young children), and WTP. Within the group of respondents who are frequently involved in purchasing decisions, women state a higher WTP than men for meat and poultry labelled as taking animal welfare into account (28% versus 21% for men) and for organic fruit and vegetables (23% versus 20% for men). On a country-by-country basis, respondents living in urban or suburban areas are found to have a higher WTP for organic fruit and vegetables in general.

The role of attitudes

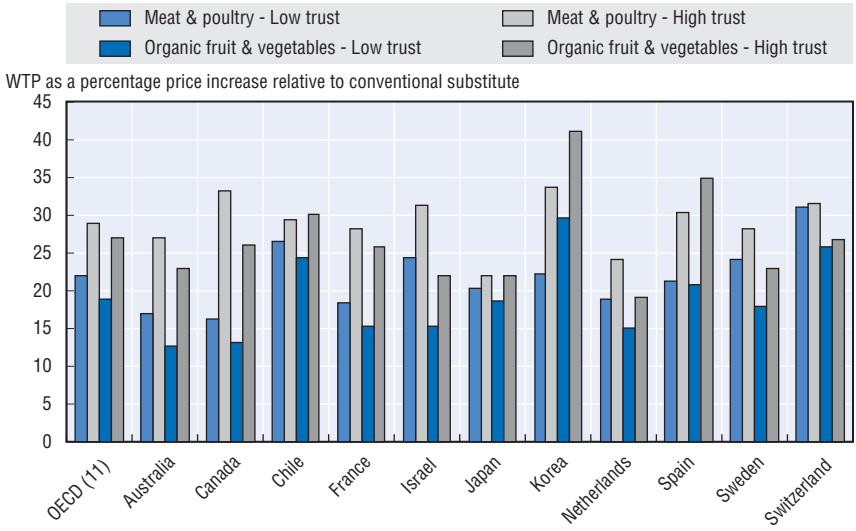
Life satisfaction and WTP are positively correlated but the correlation coefficient is rather small (0.05). While there seems to be no significant relationship between stated WTP and the respondent's decision to vote in an election, WTP is positively correlated with community involvement, and in particular supporting or participating in the activities of an environmental organisation. This is the case for both animal welfare and organic produce (Figure 6.13)

Figure 6.13. **Mean willingness-to-pay and involvement in an environmental organisation**



A similar pattern exists between WTP and seriousness of concern about the environment, as that which was observed for mean expenditures. In general respondents who are more concerned about the environment or who consider environmental issues as more serious state a higher WTP. There also seems to be some pattern between WTP and satisfaction with the local environment: respondents who are more satisfied with their local environment have a lower WTP in general. As for expenditures, a positive, but not very strong, correlation (0.13-0.16) is observed between the aggregated "awareness index" and average WTP for both organic food and meat and poultry that take animal welfare into account. In addition, a positive relationship between trust (in manufacturers and retailers) and WTP seems to hold, as was the case for mean expenditure (Figure 6.14).

Figure 6.14. **Mean willingness-to-pay and trust in manufacturers and retailers**



The role of labelling

Previous work has found that labelling tends to increase consumers' WTP for organic milk (Kiesel and Villas-Boas, 2007). In another study on the United States, consumers displayed a high WTP for animal welfare labelling (Tonsor and Wolf, 2011). In the Netherlands, the only country where an animal welfare label has been displayed, respondents who recognise the national label state a WTP for meat and poultry which are labelled as taking animal welfare into account at 27%, while the mean WTP is 17% for respondents who do not recognise the national label. The same magnitude in WTP is observed between respondents who trust the national label (30%) and those who do not (12%).

As far as organic fruit and vegetables are concerned, it is found that respondents who recognised the label and those who trust the label have a higher WTP in general (Figure 6.15). In France, Korea and Sweden, those who recognised the national organic label have a lower WTP in general. However, these figures have to be interpreted with caution because the percentage of respondents who did not recognise the label is very small in France (7%) and in Sweden (3%). There are thus only a few observations in the group of respondents who did not recognise the national organic label.

The same pattern is observed for the European organic labels (both old and new ones), see Table 6.10.

Figure 6.15. **Mean willingness-to-pay and label recognition and trust**

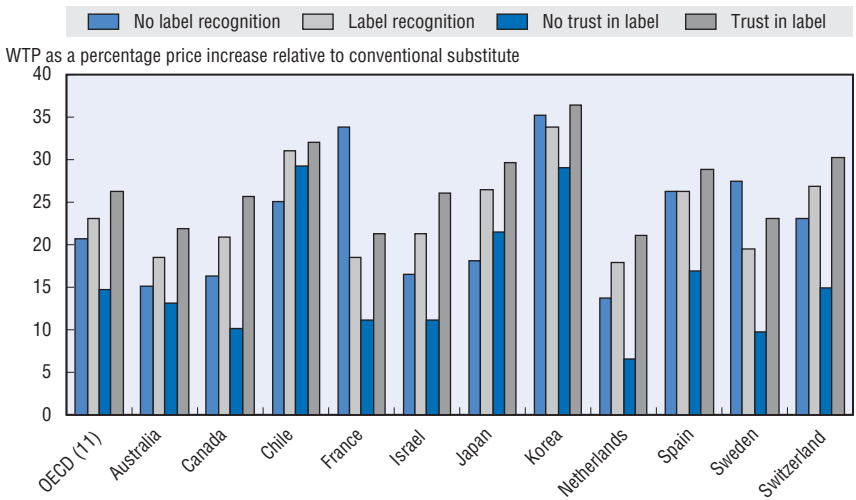


Table 6.10. **Mean willingness-to-pay and European label recognition and trust**

Percent

	No label recognition	Label recognition	No trust in label	Trust in label
France	18	21	16	23
Netherlands	16	20	13	24
Spain	24	31	26	33
Sweden	16	28	18	32

Link between expenditure and willingness-to-pay

There is a significant positive correlation between expenditure and WTP in each country, for both organic fruit and vegetables and animal welfare (Table 6.11). This is not really surprising *per se* in the sense that the respondents who buy this type of products are, by definition, willing to pay the premium for food that takes animal welfare into account and for organic produce.

Reasons for not willing to pay extra

Those respondents who declared that they were not willing to pay extra for organic fresh fruit and vegetables were asked to state why this was the case. For each of the four answers listed below, respondents had to state whether they strongly disagree (-2), disagree (-1), agree (1), strongly agree (2) or have no opinion (0).

- Answer 1: If I had more money I would pay more for organic food
- Answer 2: I do not trust the food is actually grown organically

Table 6.11. **Correlation coefficients between expenditure and willingness-to-pay**

	Animal welfare	Organic produce
OECD (11)	0.39	0.52
Australia	0.40	0.57
Canada	0.47	0.59
Chile	0.32	0.36
France	0.37	0.46
Israel	0.41	0.66
Japan	0.52	0.50
Korea	0.56	0.55
Netherlands	0.51	0.60
Spain	0.34	0.46
Sweden	0.43	0.48
Switzerland	0.24	0.48

- Answer 3: I do not believe organic products are better for health or the environment
- Answer 4: I do not think I should have to pay extra

The corresponding index, which is the simple average of the opinions in each country, is shown in Table 6.12. In all countries except Korea, most respondents are not willing to pay extra because "they do not think they should have to pay extra" (answer 4). In Korea, the main reason for not wanting to accept any price increase is that respondents "do not trust the food is actually grown organically". For respondents in all countries except Chile and Japan, money is not the primary reason for not wanting to pay extra (the index corresponding to answer 1 is negative).

Table 6.12. **Reasons for not wanting to pay extra**

	If I had more money I would pay more for organic food (1)	I do not trust the food is actually grown organically (2)	I do not believe organic products are better for health or the environment (3)	I do not think I should have to pay extra (4)
Australia	-0.37	0.39	0.25	1.30
Canada	-0.48	0.35	0.24	1.22
Chile	0.27	0.10	-0.76	1.18
Israel	-0.33	0.40	0.46	1.39
Japan	0.03	0.11	0.00	1.05
Korea	-0.08	1.29	-0.06	1.16
Netherlands	-0.48	0.52	0.32	1.32
Spain	-0.22	0.53	-0.28	1.29
Sweden	-0.43	0.61	0.11	1.34

7. Conclusions

The analysis focused on how socio-economic factors, attitudes and labelling influence the expenditure and willingness to pay (WTP) for organic fruit and vegetables with some insights on meat and poultry labelled to take animal welfare into account. The descriptive statistics and simple correlations presented point to some policy issues to be further examined by means of appropriate econometric techniques.

Factors explaining expenditure

Households' stated mean expenditures for organic fresh fruit and vegetables vary across countries and range from 13% to 35%. These figures are higher than those reported in the literature and may be an overestimation by households, as often is the case in surveys of stated behaviour, or simply the result of the respondent's confusion of what constitutes an organic label.

Results suggest a limited impact of socio-economic and demographic factors on mean expenditure for organic food. There is no significant correlation between mean expenditure and income, age, education, household size or residence.

Attitudes and behaviour seem to be the main determinants of expenditure on organic fruit and vegetables, and meat and poultry that take animal welfare into account. Previous research shows that it is the perceived private health benefits rather than the environmental benefits that affect actual purchase behaviour. Respondents who are involved in an organisation of some sort (and in particular an environmental association) are found to have higher mean expenditures than respondents who have not supported or participated in such organisations.

Attitudes such as the perceived seriousness of an environmental threat are found to increase the average mean expenditure. In all countries, respondents who consider the listed environmental issues as more serious have higher mean expenditure on average for both organic fruit and vegetables and meat and poultry taking animal welfare into account. In addition, respondents who are more satisfied with the local environment have lower expenditure on organic fruit and vegetables.

Trust has been shown in previous studies to be a major barrier against buying organic food. The OECD survey asked respondents to indicate the trustworthiness of a number of sources with regard to information on claims about the environmental impact of a product. Respondents who expressed higher trust also had a higher percentage of their expenditures on organic fruit and vegetables and meat and poultry taking animal welfare into account. In particular, respondents who consider manufacturers and retailers as more trustworthy have higher mean expenditures on both meat and poultry and

organic fruit and vegetables than respondents with low trust in manufacturers and retailers. Increasing trust in the labelling of organic products appears to be key. Advertising the health and environmental benefits of organic food is a possibility, but this has to be supported by scientific evidence. Restoring trust could be a difficult task, in particular after the identification of an organic farm as the likely source of the *E. coli* outbreak of foodborne illness that occurred in Germany in May-June 2011. Increasing trust in certification and labelling seems to be an important policy objective, in particular in Korea. The increasing number of (private and public) labels in relation to agricultural practices and food quality may have induced some confusion among consumers.

The main factors that would encourage further consumption of organic food have not changed since the 2008 OECD Household Survey: it is still a lower price, and more trust in the certification and labelling of organic products comes second. This result is compatible with the stated factors driving food choice, primarily "freshness and taste", "price" and "health". Hence, consumers may be willing to buy organic food as long as they believe or trust that these products are fresh and tasty, as well as good for their health, and as long as they can afford the price.

Affordability of organic food is found to be the most important concern for households in the lowest income quintile and for respondents aged 18 to 24. The fact that organic food is perceived as "too expensive" may not only reflect a problem of affordability. Indeed, there seems to be, in a number of cases, some misunderstanding or lack of knowledge. Some respondents do not seem to understand why organic food is more expensive than conventional food. In the follow-up questions on willingness to pay for organic food, the most common reaction in all countries, except Korea, is "I don't think I should have to pay extra". This may reflect a need for improved communication between the agricultural sector and the general public who does not seem to be aware of the higher costs induced by organic farming compared to conventional farming. It may also be a result of the more widespread distribution of organic products in standard food chain outlets and a concern that part of the price premium does not correspond to the higher cost of production. Differences in perception of organic produce could be further explored in more formal econometric analysis.

Food waste and miles

The responses to the survey indicate that only in Korea and Japan do people generally agree with the statement that meat consumption has negative environmental consequences. However, a majority of respondents in all countries agree that importing food from distant areas has significant negative environmental consequences. On average, there is also slight agreement with the statement that food waste has negative environmental consequences.

The results however suggest that young generations tend to waste more food. There is also a positive and significant correlation between food waste and household size, which could reflect the difficulty of planning food consumption over time as household size increases. However, the correlation is generally quite small and is only statistically significant in six of eleven countries. Also, no significant relationship is found between food waste and a household's decision to compost its food waste.

In general, there is a positive correlation between food waste and expenditure on organic fruit and vegetables. Comparing food waste with the rank given to environmental issues relative to five other public concerns, it is found that those ranking environmental issues relatively low (i.e. fourth to sixth) have higher levels of food waste. With respect to specific environmental issues, the only apparent relationship relates to those with a low level of concern for natural resource depletion having significantly higher rates of food waste generation.

The role of labelling

The results on labelling differ according to the country and the label considered (national organic label, EU organic label). A number of labels (public or private) may coexist in the countries studied, but the analysis presented here is based on a subset of labels that was shown to the respondents. In some of the countries that have the lowest recognition of labels, consumers may be confused by a multitude of different competing labels. In the case of Australia, for example, there are in fact six different labels for organic food (the market share of each label varies across states).

Results show significant variation across countries in terms of label identification: on the one hand, in France and Sweden more than 90% of the respondents recognise the national organic food label. Label recognition is also quite high in Switzerland (82%). On the other hand, the national organic food logo is recognised by less than 30% of the respondents in Australia, Canada, Israel, Japan and Spain. The old EU label is better known than the new one in the four European countries, but it is difficult to draw conclusions since the new one had been in use only for little more than half a year when the survey was undertaken.

On average across all countries, about half of the respondents who recognised a logo also used it. Older respondents (55+) are more likely to recognise the national organic label than younger respondents (18-34). Those aged 35 to 44 are the most likely to use the label in their purchasing decisions. Wealthier respondents are more likely to consider the organic food label in their purchasing decisions, compared to poorer respondents. In order to use a label, consumers also need to trust its claims. Indeed, respondents who

recognise the national organic label (or the European organic label) and those who trust it have higher mean expenditure than those who do not recognise the label and do not trust it. A general policy conclusion, despite the differences between countries, is that there is scope for increased awareness and knowledge of organic food labels, in particular among young respondents (18 to 34).

Willingness-to-pay

The median WTP for meat and poultry that take animal welfare into account varies from 10% to 20% (in Switzerland) while the mean WTP varies from 20% in Australia to 31% in Switzerland. There is much more variation in the WTP for organic fresh fruit and vegetables across countries. The median WTP for fresh organic fruit and vegetables varies from a 5% price increase in Australia and Canada, to a 23% price increase in Korea. The corresponding mean WTP varies from 16% in Australia and the Netherlands to 34% in Korea.

Older respondents are willing to pay less in general for organic produce and animal welfare than younger respondents. Among each age group, respondents in the highest income quintile have the highest WTP. Community involvement, in particular involvement in an environmental organisation, is positively correlated with WTP for both organic produce and animal welfare. Trends between WTP and the perceived seriousness or concern about the environment are similar to those observed for mean expenditure. Higher trust also seems to indicate higher WTP for both types of products.

Respondents who recognise the label and who trust it also have a higher WTP in general. In the Netherlands, the only country for which an animal welfare label was displayed, respondents who recognise and trust the label stated a higher WTP than those who do not recognise it and do not trust it. The results for WTP for both animal welfare and organic fruit and vegetables are thus strikingly similar to the factors that determine stated expenditure.

However, in order to draw firm policy recommendations, the findings of the descriptive analysis need to be further examined using multivariate econometric analysis. This work is ongoing.

Notes

1. Bunte et al. (2010) state an overall budget share on organic food of 2.3% in 2009 in the Netherlands and 3.4% in Switzerland. In Sweden, the total expenditure share on organic food was 3.4% in 2008 and 4.0% in 2009 according to Statistics Sweden. Expenditure shares for separate products vary to a large extent depending on product. According to Smed and Wier (2000), for fresh produce, the organic budget share was 4% in the Netherlands in 1997-2000, compared with 17% in the survey. Part of this difference is certainly attributable to the lapse in time.

2. Smed and Wier (2000) find that Denmark had very low organic meat budget shares over the 1997-2000 years (5.8% for lamb and 2.2% for minced meat) and the highest budget share for organic milk and eggs (23%).
3. Note that the set of respondents is not the same in 2008 and in 2011. Hence the comparison between the two surveys will be meaningful only if the sample of respondents in each country is representative of the population in each country. As noted in Introduction and Annex A, the sample is close to being representative.
4. The 2011 questionnaire used a slider while in the 2008 questionnaire answers on expenditure for organic fruit and vegetables were in the form of intervals for all values except 0% and 100%: [1% to 5%], [6% to 10%], [11% to 25%], [26% to 50%], [51% to 75%] and [76% to 99%]. The mid-point of each interval is considered in order to calculate the mean expenditure in each of the six countries.
5. No direct questions were asked on meat and poultry labelled to take animal welfare into account in the 2008 OECD questionnaire.
6. The absence of relationship remains for both types of food expenditure, even when controlling for household size.
7. Respondents had to rank the following six issues from 1 (the most important) to 6 (the least important) (Q22): *a)* International tensions; *b)* Economic concerns; *c)* Environmental concerns; *d)* Health concerns; *e)* Social issues; and *f)* Personal safety.
8. Respondents had to state the degree of seriousness they attribute to the following environmental issues on a scale from 0 to 10 (Q23): *a)* Waste generation; *b)* Air pollution; *c)* Climate change (global warming); *d)* Water pollution; *e)* Natural resource depletion (forest, water, energy); and *f)* Endangered species and biodiversity.
9. The index was constructed by calculating the simple average of the scores given to the six issues in Q23. A higher index indicates that the respondent considers the listed environmental problems are "more serious".
10. In economic terms, they are close substitutes, with high cross-price elasticities.
11. The median value is reported rather than the mean since there are some outliers in the responses.
12. Animal welfare labels are also available in other countries, for example in Switzerland, but these labels were not known by the researchers at the time the 2011 survey was administered.
13. The 2008 OECD survey included other food categories such as "eggs" and "milk and dairy products".
14. Calculation includes those reporting a willingness-to-pay equal to zero.
15. A slider was used in the 2011 survey with a continuous scale from 0% to 200% (or more) while intervals were presented to respondents in the 2008 survey: 0%, [1% to 5%], [6% to 15%], [16% to 30%], [31% to 50%], [>50%].

References

Abrams, K.M., C.A. Meyers and T.A. Irani (2010), "Naturally Confused: Consumers' Perceptions of All-Natural and Organic Pork Products", *Agriculture and Human Values*,Vol. 27, No. 3, pp. 365-374.

Agence Bio (2009), *Baromètre de consommation et de perception des produits biologiques en France*, Rapport n° 0901164 – Edition 2009.

Allender, W.J. and T.J. Richards (2010), "Consumer Impact of Animal Welfare Regulation in the California Poultry Industry", *Journal of Agricultural and Resource Economics*,Vol. 35, No. 3, pp. 424-442.

Andersen, L.M., K. Millock and M. Wier (2005), "Information Provision, Consumer Perceptions and Values – the Case of Organic Foods", In Krarup, S. and C. Russell (Eds.) *Environment, Information and Consumer Behaviour*, Edward Elgar New Horizons in Environmental Economics, pp. 161-178.

Bellows, A.C. et al. (2008), "Understanding Consumer Interest in Organics: Production Values vs. Purchasing Behavior", *Journal of Agriculture and Food Industrial Organization*,Vol. 6, No. 1, Article 2.

Boccaletti, S. (2008), "Environmentally Responsible Food Choice", *OECD Journal: General Papers*, Vol. 2008, No. 2, pp. 117-152.

Briz, T. and R.W. Ward (2009), "Consumer Awareness of Organic Products in Spain: An Application of Multinomial Logit Models", *Food Policy*,Vol. 34, No. 3, pp. 295-304.

Bunte, F.H.J. et al. (2010), "Limits to Growth in Organic Sales", *De Economist*,Vol. 158, No. 4, pp. 387-410.

Chang, H.S., C. Leviten-Reid and L. Zepeda (2006), "Organic Food Demand: A Focus Group Study Involving Caucasian and African-American Shoppers", *Agriculture and Human Values*, Vol. 23, No. 3, pp. 385-394.

Durham, C. (2007), "The Impact of Environmental and Health Motivations on the Organic Share of Produce Purchases", *Agricultural and Resource Economics Review*,Vol. 36, No. 2, pp. 304-320.

Epperson, J.E. et al. (2008), "Modeling Fresh Organic Produce Consumption with Scanner Data: A Generalised Double Hurdle Model Approach", *Agribusiness*,Vol. 24, No. 4, pp. 510-522.

Giannakas, K. (2002), "Information Asymmetries and Consumption Decisions in Organic Food Product Markets", *Canadian Journal of Agricultural Economics*,Vol. 50, No. 1, pp. 35-50.

Glaser, L.K. and G. Thompson (2000), *Demand for Organic and Conventional Beverage Milk*, Selected paper presented at the Western Agricultural Economics Association Annual Meeting, Vancouver, British Columbia, 29 June-1 July.

Govindasamy, R. and J. Italia (1999), "Predicting Willingness to Pay a Premium for Organically Grown Fresh Produce", *Journal of Food Distribution Research*, Vol. 30, No. 2, pp. 44-53.

Gracia, A. and T. de Magistris (2008), "The Demand for Organic Foods in the South of Italy: A Discrete Choice Model", *Food Policy*,Vol. 33, pp. 386-396.

Griffith, R. and L. Nesheim (2008), *Household Willingness to Pay for Organic Products*, CEPR Discussion Paper 6905, CEPR.

Grunert, S.C. and H.J. Juhl (1995), "Values, Environmental Attitudes, and Buying of Organic Foods", *Journal of Economic Psychology*,Vol. 16, pp. 39-62.

Hammitt, J.K. and P.R.D. Williams (2000), "A Comparison of Organic and Conventional Fresh Produce Buyers in the Boston Area", *Risk Analysis*,Vol. 20, No. 5, pp. 735-746.

Hammitt, J.K. and P.R.D. Williams (2001), "Perceived Risks of Conventional and Organic Produce: Pesticides, Pathogens, and Natural Toxins", *Risk Analysis*,Vol. 21, No. 2, pp. 319-330.

James, J.S., B.J. Rickard and W.J. Rossman (2009), "Product Differentiation and Market Segmentation in Applesauce: Using a Choice Experiment to Assess the Value of Organic, Local and Nutritional Attributes", *Agricultural and Resource Economics Review*,Vol. 38, No. 3, pp. 357-370.

Kidwell, J. and G. Thompson (1998), "Explaining the Choice of Organic Produce: Cosmetic Defects, Prices and Consumer Preferences", *American Journal of Agricultural Economics*,Vol. 80, No. 2, pp. 277-287.

Kiesel, K. and S. Villas-Boas (2007), "Got Organic Milk? Consumer Valuations of Milk Labels after the Implementation of the USDA Organic Seal", *Journal of Agricultural and Food Industrial Organization*,Vol. 5, pp. 1-38.

Kuhling, J. and H. Welsch (2009), "Determinants of Pro-Environmental Consumption: The Role of Reference Groups and Routine Behavior", *Ecological Economics*,Vol. 69, No. 1, pp. 166-176.

Li, J. and L. Zepeda (2007), "Characteristics of Organic Food Shoppers", *Journal of Agricultural and Applied Economics*,Vol. 39, No. 1, pp. 17-28.

Liljenstolpe, C. (2011), "Demand for Value-Added Pork in Sweden: A Latent Class Model Approach", *Agribusiness*,Vol. 27, No. 2, pp. 129-146.

Loureiro, M. L., J. McCluskey and R. C. Mittelhammer (2001), "Assessing Consumer Preferences for Organic, Ecolabeled and Regular Apples", *Journal of Agricultural and Resource Economics*, Vol. 26, No. 2, pp. 404-416.

Monier, S. et al. (2009), "Organic Food Consumption Patterns", *Journal of Agricultural and Food Industrial Organization*, Vol. 7, No. 2, pp. 12.

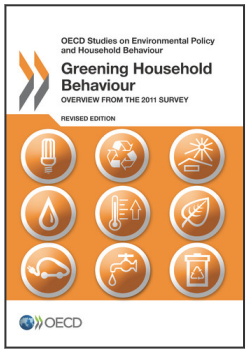
OECD (2011), *Greening Household Behaviour: The Role of Public Policy*, OECD Publishing. doi: *10.1787/9789264096875-en*.

Smed, S. and M. Wier (2000), *Forbrug af økologiske fødevarer, Del 2: Modellering af efterspørgseln* ("Consumption of Organic Foods, Part 2", In Danish, with English summary), Technical Report No. 319.

Thompson, G. (1998), "Consumer Demand for Organic Foods: What We Know and What We Need to Know", *American Journal of Agricultural Economics*,Vol. 80, No. 5, pp. 1113-1118.

Tonsor, G.I. and C. Wolf (2011), "On Mandatory Labelling of Animal Welfare Attributes", *Food Policy*,Vol. 36, No. 3, pp. 430-437.

Verhoef, P.C. (2005), "Explaining Purchases of Organic Meat by Dutch Consumers", *European Review of Agricultural Economics*,Vol. 32, No. 2, pp. 245-267.



From:

Greening Household Behaviour

Overview from the 2011 Survey - Revised edition

Access the complete publication at:

https://doi.org/10.1787/9789264214651-en

Please cite this chapter as:

Millock, Katrin and Céline Nauges (2014), "Household behaviour and food consumption", in OECD, *Greening Household Behaviour: Overview from the 2011 Survey - Revised edition*, OECD Publishing, Paris.

DOI: https://doi.org/10.1787/9789264214651-10-en

This work is published under the responsibility of the Secretary-General of the OECD. The opinions expressed and arguments employed herein do not necessarily reflect the official views of OECD member countries.

This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

You can copy, download or print OECD content for your own use, and you can include excerpts from OECD publications, databases and multimedia products in your own documents, presentations, blogs, websites and teaching materials, provided that suitable acknowledgment of OECD as source and copyright owner is given. All requests for public or commercial use and translation rights should be submitted to rights@oecd.org. Requests for permission to photocopy portions of this material for public or commercial use shall be addressed directly to the Copyright Clearance Center (CCC) at info@copyright.com or the Centre français d'exploitation du droit de copie (CFC) at contact@cfcopies.com.