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Why do (don't) we buy organic food and do we get what we bargain for?

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Preface

The market of organic foods is expanding in Sweden and for further market development it is important to know more about consumers' motives for buying organic products, and also the barriers for not buying organic food. To understand consumer behaviour is difficult, and is complicated by the fact that consumers may have perceptions of quality characteristics of organic food products that are not guaranteed by organic certification and labelling. The organic certification regulates the production processes, not the quality of products, nor the environmental effects.

EPOK has initiated this popular science knowledge synthesis to give an overview of existing literature on consumers' motives and discuss to what extent some of these motives can be supported by scientific evidence, e.g. health and nutritional, environmental or animal welfare motives. The report is as far as possible based on existing international reviews, with specific references to some regional differences, including specific comments for the Swedish context. It provides an overview of some important aspects of the present and future development of the organic market but should not be viewed as an exhaustive review.

It is concluded that some of the organic food characteristics behind these motives are well supported in the scientific literature, e.g. benefits for biodiversity and low incidence of pesticide residues in food, while other qualities cannot be considered to be clearly and consistently supported by scientific research. These conclusions set limits for how organic food could be marketed.

The report is written for a broad target group, namely stakeholders in the whole food chain, consumer organisations as well as retailers, public authorities and agricultural organisation. Ruben Hoffmann is the main author of the synthesis with Maria Wivstad as co-author. The authors gratefully acknowledge the contribution of Karin Ullvén and Axel Mie in preparing this report and thank Anna Wallenbeck, Stefan Gunnarsson, Cecilia Sundberg and Birgitta Johansson for their assistance and feedback. ■

Uppsala, November 2014
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1. Introduction

For public policy, as well as for marketing efforts by private firms, it is crucial to understand consumer food choices. Although human behaviour in the context of food purchases has been extensively researched in a multitude of disciplines, it still remains a frontier for scientific enquiry due to its complexity. It is generally accepted that food habits to a large extent are determined by attitudes acquired in childhood and that these later in life evolve depending on changing circumstances and experiences[1]. The heterogeneity of changing consumer preferences and the vast number of different food products purchased over a lifetime makes it challenging to fully understand consumer behaviour[2, 3].

The complex consumer

That the quality of food perceived by consumers reach beyond the quality inherent in the product bought in the store (e.g. prior expectations, meal preparation, eating situation), that food products are of relatively low value, that consumers to a large extent buy products from multiple locations, and the typically limited involvement in choice of food products, further complicates the understanding of food purchases[4, 5, 6]. Despite all the time that consumers spend shopping for food and preparing meals, a consumer in the store typically do not spend much more than a couple of seconds in deciding which product to choose[7,8]. With respect to organic food, understanding consumer food choice is also complicated by the fact that consumers may have perceptions of quality characteristics of organic products that are not guaranteed by organic labels relying on certification of the production process rather than characteristics of the products.

Motives, barriers and reflections...

The objective of this work is to review the existing literature in order to i) present the main motives consumers raise for buying organic foods and discuss to what extent some of these main motives can be supported by scientific evidence, ii) present barriers explaining why consumers do not buy (more) organic food and discuss some of these in relation to the Swedish market, and iii) present some reflections on and implications of the findings concerning motives and barriers. The discussion is as far as possible based on existing reviews of the scientific literature covering the different aspects of interest, but it should not be viewed as an exhaustive literature review. ■

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2. Consumer motives – supported by scientific evidence?

There exists an extensive literature that attempts to explain why consumers choose organic rather than conventional food products. The reasons for buying organic can be due to pull factors, i.e. that consumers prefer organic food because it is perceived, true or false, to have some desirable features not found in non-organic food, e.g. being more nutritious. It can also be due to push factors, i.e. that consumers for some reason want to avoid conventional products because they perceive this production system to be associated with some undesirable features such as pesticide residues. Although the motives to some extent depend on demographics and the cultural setting, the most frequent reasons stated are, according to a review from 2011[2], personal health, product quality (taste, freshness), and environmental concerns. These reasons are widely supported by numerous studies and have been consistent over time. A more comprehensive list of motives was presented in an extensive literature review from 2007[3], see Table 1.

It should be kept in mind that not all of the motives mentioned in Table 1 are normally included in consumer studies but rather one or a few of these motives are examined. In the following we will briefly discuss to what extent some of these main motives for purchasing organic food listed in Table 1 correspond to scientific evidence. Specifically, we limit this review to the first five of these motives, as these are the ones most commonly found in the literature.

2.1 Health, nutrition and food safety

Health motives including nutritional aspects have in a large number of studies been found to be the primary reason for consumers to buy organic food. These may for example be due to consumers associating pesticides used in conventional production with long-term and unknown health effects or that organic food is perceived to be more nutritious. Perceived healthiness of organic food is, as pointed out in a Swedish study from 2001[9], a quality parameter for many consumers.

"A sleeping giant"

Food safety and the lack of confidence in conventional production technologies is the fourth consumer motive for buying organic foods listed in Table 1. This is briefly discussed here, as the distinction between health and safety is not clear cut, and many studies do not clearly define the "food safety" construct but leave it to the respondents to interpret[3]. Debates in the media concerning food scares, production practices etc. have led to increased consumer awareness of food safety issues. A high level of consumer concern regarding food safety can be viewed as an indication of consumers' dissatisfaction with how the current food system responds to threats of food borne contamination[10]. Food safety is according to the Danish researcher

	Motives
i)	Health and nutritional concerns
ii)	Superior taste
iii)	Concern for the environment
iv)	Food safety and lack of confidence in the conventional food industry
v)	Animal welfare concerns
vi)	Support of local economy
vii)	More wholesome
viii)	Nostalgia
ix)	Fashionable/Curiosity

Source: Table adapted from Hughner et al. (2007)[3], table 2, p.101.

Table 1. Consumers' motives for purchasing organic food.

Klaus G. Grunert a "sleeping giant" in the sense that it normally does not affect consumers' quality perception, but at times of sanitary crises when lack of food safety is reported, it may be a dominant criterion for consumer food choice[4,11].

Consumers also relate food safety to specific production technologies, and if consumers perceive certain production technologies as unsafe it may have major impacts in the market place[11]. The Belgian researcher Wim Verbeke and collegues argues in an article from 2007[12] that the link between actual risk and the risk perceived by consumers is frequently weak with consumers tending to overestimate some risks while underestimating other risks. Furthermore, consumers do not to any great extent make a distinction between different types of risk within a specific food group. Finally, many consumers tend to not process information aimed at reducing uncertainties related to food safety, which reduces the effectiveness of e.g. information campaigns explaining different kinds of risks.

Small differences in nutritional content

Several reviews have concluded that there is no conclusive scientific evidence that organic **plant-derived food** is significantly healthier and/or more nutritious than conventional products[13,14,15] and the quality of many previous studies have been questioned[16,13]. According to the National Food Agency in Sweden there are no clear differences between organically and conventionally produced plant-derived food with respect to nutritional content and the agency calls for further studies on this topic[17].

There are, however, some recent reviews that conclude that organic products are better than conventional products from a nutritional perspective. In a recent meta-study based on 343 studies[18], it is concluded that organically produced crops and crop-based foods on average have higher concentrations of antioxidants, lower concentrations of cadmium as well as lower concentrations of nitrate and nitrites. Antioxidants can be linked to reduced risk of various diseases, while high concentrations of nitrate and nitrite are potential risk factors for some diseases.

In a meta-analysis from 2011 of studies on the difference in nutrition and health – specifically the content of secondary metabolites and vitamins – between organic and conventional fruits and vegetables it was concluded that the secondary metabolites were 12 per cent higher in organic produce although the variation was substantial between different sub-groups of these metabolites (ranging from non-significant negative to significant 16 per cent higher). Furthermore, a six per cent higher content of C-vitamins was found[19].

In a meta-analysis of nutritional content of **milk**[20,15], it was concluded that organic milk has a more beneficial composition of fatty acids than conventional milk. Most notably, organic milk contained approximately 60 per cent more omega-3 fatty acids[20]. According to the National Food Agency in Sweden, 40-45 per cent of the adult population and approximately 90 per cent of all children have an intake of omega-3 below the recommended level[21,22,23]. Although milk is a minor dietary source of omega-3 fatty acids in general, for some consumer group this difference could be important[23].

To date no corresponding comprehensive peer-reviewed meta-analysis comparing the fatty acid composition of **meats** originating from organic and conventional husbandry has been conducted and specific studies generally vary considerably in design. Although no definite conclusions can be drawn there is a well-recognised link between the composition of fatty acids in the feed and in animal products[24]. Furthermore, organic systems generally imply a higher intake of fresh forage and roughage with a favourable composition of fatty acids. Hence, it is likely that the differences found between organic and conventional milk composition may be similar to those between organic and conventional meats[23].

In summary, when comparing different components of plant foods, systematic differences between organic and conventional products are often small, and the variation between studies is large. It is therefore not possible to conclude that organic foods in general differs from conventional foods with respect to nutritional content, but that there

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are evidence of specific differences in content for certain products. There are indications that crop-based food organic products have on average higher contents of antioxidants, but there is no general agreement. For milk products, there are well-established differences in the composition of fatty acids between organic and conventional products that generally are in favour of the organic products.

It should be noted that most of the studies previously referred to focus only on food components, not on **health outcomes**, and that detectable differences in content not necessarily imply that human health is affected. The implications for human health have been addressed only in a few of the many studies comparing the composition of organic and conventional foods[16,15,25]. Even fewer studies directly examine the long-term health effects of organic food compared with conventional food. In a 2-generation study on chickens it was shown that chickens raised on organic feed had a slower growth, but a higher immune responsivity and a faster recovery after an immune challenge than chickens on conventional feed. This was interpreted as a sign of better health[26,25]. A study based on more than 50,000 French adults showed that consumers of organic food had a substantially lower risk for overweight and obesity even after adjusting for physical activity, socioeconomic and demographic factors, and adherence to nutritional recommendations[27]. The authors speculate that pesticide residues in conventional food could play a role. It is, however, unclear if other lifestyle factors associated with the preference of organic food could explain the lower risk.

Pesticide residues seldom found in organic products

In Sweden, pesticide residues are found in approximately 50 per cent of the samples of the National Food Agency and in 3-4 per cent of the samples the level of residues exceeds the allowed maximum residue level[28,29]. In exceptional cases small amounts of residues are found in organically produced food. Pesticides can spread into the environment through air and water and thus there is some risk that also organic produce is contaminated. Contamination of organic foods can also take place during transport and storage. In the scientific literature there are also evidence of detectable differences between organic and conventional foods concerning contaminants and residue levels[15,18,30] .

According to many authors there are no conclusive scientific evidence supporting that organic foods would generally be safer. This may be either because no differences compared to conventional food can be detected or because when differences can be detected, the levels of contamination in conventional foods are below what is required for foods to be considered safe for human consumption[31,32,15]. There is however evidence of a range of adverse health effects of various pesticides. Most of this evidence originates from studies of occupational or household exposure, not from studies of dietary exposure. In general, consumers in the EU need not worry about acute toxic effects of pesticide exposure via food as such intoxications have only rarely been reported[23]. On the other hand, a recent epidemiological meta-analyses commissioned by the EFSA found associations between a low-level, long-term exposure to various pesticides and chronic diseases. Such associations are not to be confused with proof of causal relationships[33]. Furthermore, there are known uncertainties in the risk assessment of pesticides, because some types of effects (e.g. endocrine disruption) are disregarded or cannot be detected. Moreover, associations of exposure and effect found in epidemiological studies are often disregarded in the risk assessment of pesticides. Choosing organic instead of conventional food lowers dietary exposure to pesticides, which is the most important source of pesticide exposure for the general population. Regardless of what can be scientifically corroborated concerning how pesticide use affects consumer health, consumers have been found to be willing to pay a premium for food produced with reduced use of pesticides and especially for organic products[34].

For a more thorough discussion on food composition, pesticides and potential health effects of organic food the reader is referred to the knowledge synthesis from EPOK; "ORGANIC FOOD – Food quality and potetial health effects. A review of current know-ledge and trends" from 2015 by Axel Mie *et al*[23].

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Author	Type of study	Products	Analyse	Conclusion: organic versus non-organic products
Barański *et al.* (2014)[18]	Meta-analysis	Crops/crop-based foods	Composition	Organic contained higher concentrations of antioxidants, had lower concentrations of cadmium and lower incidence of pesticide residues. Furthermore, significant differences were detected for some minerals and vitamins.
Dangour *et al.* (2009)[118]	Review	Crops	Composition	11 crop nutrient categories analysed: Organic contained significantly lower content of nitrogen, significantly higher content of phosphorus and higher titratable acidity, while no detectable differences were found for the remaining eight crop nutrient categories.
Brandt *et al.* (2011)[19]	Meta-analysis	Fruit and vegetables	Composition	6 per cent higher content of C-vitamins and 12 per cent higher content of secondary metabolites in organic produce although substantial variation between subgroups ranging from non-significant negative to significant 16 per cent higher.
Hoefkens *et al.* (2009b)[30]	Meta-analysis	Vegetables and potatoes	Composition	Varying results – organic better in some respects and worse in other respects, hence no general conclusion can be made.
Dangour *et al.* (2009)[118]	Review	Livestock products	Composition	No evidence of difference in nutrient content between organic and conventional.
Palupi *et al.* (2012)[20]	Meta-analysis	Dairy	Composition	Organic contained more omega-3 fatty acids, ruminant fatty acids, and very-long-chain omega-3 fatty acids, less omega-6 fatty acids, and had a higher omega 3-to-6 ratio.
Crinnion (2010)[119]	Review		Composition/ Health	Organic contained higher levels of vitamin C, iron, magnesium, phosphorus; greater antioxidant activity; lower levels of nitrates and pesticides residues. Largely lacking evidence on health benefits but health benefits of organic dairy products have been found with respect to allergic dermatitis.
Dangour *et al.* (2010)[16]	Review		Health	Largest study found that consumption of strictly organic dairy products was associated with a reduced risk of eczema in infants. No general evidence of differences in health from consumption of organic and conventional foods based on the majority of other studies.
Smith-Spangler *et al.* (2012)[15]	Review		Health/ Safety	Strong evidence is lacking concerning nutritional differences between organic and non-organic foods. Organic foods may, however, reduce exposure to pesticide residues and antibiotic-resistant bacteria.
Magkos *et al.* (2006)[31]	Review		Safety	Generalized conclusions remain tentative, absence of adequate comparative data.

Table 2. Examples of some recent literature comparing organic and non-organic products with respect to nutrition, health and safety aspects.

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2.2 Better taste

The scientific support for organic food being superior to conventional food in terms of taste is mixed. Taste is subjective and depends on many variables such as expectations, intended use and preparation[4,2]. When asking consumers if they prefer the taste of organic or conventional products it is frequently found that organic products are preferred. It is however not always the case. For example, Jonathan P. Schuldt and Mary Hannahan[35], in a study from 2013, found that organic products were perceived as more healthful but less tasty. It has been widely recognized in the economic literature that consumers may use price as a quality cue, i.e. interpret a higher price as an indicator for higher quality. In the earlier mentioned literature review from 2007 by Hughner[3], this is suggested as a possible explanation of why consumers associate organic with better taste. Furthermore, an individual consumer's perception of one attribute may be strongly affected by the individual's evaluation of other attributes. Such "halo effects" have for example been found in consumers' judgments of calorie content of organic and conventional goods[36]. The strength of potential halo effects becomes clear when the analysis includes consumers actually tasting the product prior to evaluation. For example, consumers in a recent study were presented with two identical goods – both organic –, with different labelling – organic and regular (non-organic)[37]. The goods examined were yoghurt, cookies, and chips. Statistically significant halo effects were found with respect to calorie evaluations and health judgments. The effects on taste evaluations were however more mixed. Compared with the regular-labelled alternative, organically-labelled yoghurt was perceived as more flavorful and more tasty, organically-labelled cookies was perceived as less flavorful, less tasty, and less artificially tasting, and organically-labelled chips was perceived as less artificially tasting. This illustrates how complex and difficult it is to understand consumer perception and behaviour.

Consumer and expert panels

Analyses of sensory differences between organic and conventional food products have been conducted with regular consumers, but more frequently with trained consumers and expert sensory panels. It should be emphasised that consumers may perceive things differently from trained specialist which imply difficulties to compare studies with different kinds of panels. For example, in a study on sensory differences of meat from different genotypes and rearing systems[38] it was found that while a trained panel could detect differences, the consumer panel could not. The taste perceived by consumers also depends on expectation, familiarity, geographical and cultural origins of the consumer. The perception of consumers may also depend on other attributes such as locally produced, animal welfare- and environment friendliness etc. In the following, results from some recent studies are briefly discussed and summarized in Table 3.

For further examples of studies on sensory differences between organic and conventional food products see e.g. the article from 2009 by Canavari *et al.*[54] and the EU-project ECROPOLIS (www.ecropolis.eu).

Varying results on fruits and vegetables

In an Irish study[10] it was concluded that there were no significant taste differences between organic and non-organic fruits and vegetables. Studies in the US have for example concluded that no significant differences between organic and non-organic vegetables can be found[39], and that consumers rate organic apples as equal or better than conventional alternatives[40].

Organic orange juice has been found to be better tasting than conventional orange juice in an English investigation[41], while no statistical difference was detected in a Swedish study[42].

In a study of potatoes, a trained panel could detect some differences (conventionally slightly softer, less adhesive and wetter) while the consumer panel found no significant differences with respect to sensory attributes[44].

In a review of the literature of the sensory quality of fruits and vegetables from 2006[43] it was concluded that most studies do not find any "consistent or significant" differences between organic and conventionally produced goods, but of the studies that do find differences this is most commonly in favour of the organic alternative.

Bread and milk...

Consumers have been found to perceive organic baked bread as tasting better than conventional baked bread according to studies in both the U.S. and in Sweden[45,46].Organic milk was in an Irish study not found to be more or less preferred to conventional milk[41].

Taste of meat depends on many aspects

For meat products the major components of eating quality (tenderness, juiciness, flavour) can vary substantially depending on factors in production and processing. The taste also depends on many different aspects of the production such as age at slaughter, feed, genotype, rearing conditions etc., which complicates the comparisons between organic and conventional products. According to S.N. Brown and colleagues[47] "Anecdotal evidence has suggested that rearing systems perceived as more welfare friendly for the birds produce a product that tastes better." The results of their study did however indicate the opposite, i.e. meat from conventionally reared chickens was preferred. Other studies, have found that organic chicken meat does not "taste better" than conventional[48] as well as that there are substantial but mixed differences between different kinds of organic and standard broilers with some sensory attributes scoring higher for organic alternatives and other sensory attributes scoring lower[49]. Fabio Napolitano and colleagues[50] concluded that while trained panellists could discriminate between organic and non-organic chicken breasts untrained consumers could not. Furthermore, consumer preferences were found to be significantly affected when information on the organic production system was provided.

In an Irish study comparing organic and conventionally reared steers[51], no difference between organic and conventional beef in the sensory analysis was found. In a sensory analysis of lamb in the U.K., organic chops where overall higher rated (juicier, better flavour) than the conventional counterpart[52]. Another study found no major taste differences for pork[53].

No general evidence for better taste

It can be concluded that there is no scientific support for that organic food in general tastes better but each product needs to be treated individually in the specific context. Lack of scientific support for sensory differences in blind tests does not imply that consumers are wrong (if they perceive organic food to taste better) as taste is subjective and depends on many different aspects other than what can be detected in blind tests. It does, however, limit the extent to which superior taste can be used as an argument in marketing organic foods.

Author	Location	Type of sensory panel	Products	Conclusion: organic versus non-organic products
Tobin *et al.* (2012)[10]	Ireland	Trained panel	Fruits and vegetables: carrots, onions, broccoli, tomatoes, potato, apple, banana, orange.	No significant differences.
Zhao *et al.* (2007)[39]	USA	Consumer testing	Vegetables: tomatoes, cucumbers, onions, lettuce, spinach, arugula, mustard greens.	Overall no significant difference in perceived sensory quality (although some differences detected).
Brennan and Kuri (2002)[120]	U.K.	Semi-trained panel	Carrots	Generally no differences detected (except brightness). No significant relationship between attitudes towards organic and sensory evaluation.
Ekelund *et al.* (2007)[121]	Sweden	Consumer testing	Tomatoes	No significant difference in taste between products labelled organic and those labelled Swedish. Swedish as well as organic ranked higher than products labelled Dutch.
Gilsenan *et al.* (2010)[44]	Ireland	Trained panel and Consumer testing	Potatoes	Some differences (conventional slightly softer, less adhesive and wetter) detected by trained panel while no significant differences in consumer panel.
Peck *et al.* (2006)[40]	US	Consumer testing	Apples	Organic rated as equal or better.
Grankvist and Lekedal (2007)[42]	Sweden	Consumer testing	Orange juice	No significant difference in taste.
Fillion and Arazi, (2002)[41]	England	Trained panel and consumer testing	Orange juice, milk	Organic orange juice superior while no significant differences found for milk.
Lee *et al.* (2013)[37]	USA	Consumer testing	Yoghurt, cookies, chips	Inconsistent effects (varies depending on product and attribute).
Horsted *et al.* (2012)[49]	Denmark	Trained/expert panel	Chicken breast meat	Large difference in the sensory profile between organic niche and standard broilers but small difference between the genotypes used in the organic niche system.
Lawlor *et al.* (2003)[48]	Ireland	Consumer testing	Cooked chicken breast	Sensory attributes of conventional and free-range system most preferred by untrained consumers. Concludes that no support for organic chicken having superior taste.
Walshe *et al.* (2006)[51]	Ireland	Trained panel	Beef (steers)	No significant differences.
Angood *et al.* (2008)[52]	U.K.	Trained panel	Lamb chops	Organic superior with respect to juiciness, flavour, overall liking. Conclude that there is some support that organic taste better.
Hansen *et al.* (2006)[53]	Denmark	Trained panel	Pork	Minor differences (except for texture).
Kihlberg and Risvik (2007)[46]	Sweden	Consumer testing	Baked bread	Majority perceived organic as superior (although organic as well conventional bread were among the most liked breads).
Annett *et al.* (2008)[45]	U.S.	Consumer testing (expert panel)	Baked bread	Organic preferred by consumers (expert panel found no differences except for density and appearance).

Table 3. Examples of some recent literature testing for differences in sensory quality between organic and non-organic products based on sensory panels.

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2.3 Environment

Although a common motive, environmental concerns have in many studies been found not to be a driving factor for purchasing organic food although it has a strong influence on consumers' attitudes towards organic food[3]. An exception is Denmark where environmental concerns have been found to be the primary reason for consumers to buy organic foods[3]. In a study of Swedish consumers it was concluded that egoistic motives such as health are better predictors of the purchase of organic foods than altruistic motives such as concern for the environment[55].

Motives may change over time

The motives for buying organic food differ between consumer segments and may change over time. More recent scientific articles on Swedish consumers and organic food are however scarce. A statistical survey by Demoskop 2014[56] found that environmental motives for buying organic food today are strong especially among younger consumers. In surveys commissioned by KRAV and conducted by TNS Sifo consumers have been asked what they associate the KRAV label with and in the top are "absence of pesticides", "good for the climate" and "good for the animals"[57].

Many different environmental aspects

Whether organically produced foods are better for the environment than conventionally produced foods is a complex question which involves different environmental aspects such as climate change, eutrophication, pesticide emissions and biodiversity. In measuring emissions that affect the environment on a more local level it is relevant to focus on impact per hectare (leaching of nutrients and pesticides to water bodies), while it for more global problems such as green-house gas emissions is more relevant to focus on the impact in terms of the quantity produced thus taking into account that total consumption and production determines the total pressure on the ecosystem. On average organic yields are typically lower than conventional yields[58]. This implies that the impact measured by output produced will be affected by the yield gap between organic and conventional yields. However, concerning effects on climate change not only emissions from the production should be evaluated to determine the overall effect, also carbon sequestration and possible effects on deforestation need to be taken into account[59]). Evaluation of environmental effects often needs a systems perspective analysing both direct and indirect effects of a particular agricultural system.

In recent years several articles reviewing the literature have been published. In table 4 & 5 some of the results from two meta-analyses[60,61] and one review[62] are summarized for different environmental aspects.

One of the meta-analysis[60] concluded that generally organic (relative to conventional) production result in positive environmental effects per farmed area while the effects per unit of output are not necessarily as positive. Per kg output the land requirement was found to be larger and the energy use lower in organic farming. Both of the meta-analysis[60,61] found positive environmental effects of organic agriculture with respect to soil organic matter and biodiversity. The effects on leaching and gaseous emissions were mostly found to be positive when measured per hectare, while the results per unit of output were more ambiguous or even negative. The qualitative summary made in the re-

Impact category	Tuomisto *et al.* [60 a)]	Mondelaers *et al.*[61 a)]	Gomiero *et al.*[62 b)]
	Europe		
Yields	- 22 %	- 18.6 %	(– –) → (+)
Soil organic matter	+6.6 %	+6.4 %	(0) → (++)
Nitrogen leaching (per ha)	- 30.6 %	- 29.7 %	(–) → (++)
Field experiment	- 10.5 %	- 26.0 %	
Model	- 40.3 %	- 42.4 %	
Nitrogen leaching (per kg)	+49.1 %	- 5.0 %	(–) → (++)
Greenhouse gas emissions (per ha)	N/A	- 39.2 %	(+) → (++)*
Greenhouse gas emissions (per kg)	0.0 %	- 10.1 %	(–) → (++)*
Nitrous oxide emissions (per ha)	- 30.9 %	- 14.0 %	**
Nitrous oxide emissions (per kg)	+8.5 %		**
Ammonia emissions (per ha)	- 18.8 %		**
Ammonia emissions (per kg)	+10.6 %		**
Phosphorus losses (per ha)	- 01.3 %		
Eutrophication potential (per kg)	+19.6 %		
Acidification potential (per kg)	+14.7 %		
Energy use (per kg)	- 21.1 %		(–) → (++)*
Energy use (per ha)			(+) → (++)
Biodiversity	See table below	positive	(0) → (++)

a) Estimates are from Tuomisto *et al.* (2012), table 2 p. 317, and refers to the percentage difference in impact between organic and conventional farming [(impact of organic farming – impact of conventional farming) / impact of conventional farming)]. b) Relative qualitative scale of performance of organic farming compared to conventional farming: ++ much better, + better, 0 the same, - worse, – – much worse. *Per tonnes biomass. **Included in the greenhouse gas emissions.

Source: Table 2 from Tuomisto et al. (2012), p. 317, adopted and extended with information from Mondelears *et al.* (2009) and Gomiero *et al.* (2011).

Table 4. Results of environmental impact of organic compared to conventional farming according to some recent reviews.

view[62] shows results similar to these meta-studies but with larger intervals. In the meta-analyses it was emphasized that the variations between different studies are substantial with results depending on for example the type of systems compared, on local conditions in terms of soil type and climate, and on the methods applied. This calls for caution in generalizing environmental effects of organic and conventional agricultural systems.

No synthetic pesticides

Synthetic pesticides are not used in organic production and obviously negative environmental effects caused by losses of pesticides to the environment are avoided. According to annual national surveys, pesticides used in Swedish agriculture are continuously found in the water in agricultural areas. Most frequently in low concentrations, but concentrations above ecotoxicological limits are also regularly found[63]. This implies possible negative effects for organisms and ecosystems in the water environment.

Lower nitrogen surplus

The scientific evidence about effects of organic production on eutrophication are mixed. In a study of Swedish farm data organic farms had a lower average nitrogen surplus per hectare than conventional farms, especially when comparing dairy farms[64]. A low nitrogen surplus implies a lower

risk of nitrogen loss to watercourses per hectare[65]. As mentioned above, nutrient loss per hectare is a relevant measure of risk for eutrophication locally. However, nitrogen losses to waters in relation to produced amounts could be relevant in a wider perspective and are generally similar to or higher in organic production with large variation depending on system and management[61,60].

Climate impact: a draw between organic and conventional

In the meta-analyses referred to above, it was concluded that there is more or less a draw between climate impact per produced amount in organic and conventional agricultural systems respectively[61,60], which also is the general conclusion in a recent knowledge synthesis from EPOK[59]. Another study from 2011[66] examined the climate impact of organically produced goods in Sweden and compared it with the conventional counterpart. For crop production they concluded that organic roughage generates lower emissions of greenhouse gases, the relative climate impact of organically produced cereals depends on harvest levels and the strategy for nitrogen fertilization, while the impact of organic protein crops is equivalent to that of conventional alternatives. For animal production they concluded that there are no differences for milk while comparisons for beef, pork and eggs were not possible due to that too few studies have been conducted.

Often more biodiversity on organic farms

As shown in table 4 and 5, organic agriculture has a positive effect on biodiversity. Furthermore, a meta-analysis of the effects of organic farming on biodiversity based data over the last 30 years[67] found that organic farming on average increased biodiversity (plants, insects and other animals) by 30 per cent The variation between different organisms was however considerable. For example, it was found that soil organisms were almost not affected while the biodiversity of plants and some pollinators were 50 per cent higher in organic farming. The positive effect of organic farming on biodiversity also depends on the type of landscape with less pronounced effects in areas with a mosaic landscape compared with effects in a more homogenous landscape[68]. A knowledge synthesis[68] from EPOK concluded that the biodiversity often is better on organic farms although this cannot be said to be true in all regions and in every aspect.

Tuomisto *et al.* (2012)[60] Number of studies (2004-2009) [a] showing Negative / Positive / Neither relative species abundance and/or richness		**Gomiero *et al.* (2011)[62] Relative qualitative scale of performance [b]**	
Plants	- / 10 / 1	Crop diversity	(0) → (++)
Soil microbes	1 / 9 / 3	Floral diversity	(+) → (++)
Birds	- / 3 / 2	Aboveground faunal diversity	(+) → (++)
Mammals	- / 1 / -	Habitat diversity	(0) → (++)
Butterflies	- / 3 / 2	Effect on pest control & pollinators	(+) → (++)
Spiders	- / 1 / 3		
Earthworms	- / 1 / 2		
Beetles	- / 3 / 2		
Other arthropods	- / 3 / 2		
Total	1 / 34 / 14		

a) See Hole et al., 2005[122] for previous studies. b) ++ much better, + better, 0 the same, - worse, – – much worse.

Source: Tuomisto et al. (2012), part of Table 3, p.316, and Gomiero et al. (2011), part of table 6, p.116.

Table 5. Biodiversity in organic farming compared with conventional farming.

2.4 Animal welfare

Expectations of a higher animal welfare in organic agriculture also motivate consumers to buy organic food. The extent to which animal welfare is an important motive varies depending on geographical region and the cultural setting therein, more so for animal welfare than for health and taste motives. Animal welfare has been found to be especially important in Sweden and other north European countries[69,70]. As pointed out by Hughner and colleagues[3], animal welfare is a multi-level construct and is thus used by consumers to indicate both better living conditions for the animals (ethical consideration) and higher food quality and safety for the consumer. There is a growing trend of ethical consumerism worldwide and ethical values are becoming more important for the purchasing decision[71]. In examining additional ethical attributes of organic food it was in a survey from 2010[72] found that consumers in five European countries (Austria, Germany, Italy, Switzerland and UK) ranked animal welfare highest (or among the top two) of seven ethical attributes (including e.g. local production, fair prices for farmers, and social aspects of production) of organic food. When Swedish consumers were asked what they associate the KRAV brand with, "good for the animals" was ranked higher (based on the response rate) than quality, health and biodiversity aspects while lower than absence of pesticides and climate concerns[73].

Goal of enhanced animal health and welfare

The conception of animal welfare is related to organic core values[74,75] and organic livestock farming has an explicit goal of enhanced animal health and welfare and differs from conventional production in several respects[76]. In organic farming there are different requirements concerning housing, e.g. outdoor access, larger space requirements and enrichment of the animal's environment. There are also requirements concerning the feed, e.g. that all animals should to be able to forage enabling performance of species specific behaviours, a restricted proportion of concentrate, GMO-free feed and that a large proportion is produced on-farm. Furthermore, there are special requirement about slaughter, restricted use of drugs, and mutilation[77,76,78,79,80]. Mutilations in terms of tail docking, teeth clipping, and beak trimming are forbidden by law in Sweden, regardless of production system.

Animal focus

Research on animal welfare and legislation as well as regulations for certification are nowadays more focused on the animals rather than the resources used in a production system. There has also been a transition from resource based to a more extended use of animal based measures of animal welfare. Resource based measures are e.g. requirements concerning the design of stables and inventories. Animal based measures are e.g. the mobility of an animal (lameness, problem standing up), cleanliness and condition of the animal. One example of how animal based measures is used for certification of organic production is the management tool "Ask the cow" – involving measurements of cow body condition, cleanliness, behaviour and wounds – used by dairy producers to fulfill KRAVs requirement to make an animal welfare assessment[81,80].

Different systems – partly different problems

There is no unequivocal evidence that the overall animal welfare is generally better or worse in organic production systems compared with conventional production systems, although the different systems partly face different problems. One typical characteristic of organic animal husbandry is outdoor access for (almost) all animals, to pastures or open fields during the vegetative season and to a veranda or similar semi-open space during the winter season. Outdoor access have some clear animal welfare benefits such as foraging, increased possibilities for performance of species specific behaviours, large space allowances and fresh air. However, keeping animals outdoors also challenges animal welfare as animals having to cope with e.g. parasites, extreme and large fluctuations in climatic conditions[82,83,84]. According to a knowledge synthesis from 2011[85], the information on animal health and welfare in organic pig production is limited. Sows have more behavioural freedom but may be exposed to higher risks to health and welfare than conventional production as a consequence of outdoor access, less sophisticated diets, and later weaning. Slaughter data has revealed that some health problems are less common in outdoor

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organic fattening pigs (tail damage and respiratory diseases), while others are more common (joint lesions, white spot liver due to parasite infections) than in conventional fattening pigs[86].

In a review of the literature[87] it was found that while organic production systems may give animals more opportunity for species specific behaviour, this may have both positive and negative effects on the affective state and health status of the animals. Furthermore, they found that the health problems facing organic dairy and beef production are similar to those found in conventional production systems. Similarly, in a review of health-related welfare in organic poultry from 2009[88] it was concluded that the relevant welfare issues are not specific to organic systems. They emphasized the variation between farms, suggesting that good welfare to a large extent depends on management skills. ■

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3. Why don't consumers buy (more) organic food and is this changing?

There are several reasons as to why consumers do not choose to buy organic. Most of these reasons have to do with some features of organic that pose barriers for the consumer (e.g. high price premium, lack of availability, sensory defects) although it may also be because consumers are content with the non-organic alternative products. An earlier mentioned literature review by Hughner[3] identified six deterrents for consumers to buy organic which are listed in table 6. In the following we will briefly discuss some of the reasons that are the most frequently emphasized in the literature and how these relate to the present circumstances in the Swedish market.

Barriers	
i)	High price premiums
ii)	Lack of organic food availability, poor merchandising
iii)	Scepticism of certification boards and organic labels
iv)	Insufficient marketing
v)	Satisfaction with current food source
vi)	Sensory defects

Source: Table adapted from Hughner et al. (2007)[3], table 2, page 101.

Table 6. Reasons consumers do not buy (more) organic food.

3.1 Price premium

The premium for organic products varies substantially between different products as well as between geographic markets, types of stores etc. Surveys conducted by the organization PRO in 2009–2011[89] reveal a large variation in the price premium between different products. For example, the premium for eggs was around 50 per cent, for bananas roughly 20-30 per cent, for milk around 20 per cent, and for coffee approximately 15-25 per cent. Furthermore, data indicate that there is no clear pattern in how the price premium for organic products has evolved over time as the premium for some products have increased (e.g., bananas), for other products been fairly stable (e.g., milk, eggs), and for some have decreased (e.g., coffee). Recently, retailers have however increased the number of organic products sold under their own retailer brands. In 2012–2013, such so-called private labels constituted 10–20 per cent of the assortment of organic products in the three major food retail chains[73,57]. As a comparison, approximately 17 per cent of all food and non-alcoholic drink products in grocery stores were sold under private labels[90]. Products sold under private labels are frequently priced lower than comparable products sold under other brands. According to Ekoweb[91] the price is approximately 10 per cent lower for an organic product when marketed under a private label. During recent years there has been a price pressure on organic food as a result of more organic products being marketed under private labels[91] and prices have during 2014 remained fairly stable[123]. From a consumer perspective the increase of organic products marketed under retail brands is positive as it makes more organic products more affordable for consumers.

3.2 Availability and merchandising

Availability for consumers is a question of where organic products are offered as well as which organic products are offered. It is also a question about where and how they are marketed in the store. The size of the market may affect availability for consumers both in terms of the number of stores that offer organic products and in terms of the assortment.

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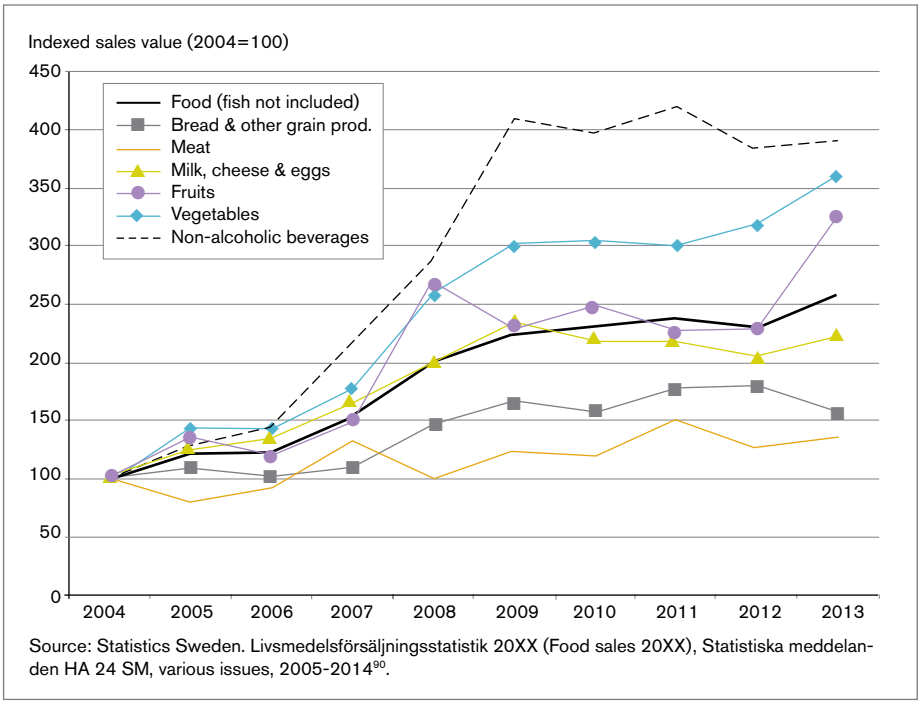
In 2013 the market share (based on sales value) of organic food and non-alcoholic beverages in Sweden amounted to 4.4 per cent and 3.3 per cent, respectively, according to Statistics Sweden[90]. According to Ekoweb[91], the market share of organic food products in 2013 was approximately 4.3 per cent[123]. The discrepancy between these estimates is due to differences in calculations. For example, Ekoweb does not consider products labelled with MSC (Marine Stewardship Council) as part of organic sales which Statistics Sweden does. Between 2004 and 2013 the market share of organic food roughly doubled. Agricultural land under organic production in Sweden has also doubled during this period and amounted to 16.5 per cent of total agricultural land in 2013[92]. Total organic retail food sales (excluding fish) has increased more than 2.5 times and sales of organic non-alcoholic beverages has roughly quadrupled[90].

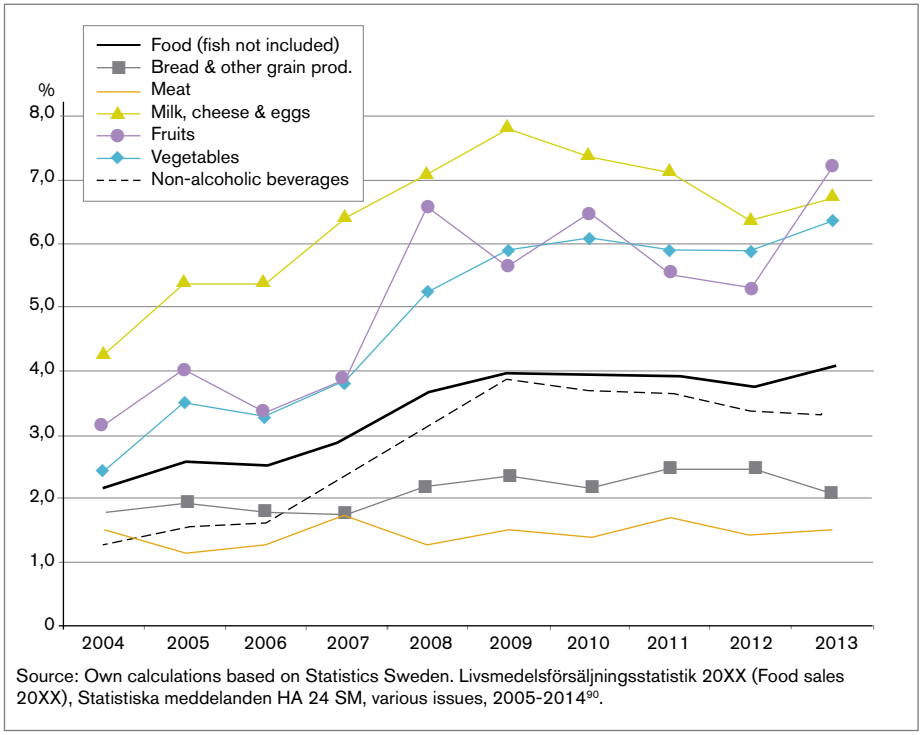
Dramatic growth during 2014

As shown in Figure 1 the sales value has increased considerably for several major food categories although they have evolved differently over time[90]. In 2013, the Swedish organic market increase was estimated to 13 per cent[91]. For the three largest Swedish food retailers, Ekoweb[90] has estimated the share of organic foods in 2013 to 5 per cent for ICA, 6.3 per cent for KF/COOP, and 3 per cent for Axfood. During 2014 the organic retail food market in Sweden according to Ekoweb experienced a dramatic growth of 41 per cent with the major retail chains (ICA, Coop, Axfood) experiencing growth rates of 40-55 per cent[123]. These growth rates are based on the value of the products sold, but since the prices have been fairly stable during the year the increase is primarily due to increases in the volumes sold. Ekoweb estimates the market share of organic food (based on sales value) to have reached 5.6 per cent of total food sales in 2014. Focus on the origin of foods, pesticide residues in conventional foods, a positive media image, and an increased interest in environmental and animal welfare aspects have according to Ekoweb contributed to this recent increase. These aspects relate to several of the motives and barriers discussed in this



Source: Statistics Sweden. Livsmedelsförsäljningsstatistik 20XX (Food sales 20XX), Statistiska meddelanden HA 24 SM, various issues, 2005-2014[90].

Figure 1. Development of sales value within some organic product categories in Sweden since 2004 (for each category 2004=100).



Source: Own calculations based on Statistics Sweden. Livsmedelsförsäljningsstatistik 20XX (Food sales 20XX), Statistiska meddelanden HA 24 SM, various issues, 2005-2014[90].

Figure 2. Market shares (value) of organic sales of some product categories in Sweden a)

report. The main driver for the observed change is however suggested to be a general health trend, which relates to the primary motive (health and nutritional concerns) previously discussed.

Better availability

According to Swedish Trade Federation, approximately 90 per cent of the food retailers offer organic products[94,95]. The main reasons for providing organic products were (in order) customer demand, to give customers the possibility to choose, that their suppliers offer these goods, retailer effort to reduce their own environmental impact, organic products are of high quality, and other reasons[94,95]. Between 2006 and 2011 the number of KRAV-certified products increased with more than 60 per cent. In 2011 the three major food retail chains (Axfood, KF/COOP and ICA) expanded the organic assortment with 200-350 products, in 2012 with 0-300 products, and in 2013 (Axfood not included) with 35-200 products[96,97,73,57]. In 2013 the major retail chains marketed between 1000 and 2500 organic products each[57]. As previously mentioned retailers increasingly market organic products under their own private brands and this development increases the organic products available to consumers. Although the market share and the number of organic food products are still small compared to non-organic products, organic food products are becoming more and more easily available for consumers.

3.3 Other barriers

Concerning the third barrier – scepticism of certification boards and organic labels, mentioned in the literature from 2007 by Hughner and collegues[3] – it should be noted that the organic label KRAV is recognized by the vast majority of consumers. The Danish researchers Kim Mannemar Sønderskov and Carsten Daugbjerg[98] found that consumer trust in organic labelling is higher in Sweden than in the UK and the US, while lagging behind the consumer trust found in Denmark. They suggest that the consumer confidence in organic labelling can partly be explained by the high level of general trust in the Swedish population.

Even if the market shares are still relatively small for most organic commodities, the market shares for many products are increasing. The recent development of the market for organic food in combination with retailers investing in organic private labels makes it plausible to assume that the barrier of insufficient marketing is less important today than just a few years ago.

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Media affects the demand

The fifth barrier, satisfaction with the conventional food supply, may decrease with media coverage entailing negative information associated with conventional food supply and positive information associated with organic food supply. A positive media image contributed for example to the dramatic increase of organic sales in Sweden in the beginning of 2014 according to Ekoweb[93]. That media coverage affects the demand for organic food has also been established in the academic literature. For example, a Danish study focusing on fruits and vegetables found that (negative) information in the media concerning pesticides in conventional products increased the likelihood of consumers changing from conventional to organic products[99]. Furthermore, information linking health and organic food consumption was found to increase both the likelihood of consumers opting for the organic alternative and the quantity consumed by those already buying organic food.

In conclusion, increasing market shares in combination with an increase in private labels have the potential of decreasing the importance of the main barriers found in the literature. Specifically, it seems reasonable to anticipate a decrease in the price premium for many organic food items and an increase in the availability as well as in the marketing efforts for organic products. ■

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PHOTO: COOP, AXFOOD & ICA

4. Reflections, implications and outlook

In this section we present some reflections based on the issues previously discussed as some of these have important implications for the marketing of organic foods and the future development of the market for organic food.

4.1 Motives and barriers – general applicability

The motives and barriers discussed in this paper are the ones most frequently cited in the literature. The motives and barriers are fairly consistent in different countries, although the ranking may differ somewhat. For example, environmental concerns have, as previously discussed, been found to be the primary reason for Danish consumers to buy organic food while for other countries generally not a driving factor for purchase, although having an important influence on attitudes towards organic. Animal welfare may be perceived as more relevant in north European countries such as Sweden[55].

There exist a vast literature devoted to identifying and analysing different types of consumers. A thorough discussion on consumer segmentation is outside the scope of this work, but it is worth to briefly refer to some of this literature. Consumers segments have been identified based on socio-economic/demographic (age, sex, income, education, etc.), psychographic (values, opinions, attitudes, interests etc.) and behaviour related characteristics. For example, a recent statistical survey by Demoskop[56] indicated that environmental motives for buying organic food today are strong especially among younger consumers. Consumers may, for example, be categorized based on how frequent they buy organic food products and there is evidence of differences between occasional and regular buyers. Regular consumers have for example been found to emphasize ethical values (i.e. environment, animal welfare) more than occasional consumers, while occasional consumers emphasize personal values of safety and healthiness more[100,101,102,103,104]. In a study from 2011[105] it was concluded that while regular and occasional consumers share common concerns (e.g. relating to health, taste, environment, fairness) the latter are less likely to relate these concerns exclusively to organic products. For more information concerning the literature on segmentation of organic and sustainable consumers the reader is referred to e.g., Verain *et al.* (2012)[106] and Pearson *et al.* (2011)[2].

4.2 Motives and barriers – different types of characteristics

Goods can be classified into three categories based on the extent to which consumers can infer and evaluate the quality of a product; a) search goods which can be evaluated prior to purchase, b) experience goods which can be evaluated after purchase; and c) credence goods which consumers cannot evaluate on their own even after purchase (or if they can the cost of doing so is excessively high)[107.108,109]. Quality is multidimensional and in reality many food products consist of both search and experience characteristics and frequently also credence characteristics (see the "The steak example" on next page). The concept of credence characteristics is however fundamental to the market for organic food as consumers for many of the characteristics have to rely on information provided by some other party such as a governmental agency or an organization that can certify that a product entails such attributes[110]. The attribute "organic" can for example be transformed into a search good e.g. through clear labelling from a party trusted by consumers. Attributes of different products can also be classified into i) intrinsic attributes which are inherent parts of the product such as taste or col-

our, and ii) extrinsic attributes such as brand, origin or organic which are not parts of the physical characteristics of the product itself.

In Figure 3 some of the main motives and barriers discussed in the previous sections have been sorted according to these classifications. What should be apparent is that the main barriers, price and availability, are characteristics of the product that are extrinsic, revealed search characteristics. The main motives, on the other hand, relate to characteristics that are more hidden.

Implications for marketing

That many attributes related to consumer motives can be classified as hidden and credence implies that the marketing of organic food, as well as public policy related to organic food, heavily relies on the information being conveyed to the consumer from a trustworthy party. In building the necessary trust, it is crucial for these parties only to convey characteristics of organic foods that can be substantiated based on scientifically established facts. This is the case regarding for example positive effects on biodiversity and low incidence of pesticide residues in organic foods. Several of the motives consumers have for buying organic foods cannot, however, be considered to be clearly and consistently supported by scientific research. This does not mean that these aspects do not matter for the consumers but it does have implications for how organic foods can be marketed. Even if all the motives consumers have for buying organic food could be substantiated by scientific evidence for some products (or product groups), it poses difficulties in using this information, especially in short, clear and unambiguous ways that the consumer can easily understand and process in the shopping situation.

4.3 Consumer trends, labelling and the interaction of labels

Given the credence characteristics of organic food, consumers have to rely on labelling from a trusted source. Organic labels have in many Western countries gained high recognition, and in Sweden 98 per cent of the consumers are familiar with the KRAV brand[73]. There is, however, a trend towards using multiple labels on organic products, so called co-branding. This is partly in response to consumer demand and partly a strategy by retailers to market premium products under their private labels.

"The steak example"

As an example, consider a steak: the fat content can be evaluated by expecting the product in the store (search), the taste can be evaluated after purchase (experience) while certain process characteristics such as whether organically produced or produced with higher animal welfare standards cannot be verified by the consumer but they have to rely on the credibility of the seller as perceived by the consumer[111].

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Ethic consumption

There is a growing trend of ethical consumerism worldwide and ethical values are becoming more important for the purchasing decision. According to a study from 2013[71], consumers are increasingly dissatisfied with anonymous and homogenous organic foods that are lacking clarity concerning the social conditions under which they have been produced. Consumers have, for example, been found to value locally produced food as high as, or even higher than, organically produced food. Different ethical attributes may, however, be perceived by consumers as either complementing or competing with each other. The literature examining the interactive effect between organic and other/additional ethical attributes on consumers' evaluation of a product have produced mixed results suggesting differences between products and geographical location[112, 113,114]. The demand for different ethical attributes suggests that there may be possibilities for differentiating organic products further in order to cater to different consumer segments[71], but it also highlights the complexity of co-branding.

		Intrinsic		Extrinsic
Revealed	Search			Price, Availability
	Experience	Taste		
		Food safety		
		Nutrition/health		
Hidden	Credence		Animal welfare	Environment

Figure 3. Classification of attributes related to motives and barriers.

Co-branding and claims

As previously mentioned there is an increasing trend of co-branding of organic labels and other types of labels such as the private labels of retailers, fair trade etc. Different labels interact and may compete with, or complement one another, in signalling potential quality. As an example of the complexity of co-branding let us consider health claims as health is one of the main motives for consumers to buy organic food. Health claims have been found to negatively affect consumers' perception of other attributes such as naturalness[115]. A recent study[116] examined how consumers reacted to nutrition, health and risk reduction claims on organic products. They found that consumers did not significantly prefer or reject products with such claims. Consumers occasionally buying organic food were however found to be significantly more likely to choose products with a claim. They concluded that nutrition and health claims can be useful in marketing organic products especially when targeting occasional buyers. In a study from 2013[117], Larceneux and collegues examined how co-branding of organic and retail brands affect the efficiency of organic labels. They concluded that, although the organic label generally made the positive environmental attribute more prominent, the marginal effect of organic label with respect to perceived quality varied depending on the brand equity; specifically the organic label was more efficient when brand equity was high and less efficient when brand equity was low. Given the relatively low market shares of many organic products, the efficiency of organic labels has been questioned, and understanding the interactive effects of different labels are important for the future development of the organic market.

4.4 Areas for future research

Based on what has been discussed in this report some areas for future research are suggested. First, there is a need for research in the Swedish setting. Over time the market conditions are changing and so is the perception and behaviour of consumers in relation to organic food. Most of the studies conducted in Sweden are a few years old and their relevance may be questionable due to the changes mentioned. Secondly, there are clearly many areas that need to be further examined that are not restricted solely to the Swedish market, e.g. the effects of co-branding in different settings.

Further research is needed concerning to what extent differences between organically and conventionally produced foods perceived by consumers can be objectively verified. Examples of other areas that need to be further examined include how much Swedish consumers are willing to pay for different attributes of organic food products, how consumers' perception and valuation of organic labelled foods is affected by private labels being marketed as organic, how labels of different ethical values interact from a consumer perspective, how organic products can be further differentiated in order to cater to the demand of different consumer segments, how the economic sustainability of organic farmers is affected by the changing consumer trends (towards different ethical values) and retailers increased use of organic private labels. A better understanding of these issues is crucial for the development and stability of the organic market. This requires that consumers feel that they get what they bargain for when buying organic as well as reasonable returns for firms at all levels of the food chain. ■

Summary

- Understanding consumer food choice is **important for the future development** of the organic market.
- Despite the extensive research conducted in different research disciplines, human behaviour in the context of food purchases remains **a frontier for scientific enquiry due to its complexity**.
- **Consumers perceive and expect organic foods to have various product characteristics that are not guaranteed by organic certification** (which only regulates the production process).
- The main motives for purchasing organic food are **health and nutritional concerns, superior taste, environmental concerns, food safety and lack of confidence in the conventional food industry, and animal welfare concerns**. Especially the first three seem to be applicable worldwide.
- Organically produced foods undoubtedly are superior to conventionally produced food in some respects (e.g. enhanced biodiversity and no contribution to synthetic pesticides in the environment), but the **scientific literature does not support a general superiority** in several of the areas which consumers consider to be important.
- The main consumer motives to a large extent relate to **attributes which the consumers cannot easily assess by themselves** and they therefore have to rely on information provided to them by another party.
- The combination of on the one hand the type of attributes, which consumers cannot evaluate by themselves, and on the other hand the lack of general univocal scientific evidence supporting the main motives puts **considerable restraints on how organically produced food can be marketed**.
- As opposed to motives, the main consumer **barriers** can to a larger extent more easily **be evaluated by the consumers themselves**.
- The main **barriers include high price premium, lacking availability, scepticism of the source of information, insufficient marketing, satisfaction with current food source, and sensory defects**.
- Current trends can be considered to **partly decrease these barriers**.
- Important for this development is **increasing organic market shares and retailers increased use of private labels** for organic foods.
- There is an increasing trend of consumers **demanding different ethical values** including not only environmental aspects but to an increasing extent also aspects such as fair trade and locally produced food.
- It is important to better understand how consumers' perception and valuation of organically labelled products are affected by **co-branding**, i.e. to what extent other labels (e.g. private labels, Fair trade) compete with or complement organic labels.

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The organic food market, in Sweden and elsewhere, is expanding, and for the future market development it is important to better understand consumers' motives for buying organic products, and the barriers for not buying more organic food. EPOK has initiated this popular science knowledge synthesis to give an overview of existing literature on consumers' motives and barriers and discuss to what extent some of these motives can be supported by scientific evidence.

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