Appetite 117 (2017) 17–28

Contents lists available at ScienceDirect

Appetite

journal homepage: www.elsevier.com/locate/appet

Organic consumption and diet choice: An analysis based on food purchase data in France

Christine Boizot-Szantai, Oualid Hamza, Louis-Georges Soler*

INRA-Aliss UR 1303, France

ARTICLE INFO

Article history:
Received 20 April 2017
Received in revised form
29 May 2017
Accepted 4 June 2017
Available online 8 June 2017

1. Introduction

The food consumption patterns observed in developed countries raise important concerns related to health and environmental issues. In this context, many studies have aimed to assess the potential benefits of organic consumption and to determine the extent to which the promotion of organic foods could be a relevant strategy to address these issues. Crinnion (2010) and Lairon (2010) reviewed multiple studies and showed that organic varieties provide significantly greater levels of vitamin C, iron, magnesium, phosphorus, and antioxidant phytochemicals than did non-organic varieties of the same foods. Whereas Smith-Spangler et al. (2012) considered that the published literature lacks strong evidence that organic foods are significantly more nutritious than conventional foods, Forman and Silverstein (2012) concluded that in terms of health advantages, organic diets have been convincingly demonstrated to expose consumers to fewer pesticides associated with human disease. Regarding environmental issues, organic farming has been demonstrated to have less of an environmental impact than conventional approaches (Heerwagen, Andersen, Christensen, & Sandøe, 2014). This point, however, is still controversial because Life-Cycle Analysis (LCA) studies comparing agricultural products from conventional and organic farming systems have reported a wide variation in the resource efficiency of products from these systems. Some studies have shown that the impacts per area of farmed land are usually less in organic systems but the impacts per produced quantity are often higher (Meier et al., 2015). However, this result is not solely due to the usually lower yields in organic systems but also to inaccurate modeling within LCA. The consequence is that compared to conventional agriculture, organic production with its greater land use requirements appears environmentally less favorable, although its energy use is markedly reduced because of the reduction of the input use of fertilizer industry, and organic production increases the value added of agriculture (Risku-Norja & Mäenpää, 2007). Although additional research is required to clearly determine the differences in the biological and toxicological status of organic food consumers and conventional food consumers (Dangour et al., 2010; Hoefkens et al., 2010; Jensen, Jørgensen, & Lauridsen, 2013), these potential benefits have justified many investigations aimed at better understanding the motivations of organic consumers and characterizing the determinants and conditions of organic market expansion.

On the one hand, studies have been conducted to identify both organic consumers and the main factors that explain their selection of organic vs. non-organic foodstuffs (see Yiridoe, Bonti-Ankomah, and Martin (2005) for a literature review). Consumers' attitudes towards and motivations for buying organic food are strongly linked to beliefs about its healthiness, taste and environmental friendliness (Bryla, 2016; Chen & Lobo, 2012; Costanigro, Kroll, Thilmany, & Bunning, 2014; Dowd & Burke, 2013; Goetzke, Nitzko, & Spiller, 2014; Honkanen, Verplanken, & Olsen, 2006; Hughner, McDonagh, Prothero, Shultz, & Stanton, 2007; Kihlberg and Risvik, 2007; Lee et al., 2013; Magnusson et al., 2003; Thøgersen, de Barcellos, Perin, & Zhou, 2015). Ethical motivations and animal welfare also affect the purchase intentions of regular organic consumers, whereas food safety concerns influence those of occasional organic consumers (Pino, Peluso, & Guido, 2012; Zander & Hamm, 2010). As shown by Aertsens, Verbeke, Mondelaers, and Van Huylenbroeck (2009), related attributes of organic food with values, such as 'security', 'hedonism', 'universalism', and 'benevolence', positively influence attitudes towards organic food consumption. Among the factors that undermine organic consumption, insufficient knowledge and a lack of trust in organic labels seem to play a key role (Honkanen et al., 2006; Hughner et al., 2007; Janssen & Hamm, 2012; Smed, Andersen, Kærgård, & Daugbjerg, 2013, p. p91). Indeed, labels and information signaling credence are important search attributes. Although

* Corresponding author. INRA-Aliss UR 1303, 94205 Ivry sur Seine, France.
E-mail addresses: christine.boizot-szantai@inra.fr (C. Boizot-Szantai), oualid.hamza@inra.fr (O. Hamza), louis-georges.soler@inra.fr (L.-G. Soler).

http://dx.doi.org/10.1016/j.appet.2017.06.003

credence cues cannot be accurately evaluated by consumers, the expectations that they generate affect consumers' perceived quality and sensory experiences (Fernqvist & Ekelund, 2014). Psychological dimensions, such as cognitive and affective attitudes, personality traits, personal norms, and perceived behavioral control, also influence the intentions to purchase organic products (Aertsens et al., 2009; Chen, 2007; Lee & Yun, 2015; Scalco, Noventa, Sartori, & Ceschi, 2017; Schleenbecker & Hamm, 2013; Welsch & Kühling, 2009). Social norms influence organic consumption because people are likely to be affected by what others think. Ruiz de Maya et al. (2011) stress the role of reference groups and routine behavior. They show that economic and cognitive factors are significant covariates of pro-environmental consumption and that the consumption patterns of reference persons strongly affect the decision to consume organic food. Interestingly, overall, the same drivers seem to explain the increase in organic consumption in emerging countries (Bruschi, Shershneva, Dolgopolova, Canavari, & Teuber, 2015; Chen & Lobo, 2012; Grannis, Hine, & Thilmany, 2003; Marques Vieira, Dutra De Barcellos, Hoppe, & Bitencourt da Silva, 2013).

On the other hand, a large amount of research has focused on the economic issues (such as the high prices of organic foods) affecting consumers' decisions and discourage repeat purchases of organic food products (Avitia, Costa-Font, Gil, & Lusk, 2015; Marian, Chrysochou, Krystallis, & Thøgersen, 2014). On the basis of a marketing literature review, Hemmerling, Hamm, and Spiller (2015) show that the most investigated topics are cost to the consumer, consumer value and benefits. Rodiger and Hamm (2015) review studies addressing the price elasticity of organic food demand. Despite an impressive number of papers published over the last decade, robust conclusions about the own-price elasticity of organic products and the cross-price elasticity of organic vs. non-organic products remain elusive (Bernard & Bernard, 2009; Bezawada & Pauwels, 2013; Bunte, van Galen, Kuiper, & Tacken, 2010; Lopez & Lopez, 2009; Monier, Hassan, Nichèle, & Simioni, 2009; Schrock, 2012). Concerning consumers' willingness-to-pay (WTP) for organic foods, Rodiger and Hamm (2015) conclude that a large share of consumers was willing to pay a higher price for organic food, although WTP differs by product categories and consumer segments. Finally, concerning the influence of socio-demographic data on WTP, contradictory results were obtained regarding the influence of family size, gender, income, and marital status. However, most studies have found that education and age variables had a strong and positive influence on WTP.

When considering all of these studies, it is worth noting that most of the available literature has addressed consumers' trade-offs between organic and conventional products, focusing on the reasons people buy organic foods and their WTP for health and environmental attributes. However, the literature excludes two important questions.

First, no consumer purchases only organic foods. Consequently, it is important (i) to determine the place of these foodstuffs within overall consumption patterns and (ii) to assess whether an increase in organic consumption is associated with modified consumption patterns. If so, then it is impossible to understand organic consumers' motivations without considering their consumption patterns or the substitutions and complementarity relationships between organic and non-organic products within the diet. Recent studies have explored this issue; by using large surveys, they have shown that organic consumption is often associated with modified consumption patterns (Kesse-Guyot et al., 2013; Petersen, Rasmussen, Strøm, Halldorsson, & Olsen, 2013). For instance, a small but statistically significant correlation between increasing organic budget shares and decreasing meat budget shares was found. The first goal of our paper is to pursue this analysis by using purchase data from a large representative sample of French households.

Second, the prices of organic foods are generally higher than those of conventional foods because they rely on stricter environmental specifications and more demanding production methods. However, if higher levels of organic consumption are associated with modified consumption patterns, what are the consequences of such modifications on household food expenditures? When considering both modified consumption patterns and price differentials between organic and non-organic foods, is an increase in organic consumption associated with larger or smaller total food budgets? In other words, does the modification of consumption patterns compensate for the increase in food budgets related to the purchase of more expensive organic products? This second point is important because, depending on the answer, research should focus not only on consumers' trade-offs between organic and conventional products (as the majority of existing studies do) but also on their willingness to change their consumption patterns (Micheelsen, Havn, Poulsen, Larsen, & Holm, 2014). The second goal of our paper is to answer these questions and better characterize the impacts of organic purchases on food budgets by accounting for variations in the overall consumption patterns. This will help us distinguish between 'quantity' and 'quality' effects, namely, the differences in the food budgets of non-organic and regular organic consumers caused by variations in the quantities of the different food groups purchased and the differences in the food budgets of non-organic and regular organic consumers caused by variations in the prices of the products purchased in the different food groups. This analysis will be able to provide interesting insights on organic consumers' preferences, not only about the trade-offs between organic and conventional foods, but also about their choices of dietary patterns.

Three important results follow. First, organic consumption seems to be one element in a wider 'quality strategy' of consumers because these consumers purchase, on average, not only more organic foods but also more national brands (compared to private labels) and more non-organic products of higher quality than non-organic consumers do. Second, we show that dietary patterns change considerably along the gradient of the organic penetration rate. Indeed, regular organic consumers have dietary patterns comprising more plant-based products, less meat, fewer alcoholic beverages and fewer prepared meals than do occasional and non-organic consumers. Independent of the specific characteristics of organic products, their diets are likely to be healthier and more environmentally friendly than those of other consumers. Third, we show that the quantity effect resulting from modified consumption patterns partially compensates for the quality effect resulting from the purchase of more expensive organic and non-organic foods by regular organic consumers. This means that the price barrier is perhaps not so high, with the major issue being the consumers' willingness to change their dietary habits, the potential loss of consumer welfare caused by a shift toward more sustainable dietary patterns, and the consumption of less-preferred foods.

2. Data and methods

The original data set is based on the records of a representative consumer panel of French households collected by Kantar Worldpanel. It is a home-scan data set that provides detailed information on all food product purchases. Among other things, the data set provides the characteristics of the goods (e.g., brand, size, regular or diet product, organic or conventional), quantities purchased, and related expenditures for each household. The data set also provides information on each household's socioeconomic characteristics, such as its demographic composition, socioeconomic status and