

# **Trust to Go Green:**

## **An exploration of consumer intentions for eco-friendly convenience food**

### **Abstract**

Interest in food products with eco-friendly characteristics and certifications has grown in recent decades. Consumers are also increasingly demanding ready-to-eat products, especially in urban environs, where modern lifestyles tend to limit their available time. Understanding the pro-environmental behaviour of convenience food consumers is particularly challenging because there is often a contradiction between eco-friendly behavioural intent and time constraints imposed by modern lifestyles in large cities. It is not clear to what extent information labels on such products are trusted by consumers and considered when making food choices. This study aims at contributing to the debate investigating the determinants influencing consumer purchase intention, focusing on minimally processed vegetables labelled with integrated-pest-management standards. More specifically, the analysis investigates the role consumer trust plays in consumer intention to buy such products. The conceptual framework builds on and extends the theory of planned behaviour. The analyses are based on face-to-face interviews in a large European city (Milan, Italy). Data were analysed by means of structural equation modelling. Results confirm the important role of consumer trust, which positively affects attitudes towards the purchase of convenience food with

1 eco-friendly attributes, and negatively affects consumer concerns around  
2 agricultural practices in relation to environmental and health impacts.

3  
4 *Keywords:* consumer trust, convenience food, eco-friendly attributes,  
5 theory of planned behaviour.

6  
7 JEL classification: D12, Q01; Q13, Q18.

## 8 9 **1. Introduction**

10 Interest in food products with eco-friendly characteristics and certifications has  
11 grown in recent decades in industrialised countries (Bougherara and Combris,  
12 2009; Falguera et al., 2012; Nuttavuthisit and Thøgersen, 2017). So-called  
13 ‘green’ products like organic, pesticide free products, or food produced  
14 following integrated-pest-management practices, are perceived by most  
15 consumers to be low-processed, naturally grown, and healthier than conventional  
16 food products Goetzke et al., 2014; Hemmerling et al., 2016; Lee and Yun,  
17 2015). Consumers are also increasingly demanding ready-to-eat products. In  
18 particular, in urban environs, modern lifestyles tend to limit the time availability  
19 of consumers (Botonaki and Mattas, 2010; Brunner et al., 2010). Thus,  
20 convenience food includes ‘time saving’ services in addition to the good itself,  
21 meaning that it is easier and quicker to prepare. Such products are, however,  
22 often criticised for not being environmentally sustainable for their technological  
23 production (Olsen, 2012).

24 In response to these contrasting consumer demands, food firms have begun to  
25 introduce convenience food with eco-friendly characteristics. In many food  
26 categories, including fresh, preserved, or frozen food, products that combine

1 convenience and (some) eco-friendly attributes are becoming more widespread  
2 (Meredith and Willer, 2016). An increase in the eco-friendly voluntary standards  
3 adopted by food firms has also become noticeable (Del Giudice, 2018). For  
4 some attributes, firms are able to follow specific public standards (for example,  
5 for organic produce); for others, they refer mainly to private ones (for example,  
6 integrated pest management, where there is no unified and commonly agreed on  
7 standard defining what is and what is not integrated agriculture) (Banterle and  
8 Stranieri, 2013).

9 Understanding the pro-environmental behaviour of convenience food consumers  
10 is particularly challenging because there is often a contradiction between eco-  
11 friendly behavioural intent and time constraints imposed by lifestyles in large  
12 cities. Moreover, the loss of connection with nature that often arises in urban  
13 areas makes it even more difficult for consumers to access sustainable options  
14 (Schösler et al., 2013). Indeed, there is the need to find organizational or market  
15 solutions able to accomplish both time-saving and eco-friendly consumer needs.

16 Previous research has explored extensively the role of consumer cognitive  
17 variables on consumer intention to engage in pro-environmental behaviour in  
18 relation to food choices. Specifically, consumer attitudes towards eco-friendly  
19 food products (Grunert et al., 2014; Honkanen et al., 2006; Lee and Yun, 2015)  
20 and consumer perceived availability of food with environmentally-friendly  
21 characteristics (Yadav and Pathak, 2016; Zhou et al., 2013) were found to be  
22 important predictors. Moreover, food-related literature has highlighted that  
23 consumer intention to buy eco-friendly products is influenced also by other  
24 variables such as food shopping habits (Menozzi et al., 2015) and consumer  
25 environmental and health concerns (Suki, 2016; Wee et al., 2014).

1 Trust has also been recognized as an important factor to explain food behaviour  
2 because it can represent a ‘shortcut’ to tackle the overwhelming amount of  
3 information that needs to be considered by consumers while shopping (Hobbs  
4 and Goddard, 2015). Indeed, in particular for food choices, heuristics are an  
5 important part of consumer decision-making processes (Chalamon and Nabec,  
6 2016; Schulte-Mecklenbeck et al., 2013). Moreover, trust is particularly  
7 interesting in the specific case analysed in this study because the two product  
8 characteristics considered (‘convenient’ and with an ‘eco-friendly’ quality  
9 attribute) convey contrasting perceptions of the potential risks and benefits  
10 associated with buying the product. Convenience food is often perceived  
11 negatively by consumers because of its lack of ‘naturalness’ due to its  
12 processing (Jackson and Viehoff, 2016). Indeed, Evans et al. (2010) argued that  
13 food processing or manipulation leads to a decrease in the perceived natural  
14 content of the product, and Abouab and Gomez (2015) stressed that handmade  
15 food production is considered more natural than technology-embedded products.  
16 The lack of naturalness associated with convenience food is perceived to  
17 negatively affect the environment and human health (Asioli et al., 2017; Román  
18 et al., 2017). On the other hand, eco-friendly products evoke a higher naturalness  
19 and greater benefits associated with healthiness and taste (Agovino et al., 2017;  
20 Michaelidou and Hassan, 2008; Mondelaers et al., 2009). As trust has been  
21 found to be a factor influencing perceived risks and benefits associated with  
22 products (Prati et al., 2012; Siegrist et al., 2007), we believe that trust can be a  
23 means to guide consumer choice under such ambiguity.

24 While the determinants for either convenience or eco-friendly products have  
25 been largely explored (for a review, see Pearson et al. (2011) and Brunner et al.  
26 (2010)), the variables affecting consumer intention to buy convenience food with

1 eco-friendly characteristics is still under investigated (Sillani and Nassivera,  
2 2015). Moreover, to the best of our knowledge, there is no investigation on the  
3 role of trust in consumer intention to buy convenience food with eco-friendly  
4 characteristics.

5 The present study aims at analysing the determinants of the purchase intention  
6 for such products that combine both types of quality attributes (i.e., that are  
7 convenient – thus quick and easy to prepare – and have eco-friendly features –  
8 that is, they have a lower environmental impact on at least one aspect, like water  
9 use, pesticide use, energy or carbon intensity, and so on). More specifically, the  
10 study concentrates on the case of minimally processed (MP) vegetables  
11 produced with integrated pest management (IPM) practices, namely, fresh  
12 vegetables processed to be ready to eat, and whose agricultural production  
13 relates to practices that reduce the use of chemicals compared to regular  
14 production processes. MP vegetables are a healthy convenience food that falls in  
15 the categories of convenience food proposed by Geeroms et al. (2008) and  
16 Brunner et al. (2010). Minimally processed fruit and vegetables represent an  
17 interesting market because even with their limited market share, the demand for  
18 such products is growing at a very fast and steady pace (Baselice et al., 2017;  
19 Nassivera and Sillani, 2017; Stranieri and Baldi, 2017; van Rijswick, 2010). The  
20 focus of the study is on vegetables as they constitute by far the larger part of the  
21 volume of such products (about 90% according to Rabobank data (van Rijswick,  
22 2011)).

23 Taking into account the above mentioned food products, the paper explores the  
24 following research questions.

1 RQ1. Can the variables affecting consumer pro-environmental behaviour be  
2 used to explain consumer intention to buy convenience food with eco-friendly  
3 characteristics?

4 RQ2. Does consumer trust affect consumer intention to buy convenience food  
5 with eco-friendly characteristics?

6 The present analysis addresses the above-mentioned issues and it specifically  
7 investigates: if trust influences the intention to buy convenience food with eco-  
8 friendly characteristics, testing its relevance in an integrated behavioural  
9 framework.

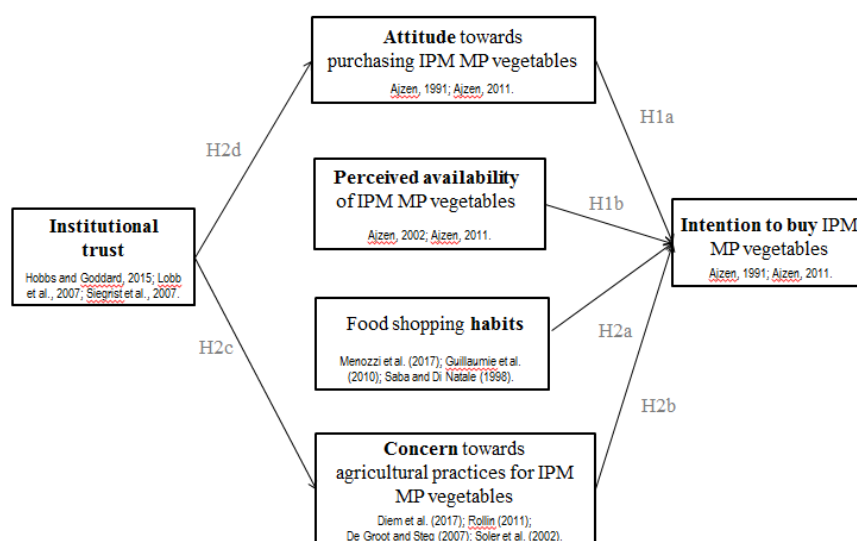
10 The conceptual framework of the research – discussed in Section 2 - is based on  
11 the theory of planned behaviour (TPB) (Ajzen, 1985), which gives insights on  
12 the psychological determinants of behaviour that are useful for the economic  
13 analysis of consumer behaviour (Steiner et al., 2017). The study analyses the  
14 role of trust as a background factor in an extended TPB framework, which  
15 considers different variables predicting behavioural intention. To reach the aims  
16 of the study, a structural equation model (SEM) is applied to the data collected  
17 via a survey of food shoppers in a large European urban area, namely, Milan,  
18 Italy (details are reported in Section 3).

19 Within this context, the research questions of this study find strong support in  
20 the stream of literature that shows the significant contribution of trust to the  
21 intention to buy eco-friendly or technology-related products. Its contribution to  
22 the stream relates to investigating how trust influences consumer behavioural  
23 intentions in the case of the simultaneous presence of contrasting perceptions  
24 relating to product quality attributes. The understanding of the determinants  
25 leading consumers to buy such products is also crucial for an effective quality  
26 differentiation strategy by firms and for policy interventions aimed at

1 encouraging and promoting sustainable practices in compliance with modern life  
 2 styles, where choices are made under time pressure; specifically, focusing on  
 3 consumers for whom pro-environmental behaviour is not the main priority while  
 4 shopping (Aschemann-Witzel et al., 2013).

## 6 2. Conceptual framework

7 The conceptual framework starts from the TPB (Ajzen, 1985), which extends  
 8 from the theory of reasoned action (Ajzen and Fishbein, 1980). Such a  
 9 psychological-related framework allows us to integrate existing economic  
 10 approaches for the analysis of consumer behaviour, which have been recognized  
 11 to have limitations in the interpretation of the behaviour determinants (Johe and  
 12 Bhullar, 2016; Vermeir and Verbeke, 2008; Yadav and Pathak, 2017). The TPB  
 13 model was integrated by considering food-related literature. The resulting  
 14 conceptual framework is presented in Figure 1. The hypothesized associations  
 15 among the variables, indicated in the figure by means of arrows, are discussed  
 16 below.



17  
 18 **Fig. 1. Conceptual model**

### 19 2.1 The TPB theory

1 The TPB analyses the antecedents of specific human behaviours, evaluating the  
2 role of intention to perform the behaviour and its determinants. According to the  
3 theory, intention to perform a behaviour is influenced by: the evaluation of the  
4 possible consequences of performing that behaviour; the expectations of  
5 reference individuals; and the potential catalysts or impediments to that  
6 behaviour. In Ajzen's model, these beliefs form attitudes towards the behaviour,  
7 perceived behavioural control, and subjective norms, respectively.

8 Attitudes relate to consumer evaluation of the effects of having the behaviour.  
9 The more positive consumers feel about buying a certain product, the higher the  
10 probability is they will purchase such a product (Honkanen et al., 2006). On the  
11 basis of Ajzen's theory the research hypothesizes:

12  
13 H1a: The more positive the consumer attitude is towards IPM MP vegetables,  
14 the higher the intention to buy them.

15  
16 Perceived behavioural control refers to individual perception of one's own  
17 ability to perform the behaviour. It relates to the perceived ease or difficulty of  
18 implementing the behaviour. Such consumer perception can depend both on  
19 individual features (like the difficulty in performing the behaviour because it is  
20 too costly in terms of money, time, physical effort, etc.) or external  
21 circumstances (like the availability in supermarkets, the accessibility of certain  
22 information, etc.).

23 Product availability was found to significantly affect the decision to purchase  
24 eco-friendly food (Aertsens et al., 2009). Several studies have highlighted that  
25 the lack of product availability is one of the deterrents of choosing eco-friendly  
26 products, like organic food, and it contributes to the so-called 'attitude-  
27 behaviour gap' for green consumers (Aschemann-Witzel and Niebuhr Aagaard,



1 2014). Sillani and Nassivera (2015) also highlight that the perceived availability  
2 of eco-friendly food products is among the significant factors that can explain  
3 pro-environmental behaviour for MP vegetables. On the basis of Ajzen's theory,  
4 the research hypothesizes:

5  
6 H1b: The higher the consumer perceived availability is of IPM MP vegetables,  
7 the higher the intention to buy them.

8  
9 The variables related to subjective norms measure consumer perceived social  
10 pressure to comply with the wishes of others (Ajzen, 1991). The aim is to  
11 evaluate consumer beliefs about what other people think they should do with  
12 regards to a specific behaviour and the relevance attributed to these. Literature  
13 on pro-environmental behaviour supports the idea that subjective norms can play  
14 an important role because of the social pressure exerted towards eco-friendly  
15 behaviour (De Leeuw et al., 2015). However, in this analysis, this determinant  
16 was not taken into consideration due to the debate still open in the literature<sup>1</sup>. In  
17 general, the authors acknowledge that social norms may have a significant effect  
18 on consumer behaviour, although in this particular study this effect should be  
19 weak as there is no strong social recognition related to IPM products. Moreover,

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<sup>1</sup> First, there is, at the moment, little agreement on the precise formulation of the role of subjective norms within the TPB. Some authors state that this determinant has to be considered as an independent variable influencing behavioural intention (Harland et al., 1999; Smith et al., 2008), whereas other authors incorporate subjective norms as an indirect activator of attitudes (Kaiser et al., 2005). Second, the effectiveness of subjective norms to explain consumer behaviour is still highly uncertain and debated in the literature (Armitage and Conner, 2001). Indeed, different studies exclude subjective norms in their analysis for a number of reasons (Godin and Kok, 1996). Many authors have highlighted that the correlation between subjective norms and intention is weaker than the relationships of attitude and perceived behavioural control with buying intention (Sparks et al., 1995; Van der Putte, 1991). Other authors have argued that the weakness of subjective norms in predicting consumer buying intention relates to the fact that there are only a few individuals whose actions are merely influenced by social pressure (DeBono and Snyder, 1995; Trafimow and Finlay, 1996). Many other studies specify that moral norms are more influential than subjective norms for the individual intention to perform a behaviour (Godin et al., 2005; Sheeran et al., 1999). Third, several food-related studies do not consider this variable or ascribe it as a poor predictor (Blanchard et al., 2009; Chen, 2016; de Bruijn, 2010; Honkanen et al., 2005).

1 compared to other behaviours, choices related to process attributes of food  
2 products – that are credence in nature – are not very visible to others. Thus, the  
3 social pressure related to such choices is very limited and should not affect the  
4 intention to buy IPM MP vegetables significantly.

5 The reason to adopt this framework is to try to, at least partially, overcome the  
6 limits of economic models based on the idea of individual choices driven only  
7 by self-interest, which do not work well in explaining consumer behaviour  
8 towards eco-friendly products (Turaga et al., 2010; Vermeir and Verbeke, 2006).

9 The assumption being that purely self-interested consumers would not consider  
10 pro-environmental behaviour if this required increased costs or personal  
11 inconvenience (Johe and Bhullar, 2016).

## 12 *2.2 Trust and other determinants of food behaviour*

13 The TPB has been used as a framework of analysis when studying food-related  
14 behaviour (Arvola et al., 2008; Menozzi et al., 2017b) and also pro-  
15 environmental behaviour in different research fields in general (Bamberg, 2003;  
16 Chen, 2016). Focusing on food consumer behavioural models, different authors  
17 have stressed the need for additional variables to strengthen the explanatory  
18 efficacy of the theory (Lobb et al., 2007; Menozzi et al., 2015; Steg and Vlek,  
19 2009; Stranieri et al., 2017). More specifically, food shopping habits,  
20 agricultural practice concerns, and consumer trust have been found to affect  
21 consumer intention to pursue an eco-friendly food choice (Govindasamy et al.,  
22 2001; Grankvist and Biel, 2001; Hobbs and Goddard, 2015; Menozzi et al.,  
23 2017a).

24 Food shopping habits relate to automatic actions that consumers conduct all the  
25 time during product procurement (Saba and Di Natale, 1998). Among these,  
26 consumer search for product label information is found to be positively related

1 to the intention to buy food products, including fruit and vegetables (Guillaumie  
2 et al., 2010; Menozzi and Mora, 2012). Labelled information, which has been  
3 found to affect consumer intention to buy food products includes: the origin of  
4 product (Scarpa and Del Giudice, 2004), organic and sustainability labels (Bond  
5 et al., 2008; Van Loo et al., 2014), the shelf life date of food (Ragaert et al.,  
6 2004), and nutritional and health-related labelled information (Lyly et al., 2007).

7 Following the above arguments, the research hypothesizes:

8 H2a: The higher the probability is to look for labelled information (food  
9 shopping habits), the higher the intention to buy IPM MP vegetables.

10  
11 Consumer agricultural practices concern, namely, the perceived risks associated  
12 with agricultural practice, is found to affect consumer intention to buy eco-  
13 friendly products like organic produce (De Groot and Steg, 2007; Soler et al.,  
14 2002). More specifically, Tarkiainen and Sundqvist (2005) confirm that organic  
15 products can be viewed as an ethical choice promoted by environmental  
16 concern. Wee et al. (2014), Shafie and Rennie (2012), and Diem et al. (2017)  
17 highlighted that consumer health and environmental concerns positively affect  
18 the intention to buy organic products. On the other hand, literature on  
19 technology-embedded products, like convenience food, mostly highlights a  
20 negative relationship between consumer risk perception and the intention to buy  
21 such products (Rollin et al., 2011). On the basis of existing literature, a possible  
22 association between consumer concern and purchasing intention of IPM MP  
23 vegetables is recognised, even if the sign is not clear given that IPM products are  
24 more eco-friendly than conventional products but less than organic ones. Thus,  
25 the research hypothesizes:  
26

1 H2b: Consumer concern towards agricultural practices significantly affects  
2 consumer intention to buy IPM MP vegetables.

3  
4 Finally, trust has been recognized as an important predictor of consumer beliefs  
5 and of consumer behaviour (Volland, 2017). Hobbs and Goddard (2015) stressed  
6 that most economic literature refers to generalized trust, namely, trust in others.  
7 However, institutional trust – namely, trust in institutions like governments and  
8 firms – has begun to be investigated by different authors as an important driver  
9 of consumer behaviour because it is considered a sort of heuristic, which  
10 influences consumer intention to buy products in the case of a lack of knowledge  
11 or time constraints.

12 Existing literature highlights how institutional trust may influence both  
13 consumer risk perception and attitudes. With regard to consumer risk perception,  
14 Lobb et al. (2007) found a negative relationship between trust in certain supply  
15 chain stakeholders and consumer risk perceptions towards chicken. In addition,  
16 Tonsor et al. (2009) confirmed that trust negatively affects risk perceptions of  
17 consumers in different countries. The same association was found for the effect  
18 of trust on perceived risks and benefits associated with eco-friendly products and  
19 technology-embedded products (Saba and Messina, 2003; Siegrist et al., 2007;  
20 Wee et al., 2014). Thus, the research hypothesizes:

21  
22 H2c: The higher the institutional trust, the lower the perceived risks related to  
23 agricultural practices for IPM MP vegetables.

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25 With regard to the relation between trust and consumer attitude, a number of  
26 studies have shown that the higher the consumer trust, the higher the probability  
27 to develop a positive attitude and, thus, to choose products with eco-friendly

1 characteristics (Govindasamy et al., 2001; Grebitus et al., 2015; Pugliese et al.,  
2 2013).

3 Existing literature also highlights that there is a positive association between the  
4 level of trust and consumer preferences towards technology-embedded food like  
5 convenience food (Botonaki and Mattas, 2010; Bruhn, 2007; Rollin et al., 2011).  
6 McComas et al. (2014) discussed the importance of consumer perceived fairness  
7 of policy makers for the development of a positive attitude towards GMO  
8 products. In addition, Siegrist et al. (2008) showed that trust in the food industry  
9 was an important determinant to explain consumer attitudes towards food  
10 produced with the use of nanotechnology.

11 At the same time, current knowledge on the effects of trust on attitudes for  
12 processed food indicates that consumers with low levels of trust towards  
13 technology-embedded products prefer unprocessed and naturally-grown  
14 products (Çabuk et al., 2014; Magkos et al., 2006). Some eco-friendly attributes  
15 of food products, like being organic, or food from integrated-pest-management  
16 practices, indicate that they are 'naturally grown', therefore, of interest to  
17 consumers with low levels of trust due to technological scepticism (Pino et al.,  
18 2012; Storstad and Bjørkhaug, 2003). Thus, when these are attributed to  
19 convenience food, like MP vegetables, this can create ambiguity in interpreting  
20 previous literature insights about how trust should influence consumer attitudes  
21 towards such products. Indeed, eco-friendly convenience food is, at the same  
22 time, at least partially 'green' and processed. This leads to the following  
23 hypothesis:

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25 H2d: Institutional trust significantly affects consumer attitude towards IPM MP  
26 vegetables.

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### **3. Methodology**

#### *3.1 Data collection*

The study was comprised of a sample of 550 consumers in charge of their household food shopping. Consumers were selected randomly in front of supermarkets. However, only consumers that declared to be responsible for their household food shopping and to have purchased at least once MP vegetables were interviewed. Interviews took place at nine supermarkets in the Milan area, in the northern part of Italy, one in each of the nine different boroughs that divide Milan, to try to intercept consumers with different socio-economic demographics. Retail stores were listed according to their borough and selected randomly from the nine boroughs sub-lists (Dixon and Leach, 1977). For the same reason, consumers were interviewed at different times of the day (morning, lunch-time, afternoon, evening). Interviews were face-to-face and followed a set of predefined questions. Details on the resulting sample can be found in Table 1. The choice of the interview setting, namely, at supermarkets, relates to the aim of capturing consumers in a food-shopping frame of mind, to try to reduce biases in responses. Indeed, this should increase consumer ability to remember the difficulties faced when food shopping among many products with various types of attributes at different levels, and having to respond to budget constraints and household preferences.

#### *3.2 Construction of the variables*

The questions of the interviews were close-ended and based on a five-point Likert scale. The interview questions were constructed following the indications of the TPB and on the basis of the results of previous literature on food choices.

1 Questions were pretested on a small sample of consumers, whose responses  
2 were not included in the dataset used for the analyses.

3 The structure of the questionnaire followed closely the conceptual framework  
4 discussed in Section 2. Following the TPB approach, each construct was  
5 investigated using multiple-item measures, namely, by including different  
6 questions to evaluate each latent variable. This should reduce the vulnerability of  
7 the data to measurement error and misinterpretation, and also allow to cover a  
8 broader range of meanings of the construct (Diamantopoulos et al., 2012).

9 More specifically, the questionnaire included a section analysing the intention to  
10 buy MP vegetables that are IPM, MP vegetables that are produced with a  
11 reduced amount of pesticides compared to ordinary products, and MP vegetables  
12 coming from agricultural practices with a reduced use of chemicals (variables  
13 INT<sub>1</sub>-INT<sub>3</sub>).

Variable name	Scale	Variable description	Variable distribution
<b>Gender</b>	dummy 0-1	0 male	48%
		1 female	52%
<b>Age</b>	scale 1-5	1 18-24	10%
		2 25-34	16%
		3 35-44	23%
		4 45-54	22%
		5 >55	29%
<b>Education</b>	scale 1-5	1 primary school	2%
		2 secondary school	16%
		3 higher education	45%
		4 university degree	29%
		5 post degree	8%
<b>Income</b>	scale 1-5	1 very difficult to balance income and expenses	9%
		2 difficult to balance income and expenses	22%
		3 just enough income to balance expenses	41%
		4 easy to balance income and expenses	21%
		5 very easy to balance income and expenses	7%
<b>Frequency of purchase of MP vegetables</b>	scale 1-5	1 less than once a week	28%
		2 once a week	18%
		3 twice a week	20%
		4 three time per week	14%
		5 more than three times per week	20%

**Table 1 – Sample description**

Furthermore, the study investigated the respondent's outcome evaluation of buying IPM MP vegetables, as an indicator of his/her attitude towards such products. The items referred to pest control, production costs of IPM production, use of pesticides, use of petrol, air emissions, and health impacts on farmers and local community (variables ATT<sub>1</sub>-ATT<sub>6</sub>).

The questionnaire also included questions related to consumer perceived behaviour control, namely his/her perceived ability to actually perform the behaviour, focusing on the accessibility of IPM MP vegetables on the basis of their availability in supermarkets, their price, their positioning, and the availability of price reductions (variables PBC<sub>1</sub>-PBC<sub>4</sub>).

Following the conceptual framework, the interviews focused also on additional factors with respect to the TPB. Indeed, a set of questions on consumer trust related to food production was included. More specifically, respondents were asked about their level of trust for: firms operating in the vegetable supply chain; food processor brands producing IPM MP vegetables; retailer private label brands producing IPM MP vegetables; and organisations responsible for controlling that food firm operations follow environmental standards (e.g., local, national, and European institutions or organizations) (variables TR<sub>1</sub>-TR<sub>4</sub>).

Moreover, a set of respondent food shopping habits concerning the regular use of labelled information were investigated, focusing on: ingredients list, nutrition facts, geographical origin, shelf life, organic certifications, IPM certifications, and other sustainability logos or certifications (variables HAB<sub>1</sub>-HAB<sub>8</sub>). The questionnaire also included questions aimed at evaluating the level of concern regarding agricultural practices with regards to the use of chemicals and to the related potential environmental and health impacts (CONC<sub>1</sub>-CONC<sub>6</sub>).



1 Table 2 reports further details on the questions for each of the variable  
2 constructs.

### 3 *3.3 Data analysis*

4 Data were first analysed by means of descriptive statistics. Subsequently, a  
5 confirmatory factor analysis (CFA) was performed to evaluate the validity of the  
6 constructs of the conceptual model. Indeed, the single variables previously  
7 described were organised in factors as indicated in Table 2.

8

Variable name	Scale	Description	Short name
<b>Intention to purchase IPM MP vegetables</b>			<b>INTENTION</b>
IPM PM vegetables	scale (1-5)	Level of intention to purchase IPM minimally-processed vegetables (no intention=1, high intention=5)	INT <sub>1</sub>
MP vegetables with a low use of pesticides	scale (1-5)	Level of intention to buy minimally-processed vegetables produced with a low use of pesticides (no intention=1, high intention=5)	INT <sub>2</sub>
MP products with a reduced use of chemicals	scale (1-5)	Level of intention to buy minimally-processed vegetables from producers using a reduced amount of chemicals' (no intention=1, high intention=5)	INT <sub>3</sub>
<b>Attitude towards IPM MP vegetables</b>			<b>Attitude</b>
Pest control	scale (1-5)	Level of agreement with the following phrase: IPM minimally-processed vegetables imply pest control for specific pests (1= strongly disagree; 5= strongly agree)	ATT <sub>1</sub>
Production costs compared to organic vegetables	scale (1-5)	Level of agreement with the following phrase: IPM minimally-processed vegetables imply a reduction in production costs compared to organic vegetables (1= strongly disagree; 5= strongly agree)	ATT <sub>2</sub>
Reduction in the use of pesticides	scale (1-5)	Level of agreement with the following phrase: IPM minimally-processed vegetables imply a reduction in the use of pesticides (1= strongly disagree; 5= strongly agree)	ATT <sub>3</sub>
Reduction in the use of petrol	scale (1-5)	Level of agreement with the following phrase: IPM minimally-processed vegetables imply a reduction in the use of petrol (1= strongly disagree; 5= strongly agree)	ATT <sub>4</sub>
Reduction of air polluting emissions	scale (1-5)	Level of agreement with the following phrase: IPM minimally-processed vegetables imply a reduction in air polluting emissions (1= strongly disagree; 5= strongly agree)	ATT <sub>5</sub>
Healthier conditions for farmers and the local community	scale (1-5)	Level of agreement with the following phrase: IPM minimally-processed vegetables imply healthier conditions for farmers and the local community (1= strongly disagree; 5= strongly agree)	ATT <sub>6</sub>
<b>Perceived availability of IPM MP vegetables</b>			<b>PB CONTROL</b>
Supermarket availability	scale (1-5)	Level of agreement with the following phrase: 'The decision to buy IPM minimally-processed vegetables is related to the availability in supermarkets' (1= strongly disagree; 5= strongly agree)	PBC <sub>1</sub>
Price	scale (1-5)	Level of agreement with the following phrase: 'IPM minimally-processed vegetables have competitive prices with respect to other minimally-processed vegetables' (1= strongly disagree; 5= strongly agree)	PBC <sub>2</sub>
Product placement	scale (1-5)	Level of agreement with the following phrase: 'IPM minimally-processed vegetables have an easy-to-reach product placement' (1= strongly disagree; 5= strongly agree)	PBC <sub>3</sub>
Price reductions	scale (1-5)	Level of agreement with the following phrase: 'IPM minimally-processed vegetables often have price reductions' (1= strongly disagree; 5= strongly agree)	PBC <sub>4</sub>
<b>Institutional trust</b>			<b>TRUST</b>
Supply chain	scale (1-5)	Level of trust in firms operating in the vegetables supply chain (1= very low trust; 5= very high trust)	TR <sub>1</sub>
Food processors	scale (1-5)	Level of trust in food processor brands producing IPM minimally-processed vegetables (1= very low trust; 5= very high trust)	TR <sub>2</sub>
Retailers	scale (1-5)	Level of trust in retailer private label brands producing IPM minimally-processed vegetables (1= very low trust; 5= very high trust)	TR <sub>3</sub>
Control institutions	scale (1-5)	Level of trust in organisations controlling compliance with environmental standards (1= very low trust; 5= very high trust)	TR <sub>4</sub>
<b>Food shopping habits</b>			<b>HABITS</b>
Ingredients list	scale (1-5)	Level of agreement with the following phrase: 'When shopping, I check the ingredients list on a regular basis' (1= strongly disagree; 5= strongly agree)	HAB <sub>1</sub>
Nutrition facts	scale (1-5)	Level of agreement with the following phrase: 'When shopping, I check the nutrition facts on a regular basis' (1= strongly disagree; 5= strongly agree)	HAB <sub>2</sub>
Geographical origin	scale (1-5)	Level of agreement with the following phrase: 'When shopping, I check the geographical origin on a regular basis' (1= strongly disagree; 5= strongly agree)	HAB <sub>3</sub>
Shelf life	scale (1-5)	Level of agreement with the following phrase: 'When shopping, I check the shelf life on a regular basis' (1= strongly disagree; 5= strongly agree)	HAB <sub>4</sub>
Organic certification	scale (1-5)	Level of agreement with the following phrase: 'When shopping, I check the presence of the organic logo on a regular basis' (1= strongly disagree; 5= strongly agree)	HAB <sub>5</sub>
IPM certification	scale (1-5)	Level of agreement with the following phrase: 'When shopping, I check the presence of IPM logos on a regular basis' (1= strongly disagree; 5= strongly agree)	HAB <sub>6</sub>
Sustainability logo/certification	scale (1-5)	Level of agreement with the following phrase: 'When shopping, I check the presence of sustainability logos or certifications on a regular basis' (1= strongly disagree; 5= strongly agree)	HAB <sub>7</sub>
<b>Agricultural practises concern</b>			<b>CONCERN</b>
Environmental programs on chemical products in agriculture	scale (1-5)	Level of agreement with the following phrase: 'Institutions should invest more money in environmental programs related to the use of chemical products in agriculture' (1= strongly disagree; 5= strongly agree)	CONC <sub>1</sub>
Control activities on agricultural practices	scale (1-5)	Level of agreement with the following phrase: 'Control activities on the environmental impact of agricultural practices are too scarce' (1= strongly disagree; 5= strongly agree)	CONC <sub>2</sub>
Concern for the environmental impact	scale (1-5)	Level of agreement with the following phrase: 'Environmentally-friendly agricultural practices imply a benefit for the environment' (1= strongly disagree; 5= strongly agree)	CONC <sub>3</sub>
Concern for the health impact	scale (1-5)	Level of agreement with the following phrase: 'Environmentally-friendly agricultural practices imply a benefit for human health' (1= strongly disagree; 5= strongly agree)	CONC <sub>4</sub>
Impact on water pollution	scale (1-5)	Level of agreement with the following phrase: 'Agricultural practices have a strong impact on water pollution' (1= strongly disagree; 5= strongly agree)	CONC <sub>5</sub>
Impact on human health	scale (1-5)	Level of agreement with the following phrase: 'Agricultural practices have a negative impact on human health' (1= strongly disagree; 5= strongly agree)	CONC <sub>6</sub>

1

2

**Table 2: Variable description**

Results of the CFA are provided in Table 3. All constructs show acceptable internal consistency, with Cronbach's alpha values between 0.62-0.79 (Hair et al., 2010). Factor loadings were higher than the threshold of 0.3 proposed by Hair et al. (2010), except for variable  $ATT_1$  measuring the outcome evaluation regarding pest control. However, the authors indicate that such guideline value may decrease with sample size and factor dimensionality. Thus, given that pest control considerations are relevant for the research question, that such variable is included in a factor based on a high number of variables, and that the sample size is larger than 350, it was decided to keep  $ATT_1$  in the model. Moreover, the p-values of the Wald test suggest keeping such a variable. Indeed, all variables included in all factors of the CFA were significant at the 0.001 level<sup>2</sup>. Table 4 reports the results of the correlation matrix. All correlations were well below 0.8 indicating that the factors were adequately separated (Brown, 2014; Sorbom, 1998).

Variable	Alpha	Factor loading	P-value	Variable	Alpha	Factor loading	P-value
<b>INTENTION</b>	0.78			<b>TRUST</b>	0.64		
IPM MP vegetables		0.44	0.00	Supply chain		0.58	0.00
MP vegetables with a low use of pesticides		0.96	0.00	Food processors		0.50	0.00
MP vegetables from producers with a reduced use of chemicals		0.90	0.00	Retailers		0.54	0.00
				Control institutions		0.53	0.00
<b>ATTITUDE</b>	0.78						
Pest control		0.21	0.00	<b>HABITS</b>	0.67		
Production costs compared to organic vegetables		0.31	0.00	Ingredients list		0.57	0.00
Reduction in the use of pesticides		0.75	0.00	Nutrition facts		0.32	0.00
Reduction in the use of petrol		0.87	0.00	Geographical origin		0.56	0.00
Reduction of air polluting emissions		0.88	0.00	Shelf life		0.55	0.00
Healthier conditions for farmers and the local community		0.43	0.00	Organic certification		0.45	0.00
				IPM certification		0.44	0.00
<b>PB CONTROL</b>	0.75			Sustainability logos/certifications		0.32	0.00
Supermarket availability		0.73	0.00				
Price		0.66	0.00	<b>CONCERN</b>	0.62		
Product placement		0.53	0.00	Environmental programs on chemical products in agriculture		0.48	0.00
Price reductions		0.71	0.00	Control activities on agricultural practices		0.39	0.00
				Concern for the environmental impact		0.37	0.00
				Concern for the health impact		0.41	0.00
				Impact on water pollution		0.47	0.00
				Impact on human health		0.33	0.00

Notes: IPM = integrated pest management; MP = minimally processed. P-values refer to the Wald test of:  $H_0$  = parameter equals zero in the population.

**Table 3 – Constructs and measurement items**

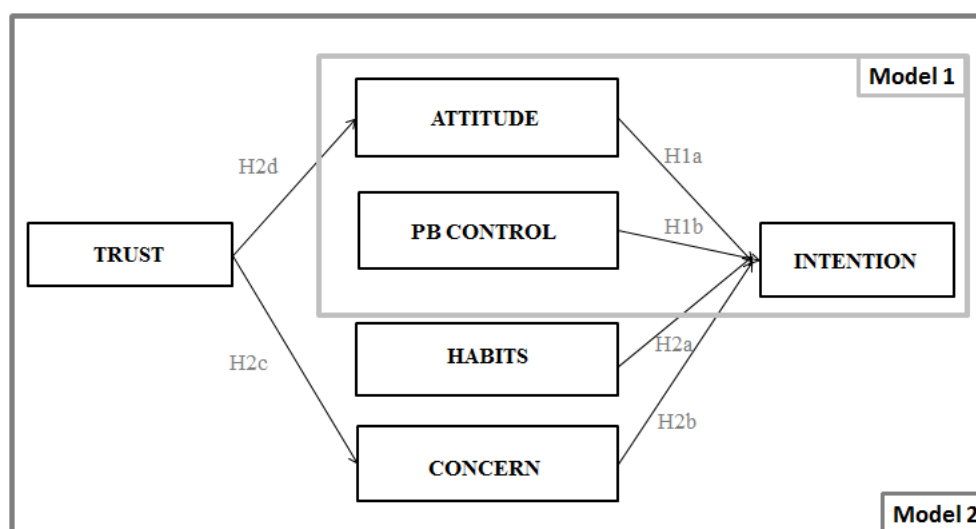
<sup>2</sup> Given that, by default, the R package lavaan fixes the (unstandardized) factor loading of the first indicator to 1, to evaluate the results of the Wald test for all indicators, several CFAs were performed, changing the order of the variables in the factors. The p-values reported in the table are the highest ones.

	INTENTION	ATTITUDE	PB CONTROL	TRUST	HABITS	CONCERN
INTENTION	1.000					
ATTITUDE	0.029	1.000				
PB CONTROL	0.474	0.056	1.000			
TRUST	0.285	0.179	0.312	1.000		
HABITS	-0.255	0.028	-0.318	0.157	1.000	
CONCERN	-0.305	0.420	-0.045	-0.145	0.593	1.000

**Table 4 – Correlation matrix**

The data were analysed using structural equation modelling. This approach allows the evaluation of the relative importance of the different latent variables included in the conceptual framework in influencing intention to purchase IPM MP vegetables.

Two models with additional constructs were tested on the basis of the TPB and food economics literature (Figure 2). More specifically, model 1 tested the role of the fundamental TPB constructs, except for social norms, and model 2 included the constructs related to food shopping habits and agricultural practice concerns, and the role of trust as a background factor influencing attitude and concern. Indeed, literature has shown how trust influences consumer attitudes towards ‘production and processing methods’ (Hobbs and Goddard, 2015; Lobb et al., 2007).



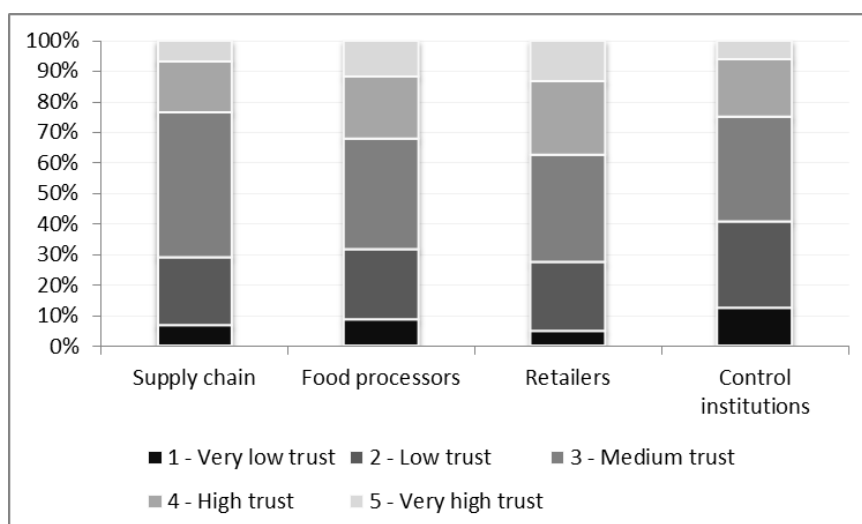
**Figure 2: Structural equation models**

1 Furthermore, previous research findings have also highlighted the role of trust in  
2 influencing the acceptance of technological processes and food products by  
3 reducing risk perceptions (Hobbs and Goddard, 2015; Ross et al., 2014; Siegrist  
4 et al., 2008). Data analyses were carried out using the Lavaan package (Rosseel,  
5 2012) of the R statistical software (R Core Team, 2013).

## 6 7 **4. Results**

### 8 *4.1 Descriptive statistics*

9 The main focus of the study is to analyse the role of trust in shaping the  
10 determinants of the intention to purchase IPM MP vegetables. Figure 3 reports  
11 the relative frequency of the answers to the four questions related to the  
12 respondents' level of trust ( $TR_1 - TR_4$ ). The comparison of the results of the four  
13 questions highlights quite consistent results; indeed, the CFA confirmed their  
14 aggregation into one unique factor. However, some differences in distribution  
15 arose. In particular, what seems to emerge is that the lowest level of trust is  
16 towards institutions meant to control compliance of food firms with  
17 environmental standards. On the other hand, the levels of trust seem to be higher  
18 for food processing and retailer brands. This may be connected to the perceived  
19 importance attributed by firms to brand reputation and, thus, to a form of  
20 calculative trust (Hobbs and Goddard, 2015).



1

2 **Figure 3 – Level of trust in the different food system actors**

3 We also analysed if trust levels vary with socio-demographic variables or the  
 4 frequency of purchase of MP vegetables, whether or not they are IPM. Table 5  
 5 reports the sign and significance levels of such associations. What seems to  
 6 emerge is that all else being equal, women are more confident with all actors in  
 7 the food system compared to men. Moreover, education and income seem to  
 8 have an effect, especially for trust in the supply chain and in the control  
 9 institutions. Results do not find a significant effect of age. Finally, as would be  
 10 expected, consumers that have higher levels of purchase of MP vegetables seem  
 11 to have higher levels of trust compared to those who do not buy such products.

Trust variable	Socio-demographic variables				Frequency of purchase variables	
	Gender	Age	Education	Income	MP veg.	IMP MP veg.
Supply chain	+ ***	n.s.	+ ***	+ ***	+ ***	+ ***
Food processors	+ **	n.s.	n.s.	n.s.	+ ***	+ ***
Retailers	+ ***	n.s.	+ **	+ **	+ ***	+ ***
Control institutions	+ ***	n.s.	+ **	+ ***	+ ***	+ ***

Notes : The table reports the sign of the relation and the significance level: \*\*\*  $p < 0.01$ ; \*\*  $0.01 \leq p < 0.05$ ; \*  $0.05 \leq p < 0.1$ ; n.s.  $p \geq 0.1$

12

13 **Table 5 – Associations between trust levels, socio-demographics, and**  
 14 **purchase frequency variables**

15

16

#### 1            *4.2 Structural equation model results*

2            The research hypotheses detailed in Section 2 were investigated by means of  
3            structural equation modelling. Table 6 reports the results of the two models  
4            explained in Section 3.3. More specifically, it presents the unstandardized  
5            estimate of each model variable, the standard errors, the Wald statistic, and its p-  
6            value<sup>3</sup>. Table 6 also details the model fit indices. Given the still open debate in  
7            the literature about how to evaluate model fit, a variety of indices of different  
8            classes are reported: absolute fit indices, incremental fit indices, and parsimony  
9            fit indices (Hu and Bentler, 1999; Kline, 2005). The results of the proposed  
10           model (model 2) indicate a reasonable fit. The values of some indices, like the  
11           adjusted goodness of fit index (AGFI), the comparative fit index (CFI), and the  
12           Tucker Lewis index (TLI), are slightly under the recommended level of 0.9  
13           (Awang, 2012; Bentler and Bonett, 1980; Hooper et al., 2008). However, results  
14           for other fit indices are in line or below the guideline values. The  $\chi^2/df$  is lower  
15           than the guideline values of 3 and 5 suggested by Kline (1998) and Schumacker  
16           and Lomax (2004), respectively. The value of the goodness of fit index (GFI) is  
17           just in line with the 0.9 threshold suggested by Hair et al. (2009) and Awang  
18           (2012). Other literature indicates that values higher than 0.80 suggest good fit  
19           (Forza and Filippini, 1998). The standardized root mean square residual (SRMR)  
20           of model 2 is 0.067, lower than 0.08 that is considered an indicator of a good fit,  
21           especially in conjunction with low values of the root mean square error of  
22           approximation (RMSEA) (Hu and Bentler, 1999). The RMSEA of the proposed  
23           model and the related test of close fit indicates a ‘good’ fit (Hu and Bentler,  
24           1999; MacCallum et al., 1996; Steiger, 2007). Given the discussion in the  
25           literature about using a set cut-off point estimate (Kenny et al., 2015), at least for

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<sup>3</sup> The estimates of the standardised solution of model 2 are reported in Table 7.

the RMSEA, the confidence interval for model 2 was calculated (0.046-0.054), suggesting that the degree of uncertainty about the estimate is limited.

Variable	Model 1			Model 2		
	Estimate	Z-value	P-value	Estimate	Z-value	P-value
<i>Effect on intention</i> <sup>#</sup>						
ATTITUDE	-0.013 (0.063)	-0.207	0.836	0.381*** (1.43)	2.660	0.008
PB CONTROL	0.263*** (0.38)	7.010	0.000	0.285*** (0.42)	6.783	0.000
HABITS				0.129** (0.62)	2.039	0.041
CONCERN				-0.469*** (1.21)	-3.863	0.000
<i>Effect on attitude</i>						
TRUST				0.081*** (0.30)	2.700	0.007
<i>Effect on concern</i>						
TRUST				-0.129* (0.071)	-1.809	0.071
<i>Model fit indices</i>						
$\chi^2/df$		5.46			2.38	
GFI		0.90			0.90	
AGFI		0.88			0.88	
CFI		0.88			0.88	
TLI		0.85			0.87	
SRMR		0.08			0.07	
RMSEA		0.09			0.05	
P-value (RMSEA<0.05)		0.00			0.48	
RMSEA C.I.		0.082-0.099			0.046-0.054	

<sup>#</sup> for a more clear representation of the relations tested by the model please refer to Figure 2.

Notes: Estimates refer to the unstandardised solution. IPM = integrated pest management; MP = minimally processed.

Significance levels: \*\*\*  $p < 0.01$ ; \*\*  $0.01 \leq p < 0.05$ ; \*  $0.05 \leq p < 0.1$

$\chi^2/df$  = Chi square /degrees of freedom; GFI= Goodness of Fit Index; AGFI=Adjusted Goodness of Fit Index; ; CFI =Comparative Fit Index; TLI= Tucker Lewis Index, also known as Non-normed Fit Index; SRMR=Standardized Root Mean Square Residual; RMSEA = root mean square error of approximation; C.I. = confidence interval.

### Table 6 – Structural equation model results

Comparing the fit indices of the proposed extended model with those of the basic TPB model, it emerges that model 2 shows a better fit with respect to model 1. Some indices, show moderate changes, however, other indices indicate quite strong model fit improvements. More specifically, model 2 presents quite a large decrease in the RMSEA values compared to model 1: from 0.091 to 0.050. The same occurs for the RMSEA confidence interval. Moreover, the test of close fit, whose null hypothesis is that the RMSEA is less or equal to 0.05 (Kenny et al., 2015), also shows better results (p-value of 0.479 for model 2 compared to



1 0.000 for model 1). Model 2 also shows an improved explanatory power in  
2 relation to the intention to purchase IPM MP vegetables ( $R^2= 0.339$  of model 2  
3 compared to  $R^2= 0.229$  of model 1), which also supports the inclusion of the  
4 additional variables in the model.

#### 5 *4.3 Hypothesis testing and interpretation of the results*

6 Focusing on the hypotheses postulated in the conceptual framework, what  
7 emerges is that there is a positive very significant association of intention to  
8 purchase IPM MP vegetables with the attitude of consumers towards such  
9 products (H1a: ATTITUDE  $\rightarrow$  INTENTION) and with perceived control  
10 variables (H1b: PB CONTROL  $\rightarrow$  INTENTION), as is expected following  
11 Ajzen's theory. Table 7 also highlights a very strong relation, especially with the  
12 control variable, which in the current model is related to the perceived  
13 availability at retail stores. Furthermore, model results confirm that food  
14 shopping habits related to label use may play a role in shaping purchase  
15 intention (H2a: HABITS  $\rightarrow$  INTENTION), and that concern related to  
16 agricultural practices is also important and might deter very concerned  
17 consumers from buying IPM products that offer less warranty than organic  
18 products (H2b: CONCERN  $\rightarrow$  INTENTION). The results also indicate that  
19 institutional trust in food supply chain-related actors (from food firms to control  
20 organisations) influences both the attitudes of consumers towards the IPM  
21 labelled products (H2d: TRUST  $\rightarrow$  ATTITUDE) and the concern about the  
22 environmental and health-related impacts of agricultural practices (H2c: TRUST  
23  $\rightarrow$  CONCERN). More specifically, we find a strongly significant positive  
24 relation between trust and attitude, namely, the outcome evaluation of the  
25 purchase of IPM MP vegetables. This indicates that the more consumers trust  
26 supply chain-related actors, the more they would be willing to buy IPM MP

1 vegetables. The relation with agricultural practices concern is instead negative  
 2 (and mildly significant). This suggests that consumers who have more trust in  
 3 the food system agents are less concerned about the environmental and health  
 4 issues related to agricultural practices and show higher levels of intention to buy  
 5 IPM products. This may indicate that building trust in IPM MP vegetable supply  
 6 chain actors could be a way of promoting the purchase of such products.

Hypothesis	Path	Standardised estimate	p-value	Effect
H1a	ATTITUDE → INTENTION	0.193***	0.008	supported
H1b	PB CONTROL → INTENTION	0.497***	0.000	supported
H2a	HABITS → INTENTION	0.174**	0.041	supported
H2b	CONCERN → INTENTION	-0.467***	0.000	supported
H2c	TRUST → CONCERN	-0.145*	0.071	supported
H2d	TRUST → ATTITUDE	0.179***	0.000	supported

7  
 8 **Table 7 – Hypothesis testing**

9  
 10 **5. Discussion and implications**

11 *5.1. Results discussion*

12 The two models presented in the analysis confirm the efficacy of a TPB-based  
 13 framework to explain consumer eco-friendly buying intention, particularly of the  
 14 extended one. More specifically, model 1 highlights the strong role of perceived  
 15 behavioural control in intention. Model 2 confirms results on the role of attitude  
 16 and perceived behavioural control as in the TPB, and of food shopping habits  
 17 and agricultural practices concern as in previous food economic literature  
 18 (Cranfield and Magnusson, 2003; Govindasamy et al., 2001; Grankvist and Biel,  
 19 2001; Koenig-Lewis et al., 2014; Menozzi et al., 2015; Stranieri et al., 2017).  
 20 Moreover, it also supports the hypotheses that trust can have a significant effect  
 21 on consumer attitudes and concerns. Indeed, the results of model 2 confirm the  
 22 validity of adding food-related variables to the standard TPB framework (model  
 23 2 vs. model 1). More specifically, the positive association between attitude and

1 the intention to purchase IPM MP vegetables shows that consumer evaluations  
2 about the likely outcomes related to buying IPM MP are strong determinants of  
3 purchase intention. Moreover, the relevance of perceived behavioural control to  
4 the intention to buy IPM MP vegetables highlights how product accessibility is  
5 key to making sustainable choices, especially for convenience food shoppers,  
6 whose shopping is often characterised by time constraints in terms of product  
7 selection.

8 The role of commonly repeated actions and food habits while food shopping is  
9 also confirmed in the results of the study. The analysis highlights a significant  
10 impact of consumer search for product information on eco-friendly behaviour.  
11 This result corroborates previous literature on the effectiveness of information-  
12 based food policy instruments in creating consumer awareness and focusing  
13 consumers on sustainable food consumption (Reisch et al., 2013; Verain et al.,  
14 2015).

15 In contrast to results on organic produce, concern for the environmental and  
16 health impacts of agriculture shows a negative association with purchasing  
17 intention. This result suggests that this type of product may not be attractive to  
18 the very concerned consumer who prefers organic food, but could instead be  
19 targeted at the share of the population who might not be committed enough to  
20 pay the premium price needed to purchase organic products but might still  
21 demand more eco-friendly attributes in their food. Such products may, indeed,  
22 be a means of engaging with environmentally friendly food choice consumers  
23 who are not already active on such issues or consumers who do not reveal  
24 environmentally conscious behaviour.

25 The model also indicates that institutional trust can affect consumer risk  
26 perception, in line with existing literature (Lobb et al., 2007; Siegrist et al.,

2007; Tonsor et al., 2009; Wee et al., 2014). Indeed, what seems to emerge is that consumers who trust the supply chain-related agents – including IPM food processors and retailer brands and control institutions – are less concerned with the possible negative impacts on the environment and human health of agricultural practices, and, thus, show a positive intention to purchase these products that provide intermediate levels of consumer warranty on such aspects. The results also highlight a strong positive association between trust in the different supply chain-related actors and the intention to purchase IPM MP vegetables. Indeed, the more consumers have trust, the more they have a positive attitude towards such products, and, thus, the more they are, again, willing to purchase them. Indeed, results confirm that trust can be included as a background factor for the intention to buy eco-friendly convenience products. This is in accordance with Hobbs and Goddard (2015), who discuss the role of trust as a cognitive shortcut when deciding among food products, especially in the absence of ‘knowledge, experience or familiarity with firms’. Indeed, following the insights of this study, low levels of institutional trust may hinder the purchase of environmentally sustainable products that could promote environmentally friendly behaviour by food firms, and thus environmentally related societal benefits (e.g., impact reduction).

### *5.2. Implications*

The present research contributes both from a theoretical and practical point of view point. It provides an integrated framework to better explain and interpret consumer eco-friendly behaviour in relation to convenience food products. Moreover, the present analysis confirms theoretically the importance of trust as a determinant in consumer behavioural models. From a managerial and policy perspective, the role of consumer attitudes in shaping consumer intentions to buy

1 IPM MP vegetables highlights the importance of information campaigns  
2 explaining to consumers how IPM products are produced and how they differ,  
3 on the one hand, from conventional products, and, on the other, from organic  
4 ones. The large amount of separate voluntary private initiatives regarding IPM  
5 practices does not allow for quick and easy understanding and recognition of  
6 IPM products. As a consequence, it may induce confusion in the final consumer  
7 and require too high information cost for many convenience food consumers,  
8 who aim at saving time and effort. Information and education campaigns  
9 adopting different means at different levels of engagement may increase the  
10 understanding and the salience of the specific characteristics and motivations to  
11 purchase IPM products.

12 The importance of product perceived availability suggests that making eco-  
13 friendly convenience products more accessible cost-wise – by providing  
14 discounts – or time and convenience-wise – by allowing a larger distribution  
15 among retailers and making them more easily recognisable – could be important  
16 options for increasing their diffusion. Indeed, literature has highlighted how high  
17 price and limited availability are important reasons that hinder purchase of  
18 organic products (Aschemann-Witzel and Niebuhr Aagaard, 2014). Thus,  
19 promoting accessibility to IPM convenience food could be a way of engaging  
20 with sustainable behaviour consumers who are not committed enough or able to  
21 buy organic food but who would be willing to act more sustainably.

22 In this study, the significance of habits referring to information search on labels  
23 highlights, once again, the potential benefits of a common and easily  
24 recognisable logo or claim for IPM products to be noticed (and possibly used to  
25 select products) by consumers who are not as accustomed to check labels  
26 thoroughly. However, it should be considered that eco-friendly labelling

1 schemes are expected to nudge, in particular, those consumers who are already  
2 engaged in sustainable food consumption (Steiner et al., 2017; Banterle et al.,  
3 2018).

4 Institutional trust can instead be considered as a strategic determinant to be  
5 reinforced in order to promote sustainable food consumption to consumers who  
6 are not particularly involved in eco-friendly behaviour. The present analysis  
7 underlines the importance of identifying and implementing policies aimed at  
8 improving trust in the food supply chain-related agents. Literature indicates that  
9 trust levels may be influenced both positively and negatively (Wales et al.,  
10 2006). Confidence in supply chain-related actors can be dramatically reduced by  
11 food scares and by fraudulent labelling. In the case of eco-friendly production  
12 processes, trust is not so much a matter of food safety but rather of believing that  
13 the indicated characteristics are actually present. Indeed, the adoption of IPM  
14 procedures in production is a credence attribute that cannot be verified directly  
15 by the consumer, but is just matter of faith. For what concerns MP vegetables or  
16 convenience food in general, there are issues related to trust in the processing  
17 technology. Strategies and policies that build consumer trust are not readily  
18 identifiable. Indeed, in addition to consumers not having complete information,  
19 trust is a complex phenomenon that does not depend only on rational judgments  
20 about risks, but involves both cognitive and emotional aspects (Tonkin et al.,  
21 2016a, 2016b). Thus, literature is increasingly highlighting how improving  
22 consumer information and knowledge is not a very effective quick-fix to  
23 increase consumer trust (Eden et al., 2008). Nevertheless, such measures may  
24 build positive attitudes towards products and affect concerns towards  
25 agricultural practices, which, in turn, affect purchase intention. Indeed, more  
26 information and knowledge may engage consumers on the topic of the use of

1 chemicals in agriculture, either by responding to concerned consumers, or,  
2 possibly, increasing concerns of previously unconcerned consumers. In any case,  
3 this increases consumer consciousness of the impacts of everyday choices,  
4 which is a positive result.

5 Returning to the discussion on how to influence trust levels, labelling has been  
6 identified by the literature as a way to affect ‘consumer perceptions of  
7 trustworthiness’ and to reinforce trust in the food system, even if interpretation  
8 of the labelled information may not necessarily remain strictly within the correct  
9 regulatory definition (Tonkin et al., 2016a, 2016b).

10 Transparency, communication, and engagement may play a role in increasing  
11 consumer confidence, especially in institutions (Hobbs and Goddard, 2015).

12 This is particularly relevant given that the results of the present study suggest  
13 that particular attention should be devoted to building trust for public  
14 institutions, which seems to be – at least in the sample of the study - lower than  
15 trust in private firms and their brands. Such measures can increase both  
16 consumer information – working on the cognitive side of trust - and consumer  
17 perceptions and ‘feelings’ about the agents. Consumers are, indeed, increasingly  
18 getting used to (and valuing) having a more proactive role and being directly  
19 engaged in public and private decisions in different sectors (Markandya and  
20 Ricci, 2012). Reorganisation and ability to adapt regulation to the continuously  
21 evolving food market risks may also be important to build trust in authorities  
22 (Wales et al., 2006).

23 Trust may also be considered a social phenomenon (Hobbs and Goddard, 2015;  
24 Tonkin et al., 2016b). Indeed, trust levels may be influenced by social  
25 interactions. Word-of-mouth (WOM) has been known to have a strong influence  
26 on product diffusion (Bass, 1969), thus, policies aimed at increasing trust could

1 be targeted at groups, taking advantage of diffusion processes therein. Moreover,  
2 current information and communication technologies (IC&T) technologies have  
3 for some years now allowed consumers to search and share information and  
4 opinions not only among their small circle of personal contacts but also with  
5 geographically distant consumers via electronic WOM, possibly amplifying the  
6 effects of policies promoting trust. These aggregation possibilities are  
7 particularly relevant for building/reducing trust in organisations and affecting  
8 firm reputation (Dellarocas, 2003; King et al., 2014).

## 9 10 **6. Conclusion, limitations, and future research directions**

11 The results of the present analysis highlight the role of trust in shaping consumer  
12 eco-friendly behaviour and it sheds light on the way trust influences behavioural  
13 variables in the case of food products characterized by contradicting attributes in  
14 relation to consumer perceptions, namely, convenience and eco-friendly  
15 attributes.

16 When analysing the insights from this study, however, a few limitations should  
17 be taken into account. The sample of respondents includes consumers living in a  
18 metropolitan area; thus, the results are not representative of the Italian  
19 population but rather of consumers living in a large European city. Furthermore,  
20 results are based on stated preferences. This follows from the TPB and from the  
21 need to collect data otherwise unavailable, like intentions, attitudes, perceptions,  
22 and control issues. Nevertheless, biases in responses may arise due to the nature  
23 of the data. To try to reduce the hypothetical nature of the questions, respondents  
24 were interviewed in front of supermarkets. Interviewing respondents ‘while  
25 voluntarily thinking about food shopping’ should increase their ability to recall  
26 their decisional processes and choices. Moreover, the current analysis stops at



1 the evaluation of the purchasing intention rather than at the behaviour itself.  
2 Nevertheless, the TPB theoretical framework and previous research shows how  
3 intentions and behaviour are strongly related, even if intentions do not always  
4 turn into actual behaviour (Sheeran and Webb, 2016). Even in the presence of  
5 the above limitations, the current research still contributes to the literature as it is  
6 among the few studies on the relation between consumer trust and consumer  
7 purchasing intention for convenience food with environmentally friendly  
8 attributes.

9 Future work may want to focus also on other types of consumers living in more  
10 rural areas to get a wider picture of the issue. Research should also test the  
11 robustness of the results on other types of convenience food with  
12 environmentally sustainable attributes. Moreover, it would be useful to analyse  
13 further the topic looking at different types of trust: trust in the information given  
14 by firms via labelling and trust related to technology adoption. Future research  
15 effort should also be devoted to study the determinants of trust and how trust is  
16 diffused via social interaction and other diffusion channels to be able to evaluate  
17 the impacts of different policies.

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