

# Attitudes of Young Consumers towards Traceability System in Organic Food Supply Chains

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**Abstract.** The main aim of this paper is to investigate the factors which affect the acceptance of a traceability system in organic food supply chains. A survey research was carried out in Greek young consumers. According to the sample, two different profiles are revealed in terms of Willingness to Pay (WTP) for a traceability system: the WTP and non-WTP organic consumers. The data were collected and analysed using descriptive statistics and multivariate statistical analyses. The results show that several concerns influence the young organic consumers' decision to accept and pay or not for a traceability system in organic food supply chains. These findings may benefit organic food supply chain stakeholders in developing further marketing strategies to engage existing and gain new consumers.

**Keywords:** Trust; Quality; Nutritional Value; Willingness to Pay; Exploratory Factor Analysis; Categorical Regression.

## 1 Introduction

In the last two decades, the recurring nature of the different food crisis or related scandals has made food safety an issue of intense public concern. Food outbreaks imply consequences at different levels of the food chain with particular relevance on consumer behaviour. Consumers are faced with different food safety problems which influence their attitudes and preferences towards specific food products and become more aware of food safety issues, diversifying their options. From a consumer perspective, the choice of one product over another depends on the added benefits perceived in it.

Among best practices to improve food safety levels and the related risks is the adoption of a traceability system. The term “traceability” signifies “*the ability to trace and follow a food, feed, food-producing animal or substance intended to be, or expected to be incorporated into a food or feed, through all stages of production, processing and distribution*” (Regulation No 178, 2002). Traceability systems

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Proceedings of the 9th International Conference on Information and Communication Technologies in Agriculture, Food & Environment (HAICTA 2020), Thessaloniki, Greece, September 24-27, 2020.

represent the most suitable tool for circulating information on product quality to end consumers and for making the manufacturing system and the whole supply chain more transparent.

The opportunity to connect traceability with the whole documentation and control system represents an effective means for boosting the consumer's perception of a food's safety and quality (Moe, 1998). Van Rijswijk et al. (2008) found that consumers' benefits associated with traceability are related to health, quality, and safety, of which the latter is associated with trust and confidence. A research in Italy showed that the trust affected the intention to purchase traceable food (Menozzi et al, 2015). On the other hand, consumers do not seem to connect traceability with the price of food (Giraud and Amblard, 2003), but in a cross-cultural study in Germany and Greece, price was a significant factor regarding their choices and as price decreases, the consumers' preferences increase (Christophorou-Kehagia et al, 2017).

Nevertheless, it is notable that the existence of a traceability system constitutes a powerful competitive tool that adds value to the product and allows the added costs to be passed on to the purchaser who is willing to pay for the plus-value offered together with the product (Mancini et al., 2002). Hence, consumers will take on a significant part of added production costs as the direct beneficiaries of food quality improvements (Yin et al, 2020).

The investigation of willingness to pay (WTP) either for organic or foods with traceability system has triggered extensive academic interest. Metref and Calvo-Dopico (2016) found that after providing consumers with information about the benefits of traceability and quality control in the food chain, they had a higher WTP. Angulo et al. (2003) found that although the Spanish consumers were concerned with the issue of food safety, 72.5% of them were not willing to pay a premium for a labelled food with a traceability certificate. Other study showed that consumers are reluctant to pay more for traceable products as the prices are unreasonably high. Likewise, they are more willing to buy traceable products at a moderate price, and their willingness to buy will drop with the increase in the product price (Chen et al, 2019).

However, in literature less attention has been given to investigate young consumers' acceptance and WTP for a traceability system in organic food supply chains. It is a common belief that the importance of generations in marketing research is well acknowledged due to cohorts' similar characteristics (Williams et al, 2010). The significance of focusing on young generation relies on the fact that this way we can track and forecast changes in the marketplace emerging from the entrance of new cohorts with a new value system, wants, and needs (Schewe and Noble, 2000). For this purpose, the objective of this paper is to investigate the factors which affect the young consumers' acceptance of a traceability system in organic food supply chains.

## 2 Methods

A survey research was performed in Greek young consumers (i.e. age between 18 and 24) in order to meet the objectives of this paper. Dataset was collected via online questionnaire (Ilieva et al., 2002). The link of the online data gathering remained active from May to October 2019 and this procedure led to a sample of 1185 valid

questionnaires. Data were evaluated using descriptive statistics and multivariate statistical analyses. The methodological procedure involved several steps. First, the validity and reliability of the variables included in the questionnaire were assessed through the implementation of Exploratory Factor Analysis using the principal components extraction method (varimax rotation) and Cronbach's alpha, respectively. Moreover, some tests were applied and particularly, normality test of Kolmogorov-Smirnov and non-parametric tests such as Mann-Whitney and Kruskal-Wallis.

Categorical Regression (CatReg) was employed to identify those factors that positively or negatively affect young consumer's decisions related to the acceptance of a traceability system in organic food supply chains. CatReg models are applied and especially, in young organic consumers who are willing to pay for a traceability system and those who are not willing. Categorical regression is a method that is based on optimal scaling and quantifies data of categorical variables by assigning numerical values in categories with a view to optimum linear regression of transformed variables (van der Krooij and Meulman, 1997). CatReg is also used when some of the variables are not numeric or the relationship between variables is not linear (Siardos, 2005).

### 3 Results and Discussion

The sample comprised of young consumers aged between 18 and 24 who are buying organic foods (every day to rare). From the 1185 respondents participating in this research, 75.4% were females and 24.6% males. The vast majority of the young consumers were university students (87.6%) and unmarried (98.6%). Furthermore, the majority of the respondents had annual household income less than 7999€ (38.9%) and between 8000€ and 14999€ (25.3%). Only the 5.1% of the young consumers did not agree to accept a traceability system in organic food supply chains. By respondents who accept it (94.9%), the 79.2% were willing to pay for a traceability system and the 20.8% were not.

Exploratory Factor analysis was used to identify the components of young consumers concerns on organic foods and summarize most of the original information to a minimum number of factors for predictive purposes. The results of Exploratory Factor analysis and Reliability analysis are illustrated in Table 1. Factor analysis showed five factors accounting for 57.7% of the total variance. All variables had loadings higher than 0.50 in each attribute of these factors which indicates a good fit. Reliability analysis (Cronbach's alpha) confirmed that the scale is reliable (Total  $\alpha=0.768$ ), exceeding the minimum standard of 0.60 suggested by Malhotra (2007).

**Table 1.** Results of Exploratory Factors analysis and Reliability analysis

Factors	Attributes	Reliability of the factor
(1 <sup>st</sup> ) 22.98% of total variance	Quality-Nutritional Value	0.855
(2 <sup>nd</sup> ) 11.84% of total variance	Food Safety	0.778
(3 <sup>rd</sup> ) 9.57% of total variance	Trust-Production method	0.687
(4 <sup>th</sup> ) 7.55% of total variance	Price	0.698

(5<sup>th</sup>) 5.77% of total variance Health 0.753

*Kaiser-Meyer-Olkin Measure of Sampling Adequacy=0.836; Bartlett Test of Sphericity: Approx. Chi-Square=9639.030; df=253; Significance=0.000; Total variance explained:57.7%; Total Cronbach's Alpha: 0.768*

CatReg models were employed to discover the acceptance level of a traceability system in each category of young consumers (the WTP and the non-WTP organic consumers) relating to additional features. Firstly, the factors which lead to accept a traceability system in organic food supply chains were investigated by the level of acceptance as a dependent variable. The F-statistic values as regards each CatReg model are statistically significant which indicates that models are well-performed (Table 2 and Table 3). Also, the coefficients of tolerance concerning all variables in each CatReg model are high and the negative Pratt's values are small which means that there is no multicollinearity problem. According to Table 2, the most significant factor in relation to Pratt's measure of relative importance which encourage young consumers to accept and their WTP for a traceability system is *Quality-Nutritional value* (78.4%). Finding which is in line with past studies (Metref and Calvo-Dopico, 2016; van Rijswijk et al, 2008).

**Table 2.** Results of CatReg model in young organic consumers' WTP

Dependent variable	Independent Variables	Beta	Pratt's measure of relative importance
Acceptance of traceability system	Quality-Nutritional value	0.670	0.784

*F-statistics: 8.558; Significance:0.000; Multiple R: 0.777; R<sup>2</sup>: 0.604; Interpretation= 78.4%*

On the other hand, the factors which affect the young consumers who are not willing to pay but accept a traceability system are presented in Table 3. Variables such as *Trust of production method* (44.3%), *Quality-Nutritional value* (26.7%), *Price* (12.5%) and *Food Safety* (10.2%) are the most significant and lead to non-WTP young organic consumers to accept a traceability system in organic food supply chains, findings which are consistent to previous studies (Chen et al, 2019; Christophorou-Kehagia et al, 2017; Menozzi et al, 2015; van Rijswijk et al, 2008).

**Table 3.** Results of CatReg model in young organic consumers' non-WTP

Dependent variable	Independent Variables	Beta	Pratt's measure of relative importance
Acceptance of traceability system	Trust of production method	0.688	0.443
	Quality-Nutritional value	0.538	0.267
	Price	0.507	0.125
	Food Safety	0.387	0.102

*F-statistics: 4.630; Significance:0.000; Multiple R: 0.877; R<sup>2</sup>: 0.769; Interpretation=93.7%*

Further discussion on the above results indicates that both groups appreciate food quality and nutritional value. However, the relative importance of this appreciation from the first group (the WTP organic consumers) is considerably higher compared to the second group (the non-WTP organic consumers) justifying their WTP for a traceability system. This is a strong indication that the consumers from the first group are more cognizant of the organic products and their decision to purchase them is more conscious; thus, the first group could be labelled the *organic conscious WTP consumers*. In addition, the second group is characterized by price concerns which are consistent to their non-WTP behaviour. Finally, an interesting finding regarding this group is the significance of production method trust and food safety factors. One possible way to explain this is that these consumers have already decided not to pay for a traceability system (even though they are aware of its benefits) and that decision increases their trust and safety issues. Therefore, the second group could be labelled the *organic sceptical non-WTP consumers*.

#### 4 Conclusions

This paper examines the attitudes of young consumers towards traceability system in organic food supply chains, investigating those factors that positively or negatively affect their decisions related to acceptance and WTP. The results suggest two groups of consumers, the *organic conscious WTP consumers* and the *organic sceptical non-WTP consumers*. Key differences between those groups are the importance the latter group place on price, production method trust and food safety. The above findings have both managerial and policy implications. Organic food supply chain stakeholders (e.g. producers, traders and retailers) could collaborate under a traceability scheme, enhancing their profile, engaging their existing clients and attracting new. Policymakers should examine the prospect of regulating traceability, considering the high level of young consumers' acceptance.

**Acknowledgments.** This project has received funding from the Hellenic Foundation for Research and Innovation (HFRI) and the General Secretariat and Technology (GSRT), under grant agreement No [1786].

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