

# Organic food product purchase behaviour: a pilot study for urban consumers in the South of Italy

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## Abstract

The aim of this paper is to explain factors that influence organic food purchases of urban consumers in the South of Italy. To achieve this goal, a multivariate limited dependent variable model has been specified to simultaneously analyse consumers' organic food purchases, the intention to purchase organic food products and the level of organic knowledge. This study uses survey data gathered from 200 consumers in Naples in 2003. Results indicate that consumers who are more willing to buy organic food products are more likely to buy a larger amount of those products. The intention to purchase depends on attitudes and organic product knowledge. Moreover, consumers' attitudes towards health and environmental benefits provided by organic foods are the most important factors explaining, both, the intention to purchase and the final decision. Finally, income and organic knowledge positively influences the final decision to buy organic food products.

**Additional key words:** attitudes, intention to purchase, organic knowledge, simultaneous equation model.

## Resumen

### **El comportamiento del consumidor en la compra de los alimentos ecológicos: un estudio exploratorio para los consumidores urbanos del sur de Italia**

El principal objetivo del trabajo es analizar los factores que influyen en la decisión de compra de los alimentos ecológicos. Para ello se plantea un modelo de ecuaciones simultáneas con variables dependientes limitadas para medir el proceso de compra de alimentos ecológicos, la intención de compra y el conocimiento de los alimentos ecológicos. Se han utilizado datos procedentes de una encuesta realizada a 200 hogares en la ciudad italiana de Nápoles en 2003. Los principales resultados indican que los consumidores más dispuestos a comprar alimentos ecológicos son los que acabarán comprando mayores cantidades de estos productos. Esta intención de compra depende de las actitudes y del conocimiento de los consumidores. Además, las actitudes de los consumidores hacia los beneficios para la salud y para el medio ambiente de los alimentos ecológicos son los principales factores determinantes, tanto de la intención de compra como del consumo final de estos productos. Finalmente, la renta y el conocimiento ecológico de los consumidores influyen positivamente en el consumo final de alimentos ecológicos.

**Palabras clave adicionales:** actitudes, conocimiento ecológico, intención de compra, modelo de ecuaciones simultáneas.

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## Introduction

Organic agriculture is produced with an objective to produce healthy and quality foods without using synthetic chemical products. Thus, organic agriculture not only preserves the environment but it also improves public health, bringing significant benefits both to the economy as well as to the social cohesion of rural areas. The interest of consumers and public institutions in organically-

produced foods has increased, mainly in developed countries, in response to consumers' concerns about food safety, human health and the environment. The Eurobarometer survey (EC, 2006) has shown that European consumers consider that the main objectives the Common Agricultural Policy (CAP) should promote are: i) to offer healthy and safety food products, ii) to respect the environment, and iii) to promote organic production. Thus, the promotion of organic agriculture constitutes an important option not only for producers but also to respond to consumers' desire for higher food quality and food production that is less damaging to environment systems.

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In the European Union (EU), organic agricultural products and foodstuffs are covered by Council Regulation EEC 2092/91 (OJ, 1991). This regulation established a specific Community framework for organic farming and defined requirements for agricultural products and foodstuffs bearing a reference to the production methods used in organic farming. This regulation has been amended on several occasions, in particular in 1999 (Regulation EEC 1804/99; OJ, 1999), where the Council extended its scope to cover organic livestock production. In December 2002, new initiatives, aiming to develop the market for organic foods and improve standards by increasing their efficacy, transparency and consumer confidence, were presented in the Commission's communication «European Action Plan for Organic Food and Farming» (EC, 2004). This communication was adopted in June 2004 and it is focused on providing information to consumers and other actors in the food chain, about the merits of organic farming, especially its environmental benefits, and increase consumer's awareness and recognition of organic products, including the recognition of the EU logo. In particular, the Action Plan promotes information and promotion campaigns to well-defined types of consumers, such as the occasional ones to increase consumers' perception that the quality of organic food products is higher than in non-organic ones and consumers' confidence in the certification system that guarantee the genuine organic produce.

In this context, a consumer-oriented analysis of organic foods is of paramount importance to policy makers. For them, to have a clear understanding of consumers' organic food purchase decisions and the factors explaining consumers' decisions to buy organic foods would be very relevant in order to help them to define and implement the information and promotion campaign proposed by the European Action Plan. Therefore, the aim of this paper is to analyse the organic food purchasing behaviour of consumers and focus specifically on the factors influencing organic food purchases, the intention to purchase and the level of organic product knowledge.

The study is focused on Italian urban consumers within a Southern region of Italy (Campania)<sup>1</sup>. This region has been chosen because recent research has indicated that in the South of Italy and particularly in the Campania

region (where Naples is located), the Public Administration rarely supports communication and commercialisation campaigns to promote organic food products (Associazione Italiana Agricoltura Biologica, 2006). However, organic agriculture can represent an important alternative agricultural production system for rural areas, such as the region of Campania.

To achieve this goal, a multivariate limited dependent variable model has been specified to simultaneously analyse consumers' organic food purchases, the intention to purchase organic food products and the level of organic knowledge. This study uses survey data gathered from 200 consumers in Naples in 2003.

## Material and Methods

### Behavioural model

The study of organic food purchasing behaviour is difficult because organic food products are available in the market together with conventional ones and the purchase decision depends on many factors that can vary sharply across individuals. Organic food products possess some credence characteristics not directly observable by consumers but which play an important role when shopping. Then, whether consumers decide to purchase organic foods will depend on many factors, including consumers' attitudes toward these unobservable organic foods characteristics (i.e. environmental protection, healthiness).

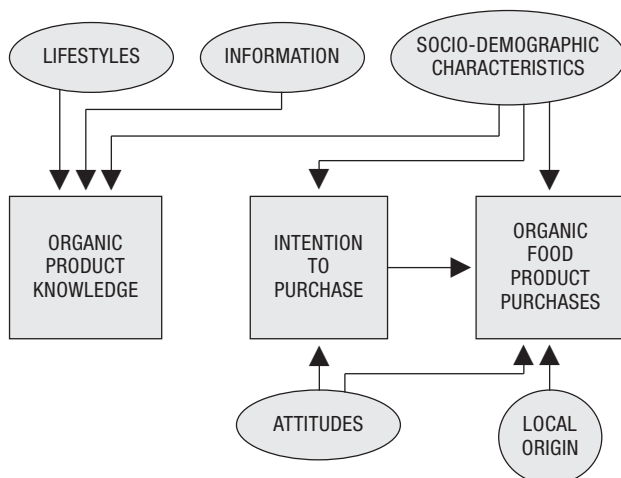
In the consumer behaviour literature there are some models with the common goal to define the main factors explaining consumer behaviour. Von Alvensleben (1997) proposed a general model on food consumer behaviour which established that the forces driving consumer behaviour are product information, product perception and attitudes. First, consumers' behaviour is determined by attitudes. The attitudes towards the product are formed not only by nutritional and healthy needs, enjoyment, convenience, safety, transparency, environmental motives, etc. but also by the product perception. Finally, the perception of a product is the result of the product information (i.e. knowledge about the product). In particular, for organic consumer behaviour, Bigné

<sup>1</sup> In Campania, according to data's published in 2005 by Elenco Regionale degli Operatori dell'Agricoltura Biologica (Regional list of organic operators, ERAB), there were 1,184 organic farms and 186 organic processing companies. Only 6% of total organic farms certify their organic production due to the high costs to obtain organic certification and the problems to get into the distribution channel. However, the organic sector in Campania has increased their market shares in foreign markets and in the institutional sector, in particular for the introduction of organic foods in schools.

(1997) established a conceptual model where «green» behaviour is determined by exogenous variables such as consumers' socio-demographic characteristics and lifestyles and endogenous characteristics such as the level of knowledge and environmental attitudes. The relationship between exogenous and endogenous variables formed a new variable named «ecological implication» that finally induces organic consumer behaviour.

In addition, Ajzen and Fishbein (1980), in their theory of reasoned action, and Ajzen (1991), in the theory of planned behaviour, stated that a person's behaviour (i.e. purchase, vote, etc.) is determined by his/her intention to perform this behaviour. For them, the best predictor of behaviour is intention. Intention is the cognitive representation of a person's readiness to perform a given behaviour, and it is considered to be the immediate antecedent of behaviour. This intention is determined by three factors: i) attitudes (considered as beliefs that a person accumulates over his lifetime), ii) subjective norms (beliefs about what others will think about behaviour) and, iii) perceived behavioural control (refers to people's perceptions of their ability to perform a given behaviour). As a general rule, the more favourable the attitude and the subjective norm, and the greater the perceived control, the stronger the person's intention should be to perform the behaviour in question. Intention is measured as the probability, rated by the subject itself, that s/he will perform the behaviour.

Taking into account the premises stated by these three models, the model of consumer behaviour (purchase) for organic food products shown in Fig. 1 has been established.



**Figure 1.** Empirical model of consumer behaviour for organic food products.

The variables represented in Fig. 1 with square boxes are considered endogenous to the model. Organic food product purchase behaviour depends on the intention to purchase that is a precursor of the final organic food purchase level. Intention depends on attitudes and knowledge. Moreover, organic knowledge is endogenously determined. The variables represented with an oval are the exogenous variables in the model which influences the three endogenous ones. The inclusion of these exogenous variables is justified by the evidence provided by previous empirical studies on consumers and organic foods describes in the next section.

### Previous empirical studies on consumers and organic foods

There is a large body of literature on consumers and organic food products. Because organic food products are, in general, more expensive than conventional ones, numerous empirical studies has focused on determining the maximum price premium consumers are willing to pay for organic products and the factors explaining this premium (Jolly, 1991; Misra *et al.*, 1991; Ott, 1991; Govindasamy and Italia, 1998; Sanchez *et al.*, 1998; Boccaletti and Nardella, 2000; Gil *et al.*, 2000; Loureiro and Hine, 2002; Millock *et al.*, 2002; Sanjuan *et al.*, 2002; Soler *et al.*, 2002; Corsi and Novelli, 2003; Brugarolas *et al.*, 2005; Canavari *et al.*, 2005; Batte *et al.*, 2007). On the other hand, many empirical studies have examined the factors explaining organic foods purchasing behaviour. This section is focused on describing main findings from this last group of studies in order to provide evidence on which factors to include in the explanation of the three endogenous variables of the model: organic food purchases, intention to purchase organic food and organic knowledge.

The empirical papers analysing the factors affecting consumers' purchase decision for organic foods found that the main reasons why consumers buy organic food products include the health and environmental attitudes of consumers, the production origin of the product (local), consumers' economic characteristics and, to lesser extent consumers' socio-demographic characteristics.

In particular, consumers' health attitudes have been found to be significant in explaining consumers' organic purchases (Schifferstein and Oude Ophuis, 1998; Torjusen *et al.*, 2001; Millock *et al.*, 2004;

Chryssohoidis and Krystallis, 2005; Durham and Andrade, 2005; Padel and Foster, 2005). Moreover, consumers' environmental attitudes are factors determining consumers purchase of organic foods (Schifferstein and Oude Ophuis, 1998; Loureiro *et al.*, 2001; Torjusen *et al.*, 2001; Millock *et al.*, 2004; Chryssohoidis and Krystallis, 2005; Durham and Andrade, 2005; Kuhar and Juvancic, 2005; Padel and Foster, 2005; Verhoef, 2005). Those papers conclude that the most important motives to buy organic foods are consumers' attitudes toward health and environmental issues. In general, it can be said that the more favourable health and environmental attitudes consumers have, the more likely they would buy organic food product and with higher intensity. In particular, some of the studies have found that both attitudes influences organic food purchase (Millock *et al.*, 2003; Durham and Andrade, 2005; Padel and Foster, 2005) but the health attitudes are more influential than the environmental ones in consumers' purchases of organic foods [except for Durham and Andrade (2005) who found, for USA consumers, that environment is more influential than health in consumers' organic purchase decision]. Moreover, some studies have found that whether organic food products are locally produced also influences consumers decision to purchase organic foods (Torjusen *et al.*, 2001; Padel and Foster, 2005; and Onyango *et al.*, 2006).

Income has been found to be a factor in explaining organic food purchases in some empirical studies conducted in Europe (Torjusen *et al.*, 2001; Millock *et al.*, 2003; Kuhar and Juvancic, 2005; Tsakiridou *et al.*, 2006) while income has not been statistically significant in determining organic food purchases, according to studies carried out for USA consumers (Loureiro *et al.*, 2001; Durham and Andrade, 2005; Onyango *et al.*, 2006; Zepeda and Lin, 2007). Findings from the European studies indicate that income positively influences organic food purchases, implying that consumers with higher income are more likely to buy organic food products.

Socio-demographic characteristics were found to be significant in explaining the decision to buy organic foods mainly in empirical studies conducted in USA (Thompson, 1998; Thompson and Kidwell, 1998; Blend and Ravenswaay, 1999; Wessells *et al.*, 1999; Loureiro *et al.*, 2001; Onyango *et al.*, 2006; Zepeda and Lin, 2007), while in Europe only age, education and household size were significant (Millock *et al.*, 2003; Lockie

*et al.*, 2004; and Tsakiridou *et al.*, 2006). Findings from the later studies indicate that older, more educated consumers and those living in larger households are more likely to buy organic food products.

Only the study by Byrne *et al.* (1991) for US consumers and that of Fraj and Martinez (2003) for Spanish analysed the intention to purchase organic food. These studies found that some consumers' sociodemographic characteristics and attitudes towards organic food products influence the intention to purchase (see Fig. 1).

Organic product knowledge is an important factor because it represents the only instrument that consumers have to differentiate the attributes of organic products from those of conventional ones, and to form positive attitudes and quality perceptions toward these products. According to Bigné (1997), organic knowledge is determined by socio-demographic variables such as education level and income and psychographic variables (values and lifestyles). In addition, organic knowledge is affected by information provided by the public administration, mass media, ecological associations and shopping site. Thus, the level of organic product knowledge will depend on socio-demographic characteristics, lifestyles and information on organic products available on the market (see Fig. 1).

Finally, several empirical studies on organic foods and consumers have been conducted in Italy<sup>2</sup>. Some of them focused on analysing willingness to pay for organic foods (Boccaletti and Nardella, 2000; Corsi and Novelli, 2003; Canavari *et al.*, 2005); customer satisfaction with organic foods (Asciuto *et al.*, 2003; Cembalo *et al.*, 2004); and consumers' store perception with regard to organic foods (Naspetti and Zanolli, 2004). Although none of the Italian empirical studies specifically analysed factors affecting consumers' purchases of organic food, some of them have studied preferences regarding organic food attributes (Cicia *et al.*, 2002; Scarpa *et al.*, 2002); and consumers' attitudes towards organic foods (Canavari *et al.*, 2002; Chinnici *et al.*, 2002; Zanolli and Naspetti, 2002; Saba and Messina, 2003), which provide some information on underlying motivations to buy organic foods by Italian consumers'. Results from the later studies indicate that main factors underlying consumers' purchases of organic foods products are: health, environment, and organic food products characteristics (nutritional content, taste, appearance and locally produce).

<sup>2</sup> We have only included those empirical papers available in English, although there are some studies also in Italian.

## Model specification

The three endogenous variables are specified in this section. The first equation in the model is consumers' organic food purchases, specified as follows:

$$OC_i^* = \lambda IP_i^* + \beta X_i + u_i \quad [1]$$

where,  $IP_i^*$  is the variable related to consumers' intention to purchase organic food products defined below,  $X_i$  is a vector of exogenous variables, and  $u_i$  is the error term normally distributed  $N(0, \sigma_u^2)$ .  $OC_i^*$  is unobserved, what is observed is the ranking level of organic food product purchase given by the individual in the survey:

$$\begin{aligned} OC_i &= 1 & \text{if } OC_i^* \leq \mu_1 (=0) \\ OC_i &= 2 & \text{if } \mu_1 < OC_i^* \leq \mu_2 \\ OC_i &= 3 & \text{if } \mu_2 < OC_i^* \leq \mu_3 \\ \dots & \dots & \dots \\ OC_i &= J & \text{if } \mu_{j-1} \leq OC_i^* \end{aligned} \quad [2]$$

where  $\mu_i$  are the unknown threshold parameters to be estimated with  $\lambda$  and  $\beta$ . The first threshold parameter is typically normalized to zero ( $\mu_1 = 0$ ) in order to estimate one less parameter.

The intention to purchase equation is defined as follows:

$$IP_i^* = \delta K_i^* + \alpha Z_i + e_i \quad [3]$$

where  $K_i^*$  is the consumers' organic product knowledge defined below;  $Z_i$  contains all exogenous variables and  $e_i$  is the error term normally distributed  $N(0, \sigma_e^2)$ .  $IP_i^*$  is unobserved. The part observed by the researcher is whether the individual reports that it is likely to very likely that s/he purchases organic food products (intention to purchase), where  $IP_i = 1$  means that consumer reports that it is likely to very likely that s/he purchases organic food and  $IP_i = 0$  otherwise. Observed and latent variables are related as follows:

$$\begin{aligned} IP_i &= 1 & \text{if } IP_i^* > 0 \\ IP_i &= 0 & \text{if } IP_i^* \leq 0 \end{aligned} \quad [4]$$

Finally, the level of knowledge about organic food is defined as:

$$K_i^* = \varpi Y_i + \xi_i \quad [5]$$

where  $Y_i$  represents the exogenous variables and  $\xi_i$  is the error term normally distributed  $N(0, \sigma_\xi^2)$ .  $K_i^*$  is unobserved, what is observed is the ranking of knowledge given by the individual in the survey:

$$\begin{aligned} K_i &= 1 & \text{if } K_i^* \leq \mu_1 (=0) \\ K_i &= 2 & \text{if } \mu_1 < K_i^* \leq \mu_2 \\ K_i &= 3 & \text{if } \mu_2 < K_i^* \leq \mu_3 \\ \dots & \dots & \dots \\ K_i &= J & \text{if } \mu_{j-1} \leq K_i^* \end{aligned} \quad [6]$$

where  $\mu_i$  are the unknown threshold parameters to be estimated with  $\varpi$ . The first threshold parameter is typically normalized to zero ( $\mu_1 = 0$ ) in order to estimate one less parameter.

## Data collection and variables definition

Data were collected from a 2003 survey conducted in Naples, which is the main Italian town in Campania Region. Naples was chosen for two reasons. First, Naples represents 30% of the population in the whole region. Second, because it can be considered a representative sample of Southern Italy because its economic indicators, such as average expenditure of food products (23%), average income (1,868 €) and demographic characteristics are very close to the economic indicators for southern Italy (Regione Campania, 2003; ISTAT, 2006). The sample included 200 consumers, with a confidence level of 95.5% ( $k=2$ ), and assuming ( $p=0.5$ ) the error is 7%. The sample was selected using a stratified random sample of consumers by quotas on the basis of age and town districts. The questionnaire was administrated face to face and respondents were the primary food buyers in the household. Interviewers approached the randomly selected individuals asking them a screening question related to whether they were the main household food shopper. The questionnaire was designed to analyse consumers' organic food knowledge, attitudes and purchase behaviour. Then, respondents received questions on three different topics. The first question was related to their knowledge on organic food products. The second set of questions was related to organic food consumption (consumption level, intention to purchase, frequency of purchase, perceived quality, place of purchase, etc.). Finally, several questions on consumers' attitudes towards organic food products and environmental aspects were included. The questionnaire also contained questions on socio-demographic characteristics (i.e. sex, family size and composition, age, education level, income) and lifestyles. The questionnaire format was validated using a pilot survey. Most respondents were female (65%) and 15% of respondents were housewives. The average household size was 2.7 and approximately 46% of the participants had completed higher education. Twenty nine percent of respondents received a monthly income below 600 € and 11% above 2,301 €.

The organic food product purchases variable ( $OC$ ) was measured using consumers' reported level of organic

purchases on a scale from 1 to 3, where 1 means non-purchase or very low, 2 is medium and 3 is a high level of purchases. Intention to purchase (*IP*) was measured by a dummy variable where 1 means that the consumer reports that it is likely to very likely that s/he purchase organic food and 0 otherwise. Finally, organic product knowledge (*K*) was measured by the consumers' reported level of knowledge from 1 to 3, where 3 indicate the highest level of knowledge.

The attitudes towards organic food products were measured by two variables. The first variable measures the importance that consumers attach to the health benefit provided by organic food products when purchased on a scale of 1 to 5, where 5 means the greatest importance (*HEALTH*). The second variable measures to what extent consumers believe that organic food products have, in general, higher quality than conventional ones (*QUALITY*). Attitudes towards environmental aspects were measured by three different variables. The

first variable represents the importance that consumers attach to the current pollution situation (*POLLUTION*); the second variable represents the importance that consumers attach to the environmental damage problem (*DAMAGE*); and the last variable represents consumers' environmental involvement on a scale from 1 to 5 focusing on whether they dispose of the garbage in different containers (*RECYCLING*). The local origin of the product was indirectly measured by the importance that consumers attach to the local origin of the product when shopping on a 1 to 5 scale, where 5 means the greatest importance (*ORIGIN*). Finally, information available in the market for organic food products was measured, indirectly, by asking individuals if they had seen organic food products at their shopping site (*INFO*).

Economic and socio-demographic consumers' characteristics included in the analysis were gender, income, occupation, age and education and, except for age, they are dummy variables as defined in Table 1.

**Table 1.** Measurement of the exogenous variables of the model

Factors	Variable definition
<b>Socio-demographic and economic characteristics</b>	
Gender: FEMALE	1 = if the respondent is female; 0 = otherwise
Income: LOWINCOME	1 = if the respondent earns less than 600 €; 0 = otherwise
Occupation: HOUSEWIFE	1 = if the respondent is housewife; 0 = otherwise
Age: AGE	Age of the respondent
Education: HIGHEduc	1 = if the respondent has completed higher education; 0 = otherwise
Lifestyles:	
— VEGETARIAN	Agreement to follow a vegetarian food diet. Likert scale from 1 to 5 where 5 means higher level of agreement
— ADDITIVE FREE	Agreement to avoid eating food products with additives. Likert scale from 1 to 5 where 5 means higher level of agreement
Attitudes towards organic food:	
— HEALTH	Organic food products are beneficial for the health. Likert scale from 1 to 5 where 5 means higher level of agreement
— QUALITY	Organic food products have higher quality than conventional ones. Likert scale from 1 to 5 where 5 means higher level of agreement
Attitudes towards the environment:	
— POLLUTION	The current pollution is very serious. Likert scale from 1 to 5 where 5 means higher level of agreement
— DAMAGE	Unless we do something, environmental damage will be irreversible. Likert scale from 1 to 5 where 5 means higher level of agreement
— RECYCLING	I dispose of my garbage in different containers. Likert scale from 1 to 5 where 5 means higher level of importance
Product origin: ORIGIN	Importance of local origin in organic food purchase. Likert scale from 1 to 5 where 5 means higher level of importance
Information provided by shopping place: INFO	Dummy variable where 1 means consumers have seen organic food products in their shopping place; 0 = otherwise

Lifestyles were measured by two variables related to specific dietary patterns. The first variable indicates the extent consumers are in agreement or disagreement with following a vegetarian diet. The second variable represents the importance that consumers attach to avoid eating food products with additives. Both lifestyles are measured on a scale from 1 to 5, where 5 means strongly agree with following the specific diet (VEGETARIAN or ADDITIVE FREE).

### Model estimation

The model defined by Eqs. [1], [3], and [5] was simultaneously estimated instead of independently because some endogenous variables are also exogenous in other equations. Then, the three equations form a multivariate limited dependent variable model where the three error terms ( $u_i$ ,  $e_i$ , and  $\zeta_i$ ) follow a multivariate normal distribution with mean zero and variance and covariance matrix  $\Omega$ . The classical estimation of limited dependent variable (LDV) models with correlated error terms is computationally demanding due to the need for high dimensional numerical integration (Hajivassiliou

and McFadden, 1998). Therefore, the estimation is done using the Monte Carlo integration following the Hajivassiliou and McFadden's procedure. The estimation was performed using the Proc QLIM in the SAS 9.1 computer program.

### Results

Table 2 presents the parameter estimates, their standard errors and  $t$ -values of the multivariate limited dependent variable model. Correlations between the error terms of Eqs. [1] and [3], [1] and [5], and [3] and [5] were statistically significant at the 5% level. This means that the simultaneous estimation of the three equations is justified.

The estimated coefficients, which were statistically significant at the 5% level in the equation «organic food purchase», are intention to purchase, as the theory of planned behaviour states, together with income (LOWINCOME), attitudes towards organic food products (HEALTH and QUALITY) and environmental issues (RECYCLING) and the local origin of the product (ORIGIN). Moreover, the threshold parameter

**Table 2.** Estimate parameters of the multivariate limited dependent variable model

Variable	Organic food products purchases		Intention to purchase		Knowledge	
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Intercept	-3.40	-4.75	-3.67	-4.13	-1.67	-4.22
Knowledge			0.767	2.38		
Intention to purchase	1.07	2.83				
HIGHEDUC					0.65	2.55
LOWINCOME	-0.363	-1.87				
VEGETARIAN					0.181	2.69
ADDITIVE FREE					0.287	3.51
HEALTH	0.24	1.68	0.302	2.29		
QUALITY	0.36	2.93				
POLLUTION			0.364	1.77		
DAMAGE			0.286	1.99		
RECYCLING	0.298	3.13				
ORIGIN	0.21	2.77				
INFO					0.49	2.48
N	182*					
Likelihood ratio	-350.58					
$\mu_1$	2.32	9.14			1.60	11.25
Correlation						
Knowledge	0.31	3.13	-0.55	-2.07		
Intention to purchase	-0.64	-4.33				

\* Respondents who stated that they did not have any knowledge on organic food were dropped in the estimation.

is positive and significant at the 5% level, which means that the variable indeed follows an ordered sequence. Moreover, none of the socio-demographic variables explain organic food product purchases. As expected, the estimated coefficient for the variable LOWINCOME is negative and statistically significant, meaning that consumers with lower income are less likely to buy higher levels of organic food products. These results also indicate, according to previous studies, that socio-demographic characteristics have limited influence on organic food choice. Thus, consumers' income is still a factor limiting the growth of organic food purchases in urban southern Italy and therefore, the expansion of the organic food market.

The positive estimate coefficient of the variable «intention to purchase» in the organic food purchase equation indicates that, as Ajzen (1991) states, intention to purchase is a precursor of purchase behaviour. Then, intention to purchase organic food products is a prerequisite in order to get higher levels of organic food purchases. In addition, attitudes towards organic food products have a positive and statistically significant effect on organic food purchases because the estimate coefficients for the variables HEALTH and QUALITY are both positive. This means that the more consumers believe that organic food products are healthier and have better quality than conventional ones, the more likely they are to buy higher levels of organic food products. Attitudes towards the environment have also been statistically significant through the consumers' attitudes towards their own recycling activities. In other words, the parameter estimate for the variable RECYCLING has been positive and statistically significant. Therefore, consumers who dispose garbage in selective containers are more likely to buy higher levels of organic food products. Finally, the local origin variable (ORIGIN) has been positive and statistically significant indicating the consumers which give more importance to the local origin of the food product when shopping are more likely to present higher levels of organic food purchases.

Regarding the intention to purchase equation, as stated by the theory of planned behaviour, it depends on attitudes and knowledge. In the case of organic food products, intention to purchase is determined by attitudes towards health and attitudes towards the environment. The positive parameter estimate for the organic product knowledge variable indicates that consumers with higher organic product knowledge are more likely to report that they have a higher probability of buying

organic foods. However, none of the socio-demographic variables have been statistically significant explaining the intention to purchase.

The positive and statistically significant estimate coefficient for the HEALTH variable indicates that the more consumers believe that organic foods are healthier than conventional foods, the more likely they are to buy organic food products. In the same way, consumers' attitudes towards pollution (POLLUTION) and environmental damage (DAMAGE) have been positive and statistically significant. It means that the more concerned consumers are on pollution and environmental damage, the more likely they will be willing to purchase organic food products.

As expected, significant variables in the organic product knowledge equation are consumers' socio-demographic characteristics, lifestyles and information available in the market on organic food products (HIGHEDUC, VEGETARIAN, ADDITIVES FREE and INFO). All of these variables have a positive effect on organic product knowledge. In addition, the threshold parameter is positive and significant at the 5% level indicating that the organic product knowledge variable indeed follows an ordered sequence.

The positive coefficient associated with the HIGHEDUC variable indicates that highly educated consumers are more likely to report higher organic product knowledge. Both lifestyle variables, VEGETARIAN and ADDITIVE FREE, have a positive and significant impact on organic product knowledge, indicating that the more importance consumers attach to a vegetarian diet and/or to avoid eating food products with additives, the higher the level of organic product knowledge that they reported. These results indicate that consumers who try to practise healthier diets believe to a greater extent that they have greater organic product knowledge. Finally, a positive effect of information provided by shopping site (INFO) has been found, meaning that consumers who have seen organic food products in their shopping site report greater organic knowledge. It is assumed that they indirectly gather information on organic food product characteristics, and this higher information, induces higher consumers' organic product knowledge.

In order to directly assess the effects of the independent variables on KNOWLEDGE and INTENTION TO PURCHASE variables (ordinal variables) the marginal effects are calculated. The marginal effects on event probability can be calculated, providing a clearer interpretation of the results. In this specific case, and



**Table 3.** Marginal effects of organic food product purchase ordered probit equation

Variable	Prob (OC = 1)	Prob (OC = 2)	Prob (OC = 3)
Intention to purchase	-0.1176198	-0.1728015	0.2904213
LOWINCOME	0.0414013	0.0608250	-0.102263
HEALTH	-0.0278127	-0.0408611	0.0686738
QUALITY	-0.0411778	-0.0604966	0.1016744
RECYCLING	-0.0342993	-0.0503910	0.086904
ORIGIN	-0.0248322	-0.0364823	0.0613145

for the continuous exogenous variables, effects are calculated by means of the partial derivatives of the probabilities with respect to a given exogenous variable.

In the case of dummy variables, the marginal effects are calculated by taking the difference between the predicted probabilities in the respective variables of interest changing from 0 to 1, holding the rest constant. The change in predicted probabilities gives a more accurate description of the marginal effect of a dummy variable on event probability, than predicting the probability at the mean level of the dummy variable. The marginal effects for the continuous variables (VEGETARIAN, ADDITIVE FREE, HEALTH, QUALITY, RECYCLING and ORIGIN) and for the dummy variables are shown in Tables 3 and 4.

Results indicate that the consumer's predisposition to buy organic food products (intention to purchase) increases the probability of buying higher levels of organic food products (Table 3). The marginal effect of the variable LOWINCOME indicates that having lower income decreases the probability of buying higher levels of organic food products. All the effects of the attitudes variables (HEALTH, QUALITY, RECYCLING and ORIGIN) on the probabilities are as expected because they increase the probability to purchase higher levels of organic food products, meaning that consumers who believe organic food products are healthier and have better quality than conventional ones, show a higher probability to buy a higher level of organic foods. Moreover, consumers who recycle (dispose of garbage in

different containers) and attached more importance to the local origin of the food product when shopping have a higher probability of buying higher levels of organic foods.

With respect to organic product knowledge, results indicate that consumers with higher education (HIGHEDEC) have a higher probability of reporting higher levels of knowledge on organic foods. The marginal effects of healthy lifestyles on the probabilities are as expected. Those consumers who strongly agree with following a vegetarian diet (VEGETARIAN) and avoid eating food products with additives (ADDITIVE FREE) are more likely to state a higher level of knowledge on organic food products. Finally, the marginal effect of the variable INFO indicates that consumers who have seen organic food products in their shopping place are more likely to report higher levels of organic knowledge.

## Discussion

The aim of this paper is to explain organic food product purchase behaviour for urban consumers in southern Italy. In particular, it was assumed that purchase behaviour for organic foods follows Ajzen's (1991) theory of planned behaviour and Bigné model. Then, we assumed that organic food product purchase behaviour depends on the intention to purchase and is a precursor of the final purchase behaviour. The intention to purchase depends on attitudes and organic product knowledge.

**Table 4.** Marginal effects of knowledge ordered probit equation

Variable	Prob (K = 1)	Prob (K = 2)	Prob (K = 3)
HIGHEDEC	-0.1724429	-0.0054147	0.1778575
VEGETARIAN	-0.0480955	-0.0015102	0.0496057
ADDITIVE FREE	-0.0764474	-0.0024004	0.0788478
INFO	-0.1266523	-0.0039768	0.1306292

### **Theory of planned behaviour: organic food purchases**

The intention to purchase organic food products positively influences the final purchase behaviour. This means that consumers who report that it is likely to very likely that they will buy organic food products have a higher probability to purchase higher levels of organic food products. In other words, those consumers who are more willing to buy organic food products are more likely to buy larger amounts of those products. Then, final organic food product purchases are closely related to consumers' predisposition to buy organic food products. Moreover, intention to purchase depends on attitudes and organic product knowledge. In the case of organic food products, purchases depend on attitudes towards health and environmental benefits provided by organic food products, together with organic product knowledge. In particular, consumers who believe that, to a greater extent, organic food products are healthier and are more concerned about pollution and environmental damage, are more likely to be willing to buy organic food products. On the other hand, consumers who report higher levels of organic product knowledge are more willing to buy organic food products.

### **Other factors influencing organic food product purchases**

In addition to testing whether organic food products purchase behaviour of urban consumers in the southern Italy could be explained by the factors stated in the theory of planned behaviour, the paper has also attempted to study whether other factors, already mentioned in previous empirical studies on organic food product purchases, determine Italian consumers' purchase behaviour for organic food.

Consumers socio-demographic characteristics have been included both in intention to purchase and final purchase behaviour for organic food products. Findings indicate that, as in other empirical studies (Loureiro *et al.*, 2001; Durham and Andrade, 2005; Kuhart and Juvancic, 2005; Onyango *et al.*, 2006), few socio-demographic characteristics explain organic food products behaviour. This study concluded that for urban consumers in southern Italy, only income influences final purchase behaviour for organic foods but none of the socio-demographic characteristics affects intention to purchase. Income influences positively final organic food pur-

chases, so, consumers with higher income have higher probabilities of buying higher levels of organic food products.

Following previous empirical studies, attitudes towards health and environmental benefits provided by organic food products have been included to explain organic food purchases. Results indicate that consumers who believe that, to a greater extent, organic food products are healthier and have higher quality than conventional ones are more likely to buy higher levels of organic food products. Moreover, consumers recycling activities positively influence organic food product purchases. In other words, consumers who state that, to a greater extent, they dispose of garbage in different containers are more likely to buy higher levels of organic food products.

Finally, as Bigné (1997) pointed out, organic product knowledge depends on consumers' socio-demographic characteristics, lifestyles and information available on the organic food market. The only socio-demographic characteristic influencing organic knowledge is education because higher educated consumers report having higher organic product knowledge. In this case, the lifestyles considered are those related to some specific food diets (vegetarian and without additives) which positively influence knowledge. Finally, information available in the market on organic food products determine consumers' organic product knowledge. In particular, if consumers have seen organic food products in their shopping place, this positively influences organic product knowledge.

### **Research implications**

Results from this paper are of great importance because they provide valuable information on consumers purchase behaviour of organic food products to help policy makers at European, National and Regional levels. Results from this study on a group of European consumers (those living in an urban area in southern Italy), add to the findings from other European studies on organic food purchase decision by extending the knowledge on factors affecting European consumers' organic food products. Then, policy makers at European level will be in a better position to design the most effective multiannual EU information and promotion campaign proposed in the «European Action Plan for Organic Food and Farming». This information would also be very useful for policy makers when designing

their respective organic farming policies for Italy or for the Campania region.

First, it is important to recognize that consumers' socio-demographic characteristics have limited influence on organic food purchases, concerning both the intention to purchase or the final decision. Only income positively influences the final decision to purchase organic food products. Thus, income is still a factor limiting organic food product consumption in southern Italy.

The most important factors explaining organic food product purchases are consumers' attitudes towards health and environmental benefits provided by organic foods. Both attitudes positively influence the intention to purchase and the final decision. Then, the most appropriate strategy to enhance organic food consumption in southern Italy is to design communication campaigns highlighting the benefits of organic food products for the whole society, through environmental protection and health benefits. These informational campaigns might make consumers more aware of the environmental and health benefits provided by organic food products.

Finally, organic product knowledge is also an important factor determining organic food purchases, although it influences the level of organic food purchase indirectly through intention to purchase. Consumers who report having higher levels of organic product knowledge will be more willing to buy organic food products. Then, this greater predisposition will result in higher levels of organic food purchases. Organic knowledge is achieved through consumer's education, lifestyles related to healthy food habits (vegetarian and/or additive free diets) and information provided in the market on organic food products.

## Policy implications

The promotion of organic agriculture constitutes an important option for the society and for the more fertile and marginal agricultural areas. This is because it provides consumers some products with higher nutritional value that are free of chemical agents, while allowing gradually restoring the natural equilibrium between the different elements of the agricultural system, that have been broken by chemical uses producing a relevant negative impacts on the environment.

Moreover, organic agriculture can represent an important alternative agricultural production system for rural areas, such as in southern Italy. Thus, the intervention of public institutions has been oriented to promote organic agriculture in rural areas. However, public ins-

titutions should also work to identify and interpret the organic demand. In this direction, public support should be applied not only through financial facilities and subsidies but also it should implement information campaigns, promotion actions and enforce control systems. In fact, results from this research have demonstrated that communication campaigns focusing on the organic products benefits for the environment and for the consumers' health could stimulate organic product consumption and therefore, the market for organic produce. In addition, a control system would reduce the uncertainty and the possible confusion and would create a favourable institutional context where different stakeholders can operate. Thus, this policy support would reduce the transaction costs originated by asymmetric information between supply and demand, expanding the organic demand.

These considerations are in agreement with the organic Italian policy, which is based on the «National Action Plan for Organic Food and Farming» enacted in November 2004 by the Italian government. This document proposes several objectives and, in particular, some of them focus on increasing the domestic demand, which include: i) the improvement of knowledge and recognition of organic food products creating a national logo and promoting consumers education; ii) the expansion of organic products by public purchases made by school and hospitals; and iii) the establishment of a fiscal policy to slow the rise on prices. Findings from this research proves that the improvement of knowledge and recognition of organic food products is very important because it has been found that the higher knowledge on organic products reported by consumers, the higher consumers' willingness to buy organic food products.

Since the «National Action Plan» has been enacted, the Italian organic food sector has started again to grow and, in particular, the number of the operators in Campania has also increased. In this Region, the public intervention has been activated by the F Measurement action 2 of Plans of Rural Development (PSR). The aim of this plan is to support the diffusion of production methods that reduces environmental impact and to guide consumers' health. Findings from this paper suggest that this Plan should also support communication campaigns on the benefits of the organic products for the environment and the consumers' health and it should encourage more information on organic foods in order to enhance organic product knowledge and therefore the amount of organic food purchases by urban consumers in southern Italy.

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