Attitudes towards honey among Italian consumers: a choice experiment approach

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Abstract

Honey is becoming increasingly popular with consumers for its nutritional benefits as well as many other functions. The objective of this article is to determine which factors influence consumers' purchase intentions and to assess the importance of certain honey characteristics to enable identification of the constituents of an ideal honey profile. This information will lead to satisfaction of consumers' preferences and formulation of marketing strategies that support honey makers.

We applied a choice experiment to the Italian honey market to define not only the ordinal ranking of preferences, but also the willingness to pay for key characteristics of the product. A face-to-face questionnaire survey was conducted in 2014 (January–July) among Italian consumers; it was completed by 427 respondents. A random parameter logit model was estimated. Results suggest the "organic" attribute was more important than others factors, such as the place where the honey was produced (landscape), but less important than the country of origin; local Italian honey was preferred to foreign honey. Respondents showed a higher willingness to pay (WTP) for honey from their country of origin versus the production method used. Our results suggest that while organic beekeeping might be an important strategy for diversification, if suitable communication is not taken into consideration, the added value of the production method might not be perceived by consumers.

Keywords: honey, consumer preferences, choice experiment

Topic: Consumer behaviour: preference analysis

Introduction

In 2013, global production of honey was about 1.66 million metric tons, and in Europe, annual production reaches about 372 thousand tons (204 thousand tons in the European Union) (FAOSTAT, 2015). The average production of honey in Italy ranges from 9 to 12 thousand tons (FAOSTAT, 2015), depending on meteorological conditions during the year.

Honey is becoming increasingly popular with consumers for its nutritional benefits as well as many other functions (Aparna & Rajalakshmi, 1999; Al-Qassemi & Robinson, 2003; Bogdanov *et al*., 2008; Ismaiel *et al*., 2014; Joshi, 2008; Schneider *et al*., 2007). Moreover, as health consciousness has increased and concerns have focused on food processing technologies, consumption of honey has increased because it is not subjected to any technological processes (Ghorbani & Khajehroshanaee, 2009; Pocol & Teselios, 2012).

Despite this positive consumption situation, the beekeeping sector in Italy has not yet learned to understand the consumers' needs in order to increase their product satisfaction and earnings (Sillani & Grillenzoni, 2007).

The objective of this study is to determine the factors that influence consumers' purchase intentions and to assess the importance given by consumers regarding honey's five primary characteristics: country of origin, landscape features of production, crystallisation, production method—organic or conventional—and price). These are needed to identify an ideal honey profile to satisfy consumers' preferences and formulate marketing strategies that support honey makers. Specifically, we used a choice experiment approach to evaluate Italian consumers' WTP to select honey attributes, incorporating consumer preference heterogeneity in a latent class model (LC).

This study contributes to the literature not only by providing estimates on Italian consumer WTP for premium honey, but also examines consumers' preferences towards local honey compared to domestic and international alternatives. Additionally, it provides insights on their specific perceptions about the organic and local origin of honey. Understanding these product-organic-origin interactions may illustrate the best marketing opportunities for domestic growers, especially for small farms in particular, who would otherwise compete with foreign producers on simple low-cost criteria.

The paper is organized as follows: Section 2 provides a short overview of the theoretical background; section 3 describes the methods and materials used; section 4 presents the results; and section 5 includes the discussion of results and concluding remarks.

Theoretical Background

According to the literature, there are various factors that influence consumers when purchasing honey. However, the decision is often habitual and dictated by knowledge of the honey's value. For example, Yeow *et al.* (2013) have determined several factors that influence consumers' purchasing behaviours regarding honey-related products such as bee

pollen, royal jelly and honey drinks. In detail, they stated that medical conditions, quality of the product, brand reputation and pricing have a positive and significant relationship with Asian consumers' purchasing behaviour. Likewise, Ismaiel *et al*. (2014) and Zulail *et al*. (2014) analysed the major factors influencing consumption, expenditure patterns and demand for honey in Saudi Arabia, finding the major motivations for consuming honey are its medicinal and nutritional values. While investigating consumer behaviour in Romania, Arvanitoyannis and Krystallis (2006) identified four main dimensions in honey-purchasing motivation: medical benefits of its consumption, dietary quality, the ethical character of honey and suitability with food consumption lifestyle.

Unnevehr & Gouzou's (1998) analysis of the US retail honey market indicated that consumers were willing to pay substantial premiums for honey based on form, container, brand and, in particular, unique monofloral sources. Similarly, Swanson & Lewis (1991) demonstrated that consumers were willing to pay for the unique characteristics of honey associated with particular floral sources, while Gambaro *et al*. (2007) found that consumers showed significantly different degrees of approval of the colour of the evaluated honeys.

Jensen & Mørkbak (2013) used principal components analysis and multinomial logit analysis to explore the role of gastronomic, externality and feasibility dimensions in the formation of consumers' values and product perceptions. They also used these methods to determine the importance of the respective dimensions in consumers' choices of local and/or organic varieties of honey and apples. They found that perceived gastronomic quality is the most important determinant for food choice, but externality and feasibility aspects are also important correlates. Ghorbani & Khajehroshanaee (2009) surveyed the consumer demand for qualitative factors of honey using the hedonic pricing (HP) model and cross-sectional data from a consumer sample. Their results showed that the type of honey, as well as its packing conditions, colour, aroma and protraction, have positive effects on its price. Murphy *et al*. (2000) used least squares regression to estimate part worths for the conjoint analysis and found that price and texture were felt to be the most important product attributes, followed by packaging, scale of production and, finally, the honey's colour. Mohamadi-Nejad (2013), using the qualitative pricing model, studied the demand for honey in urban areas of the Kermanshah province of Iran. This study showed that physical and chemical characteristics of honey affect its market price. Characteristics such as scent, production location and high traction significantly positively affect its price, while characteristics like proper packaging, bright colours and types of honey (with wax) can have significant negative effects on its market price.

As one of the few studies to analyse WTP for honey, Wu *et al*. (2014) used auction experiments. They elicited consumer WTP for honey to compare auction and posted-price mechanisms and found that WTP estimates generated by an auction were approximately 50% lower than those from a posted-price mechanism.

Many studies have also stated that a honey's origin is the most important factor considered prior to purchase. Batt & Liu (2012) found that in purchasing honey from a retail store (exploratory factor analysis revealed), there were three principal constructs most influential in the purchase decision: brand reputation, origin and value for the money. A study conducted by Roman *et al*. (2013) showed that most consumers said they only purchase honey with domestic origin, although almost half of them said they had not checked the provenance on the label. Likewise, Pocol & Bolboacă (2013) found that respondents preferred to buy honey from a local Romanian producer and had more knowledge in domestic rather than imported honey. Gyau *et al*. (2014) identified key consumer characteristics that influence preferences of honey consumers in the Democratic Republic of Congo; they showed that consumers who are married and have reached at least the level of secondary education have a strong preference for local forest and savannah honey.

Nevertheless, sufficient clarification has not been established as to which is the best strategy for differentiating honey productions that emphasise increasing producers' earnings. A number of studies have investigated processing, storage and shelf life of organic honey. Parvanov & Dinkov (2012) recommended more specific conditions for processing, storage and production of honey to preserve its natural organoleptic, physical, chemical and antibacterial features. Few studies have investigated consumer attitudes towards organic honey, yet this could be an alternative strategy to verify whether organic production would be preferred to other strategies such as geographic origin. For example, Vanyi & Csapo (2009) suggested that (in addition to price, food quality, healthy lifestyle and nutrition) food safety, organic options and animal welfare awareness influenced consumer decision-making.

Moreover, to our knowledge, there are only a few studies regarding honey and choice experiments (CE). CEs have been extensively used to understand the determinants of consumers' choice of food products. So far, CE has not been used to investigate the factors potentially shaping the choice of honey in Italy or other countries.

Therefore, the present study used a CE to investigate consumers' determinants of the choice of honey in Italy.

Methods

We applied a choice experiment to the Italian honey market to define not only the ordinal ranking of preferences, but also the WTP for key characteristics of the product.
Traditional microeconomic theory investigates the relationship between the demand for goods and their prices and income under the assumption of utility maximization and rational behaviour.

The patterns of current food consumption and demand analysis have changed over the last few decades to incorporate new factors, which are now considered more important than prices and income, to explain modern food choice processes in affluent societies.

Some authors (Rozin *et al*., 1986, p. 86) argued that economic factors, such as price, income and product availability, influence only the actual consumption of food, i.e., what and how much is chosen. This choice under budget and availability constraints does not always reflect our real preference. Economic factors can influence what people eat but cannot determine their likes. In times of economic well-being, where budget constraints are less restrictive, personal preferences become more important for purchasing decisions.

The traditional approach, though unable to explain consumer behaviour, has led many studies—especially in the last 20 years—to incorporate other factors in applied food demand analysis as proxies for unobservable factors that determine consumer preferences.

Moreover, neoclassic demand theory is silent about the intrinsic characteristics of a commodity. Neither does it provide insight on how product quality variations affect consumer perceptions and decision-making behaviour. It also provides limited explanation of how demand changes when one or more of the characteristics elicit a good change or how a new good introduced into the market fits into the preference pattern of consumers over existing goods.

This inadequacy of the traditional demand model is particularly relevant nowadays when the demand for food is no longer a demand for quantity, but more and more, a demand for quality. This and other related observations during the last few decades have given rise to new approaches to consumer modelling.

In 1965 and 1966, Gary Becker and Kevin Lancaster, in two different but related articles, introduced the concepts of household production functions. In these models, instead of deriving utility directly from goods, utility is derived from the attributes of the goods, and only when some transformation is performed. While the model of Becker and other models based on it (e.g., the demand for a health model developed by Grossman in 1972) have been widely applied, the empirical implementation of the Lancaster model in a truly observable manner is difficult due to complex identification and measurement of the “attributes”

(Silberberg & Suen, 2001, p. 343). However, the model has been more successful when applied to goods whose attributes are additive and nno-conflicting, e.g., the nutrient values of foods (Silberberg, 1985).

The impact of these two related theories on economics was substantial because the demand for quantity that was investigated up to that point by traditional microeconomic theory was transformed into demand for product characteristics or product attributes. Therefore, the utility derived by meals or foods can now be deconstructed into utility derived from product characteristics.

In this context, consumer interest towards food knowledge is basic, and an important role is played by information. In fact, the ability of consumers to perceive certain characteristics of the product may be weak, as in the case of geographical origin (PDOs and PGIs), production methods (organic food) and supply chain characteristics (Fair Trade). In these cases, label information and logo certification becomes important to ensure the existence of the characteristics desired by consumers.

The theoretical theory at the basis of this later aspect is indeed the economics of information (Akerlof, 1970; Stigler, 1961). More specifically, among the different sources of information available to the consumers, labelling can support customers in making choices connected to their preferences in terms of qualitative features by reducing information asymmetry and, thus, improving economic efficiency. In particular, Akerlof (1970) was the first to show that asymmetric information, such as quality uncertainty about a commodity, can cause the market to degenerate into one consisting of only low-quality commodities.

The underlying theory of CE is based on i) Lancaster's Consumer Theory (LCT) (Lancaster, 1966), which states that goods can be described with their essential characteristics, and that the value for an individual originates from the combination of these attributes, and ii) random utility framework (Luce, 1959; McFadden, 1974), which assumes that the utility function of each respondent is the sum of a deterministic term (a function of factors that influence the respondent's utility) and a stochastic random term (unobservable to the researcher). CE allows the evaluation of trade-offs among attributes by replicating real-world purchasing situations (Lusk *et al*., 2003). In a CE, it is assumed that a behaviour—in our case, honey choices—can be described by its characteristics ("attributes"). In the present context, honey can be viewed as a collection of its attributes, from which consumers find utility. Respondents were offered a series of choice sets and were asked to choose between three jars with different combinations of attribute levels; they were also given the option to choose none of the three jars to allow respondents to "opt out" (i.e., a no-buy alternative).

This study used, for exploratory purposes, the Multinomial Logit Model (MNL) and examined a random effect specification by implementing an LC model. Unlike the traditional MNL, where consumers are assumed to be homogeneous, here, heterogeneity in consumer preferences for honey attributes was measured using the LC model. In spite of the traditional logit, this model relaxed the limitations by offering particular flexibility to accommodate respondents' differences in decision strategies and choice consistency, which would otherwise lead to biased part worth utilities (Hensher, 2010; Hess *et al*., 2013; McFadden & Train, 2000). The increasing use of latent class (LC) and random parameter logit (RPL) models for the analysis of choice experiments in food contexts has been underpinned by a recognition of the heterogeneity in consumers' preferences and the desire to make this heterogeneity relevant for marketing segmentation purposes. In the context of segmented samples of respondents, LC analysis proves to be particularly suited. It groups respondents by looking at common choice patterns rather than clustering the sample on socio-economic characteristics.

Welfare measures are found by looking at the marginal rate of substitution between non-monetary and monetary attributes included in the indirect utility function (IUF). Therefore, it was possible to estimate the premium price (or willingness to pay – WTP) for each attribute level by dividing β coefficients by βprice:

$$WTP = - \beta / \beta price$$

As the utility function is assumed to be linear in cost, the marginal WTP for the attribute is the ratio between the parameter of the attribute and the cost parameter in the utility function.

Experimental Design

A face-to-face questionnaire survey, divided into three parts, was conducted in 2014 (January-July) among Italian consumers. The survey, including the CE, was administered in Friuli Venezia Giulia, a North-Eastern region in Italy. It was completed by 427 respondents. The first part collected respondents' socio-economic information, and they were also asked about their general opinions and experience regarding honey-related consumption habits. The focus was placed on their specific knowledge and perception of organic-produced food. Next, the choice experiment was introduced, and the attributes with corresponding levels were repeated briefly before each respondent was faced with the choice sets.

In the experimental design, a focus group was conducted with a number of consumers and producers of honey. About 50 pre-tests of the questionnaire were made before it was

administered to the final respondents. The pre-tests resulted in a number of minor changes in the formulation of questions. Based on the focus group discussion, five attributes were identified (Table 1), which were considered to be important for consumers, but which did not make them differentiate between various types of honey.

Attribute	Levels
Geographic origin	Friuli Venezia Giulia Region; other Italian regions; other countries
Honey crystallisation	Liquid (runny) state; semi-solid state
Organic	Yes; no
Landscape	Evocative landscape; beehives near industrial buildings; skyscraper hives
Price (€/500 gr.)	3; 5; 9

Table 1 – Attributes and their corresponding levels

The first attribute we considered was the geographic origin of honey, which seemed to be a preferred characteristic of consumers across all countries (Kehagia, 2007). The country of origin attribute had three levels of study: Friuli Venezia Giulia Region, other Italian regions, and other countries.

The second attribute offered respondents the opportunity to choose between liquid (runny) state honey or semi-solid state honey. Honey is susceptible to crystallisation, which occurs naturally. Crystallisation is affected by three major factors: floral origin of the nectar; high contents of fructose (Generally, honeys with very high contents of fructose remain liquid for a longer time (Yao *et al*., 2003)); and the organic honey production method.

An increasing interest and concern among consumers in the ways in which food is produced has led to a need for differentiation in production methods. Consequently, we considered two different levels for this attribute: organic or non-organic. Organic production means the production process has followed the rules established by EU Regulations (CE) N. 834/2007 and 889/2008.

With regard to landscape, the fourth attribute, we used three levels: i) intensive beekeeping carried out with a large numbers of colonies concentrated in small areas, which enables large yields but damages landscape beauties; ii) an industrial site where an apiary is located; and iii) traditional bee hives in a beautiful mountain landscape.

The price attribute had the levels € 3, € 5 and € 9.This corresponded to a 550 gr. glass jar.

To elicit consumer preferences for the attributes efficiently, a fractional factorial design was used to vary all attributes among the scenarios. The choice sets were shown in colour pictures to the respondents. An example of a choice set is illustrated in Figure 1.

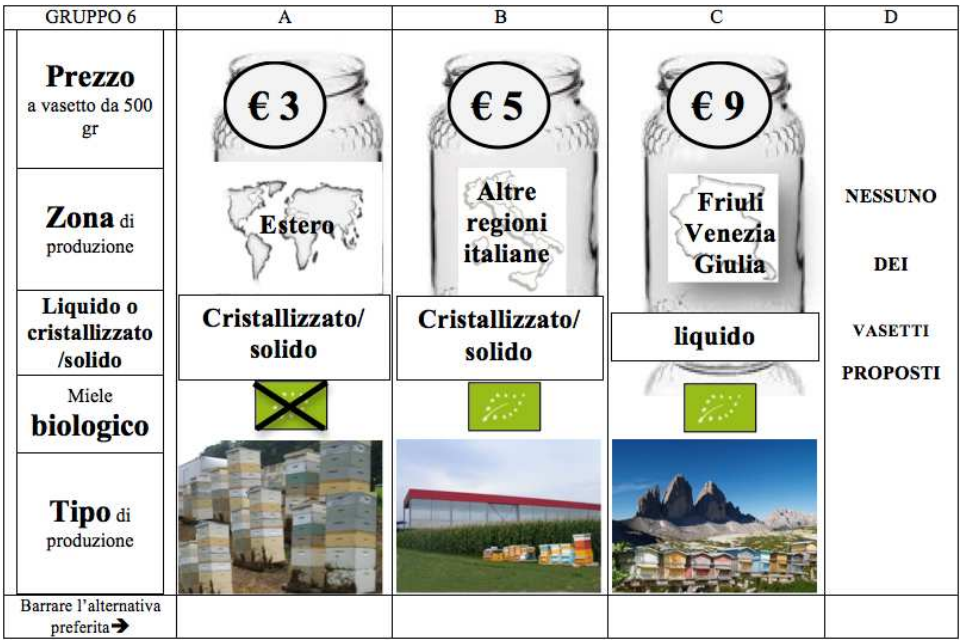

Fig. 1 – Example of choice set

Results

The majority of the respondents were female (55%). Most respondents (45%) were aged between 41–55 years. A similar proportion of respondents lived in a household with one or two (26%) to three (25%) other people. Respondents were mainly employed (67%). Table 2 presents the descriptive statistics used in the estimations.

		N°	%
Gender	Male	192	44.96
	Female	235	55.04
Age	Less than 25 years	40	9.37
	Between 25 and 40 years	136	31.85
	Between 41 and 55 years	192	44.96
	Between 56 and 70 years	52	12.18
	More than 70 years	7	1.64
Family members	1-2		40.52
	3-4		50.82

	5 and more		8.67
Educational level	Primary	8	1.87
	Lower secondary	42	9.84
	Secondary	188	44.03
	Graduate	164	38.41
	Other	25	5.85
Occupation	Entrepreneur	33	7.73
	Students or housewives	43	10.07
	Employee	289	67.68
	Self-employed	33	7.73
	Retired	19	4.45
	Other	10	2.34

Table 2 – Interviewee characteristics

More than 90% of the respondents stated that they consumed honey, however, the majority (49, 35%) consumed it only occasionally. Buying honey directly from the beekeeper was widespread among respondents, but for 36.20%, the supermarket was the primary place of purchase. Of the 65.71% who declared their preference for liquid (runny) honey, 72.95% of them regularly or rarely bought organic honey.

By means of the program NLogit4®, MNL and LC models were estimated. Both models shared the same following linear utility function:

$$U(x_i) = \beta_{optout} * OptOut_i + \beta_{fvg} * FVG_i + \beta_{foreign} * FOREIGN_i + \beta_{liq} * LIQ_i + \beta_{org} * ORG_i + \beta_{land1} * LAND1_i + \beta_{land2} * LAND2_i + \beta_{price} * PRICE_i \quad (1)$$

OptOut was a dummy that assumed a value of 1 for the no-choice option and 0 otherwise; FVG was a dummy that indicated the area of production, Friuli Venezia Giulia; FOREIGN was a dummy that indicated the area of production in foreign countries; LIQ was a dummy that indicated non-crystallised honey; ORG was a dummy that indicated organic honey; LAND1 was a dummy that assumed a value of 1 if the honey was produced in an area with an evocative landscape; LAND2 was a dummy that assumed a value of 1 if the honey was produced in an area with intensive beekeeping; and finally, PRICE was the price variable.

In Table 3, the relative marginal utility of the attributes of the entire sample can be analysed. The coefficients were all significant at a 90 or 95% confidence level. The marginal utility of local honey production was higher than that of organic production.

Variable	Coefficient	Standard Error	b/St.Er.|	
ASC	-.24626173	.12460175	-1.976	***
PREZZO	-.15066132	.01357158	-11.101	***
FVG	1.03645673	.06666132	15.548	***
ESTERO	-.57880391	.11609400	-4.986	***
LIQ	.16367705	.09222782	1.775	**
ORG	.81273154	.11343944	7.164	***
LAND1	.14024662	.08107561	1.730	**
LAND2	.16440192	.09744812	1.687	**

*** Significant at a 95% conf. level; ** Significant at a 90% conf. level.

Table 3 – Base model results

Results from the LC model are reported in Table 5. The number of segments was defined exogenously. The class four model was then selected by comparing LL function, AIC and BIC for different numbers of classes (Table 4).

	LCM-2	LCM-3	LCM-4
LL	-2780.636	-2690.608	-2578.173
AIC	2.18404	2.12091	2.04034
BIC	2.22275	2.18005	2.11985
HQIC	2.19802	2.14221	2.06892
McFadden pseudo R^2	.2170941	.2424421	.2740988

Table 4 – Latent class model statistics

The class four LCM model (LCM-4) showed that the sample had heterogeneous preferences and respondents could be divided into four classes, representing 19%, 35%, 19% and 27%, respectively. It is interesting to observe how the coefficients for class one are not significant ($p > 0.05$) apart from the local origin. The members of this class who chose the most preferred alternatives considered only the local origin of honey and seemed indifferent to the other attributes considered in our experiment.

Each of the other three classes were characterised by a different structure of preferences: members of class two were more concerned about organic beekeeping and negative landscape externalities of intensive production, while members of class three preferred more liquid (runny) honey and intensive beekeeping. We will refer to members of class two as ‘‘environmentally friendly consumers’’ and members of class three as “pro-intensive production consumers”, although they had a positive WTP for organic production. Furthermore, members of class three had, on average, a higher WTP for all attributes except

local origin. Looking at class four, we noticed that people belonging to that class gave more importance to the physical property of "liquid" honey and organic beekeeping. They could be defined as "organic consumers". Regarding product origin, all the groups preferred honey produced in Friuli Venezia Giulia. Considering the landscape externalities of production attribute, classes three and four preferred intensive beekeeping (WTP € 6.74 and € 5.23, respectively), while members of class three had a negative WTP. Consumers belonging to class two preferred crystallised honey, while members of classes three and four showed a positive WTP for a liquid consistency (WTP € 8.30 and € 6.70, respectively)

Variable	Coefficient	Standard Error	b/St.Er.|	WTP	
Class 1					
ASC	.31804273	1.03617668	.307		
PREZZO	-.11165429	.17652169	-.633		
FVG	5.62296518	1.94962597	2.884		***
FOREIGN	-.35193700	1.44569150	-.243		
ORG	1.33029849	1.13793049	1.169		
LIQ	-2.38387907	1.48122766	-1.609		
LAND1	-.17303928	.71825822	-.241		
LAND2	-.49230518	1.09302451	-.450		
Class 2					
ASC	-2.60960085	.21762801	-11.991		***
PREZZO	-.25247506	.02337571	-10.801		***
FVG	1.00785809	.10639537	9.473	3.99	***
FOREIGN	-1.63310665	.20390548	-8.009	-6.45	***
ORG	1.20269676	.20490664	5.869	4.76	***
LIQ	-1.22235722	.18718273	-6.530	-4.84	***
LAND1	.14456101	.16104496	.898		
LAND2	-.40069245	.14244346	-2.813	-1.59	***
Class 3					
ASC	-.88077809	.24789936	-3.553		***
PREZZO	-.09738186	.01789458	-5.442		***
FVG	.44079144	.11647056	3.785	4.53	***
FOREIGN	.23991440	.16616515	1.444		
ORG	.63951235	.18544040	3.449	6.57	***
LIQ	.80789194	.13672959	5.909	8.30	***
LAND1	.35907245	.11205943	3.204	3.69	***
LAND2	.65684282	.15911743	4.128	6.74	***
Class 4					
ASC	2.62099940	.23672863	11.072		***
PREZZO	-.23836458	.02717294	-8.772		***
FVG	1.28899286	.14581345	8.840	5.41	***
FOREIGN	-.60532555	.25998871	-2.328	-2.54	**
ORG	1.51010640	.21303262	7.089	6.33	***
LIQ	1.59803323	.15019284	10.640	6.70	***
LAND1	.60531080	.15226299	3.975	2.54	***
LAND2	1.25570802	.18939093	6.630	5.23	***
Estimated latent class probabilities					
PrbCls_1	.18852302	.02587890	7.285		***
PrbCls_2	.34833594	.02143602	16.250		***
PrbCls_3	.18861578	.02680915	7.036		***
PrbCls_4	.27452526	.02398397	11.446		***

Table 5 – Latent class model results

The ASC was significant ($p < 0.05$) for classes two, three and four, but negative for classes two and three, meaning there were preferences towards the 'none' option, which could not be explained by the variables contained in the model. For class four, the ASC was positive.

Discussion and Conclusion

The results revealed strong positive preferences for locally produced honey. In fact, the country of origin had a substantial effect on the interviewees' utility along all classes. This result also emerged in other research, where respondents tended to prefer products from their home region (Al-Ghamdi, 2007; Troiano, *et al*., 2014; Wu, *et al*., 2014; Zulail *et al*., 2014). The WTP for honey produced in Friuli Venezia Giulia was positive in comparison to production abroad.

Nevertheless, the results show that WTP for organic honey was higher, except in class one, meaning that only a small fraction of the interviewees was not willing to pay a premium price for organic production. These results are in line with Kehagia *et al*. (2007), who stated that Italian respondents insisted on organic honey and considered the origin of honey to be important as well. If organic honey buyers are considered more responsible for their own health and more likely to undertake preventive health action than the general population (Makatouni, 2002), our results identify organic production of honey as a driving opportunity for beekeeping. In fact, Bainbridge (2007) and Ismaiel *et al*. (2013) evidenced that the trend of consuming honey as a health food has been steadily increasing. This could be a key factor of the expected growth in the Italian demand for honey.

Notably, our results suggest the "organic" attribute was more important than the externalities produced by the type of production. However, it is interesting to observe the presence of significant market segments interested in the liquid consistency of honey, not taking into consideration that crystallisation or granulation are natural phenomena. In fact, most pure raw or unheated honey has a natural tendency to crystallise over time. There is no difference in taste or nutritional value of these two states. Crystallised honey is not spoiled and preserves the characteristics of liquid honey. It can also be restored to a liquid state.

While organically and locally grown honey have become increasingly popular in recent years, most consumers purchase honey for its aesthetic value rather than the overall environmental consequences of its production methods.

From a consumer perspective, a lack of sufficient information exists regarding the quality properties and physical aspects of honey in general, and in particular, the environmental quality variation between extensive, environmentally friendly methods of production and intensive beekeeping .

Our results suggest that while organic beekeeping might be an important strategy for diversification, if suitable communication is not taken into consideration, the added value of environmentally friendly production methods might not be perceived by consumers. According to the Akerlof theorem (1970), the adverse effects of asymmetric information in these situations gives rise to “adverse selection” and an inefficient market equilibria.

It is important to extend the research to real consumer behaviour to better understand their preferences. Lastly, it may be useful to extend this research to other states or regions.

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