# Consumers' attitudes towards sustainable food: a cluster analysis of Italian university students*

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Jel Classification: D12, Q11


## Abstract

*Public and academic attention towards sustainable consumption has been impressive in the last decade, but consumer attitudes and buying behaviours of sustainable food are still not completely understood. The current paper explores Italian university students' (N=500) attitudes towards sustainable foods through factor analysis and cluster analysis (K-means method).Three different consumer types were identified: the responsible food consumer, the inattentive food consumer and the potentially sustainable food consumer. The first and third segments, revealing high interest levels and awareness of sustainability issues in food, worth further analysis by food producers and policy makers concerned with fostering market development of these products.*


***Keywords.*** *Sustainable food; University students; Factor analysis; Cluster Analysis.*


## Résumé

Ces dix dernières années, l'opinion publique et le monde académique ont accordé une attention particulière à la consommation durable, mais nous avons encore beaucoup à apprendre sur l'attitude des consommateurs et leurs comportements d'achat en ce qui concerne les aliments bio. Dans cet article, nous avons analysé l'attitude d'un groupe d'étudiants universitaires italiens (N=500) à l'égard des aliments durables en nous appuyant sur une analyse factorielle et une analyse de regroupement (méthode des K-moyennes). Trois différents types de consommation ont été identifiés : une *consommation responsable*, une consommation *inattentive* et une *consommation potentiellement durable*. Le premier et le troisième segment, qui révèlent un niveau d'intérêt considérable et une grande sensibilité aux thèmes de la durabilité alimentaire, méritent d'être mieux évalués au profit des producteurs et des décideurs politiques, soucieux de développer le marché de ces produits.


**Mots-clés:** Aliments durables; Etudiants universitaires; Analyse factorielle; Analyse de regroupement.

## Introduction

Today sustainable consumption is a core policy objective of the new millennium in national and international arenas (Seyfang, 2005), in addition environmental and social sustainability of food production has gained strong consumer attention (Banterle *et al.*, 2010). However, over 20 years after the Brundtland Report, there is not much evidence to support the assumption that people act responsibly or that social planning can deal with the main sustainability problems effectively (Martens and Raza, 2010; Nordhaus and Shellenberger, 2007; Speth, 2004).Therefore, as shopping activities are more prominently linked to social and environmental causes, academics and campaigners accounts of consumer activism and suggest that consumers vote with their dollars (e.g. Young *et al.*, 2010; Shaw *et al.*, 2006; Barnett *et al.*, 2005). As the concept of sustainable citizenship – i.e. citizens adopting sustainable consumption patterns to take responsibility for sustainable development (e.g. Dobson, 2007) – gains strength, academic research into the buying process of sustainable products has dramatically increased. A range of factors have been explored, from psychological (e.g. de Boer *et al.*, 2007; Vermeir and Verbeke, 2006, 2008; Magnusson *et al.*, 2003), cultural (e.g. Chan, 2001), socio-psychological (e.g. Schwepker and Cornwall, 1991), to demographic (e.g. Robinson and Smith, 2002).

In their extensive research on the role that social attributes (environmental and labour conditions) play in product choice across a range of developed and emerging economies, Auger *et al.* (2010) conclude that when presented with product options that include social issues consumers in all countries are, to some degree, interested. In an analysis on the relevance of additional ethical attributes of organic foods purchases, Zander and Hamm (2010) conclude that a considerable proportion of consumers would be willing to pay an additional premium for some ethical attributes (such as animal welfare, regional production and fair prices to farmers). In a similar study conducted in California, Howard and Allen (2006) reveal that standards for the humane treatment of animals have the highest level of consumers' support, followed by a standard for local origin and for a living wage for workers involved in producing food. Gilg and colleagues (2005), in their research in Devon, note that those most committed to sustainable consumption are older consumers, members of community groups. In contrast, those who were non-environmentalists are younger, male, with low incomes, lower education and less involved in the community.

* Introduction and discussion sections are written by Azzurra Annunziata; Material and Methods and Results sections by Riccardo Vecchio.

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Literature tends to suggest that even if most consumers have a positive but passive view of sustainable consumption, policy tools and instruments should carefully target different types of households, individuals or groups. Therefore many variables should be taken into account, including income, age, education, gender attitudes and lifestyle characteristics. For some consumers, income level and status concerns indicate that initiatives could build on their desire to make green statements or send social messages. Female sensibilities may count in purchasing certain household goods, while male orientations are important in guiding larger purchases such as cars and electronics. Different approaches will appeal to younger consumers compared to older ones (e.g. Carrigan *et al.*, 2004; Smola and Sutton, 2002). As a consequence, designing effective sustainable consumption policies, consumer behaviour should be deeply analyzed. In particular, in order to develop marketing strategies that can improve sustainable consumption, researchers must understand real decision-making processes in all their complexity.

Although there has been an enormous amount of discussion surrounding the role of the food consumer in fostering sustainable development the phenomenon is still not well understood. A major issue is undoubtedly the fact that sustainable food consumption is a broad and not perfectly identifiable category. Hence much research has focused singularly on sustainability issues in specific fields, such as organic products (e.g. Zander and Hamm, 2010; Aertsens *et al*., 2009; Coley *et al*., 2009; Clarke *et al*., 2007; McEachern and McClean, 2002), local foods (e.g.Hinrichs and Allen, 2008; Seyfang, 2006), the fair-trade market (e.g. Clarke *et al.*, 2007; De Pelsmacker *et al.*, 2005) and animal welfare (e.g.Vecchio and Annunziata, 2012; Miele and Evans, 2010; Vanhonacker and Verbeke, 2007; Schröder and McEachern, 2004). Moreover, numerous research articles deal exclusively with the pro-environmental selection of food items as an indication of sustainable consumption (Tanner and Kast, 2003; Fotopoulos and Krystallis, 2002; Wandel and Bugge, 1997). Even so, in the last few decades a relevant number of studies on sustainable food consumption have been reported[1] (Hintonand Goodman, 2010;Vermeir and Verbeke, 2008; de Boer *et al.*, 2007; Robinson and Smith, 2002).

Regardless of the significant attention and growth surrounding sustainable foods, there is still demand for research investigating the intersection of economic and psychological factors that can help predict and explain consumer behaviour. At this time, a key stakeholder valued in the conceptualization of sustainable living and practice is the young consumer (e.g. Vermeir and Verbeke, 2008): these consumers represent the future of our society (Smola and Sutton, 2002) and are considered the most consumption-orientated generation of all time due to the abundance and availability of products and services (Sullivan and Heitmeyer, 2008). Further, it is believed that they have the potential to form long-term loyalties with products which satisfy them at this vital stage (Paul, 2001).

Despite these considerations, our understanding of young consumer attitudes towards sustainable food consumption is still quite incomplete.

The current research aims to verify the hypothesis of the existence of latent variables capable to influence young adults attitudes towards sustainable food products (such as organics, animal-friendly, fair-trade, local, respectful of workers' rights) and verify the hypothesisof the existence of market segments formed by consumers with similar preferences. Indeed segmentation research allows a better understanding on how to make sustainable food choices more relevant to different consumers and how to enhance sustainable food products positioning in a competitive marketing environment (Vanhonacker *et al*., 2012). Moreover, identifying distinct consumer profiles providesuseful insights on how to target, communicate and encourage these groups to make more sustainable food choices.

## Material and Methods

To reach the research goals, a quantitative survey was conducted to explore the attitudes and behaviour of Italian university students towards sustainable food consumption. Constructs in the questionnaire were based on previous similar studies (Clonan *et al.*, 2010; Vermeir and Verbeke, 2008; Seyfang, 2006; Gilg *et al.*, 2005; Tanner and Kast, 2003). In particular, since no common definition of sustainable food is yet available, for the purposes of the current research we used the classification established by the EC-funded project SUS-CHAIN (Marketing sustainable agriculture: an analysis of the potential role of new food supply chains in sustainable rural development). Specifically, Brunori and colleagues (2004), in their final report on sustainable foods in Italy, group these products according to three main criteria: an ecological criterion (including organic products, products obtained by means of integrated pest control techniques and GMO-free products); a geographical criterion (containing typical products, traditional products and mountain products); and an ethical criterion (comprising fair-trade products and animal welfare. In our research the above categories of products were broadly replicated, focusing on seasonal and local products instead of typical and traditional, and expanded, including foods with other ethical issues (such as respect of workers' rights) and foods from alternative distribution systems (such as solidarity buying groups). A pre-test questionnaire was administered to 50 university students in the city of Naples. This pre-test was developed to discover any possible weakness in the questionnaire. After the pre-test the questionnaire was revised and, between June and December 2010, a final version was delivered to a random sample of Italian university students.

To determine the sample a two-stage procedure was adopted. First, a simple sampling technique was used, set-

[1] For an extensive review of the topic see Verain *et al*., 2012.

ting 0.95 as the level of confidence an infinite population and fixing the sample error at 5%. Interviews were then conducted using two criteria: the city of residence and being a university student. Data was collected outside the universities of Naples, Rome and Udine (respectively South, Centre and North of Italy). To obtain 500 usable surveys, 1000 questionnaires were distributed, since 724 surveys were returned, representing a response rate of 72.4%, but 224 of these were not fully complete. Participants were asked to fill in the questionnaire anonymously and return it to the interviewers. A non-financial token (chocolates) was used as an incentive and given once the questionnaire was returned.

Factor and cluster analyses were applied to analyze data, as these techniques have been widely used for similar consumer studies (e.g. Vanhonacker *et al.*, 2012; Gilg *et al*., 2005; Weatherell *et al.*, 2003). First, factor analysis (with the varimax rotation method) was used to group different variables that affect university students' attitudes towards sustainable food. Based on the factors identified, non-hierarchical clustering (with K-means method) was performed to obtain segments. Bivariate analyses including cross-tabulation with Chi$^2$-statistics, Independent Samples T-test and One-Way ANOVA comparison of means were then used to profile the clusters.

The self-administered questionnaire used during the survey consisted of 69 questions (of these 40 applied a 5-point Likert-type response format) divided into four main sections. The first section included questions about general food buying practices and habits. The second section asked specific questions related to attitudes and purchase behaviour of sustainable food products. The third block attempted to measure variables such as personality, attitudes, values and individuals' lifestyles. The final section collected demographic and socio-economic information (including gender, age, residence, family income). All analysis were performed using the statistical software SPSS 15.0 (Statistical Package for Social Sciences).

## Results

Our empirical investigation of 500 university students revealed that respondents embrace food sustainability with varying degrees of involvement. Hence it is important to appreciate such nuances to develop solutions that fit specific consumer needs.

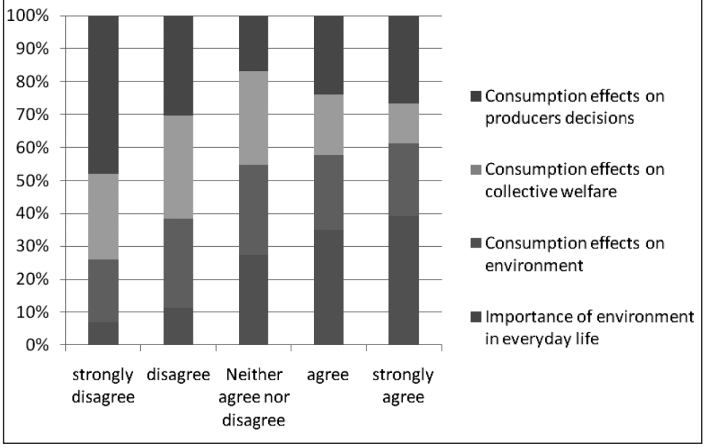
Respondent profiles were broken down by age, gender, marital status, family size (number of family members living at home), annual household average income and area of residence.

Final sample is composed of 45% individuals aging between 18 and 24, 21% among 25 and 28, 20% between 33 and 35, and 14% in the 29-32 years range. 59 % of respondents was female. Table 4 contains more details of sample socio-demographic profile.

In order to analyse students values and individual lifestyles the agreement rate on four specific topics were investigated: asking respondents to state their opinions on a Likert-type scale from 1 (strongly disagree) to 5 (strongly agree) on four statement (see Fig. 1). Final outcomes show that young citizens appear quite confused on their active role as powerful players on the market, since highest percentages are found on the neither agree nor disagree answer for all the selected topics. Moreover, only the statement "*Importance of environment in everyday life*" received a considerable amount of consent (47.8%, agree+strongly agree), while the declaration "*Consumption effects the environment*" was felt true by only 31% of the sample (25% agree+ 6% strongly agree).

"*Consumption effects on collective welfare*" and "*Consumption effects on producers decisions*" received the highest amount of disagreement (respectively 37% and 43%, disagree+strongly disagree). These data can be connected to the non-acceptance of responsibility, based on the little efficacy which individual actions are believed to have outside the restricted boundaries of one's own private life (Schröder and McEachern, 2004; Uusitalo and Oksanen, 2004; Ellen *et al*., 1991).

Figure 1 - *Agreement rate on selected topics.*

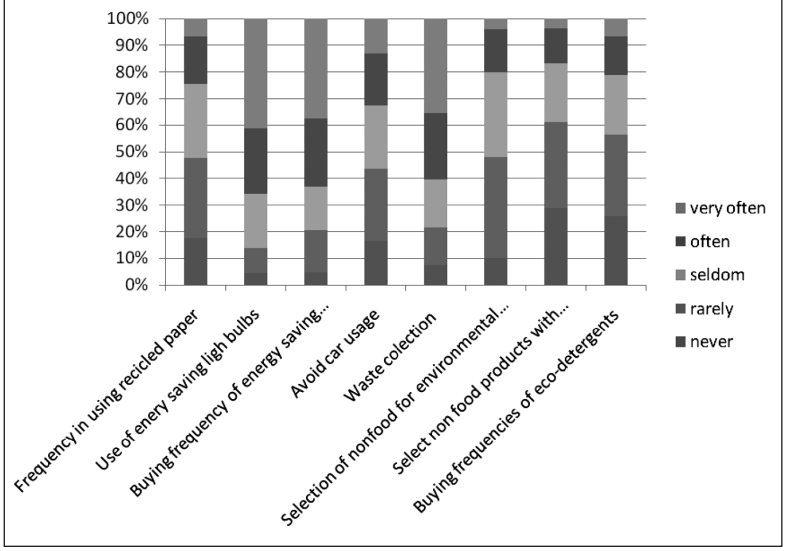



Other information on lifestyle habits somehow related with environmental sensibility was gathered to better frame respondents' overall profile. Important to highlight is the very low declared frequencies in shopping non food products with environmental and social labels (60.2% never+rarely), as buying non-food products based on their environmental impact (48%, never+rarely).

Grouping the most important variables investigated in the questionnaire, through factor analysis we obtained three factors (see Table 2), namely environmental and social values in food shopping, information and awareness. These 3 factors together explain 62.3% of the original variance[2].

[2] The factors were chosen on the basis of the eigenvalue criterion choosing only factors with eigenvalues greater than 1 (Kaiser, 1960), and considering the cumulative variance explained by the factors taken together.

Figure 2 - *Lifestyle habits.*




The first factor (environmental and social values) summarizes 10 variables and explains 26.8% of total variance: this factor is connected with variables related to consumer sensitivity towards ethical and social aspects of food. Specifically, it is affected by variables that evaluate the degree of *importance of food that respects workers' rights*, *importance of food not making animals suffer* and *importance of everyday food not damaging the environment*. Similarly, this factor is positively correlated with the predisposition to buy organic food and importance of environmental and social trademarks in purchasing foods. Hence this factor may be summarised as *environmental and social values in food shopping.*

The second factor explains 21.4% of total variance and summarises five variables. Analyzing results in Table 1, this factor clearly appears negatively related with variables that express the degree of *trust in information from producers on sustainability of products*, and also with *satisfaction with information on sustainability of foods*, while it is positively correlated with tendency of respondents to read food labels. Hence this factor can be termed *information*.

Finally, the third factor explains 14% of variance and groups six variables connected with respondents' awareness of food choice implications. This factor is particularly correlated with variables that measure respondents' degree of agreement with specific statements, such as *consumption affects producer decisions* and *modifying food consumption patterns improves the environment and welfare*.

Based on the previously described three factors, the sample was segmented using the K-means method, which is a non-hierarchical algorithm, widely used in the literaturefor similar studies (e.g. D'Souza *et al.*, 2007; Gilg *et al.*, 2005; Weatherell *et al.*, 2003). From the application of this method, division into three groups proved to be the ideal solution (see Figure 1).

The *responsible food consumer cluster* (36.2% of the whole sample) has the following main features:

• it consists mostly of older individuals (aged between 29 and 35 years), very attentive to environmental and social implications of everyday food choices, often select products that have positive environmental and social features and are generally well-informed on sustainability matters. Consumers of this segment purchase more frequently animal-friendly, fair trade and organic products, compared to the other two groups. Furthermore these consumers state to buy local foods to reduce environmental impact. Analyzing the socio-demographic variables it is clear that in this group there is a higher concentration of urban citizens, that live alone or with other students, and are part of families with medium-high household incomes. Furthermore in this segment there is a higher amount of worker-students (even if this variable is less significative than the previous ones). While the type of degree course is not statistically different among segments. Given that this segment contains the largest number of individuals who statethey are responsible for food shopping, the group exhibits the most interesting marketing opportunities for green and ethical food productdevelopment.

The second group of students, termed the *inattentive food consumer cluster* (33.2% of the whole sample), comprises:

• younger individuals (aged between 18 and 24), mostly non-buyers of sustainable foods. These respondents are generally not interested in the negative impacts of everyday food consumption on society, revealing both a low degree of knowledge of the main sustainability issues (around 20% of the individuals in this group were unable to give a definition of sustainable development) and a general low-involvement attitude to virtuous lifestyle habits. In addition, consumers in this cluster do not think that their generation is adopting unsustainable consumption patterns.Socio-demographically, this cluster is characterized by students coming from non urban areas and families with medium household income.

The third segment, the *potentiallysustainable food consumer* cluster (30.2% of the whole sample),comprises:

• individuals that consider it difficult to buy sustainable food, perceive that it is hard to find sustainable products in everyday food shopping, and are the least satisfied with the available information on sustainable food. Also in this cluster there is a majority of students that live in non urban areas and are part of families with a medium household income. Although these respondents may be sensitive to sustainable food issues, they are not wholly involved in constructive action. These consumers appear to be aware of the challenges currently faced by the environment and general welfare of food consumption. Nonetheless, their concerns are not always translated into sustainable buying behaviour. As previous studies have demonstrated, availability could act as a barrier to sustainable consumption:as these con-

Table 1 - *Matrix of rotated components.*

| | Factors | | | |
|---|---|---|---|---|
| ***Variables*** | **Environmental and social values in food shopping** | **Information** | **Awareness** | 1com[*] |
| **Buy organic** | .506 | -.032 | .191 | .696 |
| **Consumption effects on producer's decisions** | .288 | .121 | .811 | .665 |
| **Environmental impact** | .572 | .098 | .209 | .757 |
| **Workers' rights** | .631 | .023 | .075 | .625 |
| **Origin** | .428 | .132 | -.003 | .616 |
| **Buy animal-friendly food** | .421 | .277 | .067 | .686 |
| **Environmental and social brands** | .720 | .235 | .142 | .652 |
| **Importance of the environment in everyday life** | .562 | -.211 | .064 | .711 |
| **It is easy to distinguish sustainable from conventional products through labels** | .204 | -.602 | .301 | .709 |
| **Consumption effects on collective welfare** | .186 | .099 | .643 | .643 |
| **Trust information from producers on sustainability of food products** | -.108 | -.724 | -.055 | .790 |
| **Consumption effects on environment** | .301 | .119 | .698 | |
| **Agreement degree with statement "It is important that everyday food doesn't spure environment"** | .775 | -.333 | .149 | .802 |
| **Agreement degree with statement "It is important that animals do not suffer in food making"** | .818 | -.087 | .098 | .810 |
| **Agreement degree Importance of food that respects workers' rights** | .829 | .221 | .242 | .851 |
| **Satisfaction with information on sustainability of foods** | -.132 | -.611 | .106 | .854 |
| **Sustainability of food choices** | .212 | .115 | .709 | .832 |
| **Degree of information on food** | -.073 | .801 | -.266 | .534 |
| **Agreement with statement "modifying food consumption improves environment and welfare"** | .044 | .421 | .801 | .722 |
| **Agreement with statement "young people consume in an unsustainable way"** | .172 | .398 | .722 | .697 |
| **Read food labels** | .329 | .698 | .307 | .598 |
| | | | | |
| ***Eigenvalue*** | ***4.37*** | ***1.87*** | ***1.29*** | |
| ***Variance %*** | ***26.8*** | ***21.4*** | ***14,1*** | |
| ***Cronbach á*** | ***0.82*** | ***0.89*** | ***0.76*** | |
| ***Total variance %*** | ***26.8*** | ***48.2*** | ***62.3*** | |

[*] Extraction communalities are estimates of the variance in each variable accounted for by the factors (or components) in the factor solution.

sumers believe that sustainable products are less available, they have less intention of purchasing them. Therefore public policy makers and firms interested in sustainable consumerism should seek to engage these consumers, trying to better convey easy (and reliable) information to assist the consumer's everyday decision-making process.

Our results suggest that the three identified market segments require different marketing strategiesto be articulated, so as to respond to a differentiated range of consumer perceptions and attitudes towards sustainable food products.

## Discussion

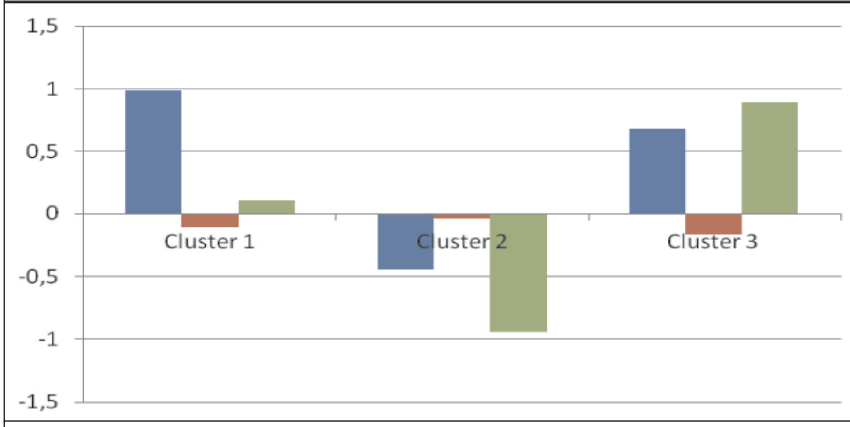
Consumers nowadays are not considered just individuals responsible solely for the private outcomes of their choices, but also social citizens with social responsibilities (Uusitalo, 2006). Hence a considerable amount of academic research is addressing the issue of sustainable consumption. Several studies have focused on consumer attitude and behaviour towards environmentally friendly products (e.g. Autio *et al.*, 2009; Moisander, 2007; Tanner and Kast, 2003; Laroche *et al.*, 2001; Mainieri *et al.*, 1999). This literature has identified mainly three sets of variables that appear to be influential in classifying the green consumer: environmental and social values; sociodemographic variables; and psychological factors. Moreover, several studies have linked sustainable or ethical behaviour to personal values (De Pelsmacker *et al.*, 2005; Thøgersen and Ölander, 2002; Grunert and Juhl, 1995).

In recent years, we have witnessed the growth of food products that appeal to many disparate consumer values (Conner, 2004).The reasons behind such choices have been widely investigated.

Specific studies of sustainable food consumption have shown that psychosocial variables and past behaviour (compared to demographics) are more predictive of the intention to purchase (Vemeir and Verbeke, 2008). Moreover, other research has proven that consumers are likely to purchase in a more sustainable way if they perceive that their purchases will actually have an impact on the environment and influence future policy (Gilg *et al.*, 2005). However, consumer motivation to buy sustainable foods can be affected by low (real or perceived) availability of the good (Vermeir and Verbeke, 2006). In addition, other scholars (Robinson and Smith, 2002) argue that a core issue in fostering sustainable food consumption is to convey specific educational messages appealing to different consumer attitudes and beliefs.

The Italian study by Brunori and colleagues (2004), highlighting that there is a lack of awareness, information and knowledge on any kind of sustainable product, concluded that the main barriers to developing these foods can be traced to five main elements: limited or imprecise knowledge of different methods of production, limited or confused knowledge of brands and certification bodies, inadequate product quality, high pricesand scant availability of products.The recent review by Verain and colleagues (2012), concluded that literature distinguishes different sustainable consumer types based on a number of variables. The most used are undoubtedly sociodemographic variables (such as gender, age and education), but their capacities for profiling sustainability segments remain quite ambiguous.Thus other variables are considered as values, openness to change, self-transcendence, conser-

Figure 3 - *Cluster centres.*




(Blue is factor 1, Red is factor 2 and Green is factor).

vation and self-enhancement, or (more centred on the domain-specific level) concern and attitudes regarding the environment.

Analyzing attitudes and behaviour of 500 University students our research tries to add quantitative information to the academic and professional debate.

Overall, important theoretical and practical implications can be drawn from our findings. The current research confirmed that in Italy, as in many developed countries (Vermeir and Verbeke, 2006), young adults are rather highly involved with sustainable food consumption. However, university students are clearly not a homogeneous group, and raising their awareness of the issues involved within sustainable food consumption needs to be targeted accordingly, matching the messages on sustainable food to specific needs. In particular, through principal components analysis with the varimax rotation method three factors (which explain 62.3% of the original variance) were identified: environmental and social values in the food shopping factor that synthesize consumers' sensitivity towards ethical and social features of foods; information factor that groups variables related to the amount of consumer knowledge of food sustainability issues; and awareness factor connected with respondents' awareness of food choice implications.

Cluster analysis (K-means method) revealed three consumer types: the *responsible food consumer* (36.2% of the whole sample); the *inattentive food consumer* (33.2%) and the *potentially sustainable food consumer* (30.6%). Similar scores within clusters are found for some variables, while different results emerge from other important variables (see Table 4). In particular, in sound with Vanhonacker and colleagues (2012), our research highlighted the existence of a consumer segment more involved and more willing to search for information in a proactive way. However, to reach this consumer segment, it seems important to provide shoppers clear, visible and transparent information.

From our results, in fact, the first and third segments reveal high interest levels and awareness of sustainability issues of food. These segments should be carefully analysed by food producers and policy makers in order to assess the appeal of such issues, adopt theright market positioning and define suitable marketing programmes.

Table 2 - *ANOVA*.

| | Cluster | | Error | | F | Sig. |
|---|---|---|---|---|---|---|
| | Mean square | df | Mean square | df | Mean square | df |
| REGR factor score 1 | 140,801 | 2 | ,437 | 497 | 321,892 | .000 |
| REGR factor score 2 | 123,436 | 2 | ,990 | 497 | 213,470 | .003 |
| REGR factor score 3 | 135,533 | 2 | ,459 | 497 | 295,525 | .000 |

Table 3 - *Food shopping habits.*

| Variables | Clust. 1 | Clust. 2 | Clust. 3 | Tot. | Sig. |
|---|---|---|---|---|---|
| Buy bulk products | 2.3 | 2.1 | 2.3 | 2.2 | .377 |
| Buy seasonal food | 4.0 | 3.5 | 3.7 | 3.7 | .000 |
| Buy organic | 2.9 | 1.7 | 2.4 | 2.4 | .000 |
| Buy food that respects workers' rights | 2.8 | 1.8 | 2.2 | 2.2 | .000 |
| Buy fair-trade products | 2.7 | 1.7 | 2.1 | 2.0 | .000 |
| Buy animal-friendly products | 2.5 | 2.0 | 2.2 | 2.2 | .000 |
| Buy from producers | 2.3 | 2.1 | 2.5 | 2.3 | .010 |
| Buy local to minimise "food miles" | 3.3 | 2.2 | 2.4 | 2.8 | .000 |
| Buy from ethical producers | 3.2 | 2.8 | 2.6 | 2.8 | .000 |
| Buy from local markets to support local economy | 3.4 | 2.5 | 2.6 | 2.9 | .106 |
| Buy through buying groups | 1.7 | 1.3 | 1.5 | 1.5 | .000 |
| Important that everyday food doesn't damage the environment | 3.8 | 2.9 | 3.3 | 3.3 | .000 |
| Importance of food made respecting animal welfare | 3.6 | 2.8 | 3.0 | 3.1 | .000 |
| Importance of food that respects workers' rights | 3.8 | 2.8 | 3.2 | 3.3 | .000 |
| Modifying food consumption improves environment and social welfare | 4 | 3 | 4.1 | 3.7 | .000 |
| University students consume in an unsustainable way | 3.9 | 2.9 | 4.3 | 3.6 | .000 |

Table 4 - *Socio-demographic profile of clusters.*

| | | % of total sample | Clust. 1 Responsible food consumer | Clust. 2 inattentive food consumer | Clust. 3 potentially sustainable food consumer | Sig. |
|---|---|---|---|---|---|---|
| ***Gender*** | Male | 41.4 | 41.5 | 41 | 41.8 | .193 |
| | Female | 58.6 | 58.5 | 59 | 58,2 | |
| ***City of residence*** | Naples | 30 | 28.2 | 30.2 | 30.2 | .225 |
| | Rome | 40 | 40.9 | 39.6 | 40.4 | |
| | Udine | 30 | 30.9 | 30.2 | 29.4 | |
| ***Geographical provenance*** | Urban | 34 | 43 | 28 | 30 | .007 |
| | Rural (town, village, countryside) | 66 | 57 | 72 | 70 | |
| ***Family household income*** | Up to 10.000€ | 15 | 12 | 17 | 15 | .005 |
| | Between 10.000 – 20.000€ | 45 | 40 | 48 | 46 | |
| | Between 20.000 – 30.000€ | 28 | 30 | 27 | 28 | |
| | Over 30.000€ | 12 | 18 | 8 | 9 | |
| ***Number of family members*** | Single | 6 | 3.6 | 5.8 | 6.3 | .231 |
| | 2 | 8.4 | 13.8 | 12.6 | 10.2 | |
| | 3 | 22.8 | 27.8 | 21.2 | 22.6 | |
| | 4 | 39.8 | 35.1 | 36.2 | 36.3 | |
| | > 4 | 23 | 18.5 | 22.6 | 24.3 | |
| ***Occupation*** | Student | 65.8 | 27.7 | 69.4 | 47.3 | .000 |
| | Student-worker | 34.2 | 72.3 | 30.6 | 52,7 | |
| ***Housing*** | Live with parents | 42.3 | 38 | 58 | 46 | .002 |
| | Live alone/with other students | 57.7 | 62 | 42 | 54 | |
| ***Degree Course*** | Economics | 16.7 | 14.3 | 14.8 | 15.6 | .102 |
| | Law | 14.3 | 15.7 | 15 | 14.2 | |
| | Communication Sciences | 8.4 | 6.4 | 7.2 | 8.2 | |
| | Political Sciences | 12.3 | 15.2 | 12.8 | 14.2 | |
| | Biology | 5.7 | 7.1 | 6.2 | 5.5 | |
| | Foreign Languages | 4.2 | 6.8 | 5.6 | 4.6 | |
| | Engineering | 11.4 | 12.3 | 12.5 | 11.5 | |
| | Environmental Sciences | 4.2 | 5.8 | 4.6 | 4.2 | |
| | Agricultural Sciences | 5.6 | 4.2 | 5 | 4.6 | |
| | Sociology/Psychology | 6.3 | 4.9 | 7.1 | 6.2 | |
| | Other | 10.9 | 7.3 | 9.2 | 11.2 | |
| ***Age*** | 18-24 | 44.8 | 22.2 | 45.2 | 37.2 | .003 |
| | 25-28 | 21.2 | 18.8 | 23.1 | 19.4 | |
| | 29-32 | 14 | 32.7 | 15.4 | 21 | |
| | 33-35 | 20 | 26.3 | 16.3 | 22.4 | |

Moreover, it appears that there is another group of consumers (the third cluster) who wish to purchase food that reflects a more sustainable and equitable food system, but it is difficult for them to articulate their preferences in the marketplace. As previously revealed (Vermeir and Verbeke, 2006), real or perceived availability acts as a barrier to sustainable consumption for these individuals.Taking into account socio-demographic variables included in the study significant differences acrosssegments havebeen found for age. In particular the cluster of responsible food consumers is characterized by a higher proportion of older individuals. In several similar studies, agesignificantly differed across segments, but no clear picture wasfound (Vanhonacker *et al.*, 2012; Yue *et al*., 2010; Jainand Kaur, 2006; Sabaand Messina, 2003; Gil *et al.*, 2000). In addition, in contrast with the findings of other studies (Vanhonacker *et al*., 2012) our research reveled significant differences between the segments considering geographical provenience (urbanorrural) and family average household income.The clustero fresponsible food consumers had, unlikethe other two, a higher concentration of respondents living in urban areas (althoughthe significance was. 007) andthat belonged to families with higher household incomes. Two other variables that were significantly different between the clusters were employment and housing, in particular in both thefirst and third clusters there is a greater concentration of working students who do not live with their parents. Whilethe type of university degreedid not have a significant difference between the clusters.

The empirical findings reveal that in order to promote sustainable food consumption among young adults, firms and policy makers should increase consumer involvement, inform consumers about product availability, promote more effectively the possible benefit sof sustainable food consumption and raise social pressure to foster more sustainable lifestyles.

Therefore sustainable food producers and stakeholders should concentrate their marketing efforts and resources, specifically, on two identified clusters: *responsible food consumers* and *potentially sustainable food consumers*. Moreover, governments can do a great deal to provide dependable information to facilitate the sustainable food market, counter market failure (asymmetric information and free-rider problems), increase social pressure and foster consumption patterns that contribute to sustainable development.

Although we recognize the need for further studies to assess the knowledge, perception and behaviour vis-à-vis sustainable food products among university students with the aid of more comprehensive assessment tools and more representative samples, the results from this research indicate that there are important marketing opportunities in this target group.

An important limitation is inherent in this type of study: stated preference methods have the drawback of strong consumer attitude-behaviour gap (Devinney *et al.*, 2010; Vermeir and Verbeke, 2008; Auger and Devinney, 2007; De Pelsmacker *et al.*, 2005; Carrigan *et al.*, 2004; Uusitalo and Oksanen, 2002, 2004; Roberts, 1996). Since individuals tend to respond to questionnaires as citizens and, in this role, they claim to pay more attention to sustainable development issues. Indeed, a substantial number of studies show that although consumers value the ethical aspect of food and are willing to pay for such products, their behaviour in the marketplace does not appear wholly consistent with their reported attitude. Moreover, our findings hold specifically within the characteristics of the sample. Any

generalisation beyond the sample may be speculative. Further research is needed in order to verify whether similar segments are found in other age cohorts and to determine the exact size of each segment in more representative samples.

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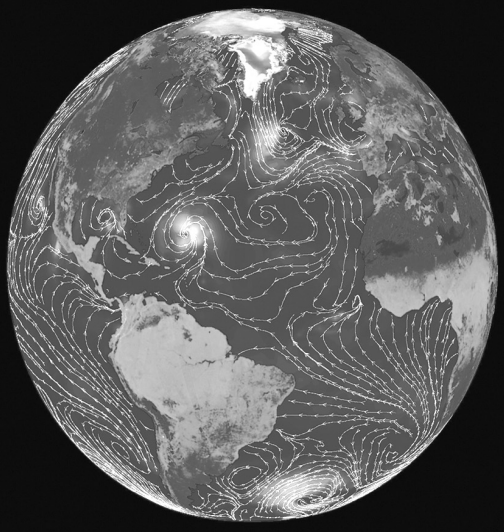

Martin Redfern

edizioni Dedalo

*Un appassionante viaggio al centro della Terra, per scoprire le origini, i segreti e il futuro del Pianeta blu.*