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Guest Editorial

Agro-food systems, at the center of relevant changes with important economic, social and environmental implications, have to face also the changes taking place in the consumer behavior. In fact, demand for agricultural and food products has substantially changed, becoming more and more complex, resulting from 'aware and conscientious' consumption patterns. More attention is paid to attributes adding value to food - food quality and safety, place of origin, respect for the environment and ethical and social standards, food waste reduction, etc. - as well as to the consequences on the social and the environmental effects of agro-food production activities.

In this context, as guest editors we aimed at achieving an issue of the *Italian Review of Agricultural Economics (REA)* that could bring to a specific focus on recent 'Consumption and nutrition dynamics', thus focusing our attention on papers relating to the behavior of consumers, their preferences and attitudes, their purchase intentions or willingness to pay, in respect to quality and value-adding attributes of agro-food products.

The five papers published on this issue aim at drawing attention to some of these aspects although representing just a narrow view of the consumption key themes covered by the recent research on agricultural and food economics. More specifically, this issue is based on a selection of four papers covering different aspects of the behavior of consumers among those originally presented during the 52nd SIDEA Annual Conference held in Rome and Viterbo on *The value of food: internationalization, competition and local development in agro-food systems*, and on an article dealing with consumer preferences, whose Authors come from the University of Göttingen.

In detail, the paper by Ivana Bassi, Federico Nassivera and Lucia Piani aims at investigating consumers' attitudes towards food produced by social farms, as well as the casual relationships between this construct and those related to social and health consciousness. For this purpose the Authors adopted a two-stage analysis through a structural equation model, calculated with the linear structural relationship (LISREL) method. The study has been carried out on a convenience sample in the province of Pordenone. As pointed out by the Authors, this is a limitation to overtake in a future research. Results confirm the reliability of the three constructs on the variables taken into account and support the hypotheses of the proposed model.

The article by Maria Rosa Fanelli and Antonia Di Florio explores the causes of food waste in the phase of domestic consumption and the actions put in place

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by consumers to reduce or prevent it. For this purpose the Authors have carried out a survey, through an online questionnaire, on a representative sample of 500 individuals, most of whom resident in Molise region. Questionnaire data had been analysed using simple correspondences, a cluster analysis and causal maps. The causes of food waste are obviously several and depend on socio-economic status and culture of consumers. Among these, expired food is the major root cause of domestic food waste. Also in this case the Authors acknowledge some limitations of the research, connected to the limited sample of consumers.

Another paper focuses on local products and investigates consumer motivations for purchasing cold cuts and, in particular, Capicollo Azze Anca Grecanico, a Slow Food Presidium in Calabria. In order to explore consumption behavior relative to local cold cuts, the Authors Agata Nicolosi, Pietro Pulina and Valentina Rosa Laganà have carried out a survey in some stores located in Calabria. A Multiple Correspondence Analysis was used to identify consumer's motivational profiles. A Logit regression was also utilized to evaluate the relationships between individual motivations and socio-demographic characteristics of consumers who purchase local cold cuts and Capicollo. The research highlights that consumers show a high propensity to the link between territory and product quality and confer a great importance to food security.

The fourth paper presented during the 52nd SIDEA Conference deals with ethical and sustainable consumption in the Italian coffee market and consumers' willingness-to-pay a premium price for ethical attributes. With the aim of investigating the attitudes towards organic and Fair Trade coffee among a sample of Italian consumers, the Authors Gianluigi Gallenti, Stefania Troiano, Marta Cosmina, and Francesco Marangon used a choice experiment method, with data obtained from a field experiment through face-to-face interviews at some points of sale. Data had been analysed using a RPL model. As main results, the paper shows high heterogeneity among respondents, most of whom seemed to be more interested in organic attributes than Fair Trade coffee.

Finally, the last contribute within this special issue regards 'Consumer Preferences for US Beef Products: a Meta-Analysis' by Xiaohua Yu, Zhifeng Gao and Satoru Shimokawa. The Authors aim at finding out the differences existing across countries in consumer preferences for US beef products with reference to current mandatory Country-of-Origin-Labelling (COOL) compliance. They conduct a meta-analysis to study consumer willingness-to-pay for US beef products collecting 57 observations from 20 primary studies. The paper analyses the heterogeneities within the observations from the point of view of facts and methodologies. As results the Authors find that consumers usually prefer their domestic beef products due to patriotism, and that Asian and European consumers are willing to pay importantly lower prices for US beef products than their domestic ones.

As guest editors, we think that this issue holds an internal coherence about some of the key themes in the recent research in agricultural and food consumption. We believe that these papers reflect the main issues discussed by agricultural economists nowadays. As guest editors, we believe that we have achieved our goals concerning the theme and quality of this number of the Review, thanks also to an accurate work carried out by the referees and the same Authors. Thanks to all scholars, to the Chief Editor and the Editorial Board, as well as to the Scientific Committee of the 52nd SIDEA Conference that appointed us.

Valeria Borsellino and Gaetana Petriccione

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Ivana Bassi,
Federico Nassivera,
Lucia Piani

Department of Agricultural, Food, Environmental and Animal Sciences, University of Udine, Italy

Keywords: social farms, ethical food, market opportunities, multifunctionality, rural development
JEL codes: L31, O13, O35, Q13

Market opportunities for social farms[1]

Although social farming is seen as a successful and innovative sector, social farms face various challenges, among which the need to find additional income required to stay in business. However, assuming that social farm food is considered as having ethical attributes, the research aims at investigating to what extent consumers are conscious of some ethical concerns (problems related to social hardship, social equity, food quality etc.), and whether this will create market opportunities for social farm food. The study area is the province of Pordenone (Italy). The results indicate that conscious consumers could represent an effective market channel also for social farm food, a notable opportunity for farms to improve their socioeconomic performance.

1. Introduction

The research aims at investigating whether consumers attitude towards social farm food is influenced by social and health concerns. The findings are hereafter presented in order to contribute to debates on market opportunities for these ethical products. The research is part of a project carried out by a healthcare authority in the Friuli Venezia Giulia region, i.e., Azienda per i Servizi Sanitari n. 6 - Friuli occidentale, aimed at exploring social farming in the local area, the province of Pordenone (Italy).

Social farming refers to those agricultural and related practises where people with physical or mental disabilities, former drug addicts, prisoners, elderly people with dementia, minors and immigrants, etc. are occupied or simply involved in order to promote their well-being (Dessein *et al.*, 2013; Hassink *et al.*, 2012; Hassink *et al.*, 2013). In the past, agricultural and rural societies developed very often many forms of solidarity, social assistance and inclusion. Nowadays, a new widespread positive perception of agricultural and rural re-

[1] This article is based on the paper presented at the 52nd SIDEA Annual Conference, Roma-Viterbo, 17th-19th September 2015.

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sources has renewed social farming in many European countries, as well as in other parts of the world (Hassink and van Dijk, 2006; Haubenhofer *et al.*, 2010), thus leading to an increasing interest in the beneficial effects of both nature and agricultural activities on the social, physical and mental well-being of people (Hine *et al.*, 2008a, 2008 b; Pascale, 2009).

Besides these beneficial effects, produced by welcoming people onto farms, social farming could generate additional positive effects: in fact, it represents a new chance to diversify rural activities, to enhance the role of renewed agriculture in society, and to strengthen the economic and social viability of farms and rural communities as a whole, thus generating a number of socio-economic benefits for all sectors involved (Pascale, 2010; Senni, 2007; Vik and Farstad, 2009). Also EU policies, through evolution, have recognised the increasing importance of social farming, and multifunctionality as a whole, and have gradually broadened their scope: from supporting agricultural practices to giving more attention and financial support to the improvement of the environment, the countryside and the quality of life in rural areas, as well as to the multifunctionality of rural economies. Multifunctionality, a core issue in the EU agricultural and rural development agenda, refers to the different functions that agriculture fulfils in society, functions that go well beyond the production of food and fibres. They include the stewardship of natural resources, landscapes and biodiversity, the creation of new job opportunities, the enhancement of the attractiveness of rural areas, etc. The choices for farms within the multifunctional paradigm are diverse, having in common the propensity of farmers to accept multiple responsibilities, to reconsider their predominant orientation towards primary production and profit maximization, to build new socio-economic relationships, and to adopt more socially responsible patterns of production and marketing (Dessein *et al.*, 2013; Durand and van Huylenbroeck, 2003; Knickel and Renting, 2000; van der Ploeg and Renting, 2000; Renting *et al.*, 2009).

Among the various multifunctional practices, social farming allows farm to broaden its scope of activities (van der Ploeg and Roep, 2003). In 2007-2013, EU rural development programmes (RDPs) offered several alternative options for funding social farming projects, even if not specifically addressed to this sector. They were mostly provided by Axis 3 measures, e.g., support for business creation and development, diversification into non-agricultural activities, basic services for rural population, and training for actors operating in the field covered by Axis 3, the latter being used for the establishment of social farming networks and support centres (O'Connor *et al.*, 2010). In the current programming period, most of these initiatives have been strengthened and now some national/regional RDPs explicitly refer to social farming; as in the case of two actions in the measure 6 of the Friuli Venezia Giulia RDP, which

focus on business creation for non-agricultural activities in rural areas and diversification in agritourism, educational and social activities.

The characteristics of the social farming sector, such as the balance between agriculture and services, the evolution of competences and practices, farmers' attitude and farm's performance, etc., are significantly affected by regulatory systems, which may significantly differ in the European countries. Regarding Italy, social co-operation is a particular form of social enterprise regulated by the Italian Law n. 381/91. It distinguishes between co-operatives of type A (or service co-operatives) that can provide care and educational services (e.g., home care, management of day centres, residential shelters, or kindergartens), and co-operatives of type B (or work integration co-operatives) that can operate in all sectors of business, agriculture included, with the purpose of integrating disadvantaged people into the workforce. Social co-operatives operating in agriculture and which focus on labour integration or on both care/education and labour integration are considered social farms. They are not-for-profit enterprises and community-based initiatives strongly integrated into the social environment, which benefit from specific regulation (Di Iacovo and O'Connor, 2009; Fazzi, 2011). Over the latest years, increasing numbers of private farms are entering the sector. Their social farming activity can be voluntary and/or closely linked to the idea of social responsibility and to ethical consumers. Other new services are provided by private farms, e.g., kindergartens, but agriculture still remains their core activity (Di Iacovo and O'Connor, 2009). Recently, the Italian Law n. 141/2015 has specifically regulated social farming, not only by defining social farming activities, but also by designating farmers (i.e., social farming initiatives on private, 'commercial', farms), as individuals or groups, alongside social co-operatives, as actors in this sector.

The successfulness and innovativeness of social farming do not hide the various challenges faced by social farms, primarily the need to find adequate funding (Hassink *et al.*, 2013). For instance, in Italy social co-operatives have a central role in the production of healthcare services. They are outsourced and financed by local healthcare boards, with the risk of dependence on public procurement (Fazzi, 2011). Nevertheless, besides the public market segment, new opportunities for social farms could be generated by the private demand for social services, e.g., clients or client representatives who contact directly a care farm, bypassing therefore care institutions (Hassink *et al.*, 2013). Furthermore, alongside the provision of social services, other opportunities for social farms to improve their social and economic performance could be generated by the possibility of marketing the produce. In this regard, the search for alternatives to the homologation of agricultural and food products has defined new groups of consumers and has led to the development of new food markets. These markets mainly focus on ethic, local, typical and very often organ-

ic products, that embody values such as environmental sustainability, solidarity with small farmers, fair trade, social justice, well-being and personal health, and that are marketed via direct or through short value chains (Rossi *et al.*, 2008; Schmit and Gómez, 2011). This tendency, or rather the increasing importance of ethical concerns among food consumers, may represent an opportunity also for social farms, both for not-for-profit and private enterprises. In fact, the search for ethical attributes indicates that the social functions of the farms and the ethical quality of their products could be explicitly remunerated by the market, at least to some extent (Carbone *et al.*, 2009).

Finally, even if there is a high variability in income flows deriving from the various multifunctional practices, all of them, social farming included, may generate market opportunities that allow farmers to stay in business on their own farms (Henke and Salvioni, 2010). This could be particularly crucial for small farmers, providing the additional income required to enable them to continue, thus reducing the risk of dependence on public procurement, at the same time reducing land abandonment, so preserving local landscape and cultural traditions (O'Connor *et al.*, 2010).

2. Methodology

The study area, the province of Pordenone, is located in the Friuli Venezia Giulia region, in North-East Italy. In line with the healthcare authority project, data was collected on a convenience sample, i.e., people employed in that same authority as potential consumers/buyers of local social farm food. The sampling is a limitation of this research. Nevertheless, the research not only matches the authority requirements, but it could be the base for future research on this topic.

The research was structured in the following tasks: research modelling, questionnaire planning, data collection and data analysis.

In order to investigate the attitudes of consumers towards social farm food (SFF), the relationships between three latent constructs, i.e., social consciousness (SC), health consciousness (HC) and social farm food attitude (SFFA), were analysed.

According to Giddings (2005), social consciousness refers to people's 'personal awareness of social injustice in their lives and in the lives of others'. Berman (1997) proposed a conceptualisation of the level of commitment, defining social consciousness as 'the development of one's relationship with the political and social world and one's personal investment in the well-being of others and of the planet as a central concern'. Ammentorp (2007) defined the development of social consciousness as a 'process involving increasing awareness of social historical context, the ability to think abstractly about time and place,

and beyond the immediate everyday conditions to understand individual experience as embedded in a broader system of social relations'.

Health consciousness relates to health actions in consumers who are aware and concerned about their state of well-being and are motivated to improve and/or maintain their health and quality of life, as well as preventing ill health, by engaging in healthy behaviour (Chen, 2009; Hartmann *et al.*, 2013; Nassivera and Sillani, 2015; Newsom *et al.*, 2005). Health consciousness has been found to predict attitude to and intention of purchasing organic food (Magnusson *et al.*, 2001, 2003).

Given this research framework, as well as that of Carbone *et al.* (2005, 2009) for social consciousness and Steptoe *et al.* (1995) and Pohjanheimo and Sandell (2009) for health consciousness, the measurement scales (observed variables) for these two latent constructs were proposed. Moreover these latent constructs were considered as antecedents of social farm food attitude. The measurement scales for the latter were proposed in accordance with Ajzen (1991), Ajzen and Fishbein (1980), Carbone *et al.* (2005, 2009), Choo *et al.* (2004), Nassivera and Sillani (2015), Shaw *et al.* (2000), and Shaw and Shiu (2002).

All the measurement scales, listed in Table 1, were identified taking the healthcare authority project into account too.

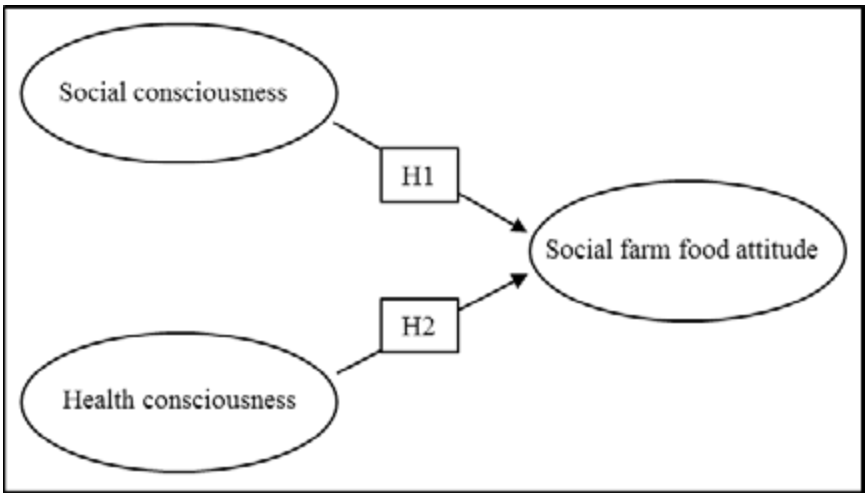
The research framework also enabled us to propose the following hypotheses: social consciousness has a positive effect on consumers' attitude towards social farm food (H1) and health consciousness has a positive effect on consumers' attitude towards social farm food (H2) (Fig. 1).

Overall this model, i.e., the constructs, their measurement scales and hypotheses, allow us to indirectly investigate whether the ethical concerns of consumers, in particular their social and health awareness, could affect the

Tab. 1. Constructs and measurement scales

Constructs	Items
Social consciousness	• I am sensitive to problems related to the economic crisis • I am sensitive to problems related to social hardship • I am interested in social equity
Health consciousness	• I think about what I eat • I look for and eat quality food products
Social farm food attitude	• SFF is a quality product • SFF is a quality product because it is environmentally sustainable • SFF is a quality product because it is seasonal • SFF is a better quality product when produced locally • SFF is good value for money

Fig. 1. Proposed model



attitudes of consumers towards social farm food, being considered products with ethical attributes.

A questionnaire was planned to collect data on each measurement scale, that was explored using a 7-point Likert scale, i.e., the respondents were asked to indicate the extent of their agreement on a scale of 1 (strongly disagree) to 7 (strongly agree). In the preliminary stage of the research, respondents' socio-demographic characteristics and a general awareness of social farming were also investigated.

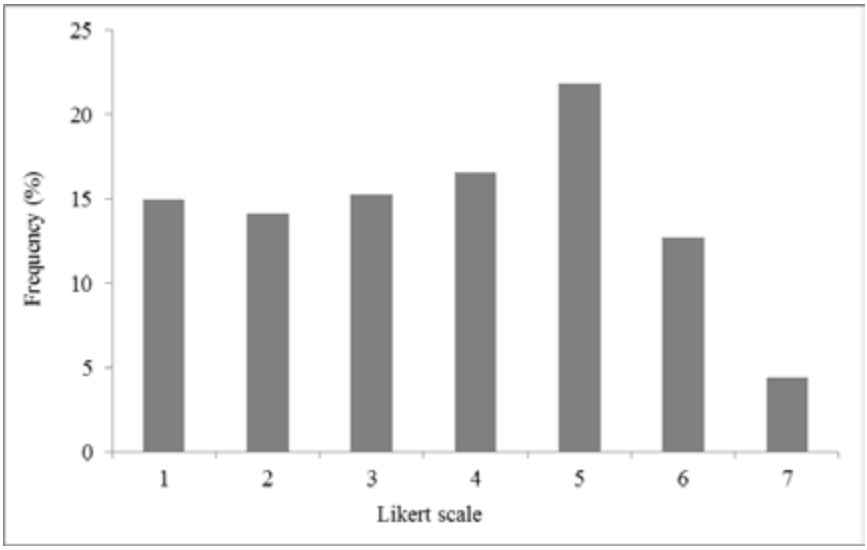
The respondents were contacted by email using a graphical interface in PHP and a relational database (RDBMS: MySQL). Data was collected between January and April 2014 using the CASI (computer assisted self-interviewing) method.

The hypotheses were tested via a structural equation model (SEM) that was calculated with the linear structural relationship (LISREL) method, via LISREL 9.1 software (Jöreskog and Sörbom, 2012).

2.1 Description of the sample

The convenience sample, after database filtering, is made up of 361 respondents (valid cases). The majority of the respondents are females (67%), aged over 50 years (50%), and with a University degree (56%); their household includes more than 2 people (64%) and the family income varies between

Fig. 2. Respondents' social farming awareness



20,000 and 30,000 euros (34%); they live in small-medium communities, with less than 15,000 inhabitants (62%).

The respondents were also asked to indicate their level of social farming awareness, using a 7-point Likert scale. As shown in Figure 2, the majority of the respondents (61%) stated that they do not know or know little (levels 1-4) about social farming. Nevertheless, 22% of the sample indicated a reasonably high level of awareness (equal to 5), and another 4% declared they are indeed aware (level 7) of firms involved in social farming, their purposes, activities, products, etc.

3. Results

A two-stage analysis was adopted, estimating, firstly, the measurement model and, secondly, the structural model.

The measurement model (first stage) enucleates the links between the observed variables (measurement scales) and the corresponding latent variables (constructs); this corresponds to the classic confirmatory factor analysis (CFA). The measurement model therefore enables us to comment on the validity and reliability of the measurement scales used for each construct.

Overall, the results of the first stage of the analysis indicate that the three latent constructs are significantly described by the proposed measurement

scales (Tab. 2). This is confirmed by the fact that all the average variance extracted (AVE) scores are above the recommended threshold of 0.45, according to Dillon and Goldstein (1984).

According to these results, the sensitiveness to problems related to the current economic and financial crisis and to social hardship, that we are still experiencing, as well as the care taken to balanced and non-discriminatory relationships, can describe at least to some extent an individual's perception of the social environment in which social farming is rooted. Health consciousness reflects an individual's readiness to do something for his/her health (Chen, 2009), e.g., to be aware of the link between health and nutrition, to spend time on his/her diet, as has been confirmed by this research. Finally, social farm food is perceived as a quality product, primarily because of its ecological sustainability and seasonality.

The structural model (second stage) identifies the causal relationships between the three latent constructs. It is estimated via several fit measures, which provide different output concerning the goodness-of-fit of the structural model: the goodness-of-fit index (GFI); the adjusted goodness-of-fit index (AGFI), which regulates the GFI for the degrees of freedom; the comparative

Tab. 2. Latent constructs and measurement scales

Constructs and observed variables	Label	Factor loading	Standard error	AVE
Social Consciousness	SC			0.53
I am sensitive to problems related to the economic crisis	e-cris	0.70	0.51	
I am sensitive to problems related to social hardship	hardship	0.97	0.05	
I am interested in social equity	soc eq	0.67	0.55	
Health Consciousness	HC			0.47
I think about what I eat	alim att	0.80	0.37	
I look for and eat quality food products	res qual	0.79	0.42	
Social farm food Attitude	SFFA			0.59
SFF is a quality product	+ qual	0.78	0.40	
SFF is a quality product because it is environmentally sustainable	Env sost	0.79	0.38	
SFF is a quality product because it is seasonal	Seasonal	0.80	0.36	
SFF is a better quality product when produced locally	Local	0.61	0.62	
SFF is good value for money	+ val	0.46	0.79	

fit index (CFI); the root mean square error of approximation (RMSEA), which in recent years has been regarded as one of the most informative fit indices (Diamantopoulos and Siguaw, 2000) due to its sensitivity to the number of estimated parameters in the model (Browne and Cudeck, 1993). The thresholds for these indices are discussed and disputed in many studies (Scott, 1994; Bagozzi and Yi, 1988; Browne and Cudeck, 1993; Hayduk, 1987). Table 3 lists the fit statistics for the structural model of this research. In general, higher values of GFI, AGFI and CFI indicate better fit.

The results show that their values meet the more restrictive 0.90 threshold level (Bollen and Liang, 1988). RMSEA is very close to the 0.08 level set by Browne and Cudeck (1993) as the maximum allowable for an acceptable model. The ratio c^2/df suggests a good fit (Hayduk, 1987). Overall, our indices suggest a good fit model coherent with the quoted literature.

Tab. 3. Main indices of model fitting

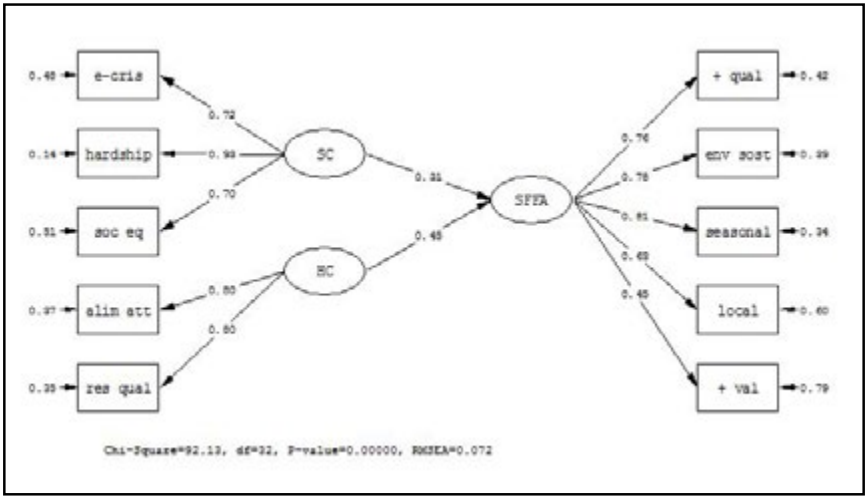
Indices	Value
GFI	0.95
AGFI	0.92
CFI	0.97
RMSEA (Test of Close Fit)	0.07
χ^2, with 32 degrees of freedom (df)	92.13
χ^2/df	2.87

Figure 3 shows the LISREL-generated model of the causal relationships between the three latent constructs and Table 4 describes the values of these relationships.

The existence of direct causal effects between the latent variables SC, HC and SFFA is confirmed by the fit indices proposed by SEM analysis, as mentioned above. These relations support the two hypotheses.

Overall, the proposed model depicts a positive reactivity of potential consumers. In fact, the results suggest that market opportunities for food produced by social farms may be reinforced, or even created, by bolstering consumers' social and health consciousness. The knowledge of the characteristics of these products and how their attributes match the ethical and ecological concerns of consumers should be deepened too.

Fig. 3. Path analysis of LISREL model



Tab. 4. Total effects between the constructs

Hypotheses	Estimate (Standardised)	Standard error	t-value
(H1) SC → SFFA	0.31	0.05	5.05
(H2) HC → SFFA	0.45	0.04	6.44

4. Conclusions

The paper presents the results of a field research aimed at investigating to what extent consumers are sensitive to social and health concerns, and if this can be expected to affect consumer attitude towards food produced by social farms.

Firstly, the results confirm the reliability of the latent constructs, i.e., social consciousness, health consciousness and social farm food attitude, on the proposed measurement scales. Secondly, the analysis of the causal relationships between these three constructs supports the hypotheses of the proposed model.

These results allow us to make a number of considerations. Firstly, the respondents' social consciousness seems to be clearly measured by all the proposed items, including their sensitivity to problems related to the current

economic and financial crisis. Thus, alongside the positive impact of this construct on consumer attitude towards social farm food, the findings suggest the further exploration of the role of social farming in innovative economic scenarios. Moreover, social farm food is perceived as a product with specific quality attributes (environmentally friendly, seasonal, etc.), that match the ethical attributes sought by alternative groups of consumers.

Overall the results indicate some implications for policy-makers and practitioners. In order to reinforce or even create new market opportunities for SFF, alongside the support of structural investment, for instance through EU policies, it is important to bolster consumers' social and health awareness, their knowledge of the characteristics of food produced by social farms and how they match consumers' ethical and ecological concerns. This could be done by supporting and implementing training activities aimed at further raising awareness of the benefits of social farming, not only for disadvantaged people, but for the wider society, economy and environment too. Other initiatives could be founded, aimed at strengthening direct relationships between farmers and communities, in order to support the creation of new market channels for SFF, such as GAS (in Italian, *Gruppo di acquisto solidale*), and hence to contribute to local development.

The research has some limitations, concerning the characteristics of the sample and the identification of the constructs and their measurement scales. Regarding the former, data was collected on a convenience sample, i.e., people employed in the aforementioned healthcare authority, as potential consumers/buyers of SFF, and therefore the results should not be generalised to broader populations. Regarding the latter, the constructs and items proposed and analysed here depended on the healthcare authority project requirements, and on the absence of literature on social/health consciousness and consumer attitude specifically related to social farm food. Nevertheless, the proposed model and the results of the research could be the base for future research on this topic. Hence, future research could investigate the potential of other consumer groups of social farm food, which differ from our sample in at least socio-demographic characteristics, size and geographical area. In order to improve the effectiveness in describing the constructs, other measurement scales could be explored, e.g., social and health items related to SFF besides those related to consumers. Moreover, how the attitude towards SFF may affect consumers' behavioural intention towards such products could be analysed, and if/how it could improve social farm performance.

Finally, we argue that if consumers are aware that the quality of their life is also related, in a wide sense, to the quality of the foods they eat, and at the same time are sensitive to the challenges of our society, their behaviour could be influenced, making them potential buyers of social farm food. This would

open up new market opportunities for farms, providing both not-for-profit and private enterprises with the additional income required to stay in business, thereby reducing the risk of dependence on public funding.

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Rosa Maria Fanelli,
Antonia Di Florio

Department of Economics, Management, Society and Institutions, University of Molise, Campobasso (Italy)

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Domestic food waste, gap in times of crisis[1]

The purpose of this paper is to identify the main causes of food waste in the phase of domestic consumption, possible solutions and areas of interest, as well as to highlight the measures that consumers have already taken or to be put in place to counter models of unsustainable consumption. The survey involved a representative sample of 500 individuals. Data analysis was conducted in three steps: an analysis of simple correspondences, a cluster analysis and causal maps. Results show that only 26% of the participants recognized the need to give more attention to the problem of food waste. Particularly sensitive segments were younger, the better educated. Another interesting finding is that in times of economic crisis, afflicting Italy now for 8 years, attitudes, buying behavior and consumption of households have become more virtuous. Overall, the analysis confirmed the behavior of the participants, especially from Molise, still little careful. However, many respondents would be willing to accept advice on how to keep food and how to use the leftovers in the kitchen.

1. Introduction

This paper concerns the dynamics of food waste, a research field still globally little explored, in which different theoretical approaches and methodologies for quantitative analysis are used. However, authoritative data on food waste quantities and composition are fragmentary (Parfitt *et al.*, 2010; Langley *et al.*, 2010; Monier *et al.*, 2010) and systematic and comparable data are missing.

Most of both national and international research focuses on the formation of waste in the stages of production and distribution (Buzby and Hyman, 2012).

Some studies estimated that, globally, one third of the edible parts of food is lost or wasted each year (FAO, 2011; Barilla, 2012; FAO, 2013).

Poor marketing practices and consumer behaviour are recognised as the main source of waste coming from high-income countries. Consumers have been identified as the greatest contributors to food waste, more than food manufacturing, distribution, grocery retail and the hospitality sectors (Griffin *et al.*, 2009; Quested *et al.*, 2011).

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In some specific stages of the chain, such as agriculture (Griffen *et al.*, 2009; WRAP, 2007) and production (Cabinet Office, 2008; C-Tech Innovation, 2004; Henningsson *et al.*, 2004; WRAP, 2007), as it is known, food waste seems inevitable. Most of it derives from an erroneous inventory management, from production surpluses, from damage or deformation. In these cases, corrective actions could be put in place.

Few recent studies (Schneider and Obersteiner, 2007; WRAP, 2008; Parfitt *et al.*, 2010) and pilot projects (Schneider and Lebersorger, 2009; Fanelli and Di Florio, 2013; Fanelli, 2015) have focused on food waste in the phase of domestic consumption, as well as campaigns such as the *Love Food Hate Waste* campaign, launched in Great Britain in November 2007 (WRAP, 2008) and the campaign *Less food wasted means more money in your wallet* in the Helsinki Metropolitan area, from 2005 to 2007 (YTV, 2008).

The most often quoted estimate is that 'as much as half of all food grown is lost or wasted before and after it reaches the consumer' (Lundqvist *et al.*, 2008).

A study from Waste and Resource Action Programme [WRAP] (2011a) estimated that households in the UK generate 7.2 million tonnes of food waste a year, most of which is thought to be avoidable, despite research suggesting that consumers have a distaste of wasted utility (Bolton and Alba, 2012). Furthermore, a previous study from the same source showed that households in the UK waste 6.7 million tonnes of food every year, around one third of the 21.7 million tonnes, and that consumers throw away 31% of the food that they buy (WRAP, 2008). Consumers waste food because it is left unused or too much cooked or prepared (WRAP, 2008). Precious land and resources that could otherwise be used to feed the poor are instead used up by developed world who is buying more food than what is going to be eaten. Moreover, the vast quantities of food that end up in landfills worldwide contribute significantly to the environmental impacts of waste, including greenhouse gas emissions.

Also the packaging affects waste, in two different ways. On the one hand, it has a positive impact on waste because it protects the products from damage and can help to extend the shelf life of some products. On the other hand, at some point, packaging will go to be wasted in the phase of domestic food, therefore excessive packaging is to be avoided.

But often the too large packages are one important cause for food waste: about 20-25% of the households' food waste could be related to packaging. Three aspects dominate the packaging related waste: packages that the consumer noted as being too big, packages that were difficult to empty, and wastage because of expired 'best before date' (Williams *et al.*, 2012).

A large part of the international literature mainly addresses the quantification of the value of wasted food (Buzby and Hyman, 2012; Parfitt *et al.*, 2010; Griffin *et al.*, 2009). In these works, in fact, the negative implications of this

phenomenon have been brought to light (Sonnino and McWilliam, 2011) without giving any possible strategies for its reduction.

Therefore, this paper aims at filling this gap by providing the results of a survey, carried out to quantify, qualify and identify the main causes of food waste as well as actions that consumers put in place to reduce or, even better, to prevent it.

The root causes of waste seem to vary according to the attitudes, eating habits and culture, and between developing and developed countries. In wealthy developed nations like Italy, food is wasted mostly at the consumption stage. There are several overlapping reasons for this. In highly developed countries, advanced technology in agriculture, as well as food processing and distribution, means that food is plentiful and cheap. Italy spends less of its income on food than most other countries in the world (20% compared to 43% in Egypt). Therefore, consumers do not appreciate the true value of food and buy more than they need without much thought. Additionally, they throw away old food that is still safe to eat, relying on 'best-by' labels which 'are generally not regulated and do not indicate food safety' according to the Natural Resources Defense Council (NRDC). Though there are other factors at work, low food prices are clearly connected to high food wastage. In an industrialized food system with low food prices, consumers often insist on extremely fresh, aesthetically perfect and abundant foods. Stores over-stock their shelves accordingly and then end up throwing out unbought foods.

2. Method

In this paper, we have used an online questionnaire to collect data. The information is filled out by a self-selected sample of 500 individuals who participated on a voluntary basis.

The questionnaire was spread from April 2014 to June 2014 through *Google Drive,* as well as through the social network *Facebook*.

The online questionnaire was designed to collect information related to the characteristics of the individual respondents, household size and composition, habits and attitudes of expenditure and food, directions and behaviors to reduce or prevent food waste in the phase of domestic consumption.

Data from the questionnaires and supplementary documentation have undergone an analysis of simple correspondences, a cluster analysis and causal maps. The first analysis allowed to identify why, how and how much is wasted; the second one divided respondents into three groups, each homogeneous and of different sizes; finally, causal maps were used to identify the main root causes of food waste in the phase of domestic consumption and the actions that the consumers take to reduce or prevent food waste.

The multivariate analysis was performed using the *R environment software* for the development of statistical analysis of data. It is considered a set of 8 variables. Data processing was carried out performing a cluster analysis. Euclidian distances were identified between point units and then it was decided to aggregate the respondents both with the hierarchical methods and using the single bond. From the resulting dendrogram, we identified and analysed individual clusters of respondents showing greater homogeneity (Fanelli and Pilati, 2003; Cerioli and Zani, 2007; Fanelli 2007; Fanelli and Felice, 2014).

The causal map, a particular type of cognitive map used to explore the cognitive structures of individuals (Huff, 1990; Fiol and Huff, 1992; Jenkins and Johnson, 1997; Scavarda *et al.*, 2006), has been used to perform the analysis of root causes. Causal relationships between elements of a system are represented by directed graphs where nodes signify ideas, concepts or problems, and unidirectional arcs connect the nodes indicating beliefs about the causal relationship between them (Scavarda *et al.*, 2006).

Causal map is a useful tool to improve quality, identify root causes, design information systems and develop strategy (Scavarda *et al.*, 2006).

The construction of a Current Reality Tree (CRT) starts with the identification of surface problems or undesirable effects (Walker and Cox, 2006). The CRT uses three types of symbols: nodes denote undesirable effects, arcs denote causal relationships and ovals represent the logical function 'AND', denoting that two or more causes are required to produce an effect. In the CRT, the undesirable effects are connected following an if–then logic and the logical relationships are tested following a systematic approach described in detail by Walker and Cox (2006). The result of this process is a graph, or tree, where the ultimate effects or problems are found at the top and, at the bottom, the root causes can be identified.

The analysis considers only products with shelf life, such as meat and fish, and fragile products, such as vegetables, bread, sweets and biscuits.As stated by Kantor *et al.* (1997), these products are the most thrown away.

3. Results

The questionnaire was completed in its entirety by 84% of respondents. The remaining 16% of survey participants did not answer some important questions such as habits and attitudes of expenditure and food, the income class of belonging and other important questions for the analysis.

The group of respondents represents the interests of young people very well. 66% of the sample is made up of women and the remaining 34% of men; the age group most represented by the survey is that one aged between 18 and

30 (70%), while it is poorly represented that one below 18 and above 61 years (less than 2%).

50% of those surveyed have a diploma, 32% a university degree, 13% have a middle school diploma and 5% have a master.

21% of respondents claimed to earn a monthly income of between € 1,201-1,600, 16% between € 801-1,200, 14% between € 2,801 and beyond.

The results of this research show that 87% of respondents shop in the supermarket, while 34% say that they have a vegetable garden or a garden. 33% go shopping once a week and 31% twice a week.

Among respondents, 34% does not have any favourite times to go shopping, whereas many others prefer to do their shopping in the early morning or mid-morning. 18% goes shopping early in the morning to buy the freshest products and during a less chaotic time of day, whereas 20% prefers to do shopping in mid-morning mainly for convenience, not giving importance to the freshness of the product.

The average household expenditure per week is between € 51-100; 45% of respondents said that spending affects their income at 21-50%.

60% of respondents consume first and second courses at lunch and dinner. The portions, for both lunch and dinner, are all average portions, almost never exceeding 200 g for each course.

Based on the answers given by the respondents, comparing food waste among the three periods, namely: pre-crisis period (before 2007), the crisis period (2007-2009) and post-crisis period (from 2009 onwards), the amount of food thrown away has changed slightly, maintained between 47-49%. In the period before the crisis, 16% said they threw away more food, a percentage that drops to 3% in the period of crisis and to 2% in the post-crisis period; while in the pre-crisis period, 4% claimed to throw away less food; that percentage rose to 17% during the crisis and 20% in the post-crisis.

Firstly, we considered the percentage of respondents by income class in order to quantify the value of domestic food waste for each class.

This is followed by the correlation between income and wasted products.

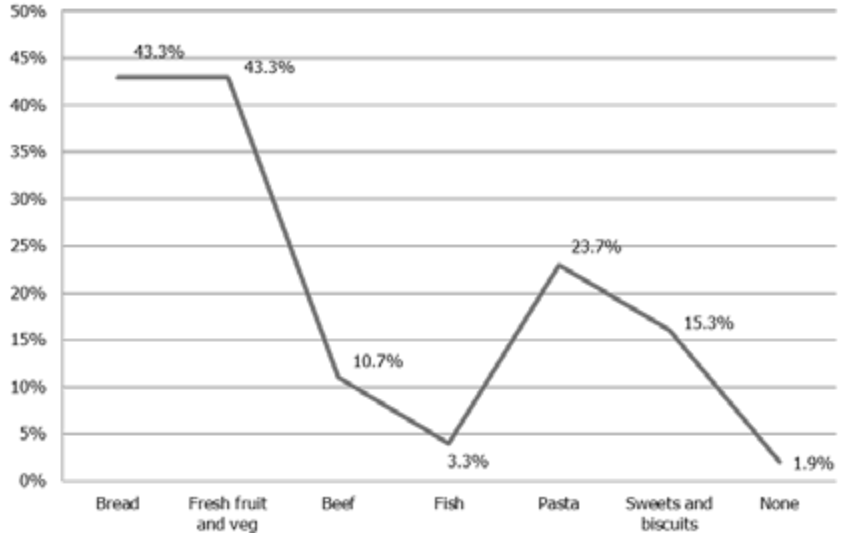
In the third stage, it is quantified, in terms of value, a weekly food waste.

Finally, an analysis of the main actions that the consumers carry out to reduce the domesticfood waste is made.

Figure 1 shows respondents divided into eight income groups and per each class, by dividing the percentage of respondents by income. The most represented share is the one ranging between € 1,201-1,600 (21%), followed by € 801-1,200 (16%). Poorly represented is the share ranging between € 2,401-2,800 (5%). While the share of € 2,801 is well-represented by 14% of the respondent class.

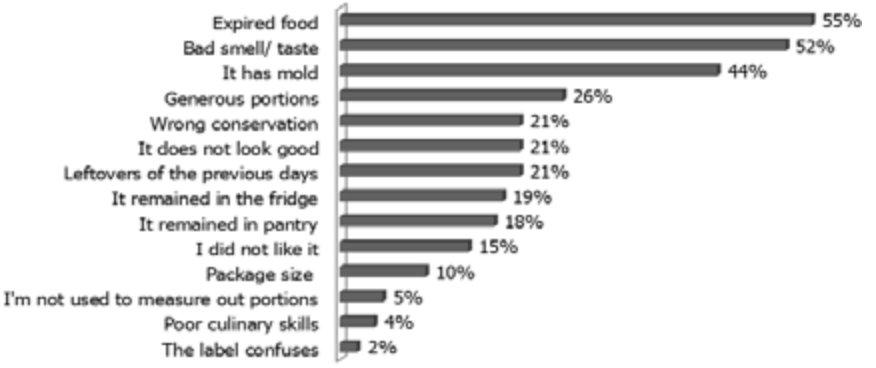
The correlation between income and wasted products is shown in Figure 2.

Fig. 1. Percentage of respondents by products more wasted



Source: Our processing of data collected with questionnaire

Fig. 2. Main root causes of domestic food waste



Source: Our processing of data collected with questionnaire

Results confirm that the income gap is an important determinant in terms of domestic food waste.

In fact, the same graph shows that the most wasted foods are meat, fruit and vegetables, making no distinction between income groups. Nonetheless,

the correlation between wastage and income groups reveals that those who throw away more food are the individuals of the wealthier classes.

With regard to the good intentions and actions, that respondents said they had undertaken and/or want to take in the future, the following emerged.

85% of those surveyed claimed to be aware of the environmental and economic value of food waste.

84% of respondents differentiate their waste and 65% of them said they had reduced the amount of compostable thrown away.

The actions that could reduce and/or minimize food waste according to respondents are:

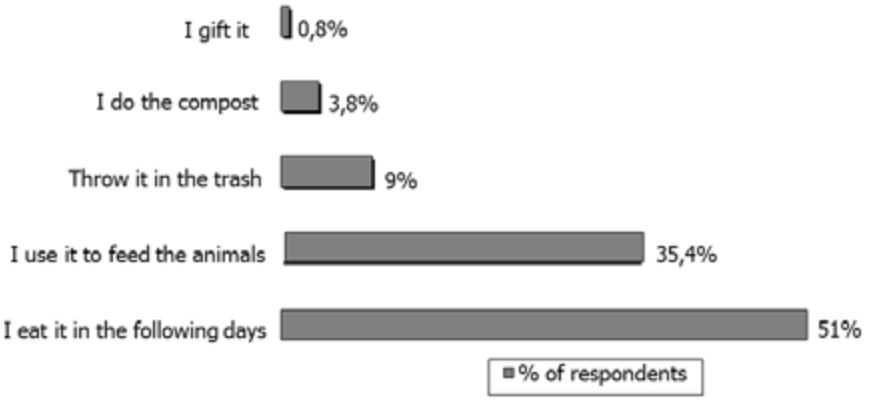
- Improving knowledge in the techniques of food preservation;
- Cooking proper portions;
- Spreading and buying single portions for students and/or for those who live alone;
- Checking the expiration dates;
- Organizing one's weekly balanced diet and purchasing, also using shopping lists.

The actions that respondents are implementing have nevertheless been grouped into the following categories:

1) Waste separation;
2) Actions to minimize or eliminate waste;
3) Get more information on the impact that waste has on the environment.

Another important element in the analysis of domestic food waste is the quantification, in value, of domestic food waste (Fig. 3).

Fig. 3. The destination of domestic food 'waste' based on percentage of respondents



Source: Our processing of data collected with questionnaire

Respondents were asked to quantify their food waste on average per week, thus trying to monetize their waste, indicating one of the four identified groups. It may be noted that the majority (60.5%) indicates less than € 5, 17% is not able to quantify their waste per week, and only 5% of waste is thought to exceed € 21 per week.

Using causal maps (Fig. 4), it is possible to map the logic between causes and effects by creating a tree, where at the top we have the symptoms and at the bottom the root causes.

By analysing these maps, we can classify the root causes of waste into two groups:

- Natural constraints: factors that influence domestic food waste. These constraints are associated to the nature of the products (short or long shelf life) and to the package size.
- Consumer root causes: the characteristics of the consumer (income, age, profession) and poor culinary skills, such as cooking too much, not eating food in a timely manner, a lack of confidence in using to leftovers, incorrect conservation.

The first group can be influenced, in some ways, by marketing decisions and the commercial interest of the industry.

The second group is instead mainly related to consumer behavior, to the insufficient purchasing planning and to the best-before dates in combination with the careless attitude of those consumers who can afford to waste food.

Some main root causes have been identified (Fig. 4) by analysing the casual maps.

To the question 'How much food do you throw away?' 4% of respondents answered a lot, 70% little and 26% none.

These answers enabled us to identify three 'homogeneous' groups of consumers, the so called:

Cluster 1: The wasteful

This group includes only women, mostly female students, aged between 18-30 years, who claimed to have a monthly income between € 1,201-1,600, a monthly budget between € 151-200, spending between € 51-100 a week and wasting between € 6-20 weekly.

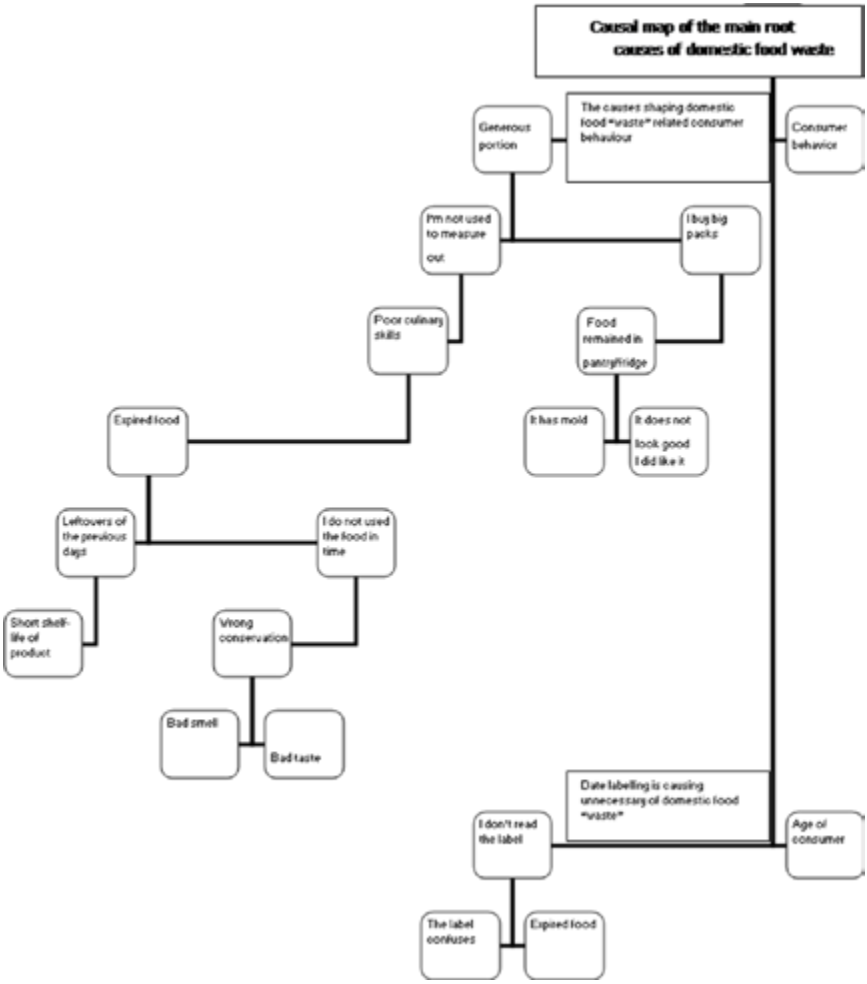
The cluster is not in the habit of weighing food and throws it away if expired.

Cluster 2: The careful

It is a mixed group consisting in many women and few men. Formed mostly by students, aged between 18-30, who claimed to have a monthly income between € 1,201-1,600, a monthly budget between € 101-150, spending between € 51-100 per week and wasting between € 0-5 weekly.

The cluster is not in the habit of weighing food; however, if it has expired, before throwing it away, it considers how long time has passed since the food has expired.

Fig. 4. Casual map of the main root causes of domestic food waste

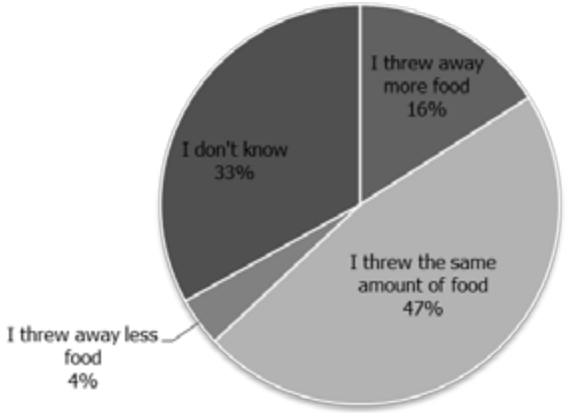


Source: Our processing of data collected with questionnaire

Cluster 3: The virtuous

The third and last group encompasses more women than men. Besides students, there are also the unemployed, aged between 18-30 years. They claimed to have a monthly income of between € 801-1,200, a monthly budget between € 101-150, spending between € 51-100 weekly and wasting between € 0-5 per week.

Fig. 5. Pre-Crisis (before 2007)



Source: Our processing of data collected with questionnaire

These respondents are not in the habit of weighing food, but even this cluster considers how long the food has expired before disposing of it. However, compared to the two previous clusters, a good percentage reported eating food even if expired.

Successively, it has been carried out an analysis of food waste during three periods: before, during and after the economic crisis (Fig. 5).

This analysis showed that the percentage of individuals who claimed to ignore how much food they throw away has remained more or less the same (33% in the period before the crisis, 32% and 29% respectively during the crisis and in the post-crisis period). The percentage of participants who said they throw away the same amount of food has remained almost unchanged (47% in the period before the crisis, 48% in the period during the crisis, and 49% in the post-crisis period).

There was a reduction, even in terms of percentages, which corresponds to the answer 'I threw away more food' (16% in the pre-crisis period, 3% in the period during the crisis, and 2% in the post-crisis period).

Conversely, the percentage of respondents who claimed to throw away less food has increased by 4% in the period before the crisis, by 17% in the period during the crisis, up to 20% in the post-crisis period.

4. Conclusions

The paper aims at exploring the problem of domestic food waste, with a focus on the main root causes and the actions that the consumers take to reduce waste.

The results revealed that the amount of food wasted has not been affected neither by the economic crisis nor by the increased attention to the environmental issues. In fact, the amount of food thrown away has changed slightly, maintained between 47-49%.

The issue of waste has been ignored for a long time and only recently has gained interest. Nevertheless, within the food system, waste affects all phases in the chain: production, processing, distribution and final consumption, in both singular and specific causes at every step.

Recently, several associations taking care of people in difficult economic conditions recover, when possible, the food discarded, thanks to the *Last Minute Market*, a spin-off of the University of Bologna, which has been running since 2003 for recovering food.

The causes of food waste are several: they depend on socio-economic status and culture, such as the bad habit of preparing more food than what can be eaten, leading to leftovers.

The study has clearly showed that each link in the food supply chain generates products in excess that cannot be sold. In addition to the negative externalities (for example pollution) for which all of society must, sooner or later, deal with, in many cases there could be not only the lacking respect of the original destination of the product, i.e. human food, but also a higher or lower cost (transportation, processing, storage and disposal), depending on the particular product, which the company must in any case support.

The rapid processes of biological deterioration of food make arduous to quantify waste. Even if data regarding waste were available, it would not be, and could not be, in the public domain.

The survey conducted on a representative sample of 500 individuals, 68.4% of whom reside in Molise, has highlighted their attitudes and behaviour in relation to food waste at home. Only 26% of respondents - among whom especially younger, better educated and residents in Molise - recognized the need to pay more attention to this problem.

However, many respondents would be willing to accept advice on how to keep food and how to use leftovers in the kitchen. At the same time, they reported the recurring difficulty to interpret the information on the labels of the products purchased. Perhaps, this could be the main reason for which the food that is not considered good is thrown away.

Another interesting finding is that in times of economic crisis, which has afflicted Italy in the last 8 years, attitudes, buying behaviours and household consumption have become more virtuous.

The authors acknowledge that the research has some limitations in relation to the fact that the analysis was restricted to some regions and to a limited group of consumers. Nevertheless, on the basis of a qualitative approach, the

identification of root causes of domestic food waste has been possible only using relatively small samples. Future studies will concern other geographical regions and expand the sample in order to generalize the results.

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Agata Nicolosi[1],
Pietro Pulina[2],
Valentina Rosa Laganà[1]

[1]Mediterranean University of Reggio Calabria, Department of Agriculture, Reggio Calabria, Italy
[2]University of Sassari, Department of Agricultural Economics and Woody Plants Ecosystems, Sassari, Italy

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A methodology for mapping consumer preferences for local products: The case of the Capicollo Azze Anca Grecanico Slow Food-Calabria[1]

This report has the purpose to investigate on motivations that drive consumers towards purchasing cold cuts and in particular Capicollo Azze Grecanico Slow Food (through a survey carried out in Calabria). The research provides also an analysis of the producers. A Multiple Correspondence Analysis has provided consumer's motivational profiles. Furthermore, a Logit regression allowed us to evaluate the relationships between individual motivations and some socio-demographic characteristics of local cold cuts and capicollo consumers. The results show a consumers' propensity to the link between territory and product quality and the importance related to food security. The results are useful for the implications of the choices, the actions and policies of marketing that can offer.

1. Introduction

In Europe, 30-50% of the member states' total volume of butchered meat is used as an ingredient for processed food products (primarily in minced meat, meat based preparations, and meat based products). In total it is estimated that approximately 70% of the production volume of processed meats is constituted by pig meat, followed by poultry (18%), beef (10%), and other types of meat (2%). The EU meat processing industry involves more than 13,000 companies, employs around 350,000 people, and represents a market of 85 billion euro (European Commission, 2013). The meat processing sector in the EU is characterised by a low level of concentration, with a preponderance for highly specialised small and medium-sized enterprises (approximately 90% of production). Furthermore, the supply chain of pork used as an ingredient is very long and complex, and comprises various production and marketing phases for the end products that function independently and with little vertical integration.

[1] This article is based on the paper presented at the 52nd SIDEA Annual Conference, Roma-Viterbo, 17th-19th September 2015

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In this context, a strong point of Italian food production is represented by the typical cold cuts with marked PDO and PGI[2], territorial connotations and other recognised marks of quality, such as Slow Food and 'Libera Terra'. For this reason, the European Union establishes some precise rules for their protection, providing for the creation of specific normative regimes of quality, to protect the consumer's good faith and to give manufacturers some concrete tools to identify and promote the best products with specific characteristics, as well as to protect them from unfair practices.

In 2014, the exports of Italian cold cuts have even increased. According to ISTAT, in 2014, our exports have reached 148,830 tons (+4.7%) with a record turnover of 1,260 billion euro (+ 6.3%). A good result in terms of volume and especially in terms of values, developed in a context characterised by the crisis and the increase in non-tariff barriers (US and Russia).

Another point of strength is the growing interest from new non-EU countries in imports of Italian cold cuts and *made in Italy* products. However, there is strong competition in the cold cuts/sausage market from other EU producers (Germany, Denmark, Spain) on one hand, and weak protection of Italian processed products on the other, as is evidenced by the presence of numerous imitations and counterfeits (Nicoletti *et al.*, 2007; Vecchio and Annunziata, 2011). Calabria boasts a great number of food and wine specialities that animate an import-export market of quality agri-food products. Amongst the cold meats, a prominent place is held by those from Calabria ('soppressata', 'salsiccia', 'capicollo' and 'pancetta'), typical pig-meat based products of ancient tradition which attained the PDO mark in 1998.

Against official data that reveal a consistency of pig numbers in Calabria amounting to 51,209 heads (ISTAT, 2010), according to reliable estimates about 130,000 pigs are reared in Calabria, 25,000 of which are intended for the production of charcuterie (ARSSA, 2008). Currently, the breed of black Apulo Calabrese pig amounts to about 3,000 animals reared across forty companies, supplying excellent quality meat primarily destined for processing, for the production of typical regional cold cuts, and also PDO (salsiccia, soppressata, capicollo e pancetta). It is a breed of great hardiness and medium-large size, characterised by a remarkable frugality and versatility that is well adapted to marginal areas. The outdoor farming system, semi-wild, and with limited investments, allows for a low environmental impact and is in line with the prin-

[2] The PDO and PGI products represent the best of European agro-food production and each is the result of a unique combination of human and environmental factors, characteristic of a given area. Regulation (EU) 1151/2012 of the European Parliament and of the Council of 21 November 2012 on quality schemes for agricultural products and foodstuffs (are hereby repealed Reg. 509/2006 and 510/2006).

ciples of environmental sustainability and animal welfare (set out under Legislative Decree 122/2011). The Rural Development Plan of the Calabria Region has provided lines of aid and intervention for the spread of extensive environmentally-friendly pig breeding, and for the promotion of typical high quality pig meat products, from which premium products of the traditional Calabrian butchery are obtained (the four PDO Calabresi salami, the Capicollo Azze Anca Grecanico, and other quality products) (Micari *et al*., 2007; Nicolosi *et al*., 2009). The black Apulo Calabrese pig is used for the production of the Slow Food protected Capicollo Azze Anca Grecanico. This 'capicollo' (using meat from the thigh), locally called 'Capicoddho Azze Anca', was particularly influenced by the cultural impression left by the ancient Greek civilisation[3].

The Association Slow Food through the Presidium supports small traditional and excellent products endangered and works around the world to protect food biodiversity and build links between producers and consumers. It is representative of a production area, a culture and made in respect of biodiversity with sustainable and environmentally friendly technologies.

In the light of these considerations, this paper aims at investigating on motivations that drive consumers towards purchasing cold cuts and in particular Capicollo Azze Grecanico Slow Food.

2. Background

In recent years we have seen an increased interest of consumers in products adhering to the requirements of social, environmental and economic sustainability. Changes in consumption and the tendency to behave in a responsible, moral and socially active manner orientate consumers to a different qualitative value (Rozin, 2006; Idda *et al*., 2008).

In Italy, the behaviour of food consumption has been characterised by a strong regional tradition and a keen sense of conviviality. The origins of this food habit can be found in the particular socio-economic development of Italy more than in other countries. Political fragmentation and social and economic situation caused a marked development and varied local products and food uses. There was a gradual abandonment of the ritual dimension of food. The

[3] The Slow Food Italian presìdi number 230, and involve more than 1,600 small producers: farmers, fishermen, butchers, herders, cheesemakers, bakers, and pastry chefs. The 'Slow Food' mark appears on product labels to better identify them on the market. Slow Food operates all over the world, has collected 1,400 traditional products at risk of extinction in the Ark of Taste, and has initiated over 400 practical projects for the protection of sustainable food production worldwide (<www.slowfood.it>).

causes of these changes lie in the changes in the pace of life and the spread of different consumption patterns, and in a progressive loss of contact of the consumer with the territory and its products.

Recently, however, the Italian consumer has shown a greater autonomy in his choices and purchases, trying to optimise the price-quality ratio of products, whilst also taking into account the place of origin and typicality[4] (Piccinini and Chang Thing Fa, 2001; Fabris, 2003).

A significant role has had the recognition by UNESCO of the Mediterranean diet as intagible cultural heritage of humanity. The Mediterranean diet involves a set of skills, knowledge, rituals, symbols and traditions concerning crops, harvesting, fishing, animal husbandry, conservation, processing, cooking, and particularly the sharing and consumption of food.

Moreover, in many cases the consumer is tending more and more to organise his buying habits critically and ethically, and to prefer products that meet certain quality standards whilst promoting the defense of the common good, environmental sustainability, and human dignity (Pascucci, 2010; Annunziata and Scarpato, 2014). If on the one hand, consumers are likely to explore the link between the territory and product quality (in terms of differentiated products and high cultural-historical value), in many cases also choosing the point of sale in which to make the purchase, on the other hand, rural communities are reorganising themselves in an effort to increase the value of their production by developing a network system and alternative food community (Presidio Slow Food/Fish, Groups of solidarity action, short supply chains, e-commerce, biological products, PDO, PGI, etc.).

It has long been discussed as to whether the red meat is really bad for health, especially if transformed.

In the case of cold cuts there is an addition of nitrites from which then originate nitrosamines, toxic to humans (additions that should be kept under control), while in the case of red meat, the cooking leads to the formation of dangerous substances, such as aromatic amines or polycyclic aromatic hydrocarbons, all potentially carcinogenic substances that can be harmful if you overdo it with the amount.

All of these substances are not present in typical meats, in particular for the craft products because there are only additives of natural origin (chilli, salt, fennel, etc.).

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[4] The Italian shopping cart is becoming ever more 'socially engaged', with those who bought products from socially responsible companies increasing by 12% compared to the previous year. 45% said they were willing to spend more on services or products originating from companies that follow social responsibility programs, and 53% expressed a preference for working in a company that has a positive social and environmental impact (Bolognani, 2014).

New structures of governance, organisations, and institutions are emerging which focus on the innovation and on the enhancement of the agri-food sector.

This phenomenon is still developing, and is increasingly gaining the interest of scholars, both from a theoretical point of view, and from those approaches based on case studies and on methodologies of innovative research (Cembalo, 2015)

The search for an environmentally aware consumer involves broad aspects of social life, and the desired quality in agricultural food production has taken on different and wider connotations. Buying a product, in short, involves not only simple economic considerations, such as the quality to price ratio, but also an ever growing concern amongst consumers about the social conditions under which certain goods are produced.

Spurred on by this strong pressure from consumers regarding ethics, ecology, and respect for 'social norms', many companies are modifying their behaviour, and can no longer expect to implement policies that are contrary to these principles that hold a central role in the choice of purchasing of food product, without seeing a reaction from consumers, or at least some of them. Experience shows that it is possible to introduce positive behaviour in companies, such as their adoption of codes of conduct or of union agreements to protect workers in terms of a general revaluation of the quality of life, to protect the environment, to care for social relations, and to defend the common good. The producer allies himself strongly with the consumer who orients the market, and has himself become the key expert and image for the diffusion of the concept of quality.

The direct relationship that develops between producers and consumers is aimed at reassuring the origin, quality, and control of food products, and is based on a rigorous system of traceability, reliability, and seriousness of the brands, supply alternative networks and network marketing (Renting *et al.,* 2003; Aguglia *et al.*, 2009; Bougherara *et al.*, 2009).

Food Community Networks (FCN) are growing worldwide (Lombardi *et al.*, 2012; Favilli *et al.*, 2015), and define those systems and organisational models that provide a direct seller/purchaser relationship between producers and consumers, resulting in clear benefits for consumers, for the producers, and for the community at large. They concern the relationship of trust that is established between the consumer and the producer to guarantee the product being purchased, to the point that a formalised certification may not be necessary (Aguglia *et al*, 2009; Cicatiello and Franco, 2008; Pascucci, 2007). Moreover, reductions in transactional costs are achieved by reducing the number of intermediaries (van der Ploeg, 2006; Cicatiello and Franco, 2008). Companies can increase their market power by selling even small quantities of product. The community benefits from the reduction in energy costs of transport and

product packaging (Bougherara *et al.*, 2009), the territory benefits from the development and the enhancement of the production areas, it favours the defense of the local varieties and the traditional transformation processes of the territory (Battershill and Gilg, 1998).

In this study, the functional integration between the production, consumption, and enhancement of the territory is considered to be an important source of strength for the small traditional productions that are at risk of disappearing (Nicolosi *et al.*, 2014), and the research has therefore focussed on the 'rural system' where the Capicollo Azze Anca Grecanico is realised, and the socio-economic, scenic, gastronomic, and touristic resources/potentiality are present. The Hellenism in Calabria has ancient roots that are not limited to the medieval Greek communities of the old Magna Graecia region, but are bound to the history of the 'Duchy of Calabria', an ancient possession of the Byzantine Empire of which the region was an outpost for centuries. A line of unbroken historical-linguistic continuity ties the first Greek colony with the Ellenofoni communities of Aspromonte of the present day. In the whole of Calabria, and in the area of study in particular, there are traces of this linguistic and cultural presence: in the place names, the dialects, the ethno-anthropological world, etc.

The Grecanic area is located in the most southerly part of the province of Reggio Calabria, in the extreme tip of the Italian peninsula, where the Apennine chain ends almost overhanging the sea. Here the sea and the mountain characterise the territory of the Aspromonte, with lush woods, and medieval villages perched on the southern slopes facing the sea. The coastline is characterised by long beaches of sand and gravel, many of them deserted and scarcely populated even in summer. The products and the cuisine reflect the mixture of cultures and traditions that have come and gone over the centuries, from the earliest times. The cuisine of the Greeks of Calabria is a pastoral one, not particularly sophisticated, but genuine: a true reflection of a community forced to live for so long in conditions of economic and social hardship and in harsh or even inaccessible territories. Among the meats, a key element was certainly the goat (and sheep) along with the pig. In the traditional world the rearing and processing of pork had a central importance, and maintains a strong hold over the common domestic rearing practices of today.

3. Methodology

The analysis takes into account the characteristics of sustainable development (environmental, social, and economic), such as those of the preservation of native breeds at risk of extinction, the recovery of traditional processing techniques and their transmission to future generations, and the market refer-

ence and type of marketing approach. We have therefore identified and interviewed producers who adhere to the *Presidio*, and who maintain real microchains within the territory. These are companies with an estimated number of 1,500 slaughtered animals. Since from each garment you can get two 'capicolli', each of whom has a weight of 2 kg just pulled that lose 30% of the weight. It is sold full piece or divided further into 2 parts, this also serves to prove the success of seasoning.

Central to the study are the consumers, seen as independent experts, who are analysed in terms of the economic, sociological, cultural, and psychological factors that determine variations in their purchasing behaviour in time and space. The decision to study and analyse a specific and quality product came from the observation of the current trend towards buying typical foods, and the propensity of consumers to explore the links between territory and quality in terms of differentiated products that have a high historical-cultural value on one hand, and the promotional policies for products with a careful examination of the economic space in which the examined product grows and develops, on the other (Oostindie *et al.*, 2016).

With reference to the market for the consumption of the Capicollo Azze Anca Grecanico, a survey was conducted through the formulation and administration of a semi-structured questionnaire, comprising free and/or pre-formulated responses, to a panel of 250 consumers intercepted and interviewed in the Grecanic area of the province of Reggio Calabria. For the administration of the questionnaires, in order to intercept consumers of different types and purchasing capacity, two retail outlets, a point of retail sale, a local market, and four local food events were selected. The questionnaires were administered in larger gatherings. The face to face interviews were carried out between May 2014 and October 2015. The valid and controlled questionnaires which were subjected to processing numbered 236. The questionnaire was divided into two parts. The first focussed on the respondents' knowledge of the marks of protection, consumption, availability and frequency of purchase of cold cuts/capicollo and the Capicollo Azze Anca Grecanico in particular, the motivations of the consumer, and the price. The second part of the questionnaire included questions that identified the type of consumer and his socio-demographic characteristics (habits of consumption and purchasing, food tastes, age, gender, and educational level).

The database of collected data was processed, analysed, and initially interpreted through descriptive analysis to highlight the principal characteristics and then making use of Multiple Correspondence Analysis (MCA) and the logit model. The software used was SPSS (version 20). MCA is used to analyse a set of observations described by a set of variables, coded as binary variables (1 and 2). We remand to Abdi and Valentin, 2007, Greenacre, 1984, Graça

J. *et al.*, 2015 for more detailed information on MCA properties and goals. Through a representation in a low-dimensional space-designed on the basis of a few major components (Abdi and Valentin, 2007; Mäkiniemi *et al.*, 2011), we aimed at defining some profiles of consumers for Capicollo Azze Anca Grecanico.

MCA allows to analyse the pattern of relationships of several categorical dependent variables. By a technical point of view, MCA is used to analyse a set of observations described by a set of nominal variables. Each nominal variable comprises several levels, and each of these levels is coded as a binary variable (1 and 2). MCA aims at attributing factor scores to each observation and to each category in order to represent relative frequencies in terms of the distances between individual rows and/or columns in a low dimensional space[5] (Hair *et al.*, 2010). MCA is obtained by using a standard correspondence analysis on an indicator matrix (X). This is a J x M matrix where Jk is the vector of the levels for each K nominal variable (with $\Sigma Jk = J$), and M is the number of observations. Performing MCA on X will provide two sets of factor scores: one for the rows and one for the columns. These factor scores are in general scaled such that their variance is equal to their corresponding eigenvalue. In MCA, proximities are meaningful only between points from the same set (i.e., rows with rows, columns with columns). In other terms, when two row points are close to each other they tend to select the same levels of the nominal variables (Idda *et al.*, 2008). However, we need to distinguish two cases: 1) the proximity between levels of different nominal variables means that these levels tend to appear together in the observations; 2) because the levels of the same nominal variable cannot occur together, the proximity between levels means that the groups of observations associated with these two levels are themselves similar.

In this study, analysis should allow us to put on evidence relationship between the six individuated motivations that lead cold cuts consumer choices. Through a representation in a low-dimensional space – designed on the basis of few principal components – we aimed at defining some clusters (profiles) for cold cuts consumers.

In this study, MCA is carried out by building a J x M indicator matrix (X), where Jk = 2 (yes or no sensitivity for each motivation) is the vector of the levels for each K nominal variable; K = 4 are the nominal variables represented by the number of motivations and M = 236 are the number of observations.

They have been applied to identify and analyse the main explanatory variables and in particular to highlight the distinctive attributes that most influ-

[5] For its inherent nature, MCA can be also viewed as a generalization of principal component analysis when the variables are categorical instead of quantitative.

ence the decision making of consumers to purchase a traditional product (Resano *et al.*, 2011). For a discussion of the methodology, see Idda *et al.* (2008). A description of the xi variables referred to each interviewed consumer is included in Table 1. The objective of this analysis was linked to the necessity to focus on fields in which to operate in order to prepare interventions in line with the expectations and with the needs of consumers and producers, also through the interaction of agribusiness marketing and territorial plans.

Tab. 1. Socio-demographic sample characterization

Variable		Description
Motivation	P	it assumes a value equal to 2 in case of positive answer to the question, and 1 otherwise
Importance of origin area	X_1	it reflects the question: It considers is important to the origin area of the CAA? 1 = No; 2 = Yes
Knowledge Slow food	X_2	1 = No; 2 = Yes
Experience	X_3	it reflects the question: Why do you buy CAA? I usually buy it 1 = No; 2 = Yes I purchase it on advice of others: 1 = No; 2 = Yes
Gender	X_4	1 if male, 2 if female
Education	X_5	1 = primary school; 2=intermediate school; 3 = high school; 4 = graduate college (or post-graduate education)
Age	X_6	1 = 18-29 years old; 2 = 30-39 years old; 3 = 40-49 years old; 4 = 50-59 years old; 5 = 60-69 years old; 6 = more than 70 years old

Logit model. Logit is a regression model commonly used in settings where the dependent variable is binary. Generally, in analyses carried out from surveys, dependent variable is a yes/no answer to the administrated question and the dependent variable reflects probability of observing a positive answer. Therefore, the empirical specification of the binary yes/no choice can be formulated in these terms (Idda *et al.*, 2008):

$$P\,(Yes|x_i) = F\_(Z_i) = F_\eta\,(\alpha + ßx_i) = \frac{1}{1+e-Zi} \quad (1a)$$

where P_i is the probability of observing a positive answer; F_η is the value of logistic cumulative density function associated with each possible value of the

underlying index Zi; Xi is a vector of independent explanatory variables; α is the intercept; ß is a vector of unknown parameters, and:

$$Z_i = \log\left(\frac{Pi}{1-Pi}\right) = \alpha+\beta_1 x_1+\beta_2 x+\ldots\beta_n x_n+\varepsilon \quad (1b)$$

In the light of (1), the developed model was described as follows: (2) Motivation (Yes|x_i)=α+$ß_1$ Importance of origin area+$ß_2$Knowledge+$ß_3$Experience+$ß_4$Gender+$ß_5$Education+$ß_6$Age.

Analyses were performed using IBM SPSS Statistics (version 20).

4. Results

4.1 Production techniques of Capicollo Azze Anca

The farmers who produce the Capicollo Azze Anca use pigs from the Grecanic area, and in particular the black Calabrese pig, an endangered native breed. The production is carried out mainly in the municipalities of: Bova, Condofuri, Melito di Porto Salvo, Palizzi and Motta San Giovanni. Pigs are reared in a semi-wild state, and fed according to a rigorous discipline that provides for cereals, fodder, tubers, and beans, and does not allow use of animal meal, silage, and GMOs. The processing follows a precise production technology that achieves the characteristic Capicollo Azze Anca. On the production process of the Capicollo Azze Anca Grecanico, the thigh muscle of the pigs is used. The processing cycle runs as follows:

S*torage of the meats:* controlled temperature between 3-3.5°C. In order to ensure the traceability of the processed products, each half carcass is assigned a lot number (which will also appear on all products derived from it), carefully noted in special registers. The carcasses remain hanging in the refrigerator for at least 24 hours.

S*ectioning and portioning of the half carcass* (at a temperature of 16°C and humidity of 70-75%).

R*emoval of the skin and cutting fat slices; boning of thigh; grooming and dissection of thigh; grooming of muscle; salting and brine.*

R*esting of muscle and slicing of the fat in cold room under brine*: for a period of about 70 hours, during which the Capicollo is manually massaged.

A*ddition of aromas and fat slices:* red chilli flakes, half grain black peppers, and whole seeds of wild fennel are added to the carcass, which is then clad with slices of the fat extracted from the brine and inserted into a net casing, tightly tied with an elastic cord, so as to facilitate the escape of excess liquids and allow proper maturation.

Binding: the binding operation determines both the compactness of the sausages and its organoleptic characteristics in general. A good adhesion of the fat slices to the muscle, moreover, is indispensable to avoid the onset of oxidation, which could irretrievably compromise the healthiness and goodness of the product.

A*geing in cold room*: on completion of the binding, the Capicollo Azze Anca is hung for a period of maturation, varying, according to the size of the product, from between 180 and 210 days, in special curing premises, in which, in compliance with the regulations in force, temperature and humidity are maintained within values ranging between 13-20°C and 70-80%, respectively. Efficient ventilation ensures adequate change of air. During the entire course of maturation, each capicollo is subjected to a thorough inspection, being turned once a day for the first 10 days and, subsequently, twice a week.

Labelling: the Capicollo Azze Anca Grecanico is released to the market only if it has undergone the minimum period of ageing, and after the affixing of the label which is compiled according to the regulations, for the traceability of the product. At the end of the curing period, the capicollo should ideally weigh between 1.5 and 2.5 kg, and in any case, never less than one kilogram. The loss from ageing varies from between 37 and 47%.

S*torage in maintenance room:* for the maturation phase, the 'capicolli' are arranged in appropriate locations in which the parameters that influence the curing (temperature, humidity, air change) are constantly monitored. The production of Capicollo Azze Anca Grecanico sold under the Slow Food mark is currently limited in extent, and it is focussed mainly on the local market. It is estimated a production of 3,000 capicolli a year with a weight of about 1,200/1,300 grams each one. Increasing amounts of the product are sold on the domestic and international market. The sale price is € 18.00 per kg.

4.2 Consumer habits in a sample area

The results of a market survey carried out in the area of investigation are reported in order to verify the strength and image of the brand, and to measure the degree of acceptance and the importance it has for consumers as a local product that is strongly anchored to the local and regional food traditions and that, at the same time, fulfils the requirements for social, environmental and ethical sustainability, etc. (Pascucci, 2010) in line with the new food trends that highlight the importance of disintermediation, ethics, responsibility of consumption, the report, and of the experience. The consumers of capicollo interviewed in the survey have a medium-high cultural level (58.9% are graduates) and for the most part consume capicollo regularly. Of the 236 re-

spondents, most fall within the 30-39 age group (34.3%) and between 18-29 (22.9% of the sample). They have a very good knowledge of organic products (94.1%), PDO (83.9%) and GPO (68.2%). Analysis showed that the PDO and PGI logos are commonly the main purchasing motivation for shoppers with an excellent knowledge of the EU certification labels, while consumers with no knowledge of the European origin trademarks tend to base their decision to buy on the product's lower price, better appearance and Italian origin (Vecchio and Annunziata, 2011). 39.8% of respondents know the Slow Food mark for products, and 35.6% the 'Libera Terra' mark for products originating from land confiscated from the mafia (Tab. 2, Tab. 3). From an initial examination of the answers given by the respondents, it emerges that almost all (98.3%) consume cold cuts regularly (89.8%) or occasionally (8.5%). Consumers consume regularly Capicollo of Calabria PDO (70%), the Capicollo Azze Anca branded Slow Food, specifically, is known to 31.8% of respondents, and 27.1% know that it is made with meat from the black Apulo Calabrese pig. 65.7% considered the ease of

Tab. 2. Socio-economic characteristics of the respondents

	number	%
Sex		
Female	122	*51.7*
Male	114	*48.3*
Age		
18-29	54	*22.9*
30-39	81	*34.3*
40-49	50	*21.2*
>50	51	*21.6*
Knowledge of protection mark		
Biological mark	222	*94.1*
POD Mark	198	*83.9*
GPO Mark	161	*68.2*
Slow Food Mark	94	*39.8*
Libera Terra Mark	84	*35.6*
Level of education		
Secondary school	139	*58.9*
Degree	80	*33.9*
Secondary/ Elementary school	17	*7.2*
Place of food purchase		
Supermarket/Ipermarket	165	*69.9*
Retailer	17	*7.2*
Town market	26	*11.0*
Local producer and doorstop selling	28	*11.9*
Food purchaser		
Interviewed	148	*62.7*
Head of Household	67	*28.4*
Other	21	*8.9*
Family production of meats	51	*21.6*

Source: Own elaboration

Tab. 3. Consumption opportunities, variation in time and judgment of the price of sausages

	Frequency	%
Consumption of sausages		
Yes, occasionally	20	*8.5*
Yes , regularly	212	*89.8*
No	4	*1.7*
Consumption opportunities of sausages		
On particular occasion	12	*5.1*
Occasionally for lunch	4	*1.7*
Occasionally for dinner	55	*23.3*
As a snack	17	*7.2*
Two or more responses	148	*62.7*
Ease of finding Capicollo Azze Anca		
Poor	77	*32.6*
Average	155	*65.7*
High	4	*1.7*
Opinion on the sausages and Capicollo Azze Anca's prices		
Excessives	13	*5.5*
Cheap	56	*23.7*
Normals	167	*70.8*
Variation in time of consumption of sausages		
Decreased	46	*19.5*
Remained constant	179	*75.8*
Increased	11	*4.7*
Frequency of purchase of sausages		
Several times a month	184	*78.0*
Once a month	38	*16.1*
Once every 2/3 months	7	*3.0*
Once a year	3	*1.2*
Never	4	*1.7*
Possible substitute for Capicollo		
Not substitutable	84	*35.6*
Bresaola	35	*14.8*
Filetto	33	*14.0*
Pancetta/Coppa	24	*10.2*
Other sausages	19	*8.1*
I don't know	41	*17.4*

Source: Own elaboration

sourcing the product as medium, and 55.9% attach importance to the Calabrian origin of the raw material and production. However, the interviews show that only 20.5% are habitual consumers of Capicollo Azze Anca Grecanico branded Slow Food. This is probably because the product, strongly anchored to the traditions and consumed regularly, is bought on impulse without regard to the brand.

Moreover, we must reiterate and underline the widespread custom of the domestic rearing and the consequent family production of cold meats (21.6% at the household level produces sausages, brawn, capicolli, bacon, etc.). The majority of respondents were also the ones responsible for purchasing food (62.7%) and the place of purchase was primarily the large distributors (70%)

due to the diversity of brands and the consumer's preference for a single location for their food shopping. However, 30% went to smaller locations, such as town markets (11%), local producers (11.9%), and retailers (7.2%).

Among the reasons given for the purchase and consumption, the highest rated parameters of choice are: the craftsmanship of the product and the safety of the meat (96.2%), followed by the quality, authenticity, and long shelf life (78%), price (57.2%) and different occasions for consumption (the question concerning opportunities for consumption in 53.8% of cases was divided between two or more responses). Other aspects which were particularly appreciated were the taste and the versatility of the product, because it was liked by everyone in the family, characterised the table, and was suitable to accompany the wine (53.8%) (Tab. 4). These reasons have been used as a base in the MCA model. The price is not considered relevant by 42.8% of respondents, who purchased primarily based on the quality, and neglect other attributes such as price.

The need to maintain local food habits is confirmed by the frequency of purchases and the average quantity purchased. For the majority of respondents, the consumption of cold meats has remained constant (75.8%) and the purchase is frequent (78% several times a month, while 16.1% buy the products at least once a month). With regard to the judgment of the pricing, the majority considered the price normal (70.8%) while 23.7% considered it low. The quantities purchased were primarily between 300 grams and one kilogram. The responses on possible substitutes for the Capicollo show a prevalence of consumers who consider Capicollo as irreplaceable (35.6%), the other responses regarding substitutes by other cold cuts such as, for example, pancetta (10.2%), bresaola (14.8%), and filetto (14%).

Tab. 4. Motivations for purchasing Capicollo Azze Anca (motivations of MCA model)

	Motivations	Strong		Weak/Not at all	
		n.	%	n.	%
ST	'Safety and Tradition': Meat safe, handcrafted, it is storable traditional product of my area	227	*96.2*	9	*3.8*
TQ	'Tasty and Quality': It is tasty, it is genuine, it is storable and reliability of the product	184	*78.0*	52	*22.0*
P	'Price'	135	*57.2*	101	*42.8*
TDO	'Togetherness/Different occasions': Enjoy and use on different occasions	127	*53.8*	109	*46.2*

Source: Own elaboration

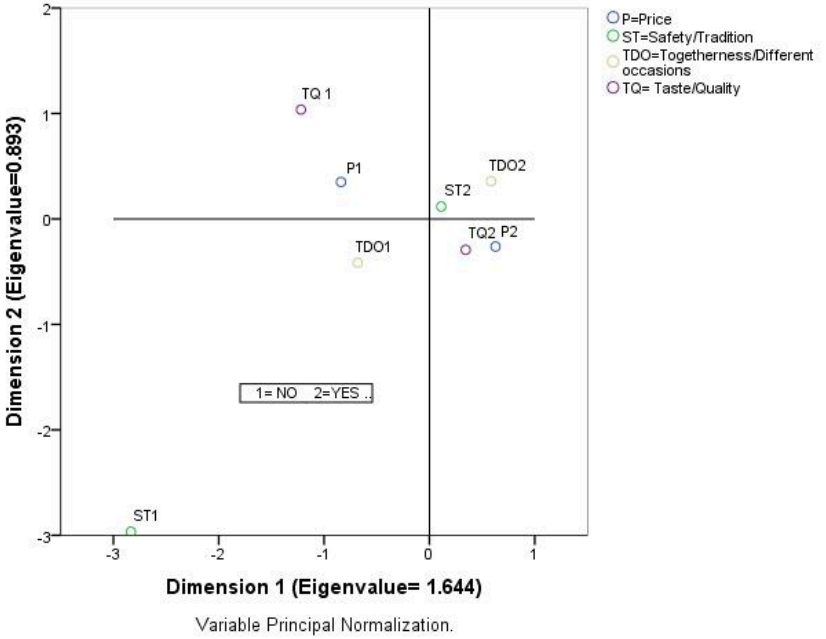
4.3 Main results and discussion Multiple Correspondence Analysis (MCA) and Logit model

MCA results show how much is difficult to classify consumers by the reasons driving the demand. The sum of the eigenvalues of the two dimensions is 2.557 of the variance explained, by the size of dimension one is equal to 41.6% and 22.3% for the dimension two (Tab. 5). Let us take a look at Figure 1 during their discussion. The first dimension (horizontal axis) clearly separates consumers driven local and craft products and sure products (positive values) those indifferent to these requirements (negative values on the horizontal axis). The second dimension (vertical axis) identifies individuals aware of buying safe products, traditional, versatile (positive values on the vertical axis), but also attaches significant importance to consumers wishing to taste and price that are placed in the quadrant with negative values for the dimension two. Therefore it is appropriate to consider carefully the characteristics of the variables in both dimensions. This result can be interpreted as a clear suggestion of using the first dimension as an indicator of regular use and aware of Capicollo, consumers consider it a typical product, handicraft, safe and quality. We can see positive in Figure 1 values for both dimensions, where there are subjects sensitive to the safety of traditional products (ST2) and conscious consumers of the versatility of the product (TDO2). They are mainly young women (18-39 years) with high average level of education. The profile of these consumers can be summarized as 'young modern consumers of traditional, safe and versatile products', they account for 16.1% of the respondents. In the positive quadrant for size 1 and size 2 we found negative for consumers willing to buy the product while paying attention to the price (P2) for its quality and for the connection to the local tradition (TQ2). They are more or less equally represented men and women older than 40 and a medium-high level of education. The profile summary in the second quadrant is 'traditionalist consumers with a special bond with the territory'. They represent 50.4% of

Tab. 5. Model Summary

Dimension	Cronbach's Alpha	Variance Accounted For		
		Total (Eigenvalue)	Inertia	% of Variance
1	.532	1.664	.416	*41.597*
2	-.160	.893	.223	*22.316*
Total		2.557	.639	

Fig. 1. Results arisen from MCA



respondents. Consumer preferences are therefore related to the historical and cultural content and refer to the place of origin and the characteristics of the product, strongly anchored traditions. In the third quadrant (negative for both dimensions) are the consumers who do not pay attention to traditional food products, but they usually buy on impulse without regard to the origin, safety and versatility of the product (17.8%). The profile of these women and men, who are equally represented between the age of 30-59 years and with a title of high school, is 'consumer disinterested and indifferent'.

In the negative quadrant for the dimension 1 and positive for the size 2, we place consumers who respond negatively to taste and quality and who are indifferent to price. Even here women and men equally represented are mainly young people between 18-39 years and with a title of high school. We can define their profile as 'casual consumers' who buy regardless of the price and the origin of the product (15.7%). The four consumer profiles above mentioned can be analyzed in depth by the support of stepwise Logit models where the relationships between Capicollo Azze Anca Grecanico purchasing reasons and socio-demographic-behavioural variables are detected.

Table 6 summarizes the results obtained by applying the logit model. Let us discuss the most important among them. The p-value associated with the index Hosmer-Lemeshow (with $\alpha = 0.05$) suggests that all four profiles and 6 variables must be satisfactory for the data[6].

The Safety/Tradition (ST) model confirms the impression given by MCA first quadrant observations, consumers are attentive to the safety of the meat, the craftsmanship and the importance of the production area, and is also consistent with the high percentage (96.2%) of consumers attentive to these aspects.

The Price model offers some interesting results. First, the most significant character is related to the importance of the origin area. Reasons for purchasing Capicollo Azze Anca is the importance of local area of production and the motivation linked to experience (buy it because is produced with safe meat, and for purchasing advice to others).

Another important aspect in the Price model is the Slow Food brand awareness, as those involved show a notable awareness of the quality and characteristics of the product and of the producers, thus representing the potential for the purchase of Capicollo Azze Anca Grecanico. Finally, descriptive analysis highlights that the consumer is primarily male.

Even in the TQ model, it is highlighted the importance of experience linked to the habits of consumption. These attributes are related to the frequency of consumption and purchase decision of cold cuts connected with the taste and the intrinsic characteristics of Capicollo Azze Anca. The TDO model highlights principally the importance of production area, the consumer's attention to the local food and also the experience**.** All of these aspects are linked to**:** the products' authenticity, the fact that the Capicollo is enjoyed by the whole family, that it is a winter food, and that it is suitable with a wine. Consumers prefer this type of salami because it is a regular part of the family, but also because the purchasing decision by the consumer is linked then to the versatility of the product, its appreciation and consumption by the whole family, and its flexibility for a variety of consumption occasions (as a snack, appetizer, entree, dinner, or lunch).

Increasing awareness and concern with global climate change has led to a push to identify local food consumption as a way to reduce food miles and help preserve the environment (Verain *et al.*, 2016). The journey from farm to fork is rarely a simple connection between farmer and consumer but it rather involves a range of different actors and agents, located in different places and at different socioeconomic scales.

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[6] This statistic examines the difference between the observed frequency and the expected frequency for deciles of data. The value is compared to a-2 distribution with g-2 degrees of freedom (g is equal to the number of deciles).

Tab. 6. Estimated parameters of the Logit models

Variables	ST = Safety/Tradition			P = Price			**TQ = Taste/Quality**			**TQ = Taste/Quality**		
	β	S.E.	P-value.	β	S.E.	P-value	B	S.E.	P-value	B	S.E.	P-value
Costant	-7.532	2.355	0.001	-6.634	1.466	0.000	-2.989	0.888	0.001	-12.578	1.904	0.000
Importance of origin area	3.875	0.890	0.000	0.578	0.278	0.370	-	-	-	3.082	0.729	0.000
Knowledge Slow Food	1.481	0.859	0.085	-0.911	0.347	0.009	-		-	3.605	0.476	0.000
Experience (I purchase it on advice of others)	-	-	-	0.754	0.373	0.043	1.793	0.469	0.000	1.453	0.392	0.000
Gender	-	-	-				-	-	-	-	-	-
Education	-	-	-	-	-	-	-	-	-	-	-	-
Age	-	-	-	-	-	-	-	-	-	-	-	-
-2 log likelihood	44.222[a]			240.943[a]			220.136[a]			191.246[a]		
Hosmer-Lemeshow	0.393			0.312			0.504			0.397		

ST: [a] =Estimation terminated at iteration number 8 because parameter estimates changed by less than ,001.
P : [a] =Estimation terminated at iteration number 5 because parameter estimates changed by less than ,001.
TQ: [a] =Estimation terminated at iteration number 5 because parameter estimates changed by less than ,001.
TDO: [a]=Estimation terminated at iteration number 6 because parameter estimates changed by less than ,001.

5. Conclusions

The report investigates the motivations of consumers about a local production. A Multiple Correspondence Analysis was developed to identify consumers' motivational profiles, and a Logit regression to evaluate the relationships between motivations and socio-demographics.

The results show a strong propensity of consumers to the link between territory and product quality and the importance related to food security. Capicollo is considered tasty, quality, storable and lends itself to a variety of consumption occasions (snacks, appetizers, entrees, snacks, dinner, lunch). The purchase decision is connected with the traditions, habits and eating patterns of consumers surveyed.

The results suggest that the total, combined effect of consumers' image of regional certification labels is substantial. To protect consumers, and support SMEs and rural economies, many countries around the world have introduced regulations enabling SMEs to legally protect the names of their regional products. The success of these regulations largely depends on consumers' appreciation of regional certification labels that inform consumers that the name of the regional product is protected and that it denotes the authentic product (van Ittersum *et al.*, 2007; van der Lans *et al.*, 2001). Hence, consumers' appreciation of regional certification labels may provide opportunities to increase consumer demand by marketing the protected regional product with Slow Food regional certification label. Any product is perceived by different consumers in different ways. Value derives from different attributes, according to the type of consumer.

Consumers' attitudes towards the region of origin influence the perceived quality of the product. Consumers' attitudes towards the region of origin also directly influence consumers' attitudes towards the protected regional product. These results suggest that the emotional aspects related to regional products are also part of consumer attitudes.

When value is based on the origin of the product that can be associated with the region, Slow Food or the producer, these different attributes assume a different importance according to the distance (geographical and cognitive).

PDO, Slow Food, PGI certification can be considered as a good tool to reduce the perceived distance for consumers living far from the region of origin (often tourists) but, on the other hand, it does not add value for people who do not perceive any cognitive distance, as locals.

This research has several implications. First, protecting regional products and marketing these protected regional products with regional certification labels, such as Slow Food labels, may be beneficial, in particular because without protection there might be the danger of copycat products spoiling

regional-product reputations (van Ittersum *et al.*, 2007; Freibauer *et al.*, 2011). Second, our research findings also enable SMEs and policy-makers to develop focussed communication strategies towards consumers.

The objective of this analysis was linked to the necessity to focus on fields in which to operate in order to prepare interventions in line with the expectations and with the needs of consumers and producers, also through the interaction of agribusiness marketing and territorial plans. It's important to train a new food model and the application of the fundamental aspects of destination marketing in order to identify a strategic plan that enhances the territory through the collaboration of all stakeholders. This takes into account the competitiveness of tourist destinations, as the sum of all its attributes, that allows it to adopt a strategic and operational positioning over its competitors also in terms of internal corporate management (Kim and Eves, 2012; Marchioro, 2014; UNWTO, 2012). At the same time, it takes into account the capacity of a territory, with all its touristic and gastronomic characteristics and peculiarities, to attract visitors to that particular destination.

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Gianluigi Gallenti[1],
Stefania Troiano[2],
Marta Cosmina[1],
Francesco Marangon[2]

[1] Dept. of Economic, Business, Mathematical and Statistical Sciences, University of Trieste, Trieste, Italy
[2] Dept. of Economics and Statistics, University of Udine, Udine, Italy

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Ethical and sustainable consumption in the Italian coffee market: a choice experiment to analyse consumers' willingness to pay[1]

Consumers increasingly consider ethical and sustainable attributes of products in their purchasing decisions, in particular with reference to food consumption. Among agri-food products, coffee is a pioneering food for sustainability and ethical certification, such as organic and Fair Trade, whose success depends significantly on consumers' willingness to pay a premium price for these attributes. This study uses a choice experiment (CE) to investigate the attitudes towards organic and Fair Trade coffee among Italian consumers. The results show considerable heterogeneity among respondents, the majority of whom tend to be more interested in organic coffee than Fair Trade coffee, even if a large group of them are willing to pay a premium price to consume Fair Trade coffee.

1. Introduction

Consumers in affluent societies increasingly consider the moral features of products in their everyday monetary decisions. They buy food produced by respecting the environment and animal welfare, use renewable energy, consume while paying attention to reducing food waste and to recycling waste, abstain from buying goods manufactured under dubious working conditions, invest in companies that operate in a socially responsible manner and so on. These aspects concern both environmental and socio-economic dimensions of the supply chain, the same involved in a sustainable development approach, so the ethics and sustainability of the supply chain have become two strongly related concepts.

This consumer behaviour can drive production activities in general, and the agri-food supply chain, toward more sustainable and ethical production models. This depends both on the consumers' willingness to pay (WTP) for sustainable and ethical attributes both from the effective communication mode of such attributes as private labels, certification standards and traceability systems.

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Several agri-food products present ethical and sustainable characteristics, including wine, olive oil, coffee, cacao, cheese, ham and different processed foods. Among these, coffee is one of the world's most valuably traded commodities, the most important agri-food product harvested in developing countries and consumed in developed countries and a pioneering industry for sustainability standards and ethical certification; therefore, it is particular interesting to analyse coffee's ethical consumption.

The aim of this paper is to investigate the attitudes of Italian consumers towards organic and Fair Trade coffee, two labels strongly connected with ethical aspects.

This article is organised as follows: first, the theoretical framework deals with relations between ethics and sustainability consumption, certifications and labels of the agri-food sector, traceability and the methods used to evaluate consumers' preferences and, in particular, consumers' WTP. Thereafter, the research analyses global coffee market trends, with particular attention to differentiation strategies, sustainability and organic and Fair Trade labels, and presents an essential review of studies, at Italian and international level, about consumers' attitudes towards organic and Fair Trade coffee. Following this is the illustration of a choice experiment (CE), conducted in accordance with several other studies, to investigate the attitudes towards organic and Fair Trade coffee among a sample of Italian consumers. The article concludes by offering some perspectives on future research on the topic and some suggestions to improve market efficiency through the implementation of an ethical traceability system.

2. Theoretical framework

2.1 Ethical and sustainable food consumption

Ethical consumption can be defined as purchase decisions by people concerned with not only the price of products and services but also with the political, social and environmental consequences of their purchases (Coff *et al*., 2008).

It is interesting to note that ethical consumption combines the role of consumer with that of citizen, and the term 'consumer-citizen' refers to this duality (Scammell, 2003); in this way, there is a reconfiguration of the consumer's role characterised by a consumer-oriented activism that represents a pathway to participation for ordinary people (Coff *et al*., 2008).

The phenomenon of ethical consumption has received increasing attention among academic researchers in recent times, with the production of a wide body of multidisciplinary literature (Coff *et al*., 2008; Newholm and Shaw, 2007). There are contributions from different disciplines, e.g. sociology (Caru-

ana, 2007), ethics (Barnett *et al.*, 2005), social psychology (Sparks and Shepherd, 1992), anthropology (Wagner, 2003), human geography (Low and Davenport, 2007) and economics (Altman, 2005).

Several studies emphasise the characteristics that ethical consumers consider important in the purchase of food (Coff *et al.*, 2008; Korthals, 2004), below summarised in ten categories in Table 1.

Some of these categories are not necessarily endorsed; e.g. it is doubtful whether an intrinsic quality can be considered an ethical element, while trust and voice are very general items, but with respect to the other elements there should be a general consensus to consider them as associated with ethical issues. Transparency appears to be a generic ethical attribute that guarantees the consumer product characteristics. This list is not necessarily exhaustive for the purposes of the present work, but serves to better focus the ethical issues of consumer demand.

It is evident that ethical consumption is strongly connected with the concept of sustainability, which also involves environmental, social and economic dimensions of production, consumption and market exchange. Therefore, in this paper we often refer only to ethical characteristics or attributes, where ethical aspects also include a sustainable dimension.

2.2 Ethical certifications and traceability in agri-food sector

Numerous agri-food products present one or more of the ethical characteristics listed in Table 1, such as wine, olive oil, coffee, cacao, cheese, ham and

Tab. 1. Main categories of characteristics of ethical demand

1.	Animal welfare
2.	Human health
3.	Methods of production and processing, and their impact (e.g. environmental, landscape)
4.	Terms of trade (fair price, etc.)
5.	Working conditions
6.	Quality (intrinsic qualities such as taste, composition, etc.)
7.	Origin and place
8.	Trust
9.	Voice (participation)
10.	Transparency

Source: Coff *et al.,* 2008

different processed foods. At the same time there are different certifications or labels that provide or declare ethical attributes of products, such as Fair Trade, organic, geographical indication (GI) (protected designation of origin – PDO; protected geographical indication – PGI), carbon footprint, vegan labels, no-palm oil/palm oil-free, OGM-free, kosher (or kasher), and halal.

Several of these certifications and labels have both ethical and non-ethical attributes. With reference to the coffee market it is evident that organic production and Fair Trade – the two more known and widespread attributes communicated to consumers – are linked to ethical aspects of coffee, but not only to these (Tab. 2).

Note that the list of attributes indicated in Table 2 is not necessarily exhaustive, but highlights that in several cases one certification or label can have both ethical attributes and non-ethical attributes, and consumers can look for ethical characteristics and non-ethical characteristics at the same time.

In fact, consumer demand for an agricultural activity that produces crops and raises animals without relying on toxic chemical pesticides, synthetic fertilisers, genetically modified seeds or practices that degrade soil, water or other natural resources can be related to ethical aspects. However, there is another component of consumer demand for organic products that relates to food safety and the absence of residues of fertilisers and pesticides on the food; this component is not concerned with ethical demands. Relating to organic products, it is relevant to remember that the public consultation on the future of the EU organic production policy, which took place in January 2013, identified the main reasons why citizens buy organic products. The respondents were asked to indicate drivers for purchasing and consuming organic products, and they claimed that the most important reason was general attitudes that concern respecting the environment and its sustainability, animal welfare

Tab. 2. Ethical and non-ethical attributes of Fair Trade and organic coffee

Certification or labels	Ethical attributes	Non-ethical attributes
Fair Trade	Terms of trade, working conditions, origin and place	
Organic	Animal welfare, working conditions and human health (farmers' health), methods of production and processing and their impact (soil and landscape preservation, reduction of CO_2 emissions, etc.)	Human health (consumer's health), methods of production and processing and their impact (no chemical residue on products)

Source: Own elaboration

and other similar elements, all characteristics of organic production that can be considered ethical aspects ('over 80% of all questioned citizens claimed that the most important rationales behind organic product consumption were concerns about the environment' [European Commission, 2013]).

It is also interesting to note that labels such as Fair Trade and organic production – but also GI and others – do not strictly follow the standard required by the traceability system provided for food security, although the GI scheme can be considered a model that inspired the traceability rules. As is well known, the EU rules that regulate the traceability system were established by several EC Regulation on the base of the principles established by the European Commission's *White Paper on Food Safety* in 2000.

In the case of organic products, consumers can be confident that they have been produced in accordance with the EU's strict environmental and animal welfare rules, and checked accordingly. These rules introduced a rigorous control system that provides for checks to be carried out on the operators at every stage of the organic chain. Each operator (farmer, processor and trader) has to be checked at least once a year, or more often based on a risk assessment. This approach is a proxy of a traceability system, but it does not necessarily track all movement of products, and the steps within the supply chain, although in some countries, including Italy, systems based on databases were recently introduced.

Moreover, in the case of Fair Trade labels, there is no EU legislation and the certification follows some NGO international standards. In these cases, as in others, consumers usually are not able to establish the origins and characteristics of products, the materials used and the processes adopted. This can only happen if the firm, or usually the whole supply chain, adopts a voluntary system of traceability according to ISO standards.

In this situation, on the one hand it is evident there is growing consumer attention to attributes of agri-food products concerning safety and quality, origin, environmental and socio-economic sustainability, the ethical nature of the processes adopted and the whole organisation of the supply chain. However, at the same time, on the other hand it is doubtful whether consumers are actually able to choose a food in a rational way based on the effective attributes communicated by labels and a certification system, as we discuss below.

In fact, paradoxically, although consumers are under pressure from information on food – from the media, the food industry, food authorities, NGOs and interest groups – details about how foods are actually produced is often not easy to find; much of the information available is superficial, conflicting or incomplete, and it is difficult for consumers to make the right choices (Coff *et al*., 2008).

Therefore, a traceability system can become a fundamental tool to assure consumers about the effectiveness of the characteristics of the products in accordance with the certification system (organic, Fair Trade, etc.). In particular,

it has become interesting the idea of 'traceability ethics', which adapts the concept of traceability to record and communicate the ethical aspects of a food's production history, including elements concerning the environmental, social and economic sustainability of the agri-food chain (Coff *et al*., 2008).

It is evident that the importance of ethical traceability for consumers is essentially manifold. Ethical traceability can help consumers make informed food choices; moreover, it can act as a means for enabling consumers to participate more fully as citizens in the shaping of the contemporary food supply. Finally, food producers can use ethical traceability as a tool for managing the ethical aspects of their own production practices and for communicating the ethical values of their products (Coff *et al*., 2008).

2.3 Economic approach

The research on ethical consumption has generated, obviously, multidisciplinary literature with different approaches to analyse the consumers' demand; Andorfer and Liebe (2012), for example, with reference to Fair Trade consumption, consider economic approaches, social psychological approaches, studies about consumer attitudes, research on information and communication, consumer values studies, sociological approaches and different research methods (qualitative, quantitative, experimental, etc.).

Andorfer and Liebe (2012) cite the economic research of Cranfield *et al*. (2010), De Pelsmacker *et al*. (2005a) and Dickson (2001), who include a price attribute in their description of ethical products to estimate respondents' willingness to pay (WTP). De Pelsmacker *et al*. (2005b) use conjoint analysis (CA) to assess the relative importance of different marketing strategies of ethically labelled coffee, without including product price. In general, price, Fair Trade and organic labels, country of origin, type of coffee beans and roast are product attributes often included in these studies. Moreover, Basu and Hicks (2008) and Auger *et al*. (2003) draw on choice experiments (CE) to estimate WTP for Fair Trade coffee and sweatshop-free manufactured athletic shoes; CE are also used to assess respondents' interest in different criteria for social labels (Howard and Allen, 2010) and to analyse the effect of social context on Fair Trade consumption (Carlsson *et al*., 2010).

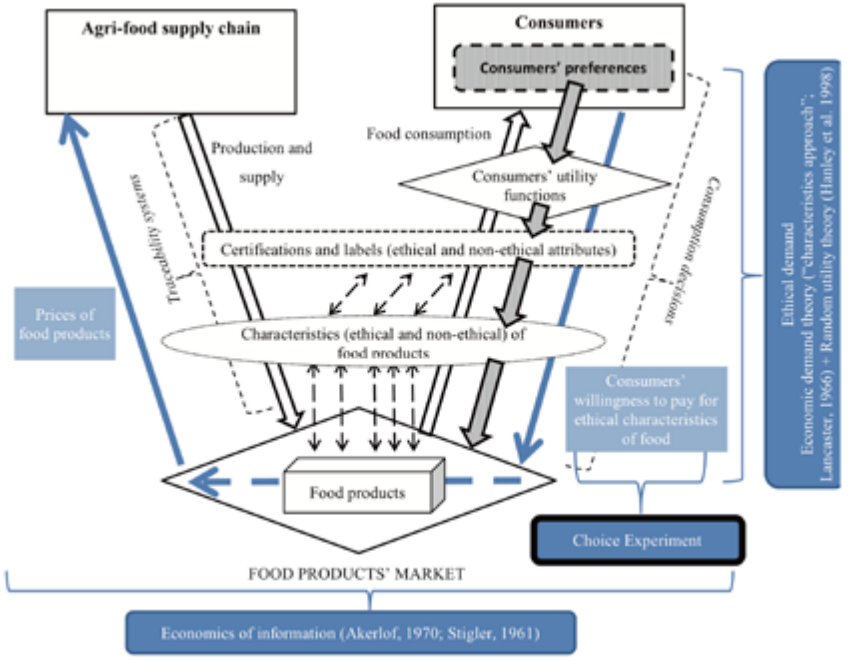
In this article, we follow an economic approach based on the new consumer demand theory of Lancaster (1966), in combination with the random utility theory (Hanley *et al*., 1998); on this theoretical basis, we conduct CE to evaluate consumers' WTP for ethical attributes of food. The economics of information theory (Akerlof, 1970; Stigler 1961) also contribute to draw the theoretical framework of our analysis.

In particular, the considerations in the preceding paragraphs about (a) the demand for ethical characteristics of products, (b) the ethical attributes provided by different certifications and labels and (c) the relationship between certification schemes, brands and labels from on one hand, traceability, and ethical traceability on the other hand, outline the following analytic scheme (Fig. 1).

With reference to consumer demand, it is necessary to note that this approach means the adoption of the so-called new consumer demand theory (Lancaster, 1966), and consequently there is the operational problem of estimating the consumers' WTP for the specific ethical attributes of the products.

Regarding the first issue, it is useful to note that the traditional microeconomic theory investigates the relationship between the demand for goods and their prices and income under the assumption of utility maximisation and rational behaviour. The patterns of current food consumption and the demand analysis has changed over the past few decades to incorporate new factors, now considered more important than prices and income, in order to explain modern food choice process in affluent societies. The traditional approach is

Fig. 1. The outline of the theoretical framework



Source: Own elaboration

not able to explain consumer behaviour, which has led many studies, especially in recent decades, to incorporate other factors in applied food demand analysis as proxies for the unobservable factors that determine consumer preferences; these studies 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 concept of household production functions. In these models, it is assumed that utility is derived from the characteristics of goods (not from the goods per se), and that the utility of product alternatives is a latent construct that only exists in the minds of individual consumers. Researchers are not able to observe this directly. Yet, indirect measurement techniques can be used to explain a significant part of the latent utility construct. An error component determined by additional unobservable attributes, measurement errors and variation between individual consumers, however, remains unexplained.

The estimation of consumers' WTP a premium for the ethical features of products is a prevalent research objective of several empirical studies. For example, consumers buying the more expensive Fair Trade product reveal their preferences for the ethical features of a product and, consequently, these consumers gain additional utility from these characteristics.

If the characteristics of goods become, in this approach, what it is actually required by the consumer it means that consumers are interested in food knowledge, and therefore information plays a substantial and important role. In fact, the ability of consumers to perceive certain characteristics of the product may be weak, as we see; in these cases, a traceability system (an ethical traceability system in our case) becomes important to ensure the existence of the characteristics desired by consumers. Moreover in the Lancaster approach the characteristics possessed by a good or a combination of goods are the same for all consumers.

The theory at the base of this later aspect is distinctive in the economics of information (Akerlof, 1970; Stigler, 1961). More specifically, among the different sources of information available to the consumer, 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. Akerlof (1970) was the first to show that asymmetric information, as quality uncertainty about a commodity, can cause the market to degenerate into one consisting of only low-quality commodities.

2.4 Choice experiments (CE)

As is well known, different methods can be used to estimate consumers' preferences for specific attributes of goods, among these contingent valuation

method (CV), conjoint analysis (CA) and choice experiments (CE) are some of the most used (see Breidert *et al*., 2006).

The basic idea behind CA and CE methods is that public and private goods can be described as a bundle of different product attributes; each combination of these characteristics results in a different product, and survey respondents are asked to evaluate these changes (Hanley *et al*., 1998). As in studies using CV, a hypothetical market of goods is constructed. However, in contrast to CV methods – and to simple item survey questions for that matter – consumers' WTP is measured indirectly and respondents are forced to make trade-offs between the different product attributes. Thus, consumer choices are supposed to be more realistic and therefore yield more valid measures of WTP. The experimental design of CA and CE allows researchers to estimate the effect of each product attribute on respondents' product evaluations or product choices independently (Luce, 1959; McFadden, 1974; Lusk *et al*., 2003).

According to Louviere *et al*. (2010), it is useful to remark that CA is a generic term used to describe several ways to elicit preferences, using methods that are purely mathematical and concerned with the behaviour of number systems, not the behaviour of humans or human preferences. Therefore, CA is generally inconsistent with economic demand theory. Instead, CE methods, which evolved out of the theory of 'conjoint measurement', have a long-standing, well-tested theoretical basis in random utility theory, and are more general and consistent with economic demand theory. In particular, CE is based on Lancaster's (1966) characteristics theory of value in combination with the random utility theory (Hanley *et al*., 1998).

Therefore, statistical analyses of the responses obtained from CE are used to estimate the marginal values of attributes of a good. Those values represent the premium price that consumers are willing to pay for the characteristics they desire.

For these reasons, this study uses CE to estimate consumers' WTP, with data obtained from a field experiment through face-to-face interviews at some points of sale.

3. The world coffee market and the ethical consumption of coffee

3.1 Trends in the global coffee market

The world coffee market shows that coffee is a widespread consumption product characterised by a considerable potential for further increases. Moreover coffee is one of the world's most valuably traded commodities and a pioneering food for sustainability and ethical certification, such as organic and

Fair Trade. In particular, coffee is one of the world's most valuably traded commodities, second only to oil, and the most widely traded agricultural product. Its consumption has doubled in the last forty years as the drink has come to form part of a modern affluent lifestyle in the Global North (Tucker, 2011).

In fact, world coffee production was estimated to be around 141.9 million bags in crop year 2014/2015, while an initial estimate of world coffee consumption in calendar year 2014 was 149.3 million bags (ICO, 2014, 2015). This production represents an average annual growth rate of 2.3% over the past four years; statistical data shows similar growth rates in the first decade of the century (ICO, 2014, 2015).

World coffee consumption is characterised by different trends; more mature or traditional markets, such as those of Europe, the USA and Japan, are relatively stable, while emerging markets, particularly Africa and Asia, are recording significant increases, albeit from a relatively low base. The strongest growth over this time has been found in emerging markets, averaging 4.6% since 2011, with particularly strong demand in Russia, South Korea, Algeria and Turkey. Exporting countries have also been recording increased demand, at an average of 2.6%. Brazil, with 20.8 million bags for 2014, is by far the largest coffee consumer among exporting countries, followed by Indonesia (4.2 million), Ethiopia (3.7 million) and Mexico (2.4 million) (ICO, 2014, 2015).

The mature market and the traditional market account for over 50% of the world's total coffee consumption, but they do not drive global growth; in fact, these markets have been growing at a rate of 1.5% over the past four years. In particular, Europe has recorded relatively modest growth over this time, increasing on average 0.8% per year, while North America has registered 2.6% over the period (ICO, 2015).

In recent decades in these areas, especially in Europe, the traditional coffee market has transformed from a principally 'bulk' market – where the coffee was a commodity – to a market with quality and sustainability claims, where the product has become, in many cases, a 'speciality food'. In fact, this sector is now characterised by an increasing awareness regarding the implications of climate change, sustainability of production and new variations in consumer demand.

Therefore, since the late 1990s and the beginning of 2000, the sustainability debate has been directly linked to the coffee sector, so that coffee is regarded as the pioneering industry for sustainability standards and certification (Potts *et al.*, 2014).

In particular, in the traditional markets and especially in Europe, the increase in specialty coffee consumption is increasing the value of demand more than the volume, although the USA and Canada are still exhibiting considerable market growth. In addition, mainstream roasters are focusing on devel-

oping more individualised products for their consumers; this trend allows for price differentiation. Exporters should be aware of the increasing market segmentation for the distinct needs of individual consumers, such as Fair Trade and organic.

In addition to the better-known niche labels (Fair Trade and organic), a number of new schemes have emerged that focus on mainstream products. The most popular mainstream labels include 4C, UTZ Certified, Rainforest Alliance and the company labels Coffee and Farmer Equity (CAFE) Practices and Nespresso AAA. Standard compliant coffee production represented 40% of global production in 2012, with Brazil and Vietnam being the largest producers of standard compliant coffee by volume in 2011/2012 (Potts *et al.*, 2014). UTZ Certified (26% per annum from 2008 to 2012) and Rainforest Alliance (30% per annum from 2008 to 2012) are the fastest-growing labels. It is expected that certified farmers and exporters can bargain for a better income due to increased efficiency and insights into their position in the supply chain. However, oversupply can lead to reduced benefits for sustainable producers (Fairtrade Foundation, 2012; ICO, 2014, 2015).

Moreover, the coffee market is also defined by high price volatility and long-term declining profits for the producers, in particular for small producers (ICO, 2014, 2015) who are the weaker agents of a complex supply chain with many actors.

In fact, the agents of the coffee supply chain also have to face high price volatility. The causes of price volatility are largely systemic, and price speculation, unfavourable weather conditions and climate change have continued to drive price volatility. The current coffee market is influenced by speculation more than ever before. This is due to the prevailing uncertainty surrounding the damage to the Brazilian crop, together with higher than usual price volatility (ICO, 2015). In addition, oversupply and growing global production contribute to the ongoing profit decline in the coffee sector, which particularly affects profits for the growers. International efforts (*e.g.* by the International Coffee Organization – ICO) to secure a more stable and predictable relationship between supply and demand have not yet counteracted the ongoing price volatility. In this situation, product segmentation, price differentiation and supply chain coordination/integration are some useful strategies to tackle high price volatility. In addition, agents can adopt other strategies of risk management concerning financial and insurance instruments, such as futures, options and insurance policies.

Of note is that the coffee supply chain is very complex and involves many actors; by some reports, a coffee bean could change hands as many as 150 times along the commodity chain between the producer and the consumer. Almost 70% of the coffee produced worldwide is sold by thousands of very

small farms (with less than five hectares) to a few international traders and coffee roasters. The international traders and coffee roasters have recently undergone a process of horizontal and vertical integration; as a result, the main groups of traders and roasters have increased their market share, and the market power distribution among farmers, traders and roasters has become highly asymmetrical (Rotaris and Danielis, 2011).

In summary, it is possible to observe that coffee is one of the most important goods produced in developing countries (in many producing countries, coffee accounts for over 75% of total export revenue) and consumed (and also transformed) in developed countries. It therefore represents a symbol of the economic relations between these two world areas in a market characterised by imperfect competition, where the market power distribution between the agents (in particular between producer on one hand and traders and roasters on the other) is asymmetrical. For these reasons, the distribution of the added value between coffee market agents represents a fundamental ethical aspect of a traditional economic problem.

Organic and Fair Trade are two of the most important ethical attributes of coffee with specific labels. The success of an organic and/or Fair Trade coffee depends on several factors. One of the most critical is the willingness of consumers to pay a premium price for ethical attributes.

3.2 Ethical consumption of coffee

Ethical certification in the coffee sector dates back to 1967, when the first organic coffee was exported from Mexico. Although principally identified as production without chemical inputs, the organic movement was initially fuelled by an interest in building farm sustainability through improved soil health. Since then, organic production has grown to be associated with, and is largely fuelled by, a combination of ensuring both environmental integrity and personal health.

The first certification initiative to explicitly target trade itself as a tool for improving farmer livelihoods was the Max Havelaar label, established in Holland in 1988. This model, which required licensees (manufacturers) to pay a minimum price for coffee while also ensuring other trade benefits, was quickly adopted in other countries; these eventually came together to form Fair Trade Labelling Organizations International (FLO) in 1997. In addition to the specification of a minimum price, Fair Trade is exceptional in that it works only with democratically organised smallholders (i.e. those organised into cooperatives) while also specifying a fixed social premium to be distributed to the producer organisations for reinvestment in the local community (Adriani

and Becchetti, 2004; Araque-Padilla *et al.*, 2015; Becchetti and Rosati, 2007; Becchetti and Solferino, 2003; Fehr and Schmidt, 1999; Gallenti and Prestamburgo, 2001). It is estimated that while conventional supply chains distribute to the farmers 8% of the price paid by the final consumers, the Fair Trade supply chain awards the farmers 18% of such value. Finally, traders and coffee roasters get 83% and 73% of the shelf price within the conventional – and Fair Trade supply chain, respectively (Rotaris and Danielis, 2011).

In recent decades, organic and Fair Trade initiatives have continued to benefit from the growing corporate and consumer interest in sustainable sourcing, with constant growth well beyond that of the conventional coffee sector as a whole. The latest reported sales for both Fair Trade (2012) and organic (2011) are in the range of 130,000 metric tons (each approximately 2.1% of the 2012 coffee trade), making them major players in total sales of sustainable coffee (Potts *et al.*, 2014).

Numerous international and Italian studies have analysed consumers' preferences and consumers' WTP for ethical attributes of coffee certified by Fair Trade or organic labels. Prominent international level studies include Arnot *et al.* (2006), Basu and Hicks (2008), Cranfield *et al.* (2010), Galarraga and Markandya (2004), Loureiro and Lotade (2005), De Pelsmacker *et al.* (2005a), De Pelsmacker *et al.* (2005b), Hudson M. *et al.* (2012), Wolf and Romberger (2010) and Yang *et al.* (2012). In Italy we evidence the studies of Bosbach and Maietta (2011), Catturani *et al.* (2008), Cicia *et al.* (2010), Rotaris and Danielis (2011) and Maietta (2005, 2009).

These studies, in particular with reference to Italian consumers' behaviour, evidence a positive WTP for ethical attributes of coffee, in particular for organic coffee, related to some variables such as personal income, and increasingly over time.

4. Choice experiment design

We applied a CE to the Italian coffee market in order to define not only the ordinal ranking of preferences but also the WTP for the key characteristics of the product: organic and Fair Trade attributes.

In fact, since the market share of the organic and Fair Trade channel ultimately depends on the consumers' preferences for the characteristics of the product and on the premium price they are willing to pay for the organic and Fair Trade label, it is necessary to analyse the consumers' choices in order to estimate the market potential of these products. As explained above, Fair Trade is more closely related to the ethical behaviour of consumers and less tied to the intrinsic characteristics of the product; in addition, the organic la-

bel is more strongly linked to the health aspects of consumption, also presenting characteristics of ethical consumption.

From a methodological point of view, the CE method approximates real-world purchasing behaviour, and for this reason is widely used in economic research to study the valuation of public and private goods, including Fair Trade and organic ones (Arnot *et al*., 2006; Carlsson *et al*., 2010; Hanley *et al*., 1998; Hudson M. *et al*., 2012).

Moreover, this study uses for exploratory purposes the multinomial logit model (MNL) and examines a random effect specification by implementing a random parameter logit model (RPL). Unlike the traditional MNL, where consumers are assumed to be homogeneous, here heterogeneity in consumer preferences for coffee attributes is measured. Despite the traditional logit, the RPL model relaxes the limitations by offering particular flexibility, in order to deal with respondents' differences in choice decision strategies and choice consistency, which would otherwise lead to biased part-worth utilities (Hensher, 2010; Hess *et al*., 2013; McFadden and Train, 2000). The increasing use of a RPL model for the analysis of CE in food contexts has been underpinned by recognition of the heterogeneity in consumers' preferences and the desire to make this heterogeneity relevant for marketing segmentation purposes.

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 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.

Prior to developing the CE and analysing consumers' preferences towards coffee, we formed a focus group and conducted a pilot study during the process of designing the questionnaire.

Focus group discussions were used to obtain information about the dimensions of the quality of coffee that are important to individuals when choosing this product. Five main attributes and their levels were defined after the focus group screening (Tab. 3): geographic origin of coffee, organic product, Fair Trade product, recyclable package and price. To enable estimation of WTP, a monetary attribute with three levels was defined as the price for a 250g package. All five were among the top ten attributes identified in the focus groups. The levels of attributes were chosen to reflect the range of characteristics that respondents might expect to experience.

Tab. 3. Attributes and attribute levels used in the CE

Attribute	Levels
Geographic origin	Ethiopia; Indonesia; Brazil
Fair Trade coffee	Yes; no
Organic	Yes; no
Recyclable package	Yes; partially; no
Price (€/250g)	3; 5; 9

Source: Own elaboration

We conducted a face-to-face questionnaire survey among Italian consumers during 2013 and 2014 in the Friuli Venezia Giulia Region. A pilot survey was conducted involving 50 consumers filling in the pilot questionnaire. Before the survey, interviewers were trained in survey administration.

The questionnaire, which was completed by 420 respondents, included questions about respondents' socio-economic characteristics, coffee-related consumption habits, their specific knowledge of organic and Fair Trade coffee (section A of the questionnaire) and their perception of the Fair Trade coffee (section B of the questionnaire). As usual in this kind of study, interviewees were contacted in the main lobby area of a number of supermarkets, groceries and Fair Trade shops because of the product's characteristics. Financial incentives were not offered.

A fractional factorial orthogonal design was then generated using SPSS® software, with 18 alternatives (or profiles) selected. The profiles were randomly combined into choice sets, so that respondents had to face six groups with three treatment combinations each, plus the opt-out alternative.

To analyse data, we used a utility function for each considered option in the multinomial logit model (base model) as follows:

$$U(x_i) = \beta_0 \cdot \text{OPT-OUT} + \beta_1 \cdot \text{INDONES}_i + \beta_2 \cdot \text{BRAZIL}_i + \beta_3 \cdot \text{FAIR}_i + \beta_4 \cdot \text{ORG}_i + \beta_5 \cdot \text{REC}_i + \beta_6 \cdot \text{NOREC}_i + \beta_{price} \cdot \text{PRICE}_i ,$$

where:
OPT-OUT = dummy for the 'none of these/no choice' option;
INDONES = dummy for origin from Indonesia;
BRAZIL = dummy for origin from Brazil;
FAIR = dummy for Fair Trade coffee attribute;
ORG = dummy for organic coffee;
REC = dummy variable for recyclable package;

NOREC = dummy variable for no recyclable package;
PRICE = price in €/kilo.

The βs coefficients can be considered as the marginal utilities of each attribute of the utility function.

5. Results

Table 4 shows the main characteristics of the respondents. The sample was highly diverse in key socio-demographic variables, which was helpful in understanding the factors affecting the coffee-buying attitudes. Of the 420 respondents, 62% were women. Each relevant age group was represented. Regarding level of education, 50% of the respondents had successfully completed high school and 32% held a university or postgraduate degree. More than half of the respondents were employed (54%), 16% were students or housewives and 22% were retired.

As for their knowledge and habits in terms of consumption of coffee, most members of the sample knew Fair Trade (71%) and organic coffee (92%), and 46% and 58% consumed them respectively.

The analysis of the data was performed using a RPL model, with the results obtained summarised in Table 4. The estimation of the model was conducted using NLOGIT® 4.0. As regards distributional assumptions made about the chosen random parameters, we opted for a triangular distribution. Although we did not observe the WTP, we could estimate the respondents' WTP from the RPL model. In addition, we were able to obtain individual specific parameters, and consequently WTP values for each respondent.

All the coefficients of the model had the expected sign except Fair Trade coffee, and they were all statistically significant ($p<0.005$). The model appeared to have a good ability to interpret the phenomenon (pseudo r-squared = 0.29; Tab. 5). We noticed that respondents tended to prefer coffee produced in Brazil, where the most traditional coffee is produced, not taking into consideration coffee quality. Their mean WTP was € 3.3. In addition, while literature shows a large range of WTP premiums for Fair Trade coffee (Van Loo *et al.*, 2015), in our study it seemed to decrease respondents' utility. According to Basu and Hicks' (2008) results, this could be due to the lack of knowledge about this type of certification and the abovementioned positive impacts on improving the livelihoods and wellbeing of producers. In order to better understand the RPL results for this attribute, and to take into consideration latent heterogeneity, we analysed the cumulative frequency distribution of individual WTPs. From the analysis of this distribution, it was possible to observe that more than half of respondents had a positive

Tab. 4. Questionnaire: Section A

Respondents' characteristics	Contents	Sample (%)	Friuli Venezia Giulia Region (%)	Italy (%)
Gender	Female	*62*	*48*	*49*
Age	Less than 25 years	*8.2*	*21*	*24*
	25-40	*35.6*	*20*	*21*
	41-55	*27.6*	*23*	*23*
	56-70	*23.1*	*19*	*17*
	Older than 70	*5.5*	*17*	*15*
Education	Primary and lower secondary	*17.9*	*49*	*55*
	Secondary	*50.0*	*38*	*34*
	Graduate	*31.6*	*13*	*11*
	Other	*0.5*	/	/
Employment	Employee	*43.2*		
	Entrepreneur/professional	*10.8*		
	Students/housewife	*15.6*		
	Retired	*22.5*		
	Other	*7.9*		
Knowledge of Fair Trade coffee	Yes	*71.5*		
Consumption frequency of Fair Trade coffee	Occasionally	*46.2*		
Knowledge of organic food	Yes	*91.7*		
Consumption frequency of organic food	Occasionally	*57.8*		

Source: Own elaboration

WTP for this attribute, highlighting the significant heterogeneity among respondents.

However, our findings demonstrate that consumers seemed to be mainly interested in pointing out the opportunities of organic coffee, as respondents were willing to pay a premium price for the organic attribute (€ 2.8). Moreover, they were also willing to pay for recyclable packaging (€ 2.5), while not having recyclable packaging seemed to decrease their utility (€ 4.7).

Tab. 5. Random parameter logit model results

	Coeff.	Std. Error	T-value	P-value	WTP estimate (€ per 250 g)
Random parameters in utility functions					
INDONES	-0.378	0.109	-3.471	0.000	-2.2
BRAZIL	0.569	0.110	5.174	0.000	3.3
FAIR	-0.744	0.131	-5.660	0.000	-4.3
Non-random parameters in utility functions					
OPT-OUT	-3.948	0.211	-18.725	0.000	
PRICE	-0.173	0.015	-11.489	0.000	
ORG	0.495	0.168	2.944	0.003	2.8
REC	0.432	0.071	6.119	0.000	2.5
NOREC	-0.814	0.122	-6.656	0.000	-4.7
Derived standard deviations of parameter distributions					
INDONES	0.929	0.128	7.248	0.000	
BRAZIL	1.009	0.092	10.962	0.000	
FAIR	0.972	0.077	12.541	0.000	

McFadden pseudo $R^{-squared}$= 0.29
Log-likelihood = -2,474.63
Number of observations: 2,520

Source: Own elaboration

6. Conclusions

This study examined attitudes towards organic and Fair Trade coffee among Italian consumers. The findings provide an understanding of how consumers perceive Fair Trade and organic attributes of coffee. The RPL results showed that respondents tend to be more concerned with organic attributes than with Fair Trade coffee. Nevertheless, the analysis also identified a considerable heterogeneity among respondents, and a consistent group of them were willing to pay a premium price in order to consume a Fair Trade coffee. However, these findings could be due to several factors: a) the attributes we considered in our CE, as we compared Fair Trade coffee with the organic attributes, while other studies did not consider this comparison. Because our respondents had to consider two ethical attributes, they could have decided to place more importance on environmental and safety considerations (organic production)

instead of the social impacts of the Fair Trade system; b) sample dimension; c) socio-economic characteristics of the respondents; d) interview location or the type of shop (supermarket vs. specialty store); and e) the heterogeneity of the sample investigated influencing the results. In particular, consumers with strikingly different socio-demographic, demographic, economic and consumptive behaviour variables could have had a different WTP for Fair Trade coffee.

These aspects underscore an important area of further research and exploration – consumer WTP in distinct markets.

These findings can be viewed as part of a more comprehensive work to understand consumer behaviour. First, they can be used for developing further research to improve producers' strategies by reflecting what consumers perceive as important; second, they can be used to improve consumers' knowledge about Fair Trade products and their impacts.

According to Bosbach and Maietta (2011) and Schollenberg (2012), consumers in developed countries are increasingly interested in the consumption of products that incorporate ethical aspects; however, it seems obvious from our study that consumers need more information about Fair Trade products. In fact, while other studies (e.g. Rotaris and Danielis, 2011) stated that respondents were willing to pay a significant premium price for certified Fair Trade coffee, our results suggest that a group of respondents were not.

It is well known that the coffee sector has been the testing ground for many of the sustainability initiatives operating across commodity sectors today. As such, the sustainable coffee market is one of the most mature markets currently in operation.

Differentiated and value-based coffees, including environmentally and socially certified products, present an opportunity for small rural producers to participate in the cost-competitive global coffee market. Indeed, securing a market position based on ethical certification is potentially a viable long-term strategy for coffee-producing smallholders.

Ethical consumption mixes the role of consumer with that of citizen. There is much talk about consumers' informed choice, and most actors in the food supply chain and elsewhere support the idea in principle (Cosmina *et al.*, 2016). However, informed food choice with respect to ethical issues in the agri-food sector is still limited. In particular, in the coffee market, ethical certification is not supported sufficiently by a traceability system. In fact, traceability has been implemented in the agri-food sector in general, and in particular inside the EU, but ethical traceability has not.

Ethical traceability has the potential to function as a communication strategy for empowerment and involvement in ethical aspects of food production. This is true both for actors in the food supply chain and for consumers. For actors in the food supply chain, ethical traceability and informed food choice

can help define the 'value-laden' and ethical qualities of their products, and thus contribute to the 'identity' of their products. For consumers, ethical traceability is paramount both for making informed food choices and for engaging in ethical issues related to food production. According to the Akerlof theorem (1970), the adverse effects of asymmetric or incomplete information give rise to 'adverse selection' and an inefficient market equilibrium that highlights the importance of an effective labelling system based on the traceability system.

Ethical traceability is put forward as a potential goal for traceability systems to allow for, and to enable, a more open and democratic approach for consumers to act as citizens in the marketplace through their purchasing decisions by asking for and obtaining the information they desire about food production practices. The realisation of ethical traceability will need to negotiate both these modern supply chain complexities and their governance, and the existing private sector and public sector-endorsed ethical traceability forms in the food system.

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Xiaohua Yu[1],
Zhifeng Gao[2],
Satoru Shimokawa[3]

[1] Courant Research Centre 'Poverty, Equity and Growth' and Department of Agricultural Economics and Rural Development University of Goettingen, Germany
[2] Food and Resource Economics Department, University of Florida, USA
[3] School of Political Science and Economics, Waseda University, Japan

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Consumer preferences for US beef products: a meta-analysis

By conducting a meta-analysis with 57 observations collected from 20 primary studies, we systematically analyze heterogeneities in consumer preferences for the Country-of-Origin-Labeling (COOL) of US beef products. We find that consumers often prefer their domestic beef products due to patriotism. Consumers in Asian (mainly, Korea and Japan) and European countries (such as France, Germany and UK) are willing to pay significantly lower prices for US beef products compared to their domestic products; while the US consumers are willing to pay more for the domestic products than the imported ones.

1. Introduction

Food labeling is an important tool for promoting and distinguishing food quality in many countries. In order to promote the competitiveness of domestic food products and provide better information to consumers, many countries (such as the US, the members of the EU, Japan and South Korea) have introduced mandatory Country-of-Origin Labeling (COOL) for food products, and it invokes a lot of arguments either from political perspectives or from academic perspectives (Carter and Zwane, 2003, Krissoff *et al*., 2004). The US beef industry is an important case, as the 2002 US Farm Bill, taking effect in September 2004, mandated COOL for fresh and frozen food commodities[1].

Opponents of COOL argue that it may decrease the profits of producers and retailers because of the high costs of labeling, record-keeping, and operating procedures, necessary to ensure compliance with these regulations, and it could also create 'deadweight' loss because of the distorted producer and consumer prices. Furthermore, international trade conflicts could be raised because COOL

[1] COOL was mandatory for fish and shellfish in 2004 and is required for beef, lamb, chicken and other covered commodities by September 30, 2008.

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is considered as a non-tariff barrier to trade (Carter and Zwane, 2003; Brester *et al.*, 2004a and 2004b). On the other hand, proponents of COOL insist that consumers have a 'right to know' the country of origin (COO) of products and that COOL is a valuable marketing tool (Lusk *et al.*, 2006). Product information is often asymmetric in markets and COOL can help consumers, at least partially, to solve the problem of imperfect information because the country of origin can serve as a proxy for product quality. Growers and ranchers have largely supported COOL because they regard it as a non-tariff barrier to trade that can potentially provide producers with a competitive advantage in domestic markets (Carter and Zwane, 2003; Umberger, 2004). Klain *et al.* (2014) find that the value of information conveyed in a label is positive for beef products in the US.

A meta-analysis of consumer preferences regarding the country of origin of food products by Ehmke (2006) indicates that consumers are willing to pay a premium for domestic food products, which can be explained by consumer ethnocentrism and patriotism (Lusk *et al.*, 2006). The US is the largest producer and consumer, and the fourth largest exporter for beef products in the world. In 2013, US produced 11.76 million metric tons of beef products, and about 10% is exported (USDA, 2014). Hence, it has attracted quite a number of studies on consumer preferences for US beef, which generally find that US consumers are willing to pay a premium for 'Certified U.S.' beef products, indicating that they believe that the domestic beef might be safer, of higher quality and fresher. However, the variations of premiums are quite large across different studies and different regions (Umberger, 2004; Gao *et al.*, 2010b). Most studies on consumer willingness-to-pay (WTP) for US food products support the policy of mandatory COOL in the US.

The attitudes of non-US consumers towards US beef products are quite dispersed across different regions. Studies in Japan (Aizaki *et al.*, 2006; Peterson and Burbidge, 2012), Korea (Chung *et al.*, 2009; Unterschultz *et al.*, 1998; Lee *et al.*, 2013), Norway (Alfnes *et al.*, 2003; Alfnes, 2004), Germany (Tonsor *et al.*, 2005), and UK (Meas *et al.*, 2014) find that the WTP for US beef products is negative in these countries compared with local beef, which implies that these consumers favor domestic beef products. However, studies in Spain (Beriain *et al.*, 2009), France and the UK (Tonsor et *al.*, 2005) show positive WTP for US beef products, which indicates that consumers in these countries prefer US beef to local counterparts.

It would be very important to scrutinize the variations of consumer preferences for the COOL with respect to US beef products in the current literature, given the fact that US is the largest producer in the world. Table 2 shows the main exported markets of US beef products. In 2013, the exported value amounted to $ 5.71 billion, about the 10% of the production, of which 66% is exported to Canada, Mexico, Korea and Japan.

Tab. 1. World major producers, consumers, importers and exporters for beef and veal (1,000 metric tons)

	2010	2011	2012	2013
Production				
US	12,046	11,983	11,849	11,757
Brazil	9,115	9,030	9,307	9,675
EU	8,101	8,114	7,708	7,470
China	5,600	5,550	5,540	5,637
India	2,842	3,244	3,450	3,850
World Total	57,576	57,422	57,623	58,620
Consumption				
US	12,038	11,646	11,739	11,617
Brazil	7,592	7,730	7,845	7,885
EU	8,202	8,034	7,760	7,602
China	5,589	5,524	5,597	5,959
Argentina	2,346	2,320	2,458	2,664
World Total	56,427	55,718	56,090	56,825
Import				
US	1,042	933	1,007	1,021
Russia	1,058	994	1,032	1,031
Japan	721	745	737	760
HK	154	152	241	473
China	40	29	99	412
World Total	6,622	6,413	6,652	7,423
Export				
Brazil	1,558	1,340	1,524	1,849
India	917	1,268	1,411	1,765
Australia	1,368	1,410	1,407	1,593
US	1,043	1,263	1,113	1,172
New Zealand	530	503	517	529
World Total	7,822	8,095	8,164	9,165

Source: USDA (2014)

Tab. 2. Top markets for US beef

Year	Japan		Mexico		South Korea		South Korea		Total Export		
	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value	% of Production
	Million lbs	$Million	Million lbs	$Million	Million lbs	$Million	Million lbs	$Million	Billion lbs	$Billion	%
2002	771	854	629	615	597	619	241	286	2.447	2.629	*9.0*
2003	918	1,182	586	623	587	754	227	309	2.518	3.186	*9.6*
2004	12	31	333	393	1	2	56	105	0.46	0.631	*1.9*
2005	17	50	464	584	1	3	106	194	0.697	1.031	*2.8*
2006	52	105	660	786	1	4	239	415	1.145	1.617	*4.4*
2007	159	294	586	732	78	124	339	575	1.434	2.187	*5.4*
2008	231	439	759	895	152	291	389	683	1.996	3.014	*7.5*
2009	274	495	628	770	141	215	363	622	1.935	2.909	*7.4*
2010	351	662	500	669	277	504	391	731	2.3	3.839	*8.7*
2011	456	873	488	791	380	661	500	1,039	2.785	5.041	*10.6*
2012	449	1,000	352	647	305	548	467	1,189	2.453	5.114	*9.4*
2013	671	1,283	403	738	253	567	463	1,190	2.584	5.711	*10.0*

Source: ERS, USDA

Many factors can influence the estimates of consumer preferences for the COOL of US beef, including methodologies, samples, as well as study place and time (Umberger, 2004; Ehmke, 2006). The meta-analysis is widely used for synthesizing the empirical studies in economic analysis (Nelson and Kennedy, 2009; Tian and Yu, 2012; Santeramo and Shabnam, 2015; Chen *et al.*, 2016; Zhou and Yu, 2015). In order to find out the systematic differences in consumer preferences for US beef products across countries and to shed some light on current mandatory COOL compliance as well, this paper conducts a meta-analysis to study consumer WTP for US beef products from 20 primary studies, which employed different methods and provided a total of 57 observations of the WTP for US beef products in different countries. Furthermore, this paper could also give some implications of the methodological issues in the current literature.

2. Method

A few meta-analyses have studied consumer preferences for COO across different food products. For instance, Ehmke (2006) collected 13 studies with 27 observations of WTP for COO and finds that consumer WTP for COO depends on the number of other credence attributes included in product descriptions and the location of the consumers. Such a meta-analysis ignored the heterogeneities of food products. Clearly the effect of COO on vegetables would be different from that on meat. Additionally, to the best of our knowledge, no meta-analyses have specifically focused on COO of US beef products, even though the beef industry is a very important part of US agriculture and many studies have been done regarding consumer preferences for US beef products.

In an assessment of 130 meta-analyses in the field of environmental and resource economics, Nelson and Kennedy (2009) separate the estimation heterogeneity into factual and methodological heterogeneities. The methodological heterogeneity refers to the heterogeneities in the current literature that are caused by methodological reasons, such as sampling methods, econometric models, or estimation approaches; while the factual heterogeneity means that the heterogeneities are caused by factual reasons, such as the differences in time, regions, cohorts or products.

Following Nelson and Kennedy (2009), and Zhou and Yu (2015), first, we will separate the variation of consumer WTP for the COO of US beef products into factual and methodological heterogeneity. Factual heterogeneity mainly refers to study location. The current literature has pointed out that consumers usually prefer domestic to imported food products, as COO is linked to patriotism (Meas *et al.*, 2014). It is reasonable that US consumers are willing to pay a

higher price for US beef products, while consumers in other countries on the contrary are willing to pay a lower price for it. We categorize the study locations into the US, Asia, and European countries, and the remaining countries (Canada and Mexico) and use dummy variables to control for this heterogeneity.

Lusk and Schroeder (2004) also point out that methodological differences can impact the studies of WTP and that choice experiments usually lead to a higher probability of payments. In the current literature, contingent valuation methods (CVM), experimental auction, and choice experiment (CE) are three main methods used to estimate consumer WTP. In order to capture the methodological heterogeneities, we comprise methodological dummy variables (CE and auction, as compared to CVM) in the regression.

Nelson and Kennedy (2009) point out that the effect-size of samples in different primary studies can generate non-homogeneous variances and smaller variances are more reliable. In order to control the heterogeneities caused by sample size, we include the sample sizes as an independent variable. Considering that the 57 observations derive from 20 papers, it can be argued that some papers may produce multiple observations. This could lead to the issue of intra-paper correlation, which biases the standard errors. We use the clustered sandwich estimator to correct the standard errors.

Furthermore, the methods of choice experiments (CE) are increasingly used in this field. For instance, 37 out of the 57 observations used in this study are obtained from CE methods. In order to study the heterogeneities in CE methods, we also perform a separate regression by using only the 37 CE observations. It is well known that experiment designs (number of attributes), survey approaches (online survey or in-person), survey time, and estimation strategies (multinomial Logit or mixed multinomial Logit) play significant roles in the choice experiment (Gao *et al.*, 2010a; Gao *et al.*, 2010b; Hensher, 2006; Islam *et al.*, 2007; Yu *et al.*, 2014a). These methodological heterogeneities in choice experiments can also be scrutinized in this step, so that it might also be possible to derive important methodological implications for the use of choice experiments in the future.

3. Data

Using the two academic search engines: Google Scholar and AgEcon Search, we collected 20 primary studies , which yield 57 observations of the WTP values for the COO of US beef products, out of which 27 observations relate to US consumers, 15 to European consumers, 13 to Asian consumers and the remaining 2 relate to Mexico and Canada. In the Appendix, we have listed all these primary studies and provided a brief introduction, including

survey country, survey year, sample size, eliciting methods, estimation methods, type of the beef products, and WTP values.

The mean WTP of all observations is -2.20$/lb, less than zero, though it is not much meaningful. When separating the samples, we found that all 29 US observations are positive and their mean value is 3.57$/lb. This implies that US consumers are willing to pay 3.57$/lb more for domestic compared with non-US beef products without controlling for other variables, thus showing that the current literature is quite consistent and indicates that COO does increase consumer welfare for beef products in the US.

On the other hand, the mean of the 28 non-US observations is -8.17$/lb and less than zero. It implies that non-US consumers are willing to pay 8.17$/lb less for US beef products than for domestic products. These statistics also show that the perceptions of US and non-US consumers regarding US beef products are quite different. Within the non-US observations, the mean WTP value for 13 Asian samples is -15.90$/lb, while the mean for 13 European countries is -2.86$/lb. Table 3 reports the t-tests for the difference between US, Asian and European consumers. It indicates that US consumers are willing to pay significant higher values for US beef than European consumers; whilst the WTP values for Asian consumers are significantly lower than those for European consumers.

Table 4 in turn presents definitions and descriptive statistics with respect to all variables included in the meta-analysis.

In the current literature, WTP for the COO of US beef products can be elicited by three different approaches: the contingent valuation method (CVM), the choice experiment (CE) and the experimental auctions. Out of the 57 observations, 37 are from choice experiments, 9 were derived using the CVM, and the remaining 11 are based on experimental auctions. The mean WTP values are -3.53$/lb, 0.64$/lb, and -0.01$/lb for CE, CVM and auctions respectively. These figures indicate that the differences with respect to methods are significant, also consistent with the literature.

Tab. 3. Comparison of WTP values between different regions

Countries	Sample size	mean WTP	US	Asian	European
US	29	3.57 [0.73]		t=7.04	t=4.42
Asian	13	-15.90 [3.85]			t=3.16
European	13	-2.86 [1.46]			

Note: Standard Errors are reported in [ ]

t-ratios are reported for each pair

Tab. 4. Description of the variables

Variables			Full Sample			US Studies			Non-US Studies			Choice Experiment		
			Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
Dependent Variable	WTP	WTP for US beef ($/lb)	-2.20	-49.00	12.19	3.57	0.20	12.19	-8.17	-49.00	9.89	-3.53	-49.00	12.19
Methodological Heterogeneities	Auction	Obs from Auctions=1, otherwise=0	0.19	0	1	0.24	0	1	0.14	0	1	0.00	0	0
	CE	Obs from Choice Experiments=1, otherwise=0	0.65	0	1	0.45	0	1	0.86	0	1	1.00	1	1
	CVMt	Obs from CVM=1, otherwise=0	0.16	0	1	0.31	0	1	0.00	0	0	0.00	0	0
	Sample Size	Sample Size in the study	388.33	10	1171	326.07	74	1171	452.82	10	1066	490.89	10	1171
Factual Heterogeneities	EU	Study in Europe=1, otherwise=0	0.22	0	1				0.46	0	1	0.24	0	1
	US	Study in US=1, otherwise=0	0.51	0	1							0.35	0	1
	Asia	Study in Asia=1, otherwise=0	0.23	0	1				0.46	0	1	0.35	0	1
	Other Countries	Study in Other countries=1, (Canada and Mexico); otherwise=0	0.02	0	1				0.04	0	1	0.03	0	1
Methodological Heterogeneities in CE	MMNL	Estimated by Mixed Multinomial Logit Model (MMNL, or Random Parameter Logit)=1; and by Multinomial Logit Model (MNL)=0										0.76	0	1
	Attributes	# of Attributes in Choice Experiment										4.51	2	9
	Online	Surveyed by Internet=1, otherwise=0										0.49	0	1
# of WTP Obs.				57			29			28			37	

In the next part, we will statistically analyze the dispersion in consumer preferences for the COO of US beef products by conducting a meta-analysis.

4. Results and Discussions

We estimate three meta-analysis models from two different categories: Model (1) and (2) using the full observations, and Model (3) only considering the CE observations. The results are reported in Table 5. We find that the results are quite consistent.

4.1 Full-Observation Models

The first two columns in Table 5 report the estimation results for full samples. Model (1) in the first column includes all possible variables (full model), while Model (2) in the second column only includes the dummy variables for country (region) difference (restricted model) for the purpose of comparison.

In general, we look at the factual heterogeneities, and we detect significant regional differences in WTP values for US beef products. In the full model, consumers' WTP values in Asian countries (mainly Japan and South Korea) and European countries are on average 23.01$/lb and 7.84$/lb respectively lower than those in US. The results are statistically significant at the levels of 1% and 5% respectively. Even though consumers in Canada and Mexico (other countries) have a higher WTP, it is not statistically significant. Similar results are found in the restricted model, and it shows robustness of the results. The results are consistent with the current literature in which consumers are usually willing to pay higher price for domestic products due to patriotism. Such a result mirrors a strong local preference for beef in most countries. The US beef is heavily discriminated in Japan, Korea and European countries, where the US and the local beef products are segregated by country-of-origin into two different markets, which cannot compete with each other.

Regarding the methodological heterogeneities, even though we find that coefficients for CE and Auction are respectively 7.48 and 1.59, unfortunately they are not statistically significant. It implies that the research approaches do not play significant roles for studying the WTP for COO of US beef products.

The coefficient for sample size is -0.007 and statistically significant at the level of 10%. It implies that estimated WTP for COO of US beef products would decrease when sample size increases. It is plausible that the distribution of the sample is not a symmetric normal distribution, and that it is slightly skewed toward to the left.

Tab. 5. WTP for US beef for the Choice-Experiment methods

Variables	All Sample		CE Sample
	(1)	(2)	(3)
Asia	-23.01***	-19.68***	-24.43***
	(4.534)	(6.573)	(4.254)
EU	-7.844**	-6.643**	-8.664
	(3.343)	(2.528)	(5.056)
Other Countries	2.386	1.430	6.739
	(3.860)	(1.567)	(6.830)
Auction	1.594		
	(1.414)		
CE	7.479		
	(4.752)		
Sample Size	-0.00708*		-0.0102***
	(0.00349)		(0.00308)
Online	0.0226		3.961
	(4.585)		(5.801)
MMNL			-10.92*
			(6.069)
Attributes			2.433
			(1.606)
Intercept	2.380**	3.783**	7.316
	(1.062)	(1.567)	(7.825)
Observations	57	57	37
R-squared	0.614	0.534	0.741

Note: ***, ** and * denotes the significant level of 1%, 5% and 10%, respectively
Cluster effect standard errors for papers in parentheses

Recently, online surveys have become more popular than the other survey methods, such as personal surveys and mail surveys. However, it is argued that online surveys may incur significant bias, because some consumers who do not use Internet are neglected. We hence include a dummy variable of online survey to control for the difference in survey methods. The estimated coefficient is 0.023, but not statistically significant. It implies that survey methods are not important for WTP results.

4.2 Choice-Experiment Observations

As CE approaches are increasingly used in the current literature, there are many arguments regarding the methodological issues, such as experiment design and estimation methods (Boxall *et al*., 2009; Gao *et al*., 2010a). Out of the 57 observations in this study, 37 are obtained from choice experiments. We can also use only this subset of observations to examine the heterogeneities among them. Similarly, we divide the heterogeneity into factual and methodological heterogeneity.

Similar to the aforementioned analyses, the factors considered with respect to factual heterogeneity include study locations (the US, Asia, Europe and other countries). Methodological heterogeneities in choice experiments are mainly caused by their design, such as in terms of the choices of attributes, sample size, survey methods and econometric methods. For instance, Hensher (2006) and Gao *et al*. (2010a) point out that the design of choice experiments can affect the results significantly. In particular, both the interaction between attributes and an increase in the number of attributes can increase the information load and cause confusions in answers of respondents. Therefore, the number of attributes and the effective sample size should be included in the meta-analysis.

Similar to the above full sample regression, we also include a dummy variable (online survey vs. other methods) in the regression in order to capture the heterogeneity. In addition, there are two major econometric methods for estimating choice experiments: the multinomial Logit model (MNL) and the mixed multinomial Logit model (MMNL), which may also cause some methodological heterogeneity in WTP. Consequently, a dummy variable capturing the choice of econometric methods is also included in the regression.

The estimation results are reported in the third column in Table 5. We find that only the coefficients for Asia, Sample Size, and MMNL (mixed multinomial logit) are statistically significant, and other variables are not so important for explaining the heterogeneity in the WTP. Basically, the results are consistent with the Full Sample model (Model (1) and (2)).

First, similar to the results in Model (1) and (2), consumers of the Asian countries have a significantly lower WTP value for US beef products, compared with US consumers. The coefficient is -24.43. Then the coefficient for EU is -8.66, but not statistically significant any more here.

Second, sample size and MMNL belong to the factors of methodological heterogeneities. In particular, the coefficient of the sample size variable is -0.010 and is statistically significant at the 1% level, which implies that the WTP for US beef will decrease as the sample size increases, similar with the results in the full-observation model and consistent with the current literature (Boxall *et al*., 2009; Lusk and Anderson, 2004). In addition to the skewed dis-

tribution, it is also possible that choice experiments often yield some high outliers of WTP values, and an increase in sample size can reduce some bias.

The coefficient for MMNL is -10.92 and statistically significant at 10%. It implies that MMNL could yield significantly lower WTP values. It is well-known that MMNL could capture some heterogeneity in consumer preferences. Therefore, it could reduce the outliers in estimation process, and could make the WTP values more robust.

The results also indicate that other methodological-heterogeneity variables, such as survey methods (online vs. other survey methods), and the number of attributes, are not statistically significant.

5. Conclusion

In order to protect their domestic agriculture, many developed countries have introduced mandatory compliance of Country-of-Origin Labeling. This caused a lot of arguments both domestically and internationally. As an important agricultural product in the US, many studies on the consumer preferences for the country-of-origin of US beef products have been conducted using different methods in different countries, and the results are quite disperse.

This paper collected 57 observations of consumer WTP for the COO of US beef products in different countries from 20 primary studies and uses a meta-analysis to systematically analyze the heterogeneities within the observations.

We divide the heterogeneities of WTP into factual and methodological heterogeneities, and find that consumers' WTP values for US beef products in Asian countries (mainly Japan and South Korea) and European countries on average are 23.01$/lb and 7.84$/lb respectively, lower than those in US. The US beef is heavily discriminated in Japan, Korea and European countries, where the US and the local beef products are segregated by country-of-origin into two different markets, which cannot compete with each other.

In addition to a possible increase in consumer welfare by conveying more production information, COOL is also an effective instrument to promote the competitiveness of domestic beef products when producers face a sharp competition of imported products in the case of US beef products.

It is sure that COOL could increase consumer welfare due to better information provision. However, it may not promote the market competiveness of domestic products in some countries under a complicated situation of domestic food safety, in particular where consumers generally lack trust on the labeling (Yu *et al.*, 2014a; Yu *et al.*, 2014b). The policy makers should be cautious before introducing mandatory COOL, and more research hence is needed.

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Appendix: Summary of the Primary Studies

#	Study	Country	Survey Year	Sample size	Format	Method	Attrib-utes#	Estimation	Products	WTP	Units
1	Aizaki *et al.* (2006)	Japan	2005	351	Mail	CE	2	MMNL	US Beef	-1126	JPY/100g
	Aizaki *et al.* (2006)	Japan	2005	351	Mail	CE	4	MMNL	US Beef	-642	JPY/100g
	Aizaki *et al.* (2006)	Japan	2005	351	Mail	CE	3	MMNL	US Beef	-505	JPY/100g
2[a)]	Alfnes (2004)	Norway	2000	1066	In-person	CE	4	MMNL	US Hormone-Free Beef	-47.8	NOK/kg
	Alfnes (2004)	Norway	2000	1066	In-person	CE	4	MNL	US Hormone-Free Beef	-52.89	NOK/kg
	Alfnes (2004)	Norway	2000	1066	In-person	CE	4	MMNL	US Hormone-Treated Beef	-226.75	NOK/kg
	Alfnes (2004)	Norway	2000	1066	In-person	CE	4	MNL	US Hormone-Treated Beef	-264.52	NOK/kg
3	Alfnes *et al.* (2003)	Norway	2000	106	In-person	Auction			US Hormone-Free	-5.78	NOK/0.5 kg
	Alfnes *et al.* (2003)	Norway	2000	106	In-person	Auction			US Hormone-Treated	-14.94	NOK/0.5 kg
	Alfnes *et al.* (2003)	Norway	2000	106	In-person	Auction			US Hormone-Free	-10.61	NOK/0.5 kg
	Alfnes *et al.* (2003)	Norway	2000	106	In-person	Auction			US Hormone-Treated	-21.38	NOK/0.5 kg
4[b)]	Beriain *et al.* (2009)	Spain	2008	290	In-person	CE	3	MNL	US Beef	11.73	% of price
5	Chung *et al.* (2009)	Korea	2007	1000	In-person	CE	7	MNL	US Beef	-13.35	$/lb
	Chung *et al.* (2009)	Korea	2007	1000	In-person	CE	8	MMNL	US Beef	-14.63	$/lb
6	Gao and Schroeder (2009)	US	2006	74	Online	CE	3	MMNL	US Beef Steak	9.09	$/12 oz
	Gao and Schroeder (2009)	US	2006	74	On-line	CE	4	MMNL	US Beef Steak	6.31	$/12 oz
	Gao and Schroeder (2009)	US	2006	76	Online	CE	4	MMNL	US Beef Steak	5.26	$/12 oz
	Gao and Schroeder (2009)	US	2006	76	Online	CE	5	MMNL	US Beef Steak	9.14	$/12 oz
	Gao and Schroeder (2009)	US	2006	211	Online	CE	3	MMNL	US Beef Steak	4.61	$/12 oz
	Gao and Schroeder (2009)	US	2006	211	Online	CE	4	MMNL	US Beef Steak	3.03	$/12 oz
	Gao and Schroeder (2009)	US	2006	187	Online	CE	4	MMNL	US Beef Steak	2.33	$/12 oz

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#	Study	Country	Survey Year	Sample size	Format	Method	Attrib-utes#	Estimation	Products	WTP	Units
	Gao and Schroeder (2009)	US	2006	187	Online	CE	5	MMNL	US Beef Steak	3.89	$/12 oz
7	Killinger *et al.* (2004)	US	2002	124	In-person	Auction			US Beef Steak	0.86	$/lb
	Killinger *et al.* (2004)	US	2002	124	In-person	Auction			US Beef Steak	0.52	$/lb
8	Loureiro and Umberger (2002)	US	2002	243	In-person	Contingent		Single-Bounded	US Beef	1.9	$/lb
	Loureiro and Umberger (2002)	US	2002	243	In-person	Contingent		Single-Bounded	US Beef Hamburger	1.33	$/lb
9	Loureiro and Umberger (2005)	US	2003	632	Mail	Contingent		Single-Bounded	US Beef Steak	0.198	$/lb
10	Loureiro and Umberger (2005)	US	2003	632	Mail	CE	5	MNL	US Beef Steak	7.568	$/lb
11	Sitz *et al.* (2005)	US	2002	273	In-person	Auction			US Beef Steak	1.2	$/lb
	Sitz *et al.* (2005)	US	2002	273	In-person	Auction			US Beef Steak	0.38	$/lb
12	Tonsor *et al.* (2005)	UK	2002	121	In-person	CE	5	MMNL	US Hormone-free Beef	2.07	$/lb
	Tonsor *et al.* (2005)	Germany	2002	65	In-person	CE	5	MMNL	US Hormone-free Beef	-3.74	$/lb
	Tonsor *et al.* (2005)	France	2002	62	In-person	CE	5	MMNL	US Hormone-free Beef	5.96	$/lb
13 [a)]	Tonsor *et al.* (2007)	US	2006	1009	Online	CE	6	MMNL	US Beef Steak	11.59	$/lb
	Tonsor *et al.* (2007)	Canada	2006	1002	Online	CE	7	MMNL	US Beef Steak	9.89	$/lb
	Tonsor *et al.* (2007)	Japan	2006	1001	Online	CE	8	MMNL	US Beef Steak	-29.62	$/lb
	Tonsor *et al.* (2007)	Mexico	2006	993	In-person	CE	9	MMNL	US Beef Steak	5.21	$/lb
14	Umberger *et al.* (2003)	US	2002	141	In-person	Contingent		Single-Bounded	US Beef Steak	0.36	$/lb
	Umberger *et al.* (2003)	US	2002	132	In-person	Contingent		Single-Bounded	US Beef Steak	0.48	$/lb
	Umberger *et al.* (2003)	US	2002	273	In-person	Contingent		Single-Bounded	US Beef Steak	0.42	$/lb
	Umberger *et al.* (2003)	US	2002	141	In-person	Contingent		Single-Bounded	US Beef Hamburger	0.36	$/lb
	Umberger *et al.* (2003)	US	2002	132	In-person	Contingent		Single-Bounded	US Beef Hamburger	0.36	$/lb

(Continued on page 195)

(Continued from page 194)

#	Study	Country	Survey Year	Sample size	Format	Method	Attrib-utes#	Estimation	Products	WTP	Units
	Umberger *et al.* (2003)	US	2002	273	In-person	Contingent		Single-Bounded	US Beef Hamburger	0.36	$/lb
	Umberger *et al.* (2003)	US	2002	141	In-person	Auction			US Beef Steak	1.03	$/lb
	Umberger *et al.* (2003)	US	2002	132	In-person	Auction			US Beef Steak	0.57	$/lb
	Umberger *et al.* (2003)	US	2002	273	In-person	Auction			US Beef Steak	0.81	$/lb
15 [a) b)]	Unterschultz *et al.* (1998)	Korea	1995	43	In-person	CE	4	MNL	US Beef	-10.85	% of price
	Unterschultz *et al.* (1998)	Korea	1995	10	In-person	CE	4	MNL	US Beef	-19.51	% of price
	Unterschultz *et al.*(1998)	Korea	1995	11	In-person	CE	4	MNL	US Beef	-8.23	% of price
	Unterschultz *et al.* (1998)	Korea	1995	22	In-person	CE	4	MNL	US Beef	-10.96	% of price
16	Abidoye *et al.* (2011)	US	2005-2006	1171	Online	CE	9	MNL	US beef	2.01	$/lb
17	Lee *et al.* (2013)	Korea	2012	500	Online	CE	3	MNL	US beef	-21.09	$/kg
18	Lim *et al.* (2014)	US	2010	1000	Online	CE	5	MNL	US beef	7.33	$/lb
	Lim *et al.* (2014)	US	2010	1000	Online	CE	5	MNL	US beef	5.75	$/lb
19	Meas *et al.* (2014)	UK	2013	402	Online	CE	5	MNL	US beef	-4.34	Pound/pack (.375 kg)
20	Peterson and Burbidge (2012)	Japan	2006	313	Online	CE	5	MNL	US beef	-501	yen/100 g
	Peterson and Burbidge (2012)	Japan	2009	103	Online	CE	5	MNL	US beef	-276	yen/100 g

Note: a) Alfnes (2004), Tonsor *et al.* (2007) and Unterschultz *et al.* (1998) did not calculate the WTP for the attributes of US beef products. We use the equation (5) in Nahuelhual *et al.* (2004) to compute the WTP values in stead.

b) Beriain *et al.* (2009) and Unterschultz *et al.* (1998) only give the WTP as percentage of prices, and we can get the WTP in cash by timing it with prices. Bardají I. *et al.* (2009) give the mean price of certified PGI beef is €3.37/kg in Navarra region of Spain, the same region with the experiment field of Beriain *et al.* (2009), and it is used for calculating the WTP in cash in Unterschultz *et al.* (1998). And Chung *et al.* (2009) give that mean price of beef in Korea in 2007 is $ 30/kg which is used in calculating the WTP in cash for Unterschultz *et al.* (1998).

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