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Research article

Evaluating consumer perceptions of social farming through choice modelling

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ABSTRACT

This study aims to analyse consumer attitudes and to value their willingness to pay a premium price for ethical food from social farming by applying discrete choice experiment methodology. Two real products, zucchini and eggs, that were cultivated in an organic social farm with work inclusion by people with autism spectrum disorders (ASDs) were considered. We relied on these two products due to their different origins (vegetal and animal) and, in the case of eggs, to compare the willingness to pay for social farming and the preservation of animal welfare. We collected 255 complete questionnaires, and our results show that respondents have a positive willingness to pay for both products if they are obtained with the work inclusion of people with ASDs. For the work inclusion of adults with ASDs, the interviewees expressed a mean WTP of 0.69 € for a box of 6 eggs and 0.85 €/Kg for zucchini. This is particularly important in supporting the economic sustainability of an activity, i.e., social farming, that typically has higher production costs and therefore needs to be supported by public subsidies. The positive attitude of consumers in terms of their willingness to pay a premium price for these products could potentially allow a strong hybridization between profit (agriculture) and nonprofit (social) activities, which could potentially both guarantee economic sustainability to firms and benefit society. Such hybridization has its roots in the view of agriculture as an integral part of the community, where each member is doing his or her part with concrete actions, including those connected to consumption choices that contribute to support the social positive externalities generated by farmers' activities.

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1. Introduction

Social farming (SF) or care farming can be defined as “the use of commercial farms and agricultural landscapes as a base for promoting mental and physical health, through normal farming activity” (Hine et al., 2008). SF is a retro-innovative solution (Stuiver, 2006) that promotes the multifunctional use of agricultural resources (plants, animals, farm spaces and relationships) to reinforce and enhance health/social protection nets both in rural and urban areas (Di Iacovo et al., 2016). In Italy, social farming was legally defined in 2015 by Law 18/08/2015 n.141. Some Italian regions had already legislated social farming before the national law, others did it after 2015, and the remaining regions are still defining the SF legislation.

Despite the legal definition of social farming and the growing interest concerning these arguments, data on Italian SF are insufficient for understanding its dimension and characteristics. According to previous statistics of the Italian National Institute of Statistics (ISTAT), SF interested 470 farms in 2003, providing work integration and social inclusion of some 7100 disadvantaged people (Franco et al., 2007). In 2016, the Research Centre for Agricultural Policies and

Bioeconomy (CREA-PB) compiled a database of approximately 1200 operators, drawing on document information, sites, available publications and websites dedicated to the topic (Giarè, 2017).

Considering the multifunctional role of agriculture, one of several social dimensions of agricultural activities is related to the ability of farming to foster the labour inclusion of vulnerable people, such as persons with autism spectrum disorders (ASDs).¹ Autism is a serious social problem throughout the world: it is estimated that 1 in 160 children worldwide has an ASD, and the prevalence appears to be increasing globally (World Health Organization, 2017).

Until now, social initiatives to support people with ASDs have focused mainly on children with ASDs. In most cases, young people with ASDs who complete their compulsory education cannot count on support or training projects for their work integration. However, a number of studies have shown the need for special programmes for employment support of adult autistic subjects (Brugha et al., 2011; Ganz, 2007; Howlin and Moss, 2012; Knapp et al., 2009). Some interesting projects have been funded to test patterns for introducing

¹ Autism spectrum disorders' (ASDs) comprise different types of life-long, pervasive developmental disorders connected to social interaction and communication associated with stereotyped patterns of behaviour (Torricco et al., 2017).

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Table 1
The attributes and levels used in the choice experiment.

Attributes	Levels	
	Zucchini DCE	Egg DCE
Use of labour from disabled people	yes; no	yes; no
Place of production close to the consumption market	yes; no	yes; no
Compliance with animal welfare procedures	–	yes; no
Price	2.00 €/kg, 2.30 €/kg, 2.60 €/kg	€2.40, €2.70 and €3.00 for a pack of six eggs

agriculture employment to adults affected by ASDs (SWANS² in 2013; ²³ Torquati et al. (2019)). Beyond the large benefits in terms of well-being, learning communication skills and real employment in some cases, these projects highlight the need for great public support in terms of subsidies paid to social farms. Furthermore, as emphasized by Di Iacovo et al. (2016), the economic crisis reduced the possibility for state intervention in support of social farming in Italy (where our case study is located) and “SF initiatives are not funded by health/social services”. This is a strong limitation to the possibility that in the future, there may be a wide diffusion of the inclusion of people with ASDs in farm activities that is actually based on the local capacity to create synergies between the private and public sectors (Torquati et al., 2015).

SF provides several positive externalities and benefits to society (such as social inclusion, social protection, labour inclusion, social responsibility, and social capital) and can be seen as an important tool for the diversification of agriculture. Despite SF often implies increased costs of production (Kinsella, 2014; Vadnal, 2006), such diversification could give SF a competitive advantage if the “ethical content” of their produce is properly recognized and valorized by final consumers. In this respect, one opportunity to reduce the need for public support is given by the possibility that consumers are willing to pay a premium price for the produce coming from social farming. In this way, it would be possible to increase the prices of the goods sold, receiving a reward for the positive social externalities and consolidating over time the economic sustainability of the social farm. The possibility of increasing the market power depends essentially on the characteristics of the demand, namely, consumer preferences for social farm food (SFF). From a marketing perspective, the ethical content of SFF can be classified as a credence attribute (Andersen, 1994; Nelson, 1970; Wilde, 1980), which cannot be directly experienced by the final consumer. In this respect, SFF success depends on the direct connection/knowledge of the producer or, if the market model does not rely on a short-chain, a certification with a respective labelling scheme.

While several studies have focused on the analysis of consumer preferences for the environmental dimension of sustainability, only a few studies have concentrated on the social and ethical dimension of

consumption preferences.⁴ Some authors (Auger et al., 2003; Uusitalo and Oksanen, 2004; Vermeir and Verbeke, 2006) found that consumers are generally ready to consider the ethical attributes of a product only when the other dimensions are not compromised. In a recent study, Nassivera et al. (2017) found that social consciousness and health consciousness had a positive impact on the perceived quality of SFF. Carbone et al. (2009) found that people with particular attention to ethical consumerism and members of consumer buying groups are more likely to buy SFF. According to the authors, one of the major factors explaining the reluctance to buy SF products is the lack of information about their social quality.

The majority of studies that tried to estimate the ethical dimension of food products in monetary terms considered consumer preferences for fair trade labels (Arnot et al., 2006; Basu and Hicks, 2008; Hainmueller et al., 2015; Howard and Allen, 2008) but to date, no other study has tried to value whether or not consumers are willing to pay more for the social externalities provided by the agricultural products obtained from SF.

To fill this gap, our study aims to value consumer attitudes towards ethical food from SF. We applied the methodology of discrete choice experiments (DCEs) to analyse the determinants of consumer demand for two products (zucchini and eggs) cultivated by a social farm.

In this way, it was possible to estimate consumers’ willingness to pay a premium price for the products coming from social farms that employ people affected by ASDs and test the possibility that the hybridization between profit (agriculture) and nonprofit (social) activities is able to both guarantee economic sustainability to firms and benefit society. In this respect, consumers can foster the role of agriculture as a tool for social inclusion by “voting with their wallet” (van der Schoor and Scholtens, 2015).

The paper is organized as follows: section two, after a brief description of the social farm under analysis, focuses on the presentation of the methodology used (DCE), experimental design, questionnaire design, consumer sample selection and data collection. In section three, we present the results, and, in the last section, we discuss the results and draw the conclusions of our study.

2. Materials and methods

2.1. Study structure

To determine whether people are willing to pay a premium price for products cultivated by people affected by ASDs, we developed two choice experiments: the first was related to zucchini and the second was related to eggs. Each respondent was asked to take part in both DCEs in the same questionnaire: first about zucchini and second about eggs. We opted for 2 choice experiments rather than a single experiment to test if the willingness to pay for social work was sensitive to the type of product: first, vegetal origin (zucchini) and second, animal origin (eggs). According to the literature, (Bennett et al., 2012; Lagerkvist and Hess, 2011; Nocella et al., 2012; Olesen et al., 2010), consumers place great importance on animal welfare when facing the choice of products of animal origin, and therefore, in the case of zucchini, we excluded such influence, while in the case of

² Sustainable Work for Autism Networking Support (SWANS), Progress Programme Pilot projects on the employment of persons with autism spectrum disorders. European Commission. <http://www.swans-autism.eu/swans-project/>.

⁴ According to Uusitalo and Oksanen (2004), while considering ethical consumption preferences, a “consumer considers not only individual but also social goals, ideals and ideologies”. Examples of “the ethical and moral aspects present in production and delivery of goods, [are] the use of child labour, suppressing or preventing labour unions”, animal welfare and production activities that foster the social inclusion of vulnerable people.

Attributes	Buying: Option A	Buying: Option B	Not buying
Type of workers	Not disabled worker labour and disabled workers	Not disabled worker labour	
Place of production	Anywhere	Close to the consumption market	
Price (€/kg)	2.60	2.00	
Your choice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Fig. 1. A choice card presented in the zucchini discrete choice experiment.

Attributes	Buying: Option A	Buying: Option B	Not buying
Type of worker	Not disabled worker labour	Not disabled worker labour and disabled workers	
Place of production	Anywhere	Close to the consumption market	
Animal welfare	Non-compliance	Compliance	
Price for a pack of six eggs (€)	2.40	3.00	
Your choice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Fig. 2. A choice card presented in the egg discrete choice experiment.

Table 2
Sample socio-economic characteristics.

Sample size (n.)	255
Gender	
Men	107 (42.0%)
Women	148 (58.0%)
Age	
<21	1 (0.4%)
21–30	50 (19.6%)
31–40	85 (33.3%)
41–50	57 (22.4%)
51–60	50 (19.6%)
>60	12 (4.7%)
Education level	
Primary or middle school certificate	8 (3.1%)
High school certification	68 (26.7%)
Bachelor's degree	51 (20.0%)
Master's degree or PhD	128 (50.2%)
Average number of family members	3.09 (sd=1.25)
Consumer association membership	18 (7.1%)
Voluntary association membership	57 (22.4%)
Income	
Low	5 (2.0%)
Medium low	109 (42.7%)
Medium high	137 (53.7%)
High	4 (1.6%)

eggs, we included animal welfare among the DCE attributes, so that we could also check the relative importance of the socially farmed product along with the other attributes usually considered salient in the literature.

To make the experiment as realistic as possible, we considered an existing social farm that employs people with ASDs. Therefore, the products presented to respondents in the DCE were supposed to be

produced by a real social farm, La Semente.⁵ La Semente selects its agricultural activities based on the following criteria: wide diversity of production processes, high modularity of tasks, wide use of manual labour, short and overlapping production cycles, presence of year-round activity, and availability of space for side activities. Hence, the production of vegetables and/or fruit, poultry production and product processing within the farm with organic methods makes no use of chemicals that are harmful to humans or the environment.

Nine autistic adults are guests at the La Semente daycare centre and are supported by healthcare operators in a 1 to 1 ratio, and they carry out daily operations normally required by poultry farming and horticultural production. The activities, which take no more than 90 min per day for each individual user, include feeding animals, collecting and packaging eggs in cardboard containers, cleaning shelters, planting and transplanting vegetables, watering and picking, washing produce, packaging produce in small containers and selling.

The farm products are mainly sold by means of the social solidarity purchasing group of the Italian Association of Organic Agriculture (AIAB), structured as the Organized Group of Demand and Offer (OGDO) (Torquati et al., 2016; Viganò et al., 2012), and the farm Solidarity joint Purchasing Group (

⁵ The daycare centre at La Semente was founded by the National Association of Autistic Subject Parents (NAASP, or ANGSA in Italian), and it hosts nine adults with ASDs. The goal of this therapeutic and socio-rehabilitative centre is to foster the acquisition of skills for the attainment of the best possible levels of personal autonomy, social interaction, and engagement in the world of work for its autistic guests. In 2013, La Semente founded a social farm with work inclusion of people with ASDs.

Table 3
Importance of factors in choosing a food product in %.

	No importance	Little importance	Moderate importance	High importance	Very high importance	Total
Product health safety and hygiene	0.4	3.9	12.2	39.2	44.3	100
Trust in the producer	0.8	3.5	20.4	46.3	29	100
Organoleptic characteristics (taste, flavour)	0	1.6	20	53.7	24.7	100
Convenience (discounts or offers)	2	9.4	41.2	31	16.5	100
Quality certifications (PDO, GPI , STG, Organic, Integrated production method)	2	14.9	41.2	31.8	10.2	100
Price	1.2	10.6	53.3	29.8	5.1	100
Sales services (parking room, bargain offers, home delivery)	14.1	35.3	31.8	16.5	2.4	100
Brand	5.9	32.9	43.1	16.1	2	100
In-product services (processed food, ready to use)	24.3	42.7	23.5	7.5	2	100

Number of respondents: 255

Table 4
RPL model results for organic zucchini.

	Coef.	Std. Err.	z	P > z	WTP ^b	WTP ^b [95% confidence interval]	
						Mean	Inf.
Mean							
ASC ^a	10.149	0.970	10.47	0.000			
Socwork ^a	3.086	0.303	10.2	0.000	0.85	0.70	1.00
Local ^a	2.375	0.264	9.01	0.000	0.65	0.52	0.78
Price	-3.642	0.320	-11.39	0.000			
Standard deviation of random parameters distribution							
ASC	4.585	0.642	7.14	0.000			
Socwork	2.738	0.296	9.25	0.000			
Local	2.449	0.271	9.05	0.000			

LL: -904.83872, Pseudo R-squared: 0.4617, Respondents: 255, Observations: 4590.

^a Random parameter assumed to be normally distributed.

^b €/kg.

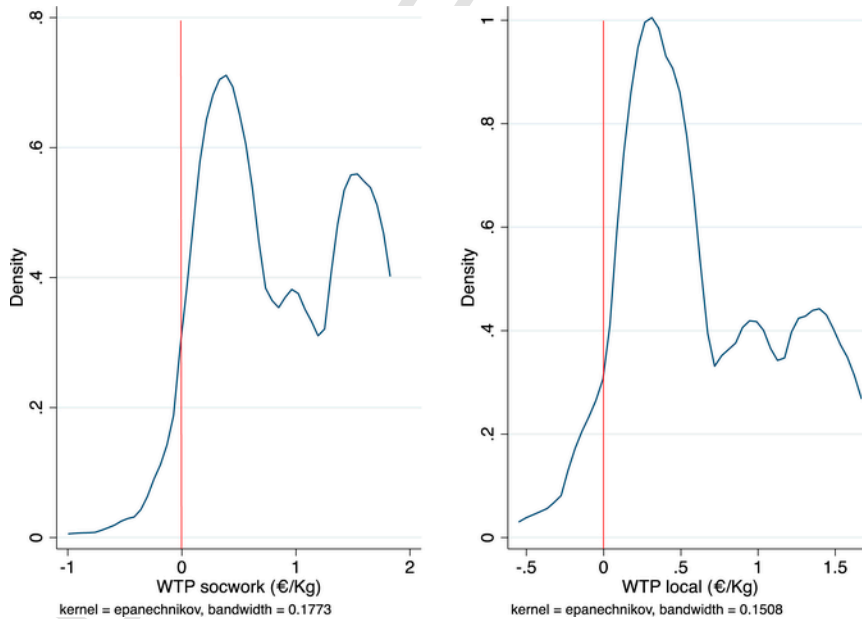


Fig. 3. Kernel density functions of the heterogeneity of the random parameters for the zucchini DCE.

Table 5
RPL model results for eggs.

	Coef.	Std. Err.	z	P> z	WTP ^b [95% Conf. Interval]		
					Mean	Inf.	Sup.
Mean							
ASC ^a	3.849	0.770	5.00	0.000			
Socwork ^a	1.575	0.224	7.03	0.000	0.69	0.46	0.91
Local ^a	1.162	0.162	7.18	0.000	0.51	0.36	0.66
Animwelf ^a	4.929	0.464	10.63	0.000	2.16	1.69	2.62
Price	-2.285	0.284	-8.03	0.000			
Standard deviation of random parameters distribution							
ASC	4.365	0.544	8.02	0.000			
Socwork	1.415	0.342	4.13	0.000			
Local	0.905	0.270	3.35	0.001			
Animwelf	2.656	0.316	8.39	0.000			

LL: -878.67256, Pseudo R-squared: 0.4773, Respondents: 255, Observations: 4590.

^a Random parameter assumed with normal distribution.

^b € for six-eggs package

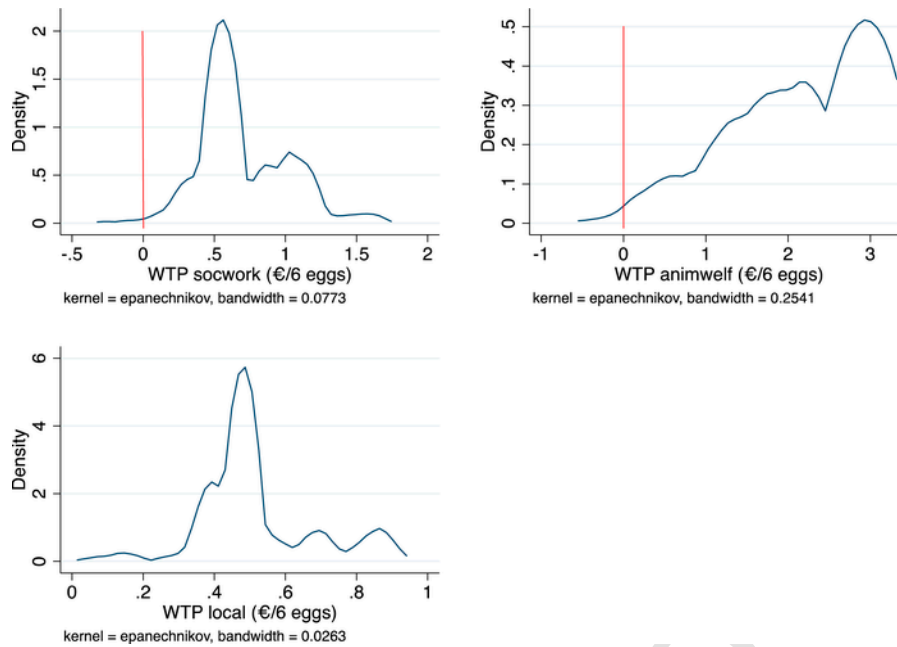


Fig. 4. Kernel density functions of the heterogeneity of the random parameters for the egg DCE.

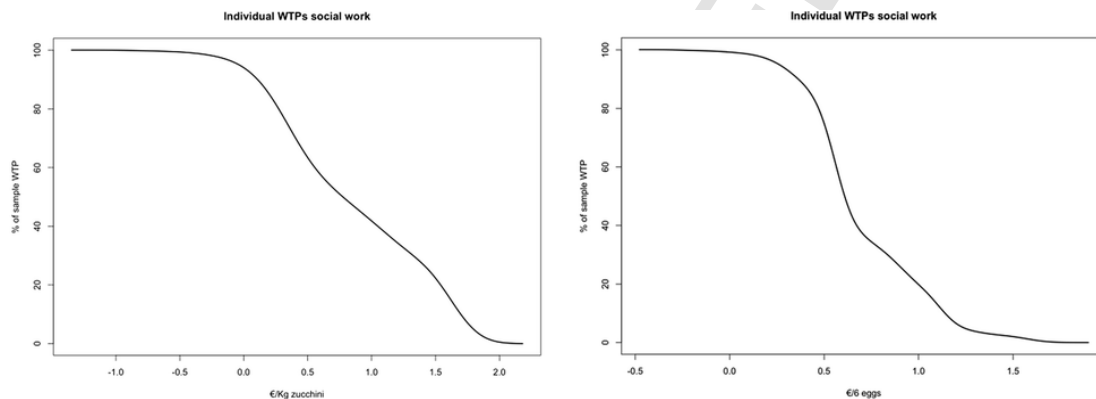


Fig. 5. Inverse cumulative density functions of individual WTPs for the attribute social work.

SPG), built around the members of the National Association of Autistic Subject Parents (NAASP, or ANGSA in Italian).

In 2015, the total revenue of the farm was equal to € 29,270, while the costs were equal to € 43,980. In the absence of public support, the operating result would be largely negative (-14,710 €), and the farm might no longer be able to employ autistic people in the future.

2.2. The choice experiment

The discrete choice experiment (DCE) methodology (Hensher et al., 2005) behavioural pillars are rooted in Lancasterian consumer theory (Lancaster, 1966); information processing in judgement and decision making in psychology (Lichtenstein and Slovic, 1971); and random utility theory, which forms the basis of several models related to consumer decision making in psychology and economics (Manski, 1977; McFadden, 1974; Yellott, 1977).

The DCE methodology finds its application in the fields of marketing, health economics, transportation and environmental valuation. Data are collected by means of a questionnaire in which respondents are requested to choose the product or policy scenario that they prefer

among those presented in each choice set. The proposed products are usually presented in pairs plus a “none of these” or “no-buy” option. They are differentiated by the levels of some common key characteristics (attributes). Specifically, each attribute can be qualitative or quantitative and is associated with a vector of levels (i.e., considering attribute price, which is quantitative, its levels are the various prices, and in our zucchini DCE, the levels are 2 €/kg, 2.30 €/kg and 2.60 €/kg). The researcher proceeds in the experimental design (Rose and Bliemer, 2009), creating different choice profiles by means of a statistical optimizing procedure where the combinations of the attribute levels are varied in each profile. The choice profiles (also known as choice options) are then grouped in the choice sets. The respondents are then requested to choose for each choice set (usually from 3 to 8) their preferred option depending on the characteristics of each option.

Looking specifically at the design of our two DCEs, the attributes chosen for the construction of the scenarios (Table 1) strictly refer to the ethical attributes of the agricultural products sold by La Semente farm: the use of labour by adults with ASDs; the place of production close to the consumption market; and compliance with animal welfare procedures (just for the choice experiment on eggs). Price was

added to the other attributes, while the organic production method was not considered a choice attribute but instead the basic condition of the product. The first 3 attributes were differentiated by 2 levels each: (i) grown/reared only with the labour of workers who were not disabled or with workers who were not disabled and disabled workers; (ii) grown/raised in the vicinity of the place of consumption or from any location; and (iii) farmed using techniques that respect animal welfare or not.

For the price attribute, 3 levels were chosen: 2.00 €/kg 2.30 €/kg, and 2.60 €/kg for the zucchini and € 2.40, € 2.70 and € 3.00 for a pack of six eggs. The intermediate price level represents the cost of production for La Semente social farm.

The questionnaire and the first experimental design were developed following the indications collected in a focus group (see Hoyos (2010) for further details about the role of focus groups in the experimental design) with 5 participants of the SPG_A and 3 families who normally purchase from the OGDO. The questionnaire was later tested (in February 2015) with face-to-face interviews with 24 families who were members of the SPGGAS_A.

In March 2015, the analysis of the results obtained from the 24 test interviews allowed for the development of a *D_p-efficient* experimental design (Rose and Bliemer, 2009) (see Figs. 1 and 2 for an example choice card) and the final version of the questionnaire. The final design consisted of 6 choice cards presented to respondents in each choice experiment (6 for zucchini and 6 for eggs). The agricultural products – zucchini and eggs – selected for the survey were flagship products of the spring–summer period of 2015. These products were visible to the interviewees and shown in some box schemes at the fair booths at La Semente during the events, which were also attended to collect the questionnaires.

Data were analysed using a random parameter logit model (RPL) (Train, 2009). The choice to rely on such model is due to its property of not being subject to the independence from irrelevant alternatives (IIA) hypothesis and to its ability to provide insights on respondents preference heterogeneity.

Two distinct models were estimated: one for the zucchini DCE and one for the egg DCE. In both cases, a linear and additive utility function was applied. In the DCE involving zucchini, the function was specified as follows:

$$U(X_i) = \beta_{ASC} \times ASC + \beta_{socwork} \times SOCWORK + \beta_{local} \times LOCAL + \beta_{price} \times PRICE \quad (1)$$

In the DCE concerning eggs, the function applied was:

$$U(X_i) = \beta_{ASC} \times ASC + \beta_{socwork} \times SOCWORK + \beta_{local} \times LOCAL + \beta_{animwelf} \times ANIMWELF + \beta_{price} \times PRICE \quad (2)$$

where ASC is a dummy variable assuming a value 0 if the option is “no choice” (“none of the two products”), SOCWORK is a dummy variable indicating if the product suggested was obtained using labour from adults with ASDs, LOCAL is a dummy variable indicating if production takes place in proximity to the consumer market, ANIMWELF is a dummy variable assuming a value 1 if the rearing technique respects animal welfare and PRICE is a continuous variable indicating the price of the product (€/kg for zucchini and €/pack for 6 eggs in the case of eggs).

2.3. Data collection and questionnaire structure

The data were collected by means of a questionnaire submitted to people during various events (fairs and markets) in which La Semente farm took part in 2015 to disseminate and publicize their activities. A total of 260 questionnaires were collected, of which 255 were found suitable for the analysis. Considering the places where the people were recruited, the sample cannot be considered representative of the whole Italian population. However, the choice of the sample was driven by the necessity to analyse the behaviour of the people belonging to the actual market segment of La Semente social farm. In other words, it is unrealistic to conjecture that the social farm under analysis could sell its products through other market channels (e.g., the large-scale retail trade). As noted by Carbone et al. (2009), social farms sell their products mainly directly to consumers or through short chains given that their products are limited, and in this respect, our sample reflects the real niche market of social farms.

The questionnaire was structured in 4 sections. The first section presented the survey, which included an information box describing the attributes of the products used in the DCE, such as the labour inclusion of disabled people, the organic production technique, local production and animal welfare. The second section focused on food buying habits, the frequency of buying organic products, participation in SPGs, and the level of knowledge of the meaning of social agriculture and fair trade. The third section presented the DCE choice tasks to the respondents. The fourth and final section presented questions related to the socio-economic characteristics of the interviewees (age, education level, place of residence, sex, city of residence, employment status, number of family members, and living standards).

3. Results

3.1. Respondents' characteristics

Looking at the socio-economic characteristics of our sample (Table 2), women represented 58% of the respondents, the majority of the sample (33.3%) belonged to the 31–40 age class and 50% of the interviewees had a high education level (master's degree or higher). The answers concerning employment status showed a sample of consumers predominantly with a job, with a prevalence of employees (35%) and professionals (17%). The number of family members on average was 3 units, while the sample was predominantly from Umbria (81%) and lived mostly in urban areas. The majority of the interviewees claimed to have a medium-high living standard (54%), and another 43% claimed to have a medium-low living standard.

The interviewees spent on average € 423 per month purchasing food products that they bought mostly in hypermarkets and supermarkets and to a lesser extent at discount stores or using a SPG. A minority of the interviewees also purchased food products in local markets or directly from farms. Of the total amount spent on food, only 10% was spent purchasing organic products. Six percent of the sample consumers were members of a SPG, which they used to make 44% of their food expenditures.

A total of 69% of the sample consumers bought organic vegetables, and only a small percentage, 7%, bought them regularly once a week. Approximately 62% of the sample consumers bought organic eggs, and among them, 20% did so once a week. Almost all interviewees managed the family purchasing either individually or together with another family member.

The majority of the interviewees (52%) had heard of SF, although they had never bought food from a social farm. The main causes of

this behaviour were that they would need more information about the goals of the companies that deal with SF and a greater availability of these products in both traditional and unconventional sales channels.

The most important factors in buying food products were high health and hygiene safety, trust in the producer and good organoleptic characteristics (Table 3). Also important was the possibility of buying with some form of bargain offer. Quite surprising, quality certification (PDO, **GPI**, Organic, etc.) was not a priority for our interviewees.

3.2. Choice experiment results

The DCE results are reported in Table 4 for the zucchini and Table 5 for the eggs.

Considering the zucchini DCE results, the estimated parameters (Table 4) were all significant considering a 99% confidence interval, and the model had great interpretative capability (McFadden pseudo R-squared: 0.462) considering the standards for these models. All the parameters had the expected sign. The RPL model showed that there was a certain heterogeneity in the consumer preferences for all the random parameters (Fig. 3).

Considering the relative importance of the attributes analysed, "Social Farming" (SOCWORK) had the greatest impact on the interviewees' utility, followed by the place of origin of the product, which was closer to the place of consumption.

Ceteris paribus, the respondents from our sample on average were willing to pay (WTP) 0.85 €/kg more for one kg of organic zucchini if it was produced using labour by adults with ASDs, while for a local product, our average consumer would pay 0.65 €/kg more than for organic zucchini that did not have this feature.

Looking at the results of the egg DCE (Table 5), the model has a good fit (McFadden pseudo R-squared: 0.47), even in this case. All the estimated parameters were significant considering a 99% confidence interval and had the expected sign. In this case, the RPL model showed that there is a certain heterogeneity in consumer preferences for all the random parameters (Fig. 4).

The second choice experiment confirmed the high importance recognized by the interviewees of the social farming attribute, a factor that was highly regarded in making the hypothetical purchasing decisions. In this case, however, the attribute recognized as being of greater importance was the protection of animal welfare through proper rearing techniques. That the eggs were produced close to the consumer was the third ranked attribute in terms of influence on consumer utility.

The average WTP for a pack of 6 organic eggs produced in compliance with animal welfare standards was € 2.16, while social agriculture was given a premium price equal to € 0.69. In monetary terms, the lower relevance was attributed to the fact that the eggs were produced locally (mean WTP = 0.51 €).

The mean WTP values do not ensure that all the respondents were willing to pay the estimated premium price. To understand the share of the respondents that were effectively willing to pay the mean premium price, it is important to analyse the distribution of the random parameters and therefore the heterogeneity of the estimate individual WTP. We analysed the kernel density functions (Figs. 3 and 4) followed by the respective inverse cumulative density distribution (ICDF) (Fig. 5) of the individual WTPs obtained from the random parameters in the two models (Demartini et al., 2018; Lusk Jayson and Schroeder Ted, 2006; Lusk and Hudson, 2004; Vecchiato and Tempesta, 2015). The ICDF allowed us to determine the number of respondents in the sample that had a WTP that was greater or equal to a specific price. Therefore, it allowed us to find the market share for

each price of a specific good. The role of the ICDF in identifying the market share is described in detail in Lusk and Hudson (2004). The ICDF can be considered an approximation of a demand curve with the assumptions that the price equals the WTP and that the quantity purchased by each individual equals one. The ICDF can then be used in conjunction with simulations of the frequency of purchases to relax the hypothesis of the individual quantity purchased and to mimic a classic demand curve. From a mathematical viewpoint, the dependent variable in the ICDF is the integral of the kernel density function (Figs. 3 and 4) for the values on the right (which are therefore greater) of a certain WTP (reported on the X axis).

From the analysis of the ICDFs, 46.8% of respondents had an individual WTP greater than 0.89 €/kg for the attribute of social work for the zucchini: lowering the premium price to 0.5€/kg would increase the market share to 63.4% of those sampled, and a further reduction to 0.4 €/kg would enable 70.5% of those sampled to be reached.

Looking at the egg results, 38.3% of those sampled were willing to pay the mean WTP of 0.69€, while 52% of those sampled would be willing to pay a premium price of 0.6€. Lowering the premium price for social work to 0.5€ would find the availability of nearly 75% of those sampled.

4. Discussion and conclusions

The results obtained in the two choice experiments highlight how consumers are increasingly careful with regard to the characteristics of the food products they buy. Such attention is not limited to sensory aspects such as food taste, but it reaches much farther. This analysis has highlighted how consumers pay attention not only to the environmental sustainability of the production process but also to its social sustainability.

As found in other studies (Mauracher et al., 2013; Tempesta and Vecchiato, 2013), consumers tend to prefer domestic if not local products because they are aware of the positive effects that their purchasing choices can have on production. According to the mean WTP estimated in this work, consumers are willing to pay a premium price of 0.51 € for a box of 6 eggs produced locally, while for zucchini, this value rises to 0.65 €/kg. For the work inclusion of adults with ASDs, the interviewees expressed a mean WTP of 0.69 € for eggs and 0.85 € for zucchini. The WTP could perhaps be better defined in this case as a gift reciprocity that embraces the concept of altruism and fairness rather than a premium price.

The results suggest that for a kilo of organic zucchini that is locally produced with the aid of disabled workers, consumers would be willing to pay 1.50 €/kg more than the market price if we add up the average WTP or 1.22 €/kg more if you refer to the lower limit values (WTP - Inf.) of the 95% WTP confidence interval, which is recommended for the application of these estimates for marketing purposes. For a pack of 6 eggs, however, the sum of the lower limit values (WTP - Inf.) is equal to 2.51 €.

Based on the estimated WTP, the operating loss of La Semente social farm for 2015 would be turned into profit, allowing the company to remunerate all the resources used and to retain a safety margin for future production activities. Nevertheless, it should be taken into account that there is a gap between attitudes towards ethical issues and buying behaviour in the sense that interest in the theme and broad expressions of the intent to purchase do not always translate into actual purchases (Uusitalo and Oksanen, 2004). This is generally justified by the fact that interviewees are motivated to give "socially desirable" answers that, in reality, collide with other real factors (price,

personal preferences, and the variety of products) that reduce their inclination to purchase ethical products.

Another interesting result that has been confirmed in the literature (Carlsson et al., 2007; Font-i-Furnol and Guerrero, 2014; Lagerkvist and Hess, 2011) is the great importance that animal welfare has for consumers. For the purchase of eggs, in our study, the respondents showed a WTP of 2.16 €, a value 3 times higher than the value estimated for the “social work” attribute and 4 times higher than the value estimated for the “local” attribute. The magnitude of the WTP for animal welfare underlies the fact that consumers probably regard animal welfare as a prerequisite for the consumption of eggs. It is likely that such a high value is connected not only to a feeling of respect towards animals but also to the fact that it is a concept that is now quite familiar even for those who are neither a breeding expert nor an agriculture expert.

Consumers are generally ready to consider the ethical attributes of a product only when the other dimensions are not compromised (Auger et al., 2003; Uusitalo and Oksanen, 2004; Vermeir and Verbeke, 2006). Not all individuals perceive what is considered a “morally problematic situation” the same way, and what is considered right does not necessarily translate into a behaviour consistent with the beliefs (Srnska, 2004). Surely, correct and complete communication is one of the possible ally to succeed in the sale of products with ethical value. In fact, according to our results, the majority of the interviewees (52%) had heard of SF, although they had never bought food from a social farm. The reported causes of such behaviour were the need of information about the goals of the social farms and a greater availability of these products in both traditional and unconventional sales channels. Several studies have shown that the lack of specific information about these products is one of the causes that prevents ethical consumption from increasing according to the potential that derives from the interest of consumers (Carbone et al., 2009; Irving et al., 2002; McGregor, 2005). McGregor (2005) states that more information about ethical issues would increase consumer awareness in this regard by directing their purchases. To confirm this, some studies reveal that consumers of fair trade products are more idealistic and less conformist and willing to pay a higher price for fair trade products (De Peelsmacker et al., 2005). Moreover, the more profound the social and political conscience of consumers is and the more access they have to information on the production and origin of the products, the more they will prefer such products (Lyon, 2006).

As stated by Uusitalo and Oksanen (2004) “today consumers are more informed and educated” but in order to make ethical choice consumption they require more information about the ethical content of their purchase. Such information could act as a signal about the positive externalities of social farming. Direct purchase from the producer is a strategy to substitute a formal certification of such content with direct trust, reducing the asymmetry of information.

In this respect, it is possible to suppose that social farms that usually sell their products through short market chains have a competitive advantage because they have the opportunity to establish a direct relationship with consumers, therefore reducing the asymmetry of information that usually characterizes longer market chains. In this way, the consumer may know who is producing, the problems connected to the farm practices and may evaluate the importance of the support provided to a social activity by paying a premium price for social farm produce.

The creation of a specific label and certification for SF products could be an alternative strategy for signalling the ethical content of the SFF and reaching a wider potential market. Nevertheless, our results should be interpreted with caution when making forecasts about the potential success of a SF certification label: in fact, our sample

cannot be considered representative of the whole population and reflects the real niche market of social farms. In order to test the effectiveness of a SF label in a broader market and see if new potential customers are willing to pay a premium price for the social farming certified products further research is needed.

One further aspect that should be considered while taking into consideration our results is that the future of SF is not strictly linked to consumers willingness to pay a premium price for their produce. While in some cases social farms might be less efficient in terms of production, they might be more efficient than other public alternatives in providing positive externalities to society (i.e. work inclusion for disadvantaged people). The latter efficiency (not tested in this study) could justify public economic support to SF, therefore lowering the importance of consumers’ willingness to pay a premium price for their produce in order to ensure their economic sustainability. Consumers support is therefore crucial when two conditions subsist: lack of public support and bad economic performance of the social farm at the conventional market prices of their products. The success of SF depends on their ability to turn their “higher private costs” that result in “higher public benefits” into a higher profit, either in the form of a reward from customers or in the form of public support.

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Conflict of interest

The authors declare that they have no conflict of interest.

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