



Consumers' acceptability and sensory evaluation of a traditional local fresh potato variety

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Abstract

Aim of study: This research explores consumers' acceptance and sensory evaluation, and measures the willingness to pay (WTP) for the most important attributes of a locally grown fresh potato variety.

Area of study: Aragon, Spain.

Material and methods: Data were collected from two experiments. Experiment 1 (shopping stage) explored the product positioning and reveals consumers' acceptance using three measurements: visual appearance rating, purchase intent, and WTP. Experiment 2 (consumption stage) corresponds to a sensory ranking task (e.g., taste, smell, texture) conducted at home once the local potato was fried.

Main results: Consumers positively valued the visual appearance and were willing to purchase the local potato. The higher the ratings of visual appearance, the higher the consumers' intention to purchase the product. Women and participants who purchased food from supermarkets were more likely to buy the local potato. Conversely, consumers over 55 years old and those who belong to a lower level of household monthly income were willing to pay less for the local potato. After tasting, the participants' rating of the product remained unchanged; however, there was a negative rating of the odor once the local potato was fried.

Research highlights: Potato producers and vendors should consider that consumers associate the local origin label with observable (e.g., appearance of color, shape) and unobservable (e.g., taste, smell, texture) attributes. Therefore, in addition to promoting the local origin and the benefits of purchasing and consuming local food, further consideration should be given to featuring physical quality aspects such as the sensory properties of the food that are important to consumers.

Additional key words: fresh potato; Spain; visual appearance; sensory rating; willingness to pay

Abbreviation used: BDM (Becker-DeGroot-Marschak); EU (European Union); OL (overall liking); PI (purchase intent); WTP (willing to pay).

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Introduction

In the last decade consumers' interest in locally grown food has increased (Bir et al., 2019). Encouraged by this increase, the number of local farms supplying local fresh produce has also expanded. One reason for this increase in supply comes from proposed policies that promote local food direct purchase/sales to consumers (Soares et al., 2017). Evidence from previous research show that consumers are also responding through increased demand and are willing to pay (WTP) more for local fresh produce (Enthoven & Van den Broeck, 2021; He et al., 2021). Some reasons for this increase in demand for local food relates to the perceived benefits of high-quality food, nutritional value, and low environmental impact (Fernqvist & Ekelund, 2014; Enthoven & Van den Broeck, 2021; He et al., 2021). However, the term "local" is determined by the "credence" nature of attributes, meaning that the quality of the product cannot be verified either *ex-ante* or *ex-post* by consumers.

As pointed out by Darby & Karni (1973) sellers do not only provide food products on the market but presume they are fully aware of consumer's needs. The problem faced by consumers is the insufficient level of information available to judge whether the quality cues (e.g., local) provided by sellers can be trusted. For this reason, quality labels coming from reputable certification agents (e.g., government agencies) aim at lowering information asymmetry and transforming credence into search attributes (Darby & Karni, 1973). When the information is trusted by consumers based on their subjective knowledge, then credence attributes are considered as important quality cues that affect purchase decisions (Caswell & Mojduszka, 1996; Grunert & Wills, 2007). However, subjective knowledge is heterogeneous among consumers. For example, some studies found that consumers believe organic food products are healthier than non-organic food products (Gundala & Singh, 2021; Yeo et al., 2022). Likewise, consumers perceive local products to be fresher, tastier, and more nutritious than non-local food (Campbell et al., 2013; Meyerding et al., 2019). If consumers know that the food is produced locally and based on their subjective knowledge think local foods are fresher, then adding a "locally produced" label may not affect the decision to purchase the food, since the judgment of freshness can be done by visual observation (at least for unpacked and non-peelable goods that can be visually observed). Yet, if consumers perceive local foods as tastier, then adding the "locally produced" label will likely affect their purchase behavior since "taste" cannot be evaluated by a visual observation. Such notions indicate that credence quality cues directly and indirectly impact consumers' choices and influence the perceptions of the product's quality and the attributes that it possesses.

Research on consumer preference for local food is ample. Most scholars have mainly explored local food systems in the context of rural areas and their development (Mundler & Laughrea, 2016), the distribution of local food

(Hedberg & Zimmerer, 2020), and consumer behavior (Birch & Memery, 2020), among others. Within consumer behavior, most studies explore the influence of "local" as a credence quality cue on consumer food choices (Bazzani et al., 2017), and/or their interactions (Meas et al., 2014). However, considering just the credence aspects of the product has limitations, especially when it is demonstrated that search and experience attributes influence consumer preferences and purchase decisions (Hughner et al., 2007). Search attributes help consumers determine the quality of a product before purchase by exploring product characteristics (Caswell & Mojduszka, 1996). Experience attributes remind consumers of the positive/negative characteristic from a previous purchase (e.g., the taste). When combined, search (e.g., appearance) and experience attributes (e.g., taste) form two important decision-making sensory attributes that affect the purchase and re-purchase of the food product (Caswell & Mojduszka, 1996; Ballco et al., 2020; Ballco & Gracia, 2020).

Within sensory attributes, it is demonstrated that consumers spend few seconds searching for information when purchasing food for different reasons (e.g., time) (Ballco et al., 2019, 2020). This makes visual appearance a key sensory attribute that attracts consumers' attention (Orquin et al., 2018; Perkovic et al., 2022). Besides search attributes, previous studies identify experience attributes as crucial predictors of repeated food purchases (Caswell & Mojduszka, 1996; Schleenbecker & Hamm, 2013). Given the importance of search and experience attributes in consumer behavior, several consumer research studies combine sensory analysis with economic methods in a common research design. Some examples include studies that find positive impacts and higher WTP values for origin labels and sensory evaluations (Feldmann & Hamm, 2015; Bekele et al., 2017; Ballco et al., 2020; Ballco & Gracia, 2020; Milford et al., 2021). The overall results of these studies show that consumer preferences are influenced by an interchange of multiple attributes. Of particular importance is the taste of the product. However, consumers cannot taste the food before purchase to acquire information on the experience attributes in most grocery stores. Therefore, it is crucial to investigate the impact of various food product characteristics at different purchase stages where information on multiple types of attributes is presented.

Given the aforementioned, the main objective of our research is to explore consumers' acceptance and the sensory evaluation of a local fresh potato variety and measure the WTP for the most important attributes. The selection of the product is driven by the interest of local producers in launching the potato variety in the local market of Aragón under a brand name with certain culinary information. Aragón is an important producing region of high-quality potatoes in Spain. The area dedicated to the production of potato in 2021 was approximately 600 ha, with an average yield of 40 tons/ha. The organoleptic quality of the production was high. Yet, the washing quality of the potato was

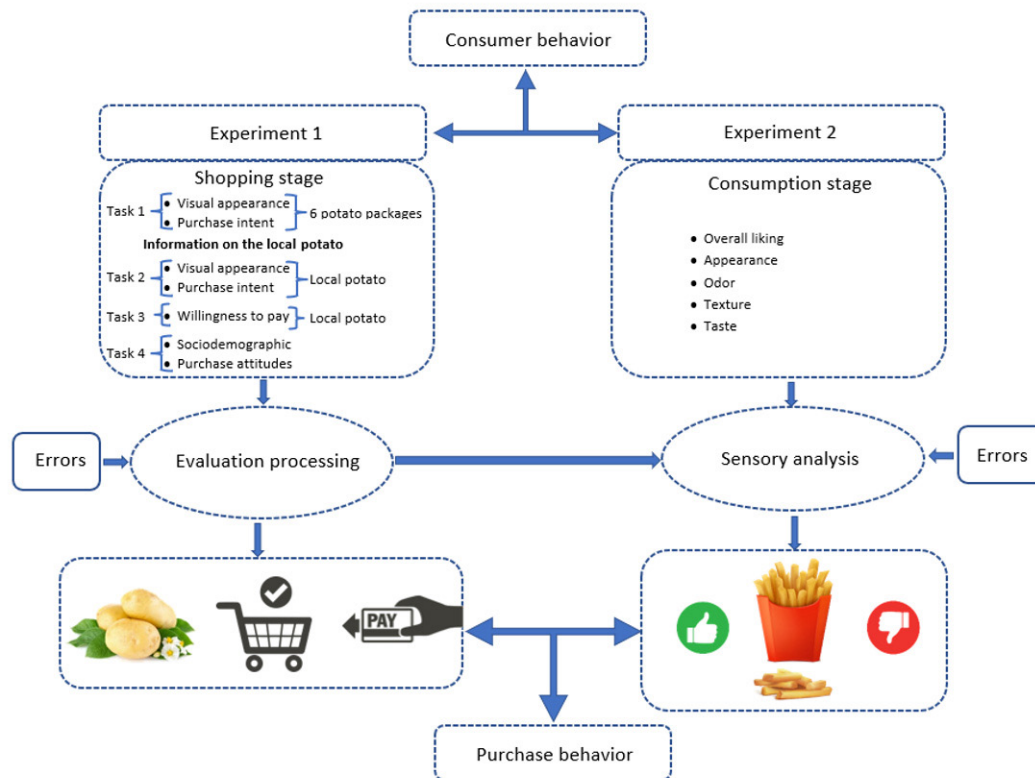


Figure 1. Experiments and the different tasks.

low¹. The primary destination of the local potato is mainly the processing industry (i.e., fried, 80%) and consumption (i.e., unprocessed, 20%) (Almunia, 2021).

To reach the main objective we collected data from two experiments performed with consumers in the fifth largest town of Spain (Zaragoza). We selected this city because it is the capital of the region where the potato producers are interested in launching the local potato. In addition, the city is centrally located, no more than 100 kilometers away from any location in the region. This is consistent with the official European Union (EU) definition of local foods, namely "...a food system in which foods are produced, processed, and retailed within a defined geographical area" (depending on the source, within a 20 to 100-km radius approximately).

This study contributes to the literature by determining fresh produce acceptance in the shopping and consumption stages in several ways. Specifically, we combined sensory analysis with experimental auctions to examine consumer preference for a traditional local fresh potato variety. The methodology explored consumer behavior on product information at different decision-making stages (i.e., purchase and consumption) and examined the trade-

off between credence (i.e., local), search (i.e., washed vs unwashed, origin), and experience (i.e., appearance, odor, texture, taste) attributes. Various researchers have studied the trade-off for fresh produce attributes, such as local and organic quality labels, brands, and sensory characteristics (e.g., appearance and/or taste), among others, Mascarello et al. (2015); Ceschi et al. (2018), Liu et al. (2019). However, these studies did not include sensory analysis (e.g., taste) in their research. To the best of our knowledge, only the study of He et al. (2021) combined a similar approach as our research. We build on the fundamentals of He et al. (2021); however, instead of using a contingent valuation method we used an experimental auction. Additionally, besides conducting the research based on a literature review and market analysis, the selection of the attributes in our case was developed in close collaboration with local producers who want to launch a differentiated potato in the local market. The local potato variety is 'Agria'.

The results of this study are expected to help policymakers and local fresh produce growers to tailor their labeling and promotion strategies around consumers' responses and decisions. Policymakers and marketers may consider the premiums that consumers are WTP for the most im-

¹ Washing quality refers to the degree to which potatoes are cleaned of dirt and debris during the washing process, which can affect their overall quality and taste. A high-quality wash will remove a significant amount of dirt, debris, and other contaminants from the surface of the potatoes, leaving them looking clean, bright, and uniform. A poor-quality wash may leave behind dirt and debris, resulting in potatoes that appear dirty, uneven, and less appealing. Other factors that can impact the washing quality of potatoes include the water temperature, the duration of the washing process, and the equipment used for washing (Smith, 2019).

portant attributes for a more efficient fund allocation and to guide decisions on promotion investments. Local fresh produce growers can use the information of this study to select the most beneficial marketing and pricing strategies. Researchers and scholars in the agri-food sector can benefit from the methodological approaches of this research and replicate them in new/differentiated food products that aim to be introduced in the market.

Material and methods

To fulfill the aim of the study two subsequent artificial experiments with consumers (Harrison & List, 2004) were applied using a within-sample subject design. Fig. 1 summarizes the two experiments and the different tasks.

The experiments were conducted at different halls owned by consumer associations and the local government and were reachable in central locations at the capital's city center. Experiment 1 mimics a real shopping environment (i.e., to evaluate the product based on the information and then decide to buy/not buy the product). In this experiment, the participants first evaluated the product of reference based on the extrinsic information on the package and compared it with other fresh potato packages available in the local market. Second, the participants were asked to reveal their acceptability of the product through visual appearance rating, purchase intent (PI) and WTP. The objective of experiment 1 was to study the acceptance of the local potato variety in the *shopping stage*. Experiment 2 corresponded to a sensory ranking task (e.g., taste, smell, texture) conducted at home once the local potato was fried. The aim of this experiment was to analyze consumers' acceptance at the *consumption stage*.

Participants

The experiments were conducted in the largest town of the producing region of the potato variety in spring 2018. The experiments were implemented in accordance with the Declaration of Helsinki approved by the independent ethics committee of the Agrifood Center of Research and Technology of Aragón (CITA). Recruited participants were representative of food shoppers and had experience with the reference product. The sample was established with people older than 18 years who were responsible for food purchases and cooking in the household (or share the responsibility). The participants were recruited via consumer associations located in different central neighborhoods and public institution halls in the city where the experiment took place (universities, town hall learning centers, community activity centers, etc.). A total of 141 participants were recruited in experiment 1 (*shopping stage*). Out of 141 consumers that participated in the first experiment, only 104 provided responses to experiment 2 (*consump-*

tion stage). Table 1 presents the descriptive statistics of the consumers' characteristics from the two experiments and compares the sample with the general population of the region. In addition, statistical analyses were conducted to measure for consumer characteristic differences between samples.

Table 1 suggests that the sample was not representative of the population in terms of sociodemographic characteristics. Yet, since the sample mainly consisted of consumers who purchase and cook food at home, it is an important representation of the general population that decides what to buy and cook in the households of the target market region. Table 1 shows that participants always or often purchase food (95.6%) and cook every day/several times a week (90.6%). Most of the respondents are female (76%), with an average age of about 54.5 years, having lived in the region for 49 years. The overrepresentation of females in our sample can be attributed to women being more responsible for cooking than men (Wolfson et al., 2021) but we cannot discard that is driven by the general trend that finds women more likely to participate in surveys than men (Curtin et al., 2000). The average composition of the households is three members, and about 70.0% of the participants live in households without children under 18 years. Regarding household incomes, about 50% of the respondents have a net household monthly income of less than 2,500€ and about 11% of them earn more than 3,500 €/month. Respondents with a secondary level of education are under-represented (26%), and participants with a higher level of education are over-represented (53%). The high proportion of participants with a university level of education is common in many studies because they are more inclined to respond to questionnaires (Verhoef, 2005).

Experimental design and implementation

Product selection

The selection of the product is driven by the interest of local producers who want to launch the potato variety in the local market of Aragón. The traditionally produced local potato variety in the region used in this research is 'Agria'. 'Agria' occupies a large part of the cultivation area in the Spanish territory, both with national and international seed. It is a variety of great importance in the region of Aragón. The different producing areas in this region are in the Valle del Jiloca (Zaragoza and Teruel), Bajo Aragón, Somontano del Moncayo (Zaragoza), and Hoya de Huesca and Pyrenees (Huesca). 'Agria' is a late-season variety, known for the strong flavor, and the particularity of not losing color when cooked. This potato is a good source of fiber, and vitamins B and C. 'Agria' is best suited to make French fries as they preserve the crispness on the outside and the tenderness on the inside. They are also very versatile with different cooking methods (e.g., baked,

Table 1. Sample demographic characteristics (% , unless stated).

Characteristics	Experiment 1 (n=141)	Experiment 2 (n=104)	Population ^{1,2}
Gender¹			
Male	24.3 ^a	22.1 ^b	49.1
Female	75.7 ^a	77.9 ^b	50.9
Age (average, standard dev)¹			
18-34	6.8 ^a	4.8 ^b	22.8
35-44	16.7 ^a	18.5 ^b	20.2
45-54	28.0 ^a	28.2 ^b	19.0
≥ 55	48.5 ^a	48.5 ^b	38.0
Level of education²			
Primary	21.3 ^a	19.2 ^b	23.0
Secondary	25.7 ^a	26.9 ^b	48.7
Higher	53.0 ^a	53.8 ^b	28.3
Household income range			
≤ 1500 €/month	24.3 ^a	25.9 ^b	N/A
1501-2500 €/month	23.5 ^a	22.1 ^b	N/A
2501-3500 €/month	19.8 ^a	22.1 ^b	N/A
> 3500 €/month	10.3 ^a	9.6 ^b	N/A
Do not know/refuse to answer	22.1 ^a	20.2 ^b	N/A
Household size (average, standard dev)	2.8 (1.0)	2.7 (1.0)	N/A
Vegetarian	3.0 ^a	1.0 ^b	N/A
Years living in the region (average)	49.9 ^a (18.6)	49.8 ^b (17.7)	N/A
Frequency of food shopping			
Always	53.2 ^a	53.8 ^b	N/A
Often	42.4	42.3	N/A
Frequency of cooking at home			
Every day	81.3 ^a	79.8 ^b	N/A
Several times a week	9.3 ^a	10.6 ^b	N/A

¹Data from INE (2017). ²Data from IAEST (2018). ^{a,b}Different superscripts indicate statistically significant similarities based on one sample t-test. N/A means not available.

mashed, roasted, and boiled) as they do not disperse and have a pleasant taste.

The type of packaging used in the experiment was selected after exhaustive market analysis of potatoes sold in the local market at the time of the research. This resulted in identifying a bag of 3 kg of potatoes as the reference packaging. The lowest market price for 3 kg of potatoes was 2.4€ or 0.8 €/kg, and the highest market price found was 3.6€ or 1.2 €/kg. Besides the local potato, five other potatoes sold in the market with different characteristics were selected. Potatoes were displayed as available in the market, in 3-kg bags with all the extrinsic information (e.g., price, brand, origin, potato variety, producer, etc.). However, as some bags do not allow for visual observation of the product, small bulk displays were set up near the packaged potatoes to allow consumers to visually inspect the differences between products (see Fig. S1 [suppl]). The

potatoes were numbered 1 to 6 where 4 was the number given to the local potato. The rest of the potatoes were from the same and different varieties ('Agria', 'Monalisa' and 'Kennebec') produced in other Spanish regions (Castilla y León, La Rioja, Galicia and two national origins labeled as Spanish) (Table 2).

Experiment 1: Shopping stage

Upon arrival, participants were informed on the nature of the experiment and signed a consent form to participate. An identification number was assigned to guarantee anonymity. The researcher explained the working sessions and provided information in clear written instructions.

The design in experiment 1 consisted of three different tasks where consumers had to evaluate visual appearance rating, declare their PI, and provide their WTP.

Table 2. Visual appearance liking and purchase intention.

Potato name	Variety	Origin	Visual appearance Mean (St. Dev.)	Potato choices (%)
1. Del Terruño ^a	Agria	Castilla y León	5.61 (1.83)	9.4
2. Denifrie ^b	Agria	La Rioja	4.33 (1.72)	0.7
3. Freir ^c	Agria	Spain	4.93 (1.86)	4.4
4. Potatico ^d	Agria	Aragón	6.78 (1.57)	39.1
5. Cachelos ^a	Kennebec	Galicia	5.61 (1.90)	14.5
6. Potato ^d	Monalisa	Spain - France	6.48 (2.09)	31.9

^{a,b,c,d}Superscript letters indicate that visual appearance liking means are different using the t-test.

First, the participants were asked to visually inspect six different potatoes as evaluated on the shelves of a supermarket, and were asked to choose one bag, the one they most prefer. To have a better visual inspection, small bulk displays were set up near the packaged potatoes to allow consumers to visually inspect the differences between products (see Fig. S1 [suppl]). Then, the participants rated their visual liking of the different potatoes using a 9-point hedonic scale from 1 “dislike extremely” to 9 “like extremely”.

Second, the participants were given information regarding the origin of the local potato. Although the regional origin of the local potato was displayed in the bag in the previous task, some of the participants might have skipped reading this information. Therefore, to ensure that all the participants had been provided the same level of information, the following information was given “*This potato is locally produced in Aragón in different counties (several counties were mentioned). The potato has been traditionally produced in the region*”. Then, the participants were asked to rate again their visual liking but, from this task and forward we examined the preferences only for the local potato (no. 4) excluding the rest of the potato packages. Ratings were measures using a 9-point hedonic scale from 1 “dislike extremely” to 9 “like extremely”.

Third, consumers were asked to declare their intent to purchase the local potato using a scale from 1 “very unlikely” to 5 “very likely”. To measure the WTP a Becker-DeGroot-Marschak (BDM) hypothetical auction mechanism was used. The participants were asked to submit a bid for the local potato. They were asked to submit their maximum WTP for the potato and we randomly drew a price; however, the participants were informed that there would not be a transaction due to the lack of product availability. Finally, participants responded to several questions regarding sociodemographic characteristics, purchase and consumption habits (Table 1). After completing the questionnaire, the participants received two pieces of the local potato, and were asked to fry them at home and then taste (Experiment 2). They were instructed to cook the potatoes

as they usually do in their household. The researcher explained the sensory analysis questions and informed the participant on how to return the sensory evaluation material. All these explanations were also written and provided with the sensory analysis materials.

Experiment 2: Consumption stage

The main objective of experiment 2 was to evaluate the experience of the sensory attributes (i.e., taste) of the locally produced potato. The participants were asked to fry the potato as they normally do at home and rate the sensory aspects. First, they were asked to rate the overall liking, then the appearance (color), followed by the odor, texture, and finally rate the overall taste. The overall liking was rated by asking them the following question: “Please rate the overall liking of this local potato. How much do you like it?”. A 9-point hedonic scale was used where 1 indicated “disliking extremely” and 9 “liking it extremely”. The questions regarding the rest of the sensory aspects were similar. More precisely, the participants were asked “How much do you like the overall taste of this local potato?”. An identical question was repeated for odor and texture. Likewise, their rating consisted of a 9-point hedonic scale where 1 indicated “disliking it extremely” and 9 “liking it extremely”.

Methodology

Experiment 1: Shopping stage

All the statistical analyses for both experiments were conducted in STATA 10.1 (StataCorp L.P., 2007). For the evaluation of the different potato packages (Task 1 in Fig. 1), we report the percentage of respondents choosing each package and the average and standard deviations for the visual appearance liking scores (Table 2). To test if the visual appearance liking scores are different among potatoes, we used t-tests.

² If participants paid attention to the information on the bag, we expected that this rating and the previous would be similar.

Table 3. Recursive system with correlated errors estimates: purchase intention (PI) and willingness to pay (WTP) models.

PI			WTP		
Average (St. dev.)	3.88 (0.89)		2.89 (0.63)		
Variables	Coefficient	t-ratio	Variables ²	Coefficient	t-ratio
Constant	2.37	7.03***	Constant	2.27	10.20***
Visual appearance ¹	0.14	3.38***	PI	0.20	3.77***
Female	0.40	2.41**	Age55	-0.14	-1.64*
Vegetarian	-1.06	-2.57**	Low income	-0.28	-2.84***
Shop_super	0.44	3.08***			
Adj R ²		0.20	Adj R ²		0.15
Adj R ² model only appearance in PI		0.14	Adj R ² model only intention in WTP		0.06

¹Visual appearance liking for the local potato: mean=6.70 and St. dev. = 1.64. ²See Table S1 [suppl]. ***, **, * denote statistical significance at 1%, 5%, and 10%, respectively.

The average of the measurements for visual appearance liking, PI and the WTP for the local potato (Task 2 and 3 in Fig. 1) was calculated to study the acceptability of the local potato. To study the relationships among these three measurements, we estimated different single and two regression models. To specify these models, we considered that, although the three measures offer different ways of understanding food products' acceptability, they assess different aspects of the same phenomenon. Ginon et al. (2014) previously analyzed the relationship between WTP and overall liking scores by calculating the consistency between them (using a Kendall correlation coefficient between mean values). They found consistent results with previous studies (Ginon et al., 2009; Andersen et al., 2019), an overall consistency in variant ranking between hedonic and WTP. Considering these studies, we analyzed the relationship between WTP and either overall liking scores or PI scores, respectively. To do that, we used a set of different regression models. First, we run a regression of WTP on either overall liking or PI. The overall liking scores directly measure the sensory characteristics of the product, reflecting sensory preferences. The willingness to buy and the WTP, for their part, also include other attributes in their evaluation, reflecting purchase preferences.

This means that we expect a higher explanatory power of the PI scores on the WTP relative to the explanatory power on the overall liking scores (Ginon et al., 2009). The last two measurements are more similar and related with one another (i.e., the Pearson correlation coefficient should be statistically significant and different from zero). In other words, consumers are generally willing to pay for a product if they previously liked it, which might indirectly affect WTP through the influence on the PI. Therefore, we assume that WTP is directly explained by the PI and this PI is determined by the overall liking. Then, the following two-equation model was specified and estimated:

$$PI = \varphi + \mu OL + \eta X + \gamma \quad (1)$$

$$WTP = \alpha + \beta PI + \lambda X + \varepsilon \quad (2)$$

where OL is the overall liking and WTP is the participants' WTP. In addition, X is the set of sociodemographic, purchase and consumption habits of consumers, ε and γ are the error terms. We assumed that these two errors were correlated following a joint normal distribution $N(0, \Omega)$. Then, a recursive system with correlated errors was estimated (Drukker, 2011). Table 3 shows the esti-

Table 4. Mean, correlation estimates of sensory and overall liking evaluation scores.

	Mean (St. dev.)	Correlations	Estimation		Adj R ²
			Constant (t-ratio)	Beta (t-ratio)	
Overall liking ^a	7.51 (1.26)				
Appearance ^b	6.93 (1.74)	0.46**	5.17 (10.75)***	0.33 (9.99)***	0.20
Odor ^c	6.52 (1.62)	0.50**	4.93 (10.49)***	0.39 (5.53)***	0.25
Texture ^b	7.05 (1.53)	0.59**	4.13 (8.33)***	0.48 (6.97)***	0.34
Taste ^a	7.47 (1.36)	0.66**	3.00 (5.67)***	0.60 (8.62)***	0.44

^{a, b, c, d} Different superscripts indicate that the different liking means are different using the t-test. ***, **, * denote statistical significance at 1%, 5%, and 10%, respectively.

mations for this two-equation recursive model and the variables included in this model are described in Table S1 [suppl].

Experiment 2: Consumption stage

The average and standard deviation for the different sensory likings (OL, appearance, odor, texture, and taste) and the Pearson correlation between them were calculated and reported in Table 4. To test if the different sensory likings were statistically different, t-test analyses were conducted. To measure the contribution of each of the sensory likings in consumers' evaluation of OL, four single regressions were estimated. The OL scores were the endogenous variables in the four equations and the different sensory liking scores were the explanatory variables in each of them. Then, the adjusted R^2 is an indication of how much each of the sensory liking scores explain the OLs. The higher the value the higher the explanation. In addition, the estimated coefficient for each of the sensory liking scores measures the marginal effect of this particular sensory liking on the OL. Then, the higher the marginal effect the higher the influence on the OL. Considering both values, the adjusted R^2 and the liking estimated marginal effects, the higher they are, the more important the sensory liking scores in the OL.

Results

Experiment 1: Shopping stage

The results reported in Table 2 show that the overall visual liking hedonic score was higher for Potatico (no. 4, local potato) and Potato (no. 6, potatoes from the regional wholesaler) with statistically similar values. Conversely, Denifrie (no. 2) received the least visual liking score. Results provided the same level of acceptability in the choice questions. Potatico and Potato covered 70% of the choices, 40% for the local variety and 30% for Potato.

The average PI for the local potato variety was 3.88 and the mean WTP account of 2.89 €/package or 0.96 €/kg (Table 3).

Information provided on the origin of the local potato variety did not significantly change the overall visual liking score (6.70 vs. 6.78 two tailed probability for difference in means 0.85). Table 3 also shows the estimations for the two-equation recursive model (Eqs. 1 and 2). The last row shows the adjusted R^2 for the models with only the visual appearance liking (OL) and the PI, respectively. To this baseline model, we added the socio-demographic characteristics together with the potato purchase and consumption habits. Table 3 shows the final model with the variables that were statistically different from zero at a 10% significance level. Estimations for the PI equation indicate that visual liking positively influenced the PI, as expected. As visual appearance liking scores increased,

the consumers' intention to purchase the product also increased. Moreover, the variables FEMALE and SHOP_SUPER had a positive effect on the intention to purchase local potatoes. Women and participants who purchased in supermarkets were more likely to buy local potatoes. Surprisingly, vegetarian consumers were less likely to buy local potatoes. As expected, the intention to purchase local potatoes positively influenced the WTP. On the contrary, the estimated coefficients for the two variables AGE55 and LOWINCOME were negative and statistically significant. This indicates that consumers who were older than 55 years and those that belong to a household with lower monthly income level (< 1,500 €) were less willing to purchase the local potato.

These results indicate that although the three measurements assess consumers' acceptability for a product and, as expected, they were positively related, it seems that consumers evaluated different aspects of the acceptability as they explain each other only to some extent. In particular, the visual liking only explained 14% of the PI and the PI less than 10% of the WTP. Then, the three measures can be used as complementary ways of measuring the acceptability of a new product in the market. The visual appearance provided the sensory acceptability of the product, while the PI and the WTP reported the purchase preferences with the WTP also giving a monetary valuation of the acceptance. In addition, the consumers' socio-demographic characteristics and the purchase and consumption habits explained the acceptability but only to some extent because the attained explanatory power was still low.

Experiment 2: Consumption stage

Table 4 presents the average of the overall and different sensory evaluation scores for the local potato in the second column. The OL of the local potato was the highest among all the evaluations and statistically higher than the visual appearance in experiment 1 (t-test=3.35) (Table 2). Then, it seems that the local potato was accepted in the shopping context, and the expected acceptability was confirmed once the potato was cooked (fried in our case) and consumed. The t-test among different sensory evaluations indicated that the OL and taste were statistically similar. However, appearance (color) and texture were similar but statistically lower than the OL and taste. Finally, the odor of the local fried potato received the lowest score. The third column of Table 4 shows the correlation between the OL and each of the different sensory evaluations. As expected, all the evaluating scores were statistically correlated with taste being the most correlated sensory attribute.

The estimations of the contribution of each of the different sensory in the OL scores are also presented in the following columns to provide their importance. The highest adjusted R^2 and estimated beta coefficient corresponded with taste and the lowest, with appearance.

Discussion

Local fresh produce demand has rapidly increased within the last decade. This increase is also in concordance with the increase in demand in terms of sales at different supermarkets, hypermarkets, farmers markets, and food stores. Some of the main reasons of this increase in demand lies within consumers' perceptions that local food is fresher, more nutritious and healthier, and buying local supports the environment and the local economy (Darby et al., 2008; Martinez et al., 2010; Curtis & Cowee, 2011; Roosen et al., 2012; Fernqvist & Ekelund, 2014; Feldmann & Hamm, 2015; Fan et al., 2019). Several methods have been used by researchers to study local food. Earlier studies tend to examine the impact of "local" using questionnaires or experimental auction methods (Loureiro & Umberger, 2003; Weatherell et al., 2003; Darby et al., 2008; Hu et al., 2012; He et al., 2021). However, during food purchases, consumers evaluate various extrinsic attributes, such as the color of the food to sometimes determine freshness, the size of the food to sometimes determine the quantity to purchase, and the shape, among others. These extrinsic evaluations are then combined with several intrinsic attributes such as the sensory aspects (i.e., taste, smell, texture) that are either experienced in the store through sampling, or from previous consumption experiences. Besides evaluating the importance of extrinsic attributes on local foods, in this article, we also consider intrinsic attributes to study their interactions and expand our understanding on consumer preferences and choices.

We combined sensory experiments with experimental auctions to explore the trade-off between credence (i.e., local), search (i.e., washed vs unwashed, origin), and experience (i.e., appearance, odor, texture, taste) attributes on consumer preferences for a local potato. Investigating the trade-off of different attributes at various consumer decision stages is crucial to select marketing strategies, increase repeat purchases, and boost sales. The results from experiment 1 (*Shopping stage*) in terms of visual appearance liking and PI show that the overall visual liking is higher for the local potato and the regional wholesaler potato with statistically similar values. Similar results were observed in terms of potato choices. The results from the choice question indicated that more than 30% of participants were willing to choose either the local potato or the regional wholesalers' potato. These results corroborate with the findings from previous research that found positive associated attitudes towards and intentions to buy local foods (Jensen et al., 2019; Hurgobin et al., 2020; Zhang et al., 2020; Enthoven & Van den Broeck, 2021; Kumar et al., 2021; Stein & Santini, 2022).

Estimations for the PI indicate that the visual liking positively influences PI. In other words, as the visual appearance liking increase, the consumers' intention to purchase the product also increase. In terms of sociodemographic characteristics findings indicate that women and partici-

pants who purchase food in supermarkets were more likely to buy the local potato. Multiple studies have found concurring results, with women generally having more positive attitudes towards the purchase of local food (Gracia et al., 2012; Flynn et al., 2014; Korhonen & Muiilu, 2022; Carreras-Simó et al., 2023). On the contrary, consumers older than 55 years, and those with a high level of household income were more price-sensitive and would be less willing to purchase the local potato. This is in line with the previous research suggesting that price is acknowledged to be a key variable in consumers' local food choices (Berg & Preston, 2017; Printezis et al., 2019; Hurgobin et al., 2020; Winterstein & Habisch, 2021) and that higher prices limit the purchase of local food (Byker et al., 2010; Lynes et al., 2014).

The results from experiment 2 (*Consumption stage*) suggest that the OL and taste liking scores are statistically similar. Appearance (color) and texture were similar but statistically lower than the OL and taste liking scores. The odor of the local fried potato received the lowest liking score. The correlation between the OL with the rest of the sensory attributes suggest that all the liking scores were statistically correlated, with taste being the most correlated attribute. This result corroborates the findings of Andersen et al. (2019), who showed taste to be the most important attribute in the OL and odor the least important attribute.

These results can have several implications for local potato producers and vendors. Promoting the local origin on food labels seems a promising labeling strategy to boost sales; however, our results show that consumers associate the local origin label with observable (e.g., appearance of color, shape, washed vs unwashed) and unobservable (e.g., taste, smell, texture) attributes. Therefore, in addition to promoting the local origin of the food and the benefits of purchasing and consuming local food, further consideration should be given on featuring physical quality aspects such as the sensory properties of the food that are important to consumers. This study did face some limitations that can encourage future research. First, our sample is limited to the population of one region. Future research should use a larger range of participants to test the robustness of our findings. Second, we as researchers have a lack of control over the process of frying the potato and if participants followed our instructions in the second experiment at home. Future research can overcome this limitation by conducting the second experiment in a sensory lab. Third, another limitation in our study is the use of the hypothetical auction method. Future research can overcome this limitation by replicating the methodology with real-life auctions with actual economic incentives and product transactions. Fourth, our sample differs from that of the Spanish population. Obtaining a representative sample is costly and difficult. This limitation can be addressed by replicating the experiments in different regions in the country to provide more robust representative findings. Finally, another limitation is the possibility of selection bias

in our sample because participants in the experiments were volunteers. Subjects participate in economic experiments like our, voluntarily. This is an important component of research ethics. However, having volunteer participants may lead to a sample that is not representative of the general population. Volunteer bias reduces the heterogeneity of the sociodemographic characteristics of the sample in relation to the general population and might affect the external validity of the findings (Rosenthal & Rosnow, 1975). Even though our sample is not a perfect representation of the general population, the sociodemographic characteristics of participants are heterogeneous with many values approximating (age range and level of education) the characteristics of the general population. In addition, the sample consisted mainly of consumers who purchase and cook food at home, which is an important representation of the general population who decides what to buy and cook in the households of the target market region. For these two reasons, we believe that the findings of our experiment have external validity.

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References

- Almunia JA, 2021. Mejora de producción y comercialización de la patata de calidad de Aragón. <https://Aragondesarrollorural.es/archivos/8930> [03 March 2023].
- Andersen BV, Brockhoff PB, Hyldig G, 2019. The importance of liking of appearance, -odour, -taste and -texture in the evaluation of overall liking. A comparison with the evaluation of sensory satisfaction. *Food Qual Prefer* 71: 228-232. <https://doi.org/10.1016/j.foodqual.2018.07.005>
- Ballco P, de-Magistris T, Caputo V, 2019. Consumer preferences for nutritional claims: An exploration of attention and choice based on an eye-tracking choice experiment. *Food Res Int* 116: 37-48. <https://doi.org/10.1016/j.foodres.2018.12.031>
- Ballco P, Caputo V, de-Magistris T, 2020. Consumer valuation of European nutritional and health claims: Do taste and attention matter? *Food Qual Prefer* 79: 103-793. <https://doi.org/10.1016/j.foodqual.2019.103793>
- Ballco P, Gracia A, 2020. An extended approach combining sensory and real choice experiments to examine new product attributes. *Food Qual Prefer* 80: 103830. <https://doi.org/10.1016/j.foodqual.2019.103830>
- Bazzani C, Caputo V, Nayga RM, Canavari M, 2017. Revisiting consumers' valuation for local versus organic food using a non-hypothetical choice experiment: Does personality matter? *Food Qual Prefer* 62: 144-154. <https://doi.org/10.1016/j.foodqual.2017.06.019>
- Bekele AD, Beuving J, Ruben R, 2017. How do health information and sensory attributes influence consumer choice for dairy products? Evidence from a field experiment in Ethiopia. *Int J Qual Reli Manag* 34(5): 667-683. <https://doi.org/10.1108/IJQRM-12-2014-0195>
- Berg N, Preston KL, 2017. Willingness to pay for local food?: Consumer preferences and shopping behavior at Otago farmers market. *Transportation Research Part A: Pol and Prac* 103: 343-361. <https://doi.org/10.1016/j.tra.2017.07.001>
- Bir C, Lai J, Widmar NO, Thompson N, Ellett J, Crosslin C (Eds.), 2019. There's no place like home: Inquiry into preferences for local foods. *J Food Distr Res* 50(1): 29-45.
- Birch D, Memery J, 2020. Tourists, local food and the intention-behaviour gap. *J Hosp Tour Manag* 43: 53-61. <https://doi.org/10.1016/j.jhtm.2020.02.006>
- Byker C, Rose N, Serrano E, 2010. The benefits, challenges, and strategies of adults following a local food diet. *J Agr Food Sys Com Dev* 1(1): 125-137. <https://doi.org/10.5304/jafscd.2010.011.013>
- Campbell BL, Mhlanga S, Lesschaeve I, 2013. Perception versus reality: Canadian consumer views of local and organic. *Can J Agr Econ* 61(4): 531-558. <https://doi.org/10.1111/j.1744-7976.2012.01267.x>
- Carreras-Simó M, Codinach-Segura S, Filimon N, Fusté-Forné F, 2023. Exploring consumer preferences for local food: The case of traditional coastal fishmongers in Costa Brava (Catalonia, Spain). *J Agr Food Res* 11: 100527. <https://doi.org/10.1016/j.jafr.2023.100527>
- Caswell J, Mojduszka E, 1996. Using informational labeling to influence the market for quality in food products. *Am J Agric Econ* 78(5): 1248-1253. <https://doi.org/10.2307/1243501>
- Ceschi S, Canavari M, Castellini A, 2018. Consumer's preference and willingness to pay for apple attributes: A choice experiment in large retail outlets in Bologna (Italy). *J Int Food Agri Mark* 30(4): 305-322. <https://doi.org/10.1080/08974438.2017.1413614>

- Combris P, Bazoche P, Giraud-Héraud E, Issanchou S, 2009. Food choices: What do we learn from combining sensory and economic experiments? *Food Qual Prefer* 20(8): 550-557. <https://doi.org/10.1016/j.foodqual.2009.05.003>
- Curtin R, Presser S, Singer E, 2000. The effects of response rate changes on the index of consumer sentiment. *Pub Opin Quar* 64(4): 413-428. <https://doi.org/10.1086/318638>
- Curtis K, Cowee M, 2011. Buying local: diverging consumer motivations and concerns. *J Agr* 29(1). https://digitalcommons.usu.edu/appecon_facpub/98
- Darby MR, Karni E, 1973. Free competition and the optimal amount of fraud. *J Law Econ* 16(1): 67-88. <https://doi.org/10.1086/466756>
- Darby K, Batte MT, Ernst S, Roe B, 2008. Decomposing local: A conjoint analysis of locally produced foods. *Am J Agr Econ* 90(2): 476-486. <https://doi.org/10.1111/j.1467-8276.2007.01111.x>
- Drukker D, 2011. Estimating and interpreting structural equation models in STATA. Italian Stata Users Meeting, Venice (Italy). https://www.stata.com/meeting/italy11/abstracts/italy11_drukker.pdf
- Enthoven L, Van den Broeck G, 2021. Local food systems: Reviewing two decades of research. *Agr Sys* 193: 103226. <https://doi.org/10.1016/j.agry.2021.103226>
- Fan X, Gómez M, Coles P, 2019. Willingness to pay, quality perception, and local foods: The case of broccoli. *Agr Res Econ Rev* 48(3): 414-432. <https://doi.org/10.1017/age.2019.21>
- Feldmann C, Hamm U, 2015. Consumers' perceptions and preferences for local food: A review. *Food Qual Prefer* 40: 152-164. <https://doi.org/10.1016/j.foodqual.2014.09.014>
- Fernqvist F, Ekelund L, 2014. Credence and the effect on consumer liking of food - A review. *Food Qual Prefer* 32: 340-353. <https://doi.org/10.1016/j.foodqual.2013.10.005>
- Flynn KC, Popp J, Hausmann S, Whisenhunt J, 2014. Gender differences in consumption and perception of local produce among high school students. *North Am Col Teac Agr* 58: 317-323.
- Ginon E, Lohéac Y, Martin C, Combris P, Issanchou S, 2009. Effect of fibre information on consumer willingness to pay for French baguettes. *Food Qual Prefer* 20(5): 343-352. <https://doi.org/10.1016/j.foodqual.2009.01.002>
- Ginon E, Combris P, Lohéac Y, Enderli G, Issanchou S, 2014. What do we learn from comparing hedonic scores and willingness-to-pay data? *Food Qual Prefer* 33: 54-63. <https://doi.org/10.1016/j.foodqual.2013.11.003>
- Gracia A, de Magistris T, Nayga RM, 2012. Importance of social influence in consumers' willingness to pay for local food: Are there gender differences? *Agribusiness* 28(3): 361-371. <https://doi.org/10.1002/agr.21297>
- Grunert KG, Wills JM, 2007. A review of European research on consumer response to nutrition information on food labels. *J Pub Heal* 15(5): 385-399. <https://doi.org/10.1007/s10389-007-0101-9>
- Gundala RR, Singh A, 2021. What motivates consumers to buy organic foods? Results of an empirical study in the United States. *Plos One* 16(9): e0257288. <https://doi.org/10.1371/journal.pone.0257288>
- Harrison GW, List JA, 2004. Field experiments. *J Econ Lit* 42(4): 1009-1055. <https://doi.org/10.1257/0022051043004577>
- He C, Liu R, Gao Z, Zhao X, Sims CA, Nayga RM, 2021. Does local label bias consumer taste buds and preference? Evidence of a strawberry sensory experiment. *Agribusiness* 37(3): 550-568. <https://doi.org/10.1002/agr.21680>
- Hedberg RC, Zimmerer KS, 2020. What's the market got to do with it? Social-ecological embeddedness and environmental practices in a local food system initiative. *Geoforum* 110: 35-45. <https://doi.org/10.1016/j.geoforum.2020.01.022>
- Hu W, Batte MT, Woods T, Ernst S, 2012. Consumer preferences for local production and other value-added label claims for a processed food product. *Eur Rev Agr Econ* 39(3): 489-510. <https://doi.org/10.1093/erae/jbr039>
- Hughner RS, McDonagh P, Prothero A, Shultz II CJ, Stanton J, 2007. Who are organic food consumers? A compilation and review of why people purchase organic food. *J Cons Beh* 6(2-3): 94-110. <https://doi.org/10.1002/cb.210>
- Hurgobin Y, Le Floch V, Lemercier C, 2020. Effect of multiple extrinsic cues on consumers' willingness to buy apples: A scenario-based study. *Food Qual Prefer* 81: 103860. <https://doi.org/10.1016/j.foodqual.2019.103860>
- IAEST, 2018. Estadística local de Aragón. Ficha Territorial Zaragoza. http://bonansa.aragon.es:81/iaest/fic_mun/pdf/P50.pdf [28 Nov 2018].
- INE, 2017. INEbase / Demografía y población / Cifras de población y Censos demográficos / Cifras de población / Últimos datos. http://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica_C&cid=1254736176951&menu=ulti-Datos&idp=1254735572981
- Jensen JD, Christensen T, Denver S, Ditlevsen K, Lassen J, Teuber R, 2019. Heterogeneity in consumers' perceptions and demand for local (organic) food products. *Food Qual Prefer* 73: 255-265. <https://doi.org/10.1016/j.foodqual.2018.11.002>
- Korhonen K, Muilu T, 2022. Characteristics and stability of consumer food-buying groups: The case of food circles. *Rev Agri Food Env Stud* 103(3): 211-245. <https://doi.org/10.1007/s41130-022-00172-4>
- Kumar S, Talwar S, Murphy M, Kaur P, Dhir A, 2021. A behavioural reasoning perspective on the consumption of local food. A study on REKO, a social media-based local food distribution system. *Food Qual Prefer* 93: 104264. <https://doi.org/10.1016/j.foodqual.2021.104264>
- Liu R, Gao Z, Nayga RM, Snell HA, Ma H, 2019. Consumers' valuation for food traceability in China: Does trust matter? *Food Pol* 88: 101768. <https://doi.org/10.1016/j.foodpol.2019.101768>
- Loureiro M, Umberger W, 2003. Estimating consumer willingness to pay for country-of-origin labeling. *J Agr Res Econ* 28.
- Lynes J, Whitney S, Murray D, 2014. Developing benchmark criteria for assessing community-based social mar-

- keting programs: A look into Jack Johnson's "All at Once" campaign. *J Soc Mark* 4. <https://doi.org/10.1108/JSOCM-08-2013-0060>
- Martinez SM, Hand M, Da Pra S, Pollack K, Ralston T, Smith S, et al., 2010. Local food systems: Concepts, impacts, and issues. Economic Research Service, USDA, Econ Res Report No. 97, Washington DC.
- Mascarello G, Pinto A, Parise N, Crovato S, Ravarotto L, 2015. The perception of food quality. Profiling Italian consumers. *Appetite* 89: 175-182. <https://doi.org/10.1016/j.appet.2015.02.014>
- Meas T, Hu W, Batte MT, Woods TA, Ernst S, 2014. Substitutes or complements? Consumer preference for local and organic food attributes. *Am J Agr Econ* 97(4): 1044-1071. <https://doi.org/10.1093/ajae/aau108>
- Meyerding SG, Trajer N, Lehberger M, 2019. What is local food? The case of consumer preferences for local food labeling of tomatoes in Germany. *J CleaProd* 207: 30-43. <https://doi.org/10.1016/j.jclepro.2018.09.224>
- Milford AB, Trandem N, Pires AJG, 2021. Fear of pesticide residues and preference for domestically produced strawberries. *Rev Agr Food Env Stu* 102(4): 369-391. <https://doi.org/10.1007/s41130-020-00134-8>
- Mundler P, Laughrea S, 2016. The contributions of short food supply chains to territorial development: A study of three Quebec territories. *J Rural Stud* 45: 218-229. <https://doi.org/10.1016/j.jrurstud.2016.04.001>
- Orquin JL, Perkovic S, Grunert KG, 2018. Visual biases in decision making. *App Econ Pers Pol* 40(4): 523-537. <https://doi.org/10.1093/aapp/ppy020>
- Perkovic S, Schoemann M, Lagerkvist CJ, Orquin JL, 2022. Covert attention leads to fast and accurate decision-making. Preprint. <https://doi.org/10.31234/osf.io/xmh7y>
- Printezis I, Grebitus C, Hirsch S, 2019. The price is right!? A meta-regression analysis on willingness to pay for local food. *PLoS One* 14(5): e0215847. <https://doi.org/10.1371/journal.pone.0215847>
- Roosen J, Kottl B, Hasselbach J, 2012. Can local be the new organic? Food choice motives and willingness to pay. AAEA Annual Meeting, Boston, MA, USA.
- Rosenthal R, Rosnow RL, 1975. *Primer of methods for the behavioral sciences*, 117 pp. John Wiley & Sons.
- Schleenbecker R, Hamm U, 2013. Consumers' perception of organic product characteristics. A review. *Appetite* 71: 420-429. <https://doi.org/10.1016/j.appet.2013.08.020>
- Smith J, 2019. Potato washing: How to ensure high quality. <https://www.potatogrower.com/2019/05/potato-washing-how-to-ensure>
- Soares P, Martínez-Mián MA, Caballero P, Vives-Cases C, Davó-Blanes MC, 2017. Alimentos de producción local en los comedores escolares de España. *Gaceta Sanitaria* 31(6): 466-471. <https://doi.org/10.1016/j.gaceta.2016.10.015>
- StataCorp LP. 2007. *Stata user's guide: Release 10*. College Station, Tex: StataCorp LP.
- Stefani G, Romano D, Cavicchi A, 2006. Consumer expectations, liking and willingness to pay for specialty foods: Do sensory characteristics tell the whole story? *Food Qual Prefer* 17(1): 53-62. <https://doi.org/10.1016/j.foodqual.2005.07.010>
- Stein AJ, Santini F, 2022. The sustainability of "local" food: A review for policy-makers. *Rev Agri Food Env Stu* 103(1): 77-89. <https://doi.org/10.1007/s41130-021-00148-w>
- Verhoef PC, 2005. Explaining purchases of organic meat by Dutch consumers. *Eur Rev Agri Econ* 32(2): 245-267. <https://doi.org/10.1093/eurrag/jbi008>
- Weatherell C, Tregear A, Allinson J, 2003. In search of the concerned consumer: UK public perceptions of food, farming and buying local. *J Rural Stud* 19(2): 233-244. [https://doi.org/10.1016/S0743-0167\(02\)00083-9](https://doi.org/10.1016/S0743-0167(02)00083-9)
- Winterstein J, Habisch A, 2021. Is local the new organic? Empirical evidence from German regions. *Brit Food J* 123(11): 3486-3501. <https://doi.org/10.1108/BFJ-06-2020-0517>
- Wolfson JA, Ishikawa Y, Hosokawa CH, Janisch K, Massa J, Eisenberg DM, 2021. Gender differences in global estimates of cooking frequency prior to COVID-19. *Appetite* 161: 105117. <https://doi.org/10.1016/j.appet.2021.105117>
- Yeo SF, Tan CL, Tseng ML, Tam S, San WK, 2022. Factors influencing organic food purchase decision: Fuzzy DEMATEL approach. *Brit Food J* 124(12): 4567-4591. <https://doi.org/10.1108/BFJ-05-2021-0509>
- Zhang T, Grunert KG, Zhou Y, 2020. A values-beliefs-attitude model of local food consumption: An empirical study in China and Denmark. *Food Qual Prefer* 83: 103916. <https://doi.org/10.1016/j.foodqual.2020.103916>