Article

Consumer Preferences for Sustainable Product Attributes and Farm Program Features

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Abstract: Previous literature primarily focused on consumers’ preference for specific sustainable attributes, such as a product being organic, eco-friendly, locally grown, and fair trade. Little is known about consumers’ preference for sustainable program features. We conduct two online choice experiments with U.S. consumers and find that consumers consistently care about farmers’ engagements in sustainable programs, and they are willing to pay a price premium for products from such programs. Consumers also value promoting science in sustainability, establishing concrete measurements of sustainability, and communicating sustainable practices with consumers and downstream industries. We apply the latent class logit model to investigate the potential segmentation of consumers. Three consumer segments are identified based on participants’ heterogeneity in preferences. Our research provides useful information for designing new sustainability programs.

Keywords: sustainability; farm programs; consumer preferences; market segments

1. Introduction

Sustainable agriculture in the U.S. is defined as agricultural applications that will, in the long turn, satisfy human food needs, enhance environmental quality, preserve nonrenewable resources, and “sustain the economic viability of farm operations and enhance the quality of life for farmers and society as a whole” (U.S. Code Title 7, Section 3103). The Sustainable Agriculture Research and Education program summarizes the common goals of all sustainable agriculture as (1) long term profit, (2) stewardship of natural resources, and (3) quality of life for farmers, ranchers, and their communities. Besides environment responsibilities, the above definition and summary emphasizes the importance of profitability as a key component of sustainable agriculture, and thus understanding consumers’ preference for sustainable agriculture is particularly important.

Previous studies related to sustainable agriculture primarily focused on consumer preferences and purchasing motivation of sustainable agriculture-related attributes, such as being organic, eco-friendly, locally produced, and fair-trade. Organic and eco-friendly attributes are associated with sustainable agriculture’s goal of responsible stewardship of natural resources. Hamzaoui Essoussi and Zahaf [1] and Aertsens et al. [2] found environmental concerns to be one of the motivations for organic consumption. A large body of consumer literature have focused on consumers’ attitudes, perceptions, and willingness-to-pay (WTP) for organic products (see Hemmerling et al. [3] for a review) and found U.S. consumers to be generally willing to pay a premium for organic products [4–8]. For consumer studies on eco-friendly products, Marette et al. [9] studied consumer demand for apples with reduced...
pesticide use and concluded that messages about pesticide use and pesticide residues significantly impact consumers’ choices. Uchida et al. [10] found that Japanese consumers are willing to pay a 20% price premium for Marine Stewardship Council eco-labeled seafood.

Locally produced and fair-trade attributes are other examples of sustainable agriculture attributes that are studied extensively. These two attributes are closely related to sustainable agriculture’s goal of ensuring the quality of life for farmers, ranchers, and their communities. In addition, they sometimes are associated with eco-friendly agricultural practices. For instance, Feldmann and Hamm [11] conducted a review of consumers’ perceptions and preferences for locally grown products. They found consumers are willing to pay more for locally grown products because they want to support the local community and improve conditions for farmworkers. Perceived environmental benefits and better quality and taste also motivate consumers to purchase locally grown products. Onozaka and McFadden [12] studied several sustainability attributes, i.e., organic, fair trade, carbon footprint, and location claims. They found locally grown has the highest consumer WTP value. Hemmerling et al. [3] also found that most studies indicated a higher WTP for locally grown products than organic products. Regarding fair trade products, there is evidence which indicates that fair trade enhances the welfare of farmers and encourages stewardship of natural resources. Dragusanu and Nunn [13] found fair-trade is associated with higher income for farm owners. Dragusanu et al. [14] reviewed the effects of fair-trade and concluded that, on average, fair-trade products receive higher prices, and farmers have greater access to credit, a more stable perceived economic environment, and are more likely to engage in environmentally friendly practices. The demand for fair-trade products is also well documented. Hainmueller et al. [15] conducted an in-store experiment and found when they carried a fair-trade label, sales of the two most popular coffees rise by almost 10%. Dragusanu and Nunn [13] found fair-trade is associated with higher prices, improved sales, and more revenues.

Despite the studies on consumer preferences for specific sustainable attributes such as local, organic, and fair trade, to our knowledge, there is no existing literature investigating consumers’ preferences for the features of sustainable agriculture programs. Due to the broad scope of sustainable agriculture, different sustainability programs focus on different practices. For example, some sustainable agriculture program promotes scientific research and helps farmers finding innovative marketing strategies to reach more consumers (National Institute of Food and Agriculture 2016 Annual Report 2016 (Available at https://nifa.usda.gov/resource/national-institute-food-and-agriculture-2016-annual-report). The Sustainable Iowa Land Trust program (2016) requires farmers to demonstrate the use of sustainable practices, and farms will be inspected once a year based on the checklist. Other programs, such as the Regional Sustainable Development Partnerships in Minnesota, promote farmers’ engagement in sustainability programs and communication between all participating parties.

The broad scope of sustainable agriculture and different practices might lead to consumer confusion and misperception. Therefore, it is crucial to understand what sustainable program features are important to consumers. To fill this knowledge gap, our study investigates what features of sustainability programs consumers like or dislike. Some sustainable farming features may not be perceived as desirable. For instance, some consumers may perceive an independent sustainable certification as being credible, while others may prefer programs that encourage farmers to engage in the certification process. More specifically, we aim to answer the following questions: Do consumers value farmers’ engagements in sustainable farming programs? Do programs promoting farmers’ engagement induce higher consumer WTP? Among existing sustainable farming practices, what are the features likely to induce consumer WTP premiums? Do preferences vary across different consumer groups? To answer the above questions, we conducted two versions of choice experiments using online surveys and employed mixed logit models and a latent class logit model to identify consumer WTP for program features and consumer segmentations differing in their preferences.
2. Choice Experiment and Model

2.1. Choice Experiment

Choice experiment (CE) has been widely used to research consumer behaviors, preferences, and willingness to pay (WTP) for different goods. The method has been applied to various topics, such as studying the effect of additional product information [16] and predicting market performance for new products [7]. CE presents participants with options that have various levels of attributes and ask participants to choose among the alternatives. Attribute levels vary across the alternatives and are designed in the way that ensures there is always a trade-off between alternatives. With different combinations of attributes in each choice set, CEs replicate a consumer’s rational decision-making process and are useful in estimating consumers’ utility function.

One possible drawback for hypothetical CE is that participants do not pay real money when making decisions, and the choices they make are therefore not real. However, the validity of CEs in consumer studies has been proved. Carlsson and Martinsson [17] suggested that CE responses are statistically indistinguishable across hypothetical and non-hypothetical (real purchasing) treatments. Lusk and Schroeder [18] demonstrated that the biases associated with estimated marginal WTP using hypothetical CE are reduced when CE questions are framed in a way that is similar to actual purchasing settings (non-hypothetical settings). They also found that although total WTP (relative to opt-out) was upwardly biased in hypothetical choice experiments, the marginal WTP (the difference in WTP for two products) was consistent. Yue and Tong [6] found the difference between hypothetical and non-hypothetical choice experiment estimation of WTP is 7.5–9.0%, which outperformed most contingent valuation studies examined by List and Gallet [19].

We conducted two versions of CEs in this study. The first CE focuses on consumers’ WTP for general sustainable farming attributes and farmers’ engagement, and the second CE focuses on consumers’ preference for different sustainable agriculture program features. In both versions of CEs, respondents were asked to choose between two options of canned sweet corn (15.5oz/3.5 servings) with varying prices. We chose canned sweet corn due to its popularity and its reduced perceived heterogeneity from respondents. Also, although this study focused on a particular product, the majority of the sustainable program features are general.

In the first version of the CE, respondents were asked to choose between canned sweet corn with different production/processing methods, certification methods, food miles, and prices. We used three types of production/processing methods (conventional, organic, and sustainable), four types of certifications, four levels of farm miles, and three levels of prices (The average price of canned sweet corn, according to the US Department of Agriculture (USDA), is about $0.48 per cup in 2016, and is about $0.52 after adjusting to 2019 USD. Thus, the price for a 15.5 oz canned sweet corn is about $1. According to USDA, organic corn prices are generally two to three times higher than conventional corn prices. The prices were chosen to cover the price range of conventional and organic sweet corns). Respondents were provided with the definition of sustainable agriculture “sustainable agriculture is an integrated system of plant and animal production practices having a site-specific application that will last over the long term (1) enhance environmental quality and the natural resource base upon which the agricultural economy depends, (2) make the most efficient use of nonrenewable resources and on-farm resources and integrate, where appropriate, natural biological cycles and controls, (3) sustain the economic viability of farm operations, and (4) enhance the quality of life for farmers and society as a whole.” Table 1 summarizes the levels of the attributes used in the first CE. We include a column that specifies the coding for each variable. Price and food miles are treated as continuous variables, while production methods and certifications are treated as dummy variables, with conventional and no certification as the base level.
Table 1. Product Attributes and Attribute Levels, Choice Experiment, Version One.

| Product Attribute | Attribute Levels | Variable Type |
|-------------------|-----------------|---------------|
| Price of canned sweet corn (15.5oz/3.5 servings) | $1.49 | Continuous variable |
|                   | $1.99 | |
|                   | $2.49 | |

Production Method

|                |          |
|----------------|----------|
| Conventional   | Dummy variables, Conventional as the reference |
| Sustainable    |          |
| Organic        |          |

Certification

|                        |          |
|------------------------|----------|
| No certification       | Dummy variables, No certification as the reference |
| Participatory certified (farmers participate in certification decision-making) | |
| USDA certified         |          |

Food Miles

|                |          |
|----------------|----------|
| 100 miles      |          |
| 300 miles      |          |
| 1000 miles     |          |
| 2500 miles     |          |

In the second version of CEs, respondents were asked to choose between canned sweet corn with five farm program attributes. These attributes covered five major aspects of sustainability programs, i.e., farmers’ engagement, the role of science, marketing promotions, sustainability measurements, and communication on sustainability practices. These five aspects of sustainable agriculture programs are selected based on the sustainable agriculture programs listed as partners of the USDA National Institute of Food and Agriculture (Available at [https://nifa.usda.gov/program/sustainable-agriculture-program](https://nifa.usda.gov/program/sustainable-agriculture-program)). Promoting farmers’ engagement is listed as a program feature of the Regional Sustainable Development Partnerships in Minnesota. Communicating and funding sustainable-agriculture-related science is mentioned in the National Institute of Food and Agriculture Annual Report of 2016. Marketing promotion is a common focus of the program marketing guide, such as the farmers’ market guide of North Central Region Sustainable Agriculture Research & Education (SARE) (An example of a farmers market guide can be found at [https://www.northcentralsare.org/Resources-and-Learning/Books/The-New-Farmers-Market/](https://www.northcentralsare.org/Resources-and-Learning/Books/The-New-Farmers-Market/)). Lastly, several sustainable agriculture programs have developed very specific sustainability measurements and guidelines for sustainability practices (An example of a sustainability guideline can be found at [https://silt.org/sustainability-guidelines-and-requirements/](https://silt.org/sustainability-guidelines-and-requirements/)). We expect that consumers would demand concrete measures of sustainability and good communication of sustainable practices.

To capture consumer preferences, we designed a choice experiment with various sustainable practices to evaluate if some program practices would induce a WTP premium or not. The attribute levels are presented in Table 2. Similar to in Table 1, we also provided the coding for each variable, where the price is treated as a continuous variable, and program features are treated as dummy variables with a certain feature as the base level. The details of the attribute levels are described as follows.

First, regarding farmers’ engagement, the lowest level of farmers’ engagement is that managers dominate the certification process, i.e., managers tell farmers what is required to participate. We included two higher levels of farmers’ engagement, i.e., farmers participate in learning what is required to meet...
consumer demands and farmers advise program managers on program requirements and activities, and the latter one has the highest level of farmer engagement.

Table 2. Product Attributes and Attribute Levels, Choice Experiment, Version Two.

| Product Attribute and Attribute Levels | Variable Type |
|--------------------------------------|---------------|
| Price of canned sweet corn (15.5oz/3.5 servings) | Continuous Variable |
| $1.00 | |
| $1.50 | |
| $2.00 | |
| Farmer engagement in a sweet corn sustainability program | Dummy Variables, 1 as the reference |
| 1 Managers tell farmers what is required to participate. | |
| 2 Farmers advise program managers on program requirements and activities. | |
| 3 Farmers participate to learn what is required to meet consumer demands. | |
| The role of science in the sustainability program | Dummy Variables, 1 as the reference |
| 1 Farmers must seek out scientific information on their own. | |
| 2 Program communicates scientific information to farmers. | |
| 3 Program funds science that will increase the sustainability of farmer practices. | |
| Consumer access to sustainably produced processed vegetables | Dummy Variables, 1 as the reference |
| 1 Program focuses on helping farmers produce crops more sustainably. | |
| 2 Program helps farmers create new market opportunities. | |
| 3 Program helps farmers and processors reach more consumers. | |
| How sustainability is measured on participating farms | Dummy Variables, 1 as the reference |
| 1 Farmers declare that they are sustainable with no on-farm measures required. | |
| 2 Farmers in program must demonstrate use of sustainable practices. | |
| 3 Measures of on-farm practices and consumer buying decisions are used to measure sustainability. | |
| How the program communicates findings with food processors and grocery chains | Dummy Variables, 1 as the reference |
| 1 Program develops grower sustainability scorecards that will be provided to processors and grocery chains. | |
| 2 Program provides popular materials to food processors and grocery chains on sustainability to distribute to consumers. | |
| 3 Program provides facts on farmer use of sustainable practices that food processors and grocery chains can communicate to consumers. | |

Second, in terms of the role of science, we used the case where the program plays a passive role, i.e., farmers must seek out scientific information related to sustainable agriculture on their own, as the base level. We then include two more levels for the role of science, i.e., the program provides scientific information to farmers, or the program funds science. Both levels were program practices introduced in the National Institute of Food and Agriculture 2016 Annual Report (2016).

Third, regarding marketing promotion, we used the typical practice of sustainable agriculture programs, i.e., helping farmers produce crops more sustainably (without a marketing focus), as the base level. We are interested in what consumers think about a sustainable program that does marketing promotion. Thus, we included two alternative program practices, i.e., the program helps farmers to create new market opportunities, or the program helps farmers and processors reach more consumers.

Fourth, we expected having measurements of sustainable practices to be an essential attribute, as studies demonstrated that the concrete information on sustainable agriculture has a significant impact on consumer preferences [9,10]. Thus, we designed variations in sustainable practice measurement. We set the base level to be that farmers declare that they are sustainable with no on-farm measures required. We then included two more levels, i.e., farmers in the program must demonstrate the use of sustainable practices, or measures of on-farm practices and consumer buying decisions are used to
measure sustainability. The last level not only considers farm practice but also marketing performance as sustainability measurement.

Lastly, in addition to communicating program practices to consumers, we expected that consumers may care about how programs communicate with food processors and grocery chains because such communication promotes sustainable program transparency. We thus used the current farm practice, i.e., sustainability scorecards, as the base level, and the included program provides popular materials, or program provides facts on farmer use of sustainable practices, as alternative practices.

To mimic actual shopping, we included an opt-out option for both of the CEs. The two versions of experiments were generated using optimal D-efficiency fractional factorial design with two blocks. Each participant randomly answered one of the two blocks of questions. Each block consisted of 6 or 8 questions for the first and the second version of the CEs, respectively. We presented an example of the first and the second version of CE in Tables 3 and 4, respectively. Besides the choice scenarios, we also asked questions about participants’ socio-demographic backgrounds and economic status. The CEs were conducted online, and participants were randomly selected across the United States recruited by Qualtrics™, a professional survey company. A pretest of the survey was conducted to validate the experiment design. Only consumers who were primary grocery shoppers were allowed to take the surveys.

Table 3. Example of Choice Scenario, Choice Experiment Version One.

| Attribute                                      | Option A                                      | Option B                                      | Option C                                      |
|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|
| Production/Processing Method                  | Sustainable                                   | Organic                                       | Neither option A or B                          |
| Certification                                 | Participatory certification (producers/processors participate in certification decision-making) | US Department of Agriculture Certification |                                |
| Food Miles (farm to store)                    | 100 miles                                     | 1000 miles                                    |                                               |
| Price of canned sweet corn (15.5oz/3.5 servings) | $2.49                                         | $1.49                                         |                                               |

Table 4. Example of Choice Scenario, Choice Experiment Version Two.

| Attribute                                      | Option A                                      | Option B                                      | Option C                                      |
|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|
| Farmer engagement in a sweet corn sustainability program | Farmers advise program managers on program requirements and activities. | Managers tell farmers what is required to participate. |                                |
| The role of science in the sustainability program | Farmers must seek out relevant scientific information on their own. | Farmers must seek out relevant scientific information on their own. |                                |
| Consumer access to sustainably produced processed vegetables | The program helps farmers produce crops and find market opportunities. | The program focuses on helping farmers produce crops more sustainably. | Neither Option A or B |
| How sustainability is measured on participating farms | Farmers declare that they are sustainable with no on-farm measures required. | Measures of on-farm practices and consumer buying decisions are used to measure sustainability. |                                |
| How the program communicates findings with food processors and grocery chains | The program provides facts on farmer use of sustainable practices that food processors and grocery chains can communicate to consumers. | The program provides facts on farmer use of sustainable practices that food processors and grocery chains can communicate to consumers. |                                |
| Price of canned sweet corn (15.5oz/3.5 servings) | $1.00                                         | $1.50                                         |                                               |
2.2. Econometrics Model

A mixed logit model was employed to analyze the CE data. A mixed logit model allows consumers’
taste parameter to vary by some distribution, and it does not need the independence of irrelevant
alternatives (IIA) assumption [20,21].

We assumed a linear utility function as Equation (1):

\[ U_{ijt} = x_{ijt} \beta_i + \varepsilon_{ijt}. \] (1)

In Equation (1), individual \( i (i = 1, 2, \ldots, N) \) selects alternative \( j \) with the preferred attributes
and price combination among a set of \( J \) alternatives (\( j = 1, 2, \ldots, J \)). The individual needs to make
choices for \( t (t = 1, 2, \ldots, T) \) choice scenarios. Additionally, \( x_{ijt} \) is a vector of observed attributes,
including a price level, and \( \beta_i \) is the random coefficient vector following some density function
\( f(\beta|\theta) \), where \( \theta \) is a vector of the parameters that define the distribution. In this study, we assume the density
function \( f(\beta|\theta) \) is multivariate normal, and thus \( \theta \) includes the mean vector and a variance matrix
of a multivariate normal distribution. To reduce the number of parameters, we also assumed the
variance matrix as being diagonal. \( \varepsilon_{ijt} \) is the random term assumed to be independently and identically
distributed following type I extreme value distribution.

\[ p_i(y_i|x_i, \beta_i) = \prod_{t=1}^{T} \prod_{j=1}^{J} \left( \frac{\exp(x_{ijt} \beta_i)}{\sum_{l=1}^{J} \exp(x_{il} \beta_i)} \right)^{y_{ijt}}. \] (2)

The likelihood function could then be defined as:

\[ L = \int_{\theta \in \Theta} L_i(y_i|x_i, \beta_i) f(\beta_i|\theta) d\beta_i \] (3)

where \( f(\cdot) \) is the density function of a normal distribution with parameter \( \theta \in \Theta \). To simulate the integral
in Equation (3), we applied 1000 Halton draws of \( \beta_i \) from the distribution \( f(\beta_i|\theta) \). The parameters
were estimated by using Maximum Likelihood. The mixed logit models were estimated using the R
package “mlogit” [22].

The WTP for attribute \( k \) was then defined as

\[ WTP_k = -\frac{\beta_k}{\beta_p} \] (4)

where \( \beta_k \) is the marginal utility of attribute \( k \) and \( \beta_p \) is the marginal disutility from price. Since both \( \beta_k \)
and \( \beta_p \) were estimated, the standard error of WTP was then estimated using the Delta Method.

Furthermore, the main focus of this study was to understand consumer preferences for sustainable
agriculture programs. We employed a latent class logit model (see Boxall and Adamowicz [23] and
Greene and Hensher [24]) to identify market segments based on consumers’ preference heterogeneities
and demographics. The latent class analysis assumes that consumers can be segmented into a few
classes, and the preferences are heterogeneous across different classes, while members of each class
have homogeneous preferences. The purpose of the latent class logit model is to identify market
segments in terms of consumer preferences for sustainable agriculture programs.

Suppose individual \( i \) belongs to class \( q (q = 1, \ldots, Q) \) with the probability

\[ \pi_{iq} = \frac{\exp(z_i \gamma_q)}{\sum_{l=1}^{Q} \exp(z_i \gamma_l)}. \] (5)
In Equation (5), $\gamma$ denotes vectors of parameters with $\gamma_1$ set to 0, and $z_i$ denotes the demographics of individual $i$. Since individuals within the same group are assumed to have a homogeneous taste parameter, the distribution of taste parameter $\beta_i$ for individuals in class $q$ can be specified as $f(\beta_i | \gamma) = \pi_{iq}$. We can then write individual $i$’s contribution to the likelihood function as

$$L_i(y_i | x_i, z_i) = \sum_{q=1}^{Q} \pi_{iq} \left\{ \Pi_{t=1}^{T} \Pi_{j=1}^{J} \frac{\exp(x_{ijt} \beta_{q})}{\sum_{l=1}^{L} \exp(x_{ijl} \beta_{q})} \right\}^{y_{ij}}.$$

The parameters were estimated by using maximum likelihood. The latent class logit model was estimated with R package “gmnl” [24].

3. Results

3.1. Summary Statistics

Table 5 presents the summary statistics for participants of the two versions of CEs. Participants of both versions of CEs were consumers who conducted grocery shopping at least twice a year. In order to make Mixed Logit and the latent class analysis comparable, the second version of CE was restricted to participants who provided information on the key demographic variable summarized in Table 5 for CE 2 (After excluding infrequent shoppers, those who did not completed the survey or failed to provide information crucial to the estimation, a total of 1238 participants were included.). As indicated in Table 5, the majority of participants were frequent grocery shoppers, i.e., they shopped groceries at least biweekly. The final sample size of CE version 1 was 1010. The average age was about 51. About half of participants were female, and 53% of participants were married. The average household size was two to three people. Most of participants had less than some college education. The median household income was around $50,000 per year.

The second version of the CE included additional demographic variables, such as employment status and if the household had at least one child or not. The summary statistics for participants in the second version of CE are also shown in Table 5. In total, 757 participants completed the survey. The average age of participants was 50. Among these participants, 71% was female, 55% was married, and 71% had no children under 12 years old living in the same family. The average household size was two to three people. Most of participants had less than some college education, and the income distribution was similar to that of participants who participated in the first CE. Besides, 61% of participants were employed full-time, 24% were part-time.

We also included the census data from the American Community Survey (ACS) in 2018 as the reference. Due to the fact that our samples were restricted to those who were primary shoppers in a household, participants’ demographics in our samples deviated from the census data in certain aspects. For instance, in CE version 2, there were more female participants, and more participants tended to be married.
Table 5. Summary Statistics for Choice Experiment Participants.

| Variables                  | CE 1  | S.D. | CE 2  | S.D. | ACS (2018) |
|---------------------------|-------|------|-------|------|------------|
| Age                       | 50.58 | 16.34| 49.70 | 16.39| 38.20 (Median) |
| Household Size             | 2.56  | 1.35 | 2.59  | 1.35 | 2.63 (Mean)  |
| Female                     | 487   | 51.10| 538   | 71.07| 49.20       |
| Male                       | 466   | 48.90| 219   | 28.93| 50.80       |
| Education                  |       |      |       |      |            |
| Graduate Degree            | 147   | 15.43| 88    | 11.63| 12.60       |
| Some Graduate School       | 40    | 4.20 | 24    | 3.17 |            |
| College Diploma            | 287   | 30.12| 231   | 30.52| 28.60       |
| Some College               | 285   | 29.91| 215   | 28.40| 20.30       |
| High School Diploma        | 175   | 18.36| 184   | 24.31| 26.90       |
| Some High School or Less   | 19    | 1.99 | 15    | 1.98 | 11.70       |
| Marital Status             |       |      |       |      |            |
| Married                    | 508   | 53.31| 415   | 54.82| 47.75       |
| Not Married                | 445   | 46.69| 342   | 45.18| 52.25       |
| Income                     |       |      |       |      |            |
| $15,000 or under           | 78    | 8.67 | 108   | 14.27| 10.60       |
| $15,001–$25,000            | 111   | 12.33| 76    | 10.04| 9.00        |
| $25,001–$35,000            | 91    | 10.11| 102   | 13.47| 8.90        |
| $35,001–$50,000            | 142   | 15.78| 119   | 15.72| 12.40       |
| $50,001–$65,000            | 142   | 15.78| 117   | 15.46| 30.00       |
| $65,001–$80,000            | 108   | 12.00| 81    | 10.70| (550,001–100,000) |
| $80,001–$100,000           | 95    | 10.56| 71    | 9.38 |            |
| $100,001–$150,000          | 84    | 9.33 | 64    | 8.45 | 15.00       |
| Over $150,000              | 49    | 5.44 | 19    | 2.51 | 14.20       |
| With Children              |       |      |       |      |            |
| Yes                       | 220   | 29.06|       |      | 37.72       |
| No                        | 537   | 70.94|       |      | 62.28       |
| Employment Status          |       |      |       |      |            |
| Full time                  | 267   | 60.54|       |      | 60.09       |
| Part time                  | 105   | 23.81|       |      | 17.02       |
| Others                     | 69    | 15.65|       |      | 22.89       |

3.2. Estimation Results

3.2.1. Consumer Preference for Sustainable Certification and Farmers’ Engagements

The first CE was designed to measure consumers’ preference for general sustainable certification and farmers’ engagements in certification programs. To reduce the possibility of numeric overflow of the exp() function (The maximum finite number of a 64-bit machine is approximately exp(709.7827).), we divided farm miles by 1000. For the mixed logit estimation, we allowed all coefficients to be random without correlation.

In Table 6, we present the results for the mixed-logit model, and all product attribute coefficients were assumed to be random without correlation with each other. Consumers’ marginal utility gain from sustainable agriculture and organic products is statistically significant and positive, and the magnitude is slightly higher for sustainable compared to organic. In addition, although compared to the USDA certified products consumers’ marginal utility gain is smaller for participatory certifications, i.e., the programs that encourage farmers to have a more active role in certification processes, participants have positive marginal utility for participatory certifications; however, independently certified programs do not induce statistically significant marginal utility. Mixed logit was used to investigate if individuals’ taste parameters for the studied attributes varied significantly. The insignificant standard deviations for organic, sustainable, certification, and food miles indicate individuals’ taste parameters do not vary significantly for these attributes; however, we did find the standard deviation for the intercept is significant, which indicates individuals’ preferences and WTP for conventional sweet corns vary significantly.
Table 6. Mixed Logit Coefficients, Choice Experiment Version One.

| Variables                        | Coef  | Std. Error | p    |
|----------------------------------|-------|------------|------|
| **Intercept**                    | 1.929 | 0.567      | ***  |
| **Organic**                      | 0.410 | 0.209      | **   |
| **Sustainable**                  | 0.475 | 0.155      | ***  |
| **Independently certified**      | −61.282 | 732.290   |      |
| **Participatory certification**  | 0.352 | 0.161      | **   |
| **USDA certified**               | 0.529 | 0.165      | ***  |
| **Farm miles**                   | −0.024 | 0.065      |      |
| **Price**                        | −0.778 | 0.243      |      |

Standard Deviations

| Variables                        | Coef  | Std. Error | p    |
|----------------------------------|-------|------------|------|
| **Intercept**                    | 1.267 | 0.732      | *    |
| **sd.Organic**                   | 0.007 | 13.136     |      |
| **sd.Sustainable**               | 0.548 | 1.146      |      |
| **sd.Independently certified**   | −146.470 | 1729.100  |      |
| **sd.Participatory certification** | −0.009 | 7.597      |      |
| **sd.USDA certified**            | 0.015 | 7.389      |      |
| **sd.Farm miles**                | −0.019 | 1.887      |      |
| **sd.Price**                     | 0.007 | 2.208      |      |

Note: Log Likelihood = −6358.3. First section of the table summarize the mean coefficients, and the second section summarize the standard deviation coefficients. * p < 0.1, ** p < 0.05, *** p < 0.01.

Table 7 summarizes the WTP premium for the product attributes. We provided both the mean and the confidence interval at the 95% significance level. We derived the WTP from the mixed logit model presented previously. On average, consumers were willing to pay $0.53 and $0.61 for organic and sustainable certified canned corn compared to the conventional counterpart, respectively. The two WTP premiums were significant at the 95% significance level. The WTP premium for independent certification was statistically insignificant, while the WTP premium for participatory certification and USDA certification were both statistically significant. Consumers were willing to pay, on average, about $0.45 and $0.68 premiums for participatory and USDA certifications, respectively. The WTP for farm miles was statistically insignificant.

Table 7. Willingness-to-pay Premium for Attributes, Choice Experiment Version One.

|                | Estimate | SE  | 2.50% | 97.50% |
|----------------|----------|-----|-------|--------|
| **Conventional Product** |          |     |       |        |
| Organic        | 0.528    | 0.226 | 0.085 | 0.971  |
| Sustainable    | 0.610    | 0.159 | 0.299 | 0.922  |
| Independently certified | 0       | 0    | 0     | 0      |
| **No Certification** |          |     |       |        |
| Participatory Certified | 0.452    | 0.150 | 0.158 | 0.746  |
| USDA certified  | 0.680    | 0.226 | 0.237 | 1.123  |
| Farm miles (per 1000) | 0       | 0    | 0     | 0      |

Note: The willingness to pay (WTP) standard error was evaluated using the Delta Method. “—” means the WTP is not calculated due to the attribute’s insignificant coefficient.

3.2.2. Consumer Preference for Specific Farm Program Features

A mixed logit model was employed to analyze the second CE data to understand consumer preference for specific farm program features. All program feature coefficients were assumed to be normal distributions without any correlation between each other. The estimation results for the mixed logit model are shown in Table 8. As mentioned previously, each program attribute is a dummy variable, and Table 2 shows the base attribute level.
Table 8. Mixed Logit Coefficients, Choice Experiment Version Two.

| Reference Variables                                      | Coef   | Std. Error |
|-----------------------------------------------------------|--------|------------|
| Managers tell farmers what is required to participate.    |        |            |
| Farmers advise program managers on program requirements and activities. | 104.218| 4.186 ***  |
| Farmers participate to learn what is required to meet consumer demands. | 8.632  | 1.645 ***  |
| Farmers must seek out scientific information on their own. |        |            |
| The program communicates scientific information to farmers. | 8.186  | 1.682 ***  |
| The program funds science that will increase the sustainability of farmer practices. | 6.870  | 1.495 ***  |
| The program focuses on helping farmers produce crops more sustainably. |        |            |
| The program helps farmers create new market opportunities. | −0.421 | 1.623      |
| Farmers in program must demonstrate use of sustainable practices. | −3.164 | 2.277      |
| The program helps farmers and processors reach more consumers. | 12.562 | 1.840 ***  |
| Measures of on-farm practices and consumer buying decisions are used to measure sustainability. | 11.301 | 2.539 ***  |
| The program develops grower sustainability scorecards that will be provided to processors and grocery chains. |        |            |
| The program provides popular materials to food processors and grocery chains on sustainability to distribute to consumers. | −4.484 | 1.694 ***  |
| The program provides facts on farmer use of sustainable practices that food processors and grocery chains can communicate to consumers. | 4.336  | 2.145 **   |
| Price                                                     | −37.909| 3.703 ***  |

| Reference Variables                                      | Coef   | Std. Error |
|-----------------------------------------------------------|--------|------------|
| Intercept                                                 | 82.369 | 4.809 ***  |
| sd. Farmers advise program managers on program requirements and activities. | −9.932 | 6.109      |
| sd. Farmers participate to learn what is required to meet consumer demands. | −2.461 | 7.998      |
| sd. The program communicates scientific information to farmers. | −43.283| 7.508 ***  |
| sd. The program funds science that will increase the sustainability of farmer practices. | 1.306  | 8.972      |
| sd. The program helps farmers create new market opportunities. | −31.875| 6.883 ***  |
| sd. The program helps farmers and processors reach more consumers. | 40.361 | 8.679 ***  |
| sd. Farmers in the program must demonstrate the use of sustainable practices. | 1.328  | 5.682      |
| sd. Measures of on-farm practices and consumer buying decisions are used to measure sustainability. | −32.123| 7.713 ***  |
| sd. The program develops grower sustainability scorecards that will be provided to processors and grocery chains on sustainability to distribute to consumers. | −12.288| 6.836 *    |
| sd. The program provides facts on farmer use of sustainable practices that food processors and grocery chains can communicate to consumers. | −0.798 | 7.595      |
| Price                                                     | 38.854 | 2.971 ***  |

Note: Log Likelihood = −6174.2. First section of the table summarizes the mean coefficients, and the second section summarize the standard deviation coefficients. * p < 0.1, ** p < 0.05, *** p < 0.01.
Compared to the base group, the coefficients for two attributes representing a higher level of farmer engagement in the sustainability program were both significant and positive, indicating that consumers value a farmer’s engagement. This result was consistent with what we found using the first CE. The positive and significant coefficients of the attributes related to the role of science suggested that consumers preferred programs to communicate scientific information to farmers or fund scientific research. Furthermore, compared to the program focus on helping consumers to produce more sustainably, programs that focused on marketing did not induce additional utility. This indicates that participants viewed marketing promoting and sustainable producing as being statistically indifferent.

The preference for measurement of sustainability was statistically significant; consumers preferred programs showing that farmers can demonstrate their practices are sustainable, and on-farm practices and consumer buying decisions are used to measure sustainability. Programs that provide popular materials to distribute to consumers did not induce a higher marginal utility, compared to programs that develop sustainability scorecards. On the other hand, programs that provide facts on farmers’ sustainable practices induced a higher utility than sustainability scorecards. The coefficient of price was negative and significant, indicating that price was an important factor when participants make a decision.

The WTPs for program features derived from the mixed-logit model are presented in Table 9. The base levels are listed in the first column of the table. Compared to sweet corn produced by the program where managers tell farmers what is required to participate in a sustainability program, participants were willing to pay $0.23 and $0.22 more per can for sweet corn produced by the programs that encourage farmers to play more active roles. Participants were also willing to pay $0.18 and $0.21 more for canned sweet corn produced with the program communicating scientific information to farmers and program funding science, compared to programs in which farmers seek out scientific information on their own.

Besides, participants were willing to pay premiums of $0.33 and $0.30 for sweet corn produced by the program with explicit measurements of sustainability, compared to self-declared sustainable agriculture programs. Furthermore, the consumer WTP premium for a program that focuses on marketing was insignificantly different from a program that focuses on sustainable agriculture practice. Compared to canned sweet corn produced by a program providing popular materials to consumers, consumers were willing to pay a premium of $0.12 for canned corn by a program with sustainable scorecards, and the WTP was even higher when the program provides facts of sustainable practices, i.e., $0.14 more per can compared to programs with sustainability scorecards.

A latent class logit model was conducted to segment different consumer groups based on their preferences and demographic backgrounds. In empirical studies, information criteria such as the Bayesian Information Criterion (BIC) and Akaike Information Criterion (AIC) are frequently used when choosing the optimal number of latent classes [23]. We found the cases with higher than 4 classes had a singular variance covariance matrix. Thus, in Table 10, we show the AIC and the BIC (Nylund et al. [25] showed that the BIC performs better than the AIC, and Dias [26] indicated that the AIC penalty 3 performs better than the AIC penalty 2.) with 2 classes and 3 classes. As Table 10 indicates, the 3 class is preferred than the 2 class, as the AIC2, AIC3, and BIC are lower for 3 classes.
Table 9. Willingness-to-pay Premium for Attributes, Choice Experiment Version Two.

| Reference Program Attribute                                      | Program Attribute                                                                 | Estimate | SE  | 2.50% | 97.50% |
|------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------|-----|-------|--------|
| Managers tell farmers what is required to participate.           | Farmers advise program managers on program requirements and activities.           | 0.228    | 0.038| 0.152 | 0.303  |
| Farmers must seek out scientific information on their own.       | Farmers participate to learn what is required to meet consumer demands.            | 0.216    | 0.042| 0.134 | 0.298  |
|                                                                  | The program seeks out scientific information to farmers.                           | 0.181    | 0.041| 0.101 | 0.261  |
|                                                                  | The program funds science that will increase the sustainability of farmer practices.| 0.214    | 0.047| 0.122 | 0.306  |
| The program focuses on helping farmers produce crops more sustainably. | The program helps farmers create new market opportunities.                        | —        | —   | —     | —      |
| Farmers declare that they are sustainable with no on-farm measures required.| The program helps farmers and processors to reach more consumers.                 | —        | —   | —     | —      |
|                                                                  | Farmers in the program must demonstrate the use of sustainable practices.         | 0.331    | 0.039| 0.254 | 0.409  |
|                                                                  | Measures of on-farm practices and consumer buying decisions are used to measure sustainability. | 0.298    | 0.062| 0.177 | 0.419  |
| The program develops grower sustainability scorecards that will be provided to processors and grocery chains. | The program provides popular materials to food processors and grocery chains on sustainability to distribute to consumers. | −0.118   | 0.045| −0.206| −0.031 |
|                                                                  | The program provides facts on farmer use of sustainable practices that food processors and grocery chains can communicate to consumers. | 0.114    | 0.054| 0.009 | 0.220  |

Note: WTP is derived from the Mixed-Logit Model. Standard error was evaluated using the Delta Method. “—” means the WTP is not calculated due to the attribute's insignificant coefficient. 3.2.3. Consumers Segmentation-Latent Class Logit Estimation Results.
Table 10. Model Selection for Latent Class Logit Model (Choice Experiment 2).

| Classes | LLF     | Number of Parameters | AIC2 | AIC3 | BIC  |
|---------|---------|----------------------|------|------|------|
| 2       | -5691.10| 35                   | 11452| 11452| 11687|
| 3       | -5472.00| 58                   | 11060| 11060| 11449|

The estimation results of the latent class logit model using 3 classes are presented in Table 11. Similar to Table 9, the column named “base level” lists the base level for the corresponding attribute. Consumers of class I, II, and III consist of 19.41%, 18.44%, and 62.15% of the sample, respectively. First, the majority of participants (81.6%), except class II, preferred farmers to play a more active role in the sustainable program. This result was consistent with our finding in CE version 1 that participants preferred certification that farmers play a more active role than an independent certificate. Second, at a 95% level of significance, participants of class II and III (80.6%) cared about if programs communicate scientific information to farmers or fund sustainable agriculture study. Third, in terms of marketing promotion, none of the three classes preferred programs that focus on promoting market opportunities or reach more consumers to programs that focus on helping farmers produce crops more sustainably. In fact, the program focus on marketing generated negative utility for consumers of class I, and the negative effect was significant at a 1% significance level. However, for participants of class II and III, the marketing-related program coefficients were insignificant, which suggests a statistical indifference between marketing promotion and facilitating sustainable production, rather than an indication that marketing promotion is not important to consumers. Fourth, having a concrete measure of sustainability was the most preferred program practice. Participants of all classes preferred programs that use sustainable practices to programs compared to farmers’ self-declared sustainability. The comprehensive measure of sustainability, which considers both on-farm and consumer buying decisions, was also preferred by participants of class I and III. Lastly, participants in class II and III preferred sustainability scorecards compared to the practice of communicating sustainable measures with processors and grocery chains. Furthermore, providing facts on farmers’ use of sustainable practices was more preferred to sustainability scorecards by consumers in class III. Providing practice facts should be perceived as richer in information by consumers, and this result is consistent to the tendency of demanding more information.

Table 12 presents the effect of demographics on class membership. Table 12 indicates that compared to participants with college or higher degrees, participants with high school or less were less likely to fall into class II and III. Recall that class II and III participants have strong preferences for programs that communicate science with farmers and fund sustainable agriculture studies; such an association between class membership and consumer demographics is reasonable. In addition, classes II and III tended to have higher incomes. Class III tended to have a full-time job. The magnitudes of price coefficients suggested that class II and III were less price sensitive compared to class I, and the price coefficient for class III was not statistically significant.
Table 11. Estimation Results from Latent Class Logit Model (Choice Experiment Version 2).

| Base Level of Program Feature Attribute | Class I |     | Class II |     | Class III |     |
|-----------------------------------------|---------|-----|----------|-----|-----------|-----|
|                                         | Coef.   | Std. Dev. | Coef.   | Std. Dev. | Coef.   | Std. Dev. |
| Intercept                               | 13.3209 | 1.7739 *** | 0.1110 | 0.3051 *** | 1.0197 | 0.1221 *** |
| Price                                   | −7.8257 | 1.1755 *** | −1.4755 | 0.2037 *** | −0.0958 | 0.0752 *** |
| Farmers advise program managers on program requirements and activities. | 0.5421 | 0.2654 ** | 0.2436 | 0.1758 | 0.2198 | 0.0509 *** |
| Farmers participate to learn what is required to meet consumer demands. | 1.2902 | 0.3314 *** | −0.0350 | 0.2098 | 0.2591 | 0.0661 *** |
| Managers tell farmers what is required to participate. | −0.4611 | 0.2550 * | 0.7099 | 0.1762 *** | 0.3179 | 0.0476 *** |
| Farmers must seek out scientific information on their own. | 0.7397 | 0.4298 *** | 0.5482 | 0.1943 *** | 0.3543 | 0.0701 *** |
| The program communicates scientific information to farmers. | −0.3974 | 0.2289 *** | −0.0669 | 0.1652 | 0.0644 | 0.0499 |
| The program funds science that will increase the sustainability of farmer practices. | 1.9879 | 0.5849 *** | 0.4944 | 0.1605 *** | 0.3683 | 0.0461 *** |
| The program helps farmers create new market opportunities. | −2.0996 | 0.7387 *** | 0.0736 | 0.1762 | −0.0287 | 0.0680 |
| The program helps farmers and processors reach more consumers. | 1.8510 | 0.6136 *** | 0.3026 | 0.2007 | 0.4037 | 0.0689 *** |
| Farmers declare that they are sustainable with no on-farm measures required. | −0.3082 | 0.2810 ** | −0.4356 | 0.1800 ** | −0.1384 | 0.0544 ** |
| The program develops grower sustainability scorecards that will be provided to processors and grocery chains. | −0.1513 | 0.3459 ** | −0.0612 | 0.1794 | 0.2071 | 0.0693 *** |
| Share in the Total Population            | 19.41% | 18.44% | 62.15%   |     |           |     |

Notes: log likelihood = −5472. parentheses * p < 0.1, ** p < 0.05, *** p < 0.01. The reference levels are provided in the first column.
Table 12. Socio-demographic Backgrounds from Membership Function of the Latent Class Logit Model (Choice Experiment 2).

| Reference Level | Variables                      | Class II         | Std. Dev. | Coef. | Std. Dev. | Class III         | Coef. | Std. Dev. |
|-----------------|--------------------------------|------------------|-----------|-------|-----------|------------------|-------|-----------|
|                 | Intercept                      | 0.5520           | 0.1919    | ***   | 1.1324    | 0.1635           | ***   |
| Education:      | High School or Less            | −0.4221          | 0.1182    | ***   | −0.4017   | 0.0984           | ***   |
|                 | Some College                   | −0.1179          | 0.1172    | −0.0619 | 0.0988   |
| Male            |                                | −0.1699          | 0.1043    | −0.1315 | 0.0877   |
| Not Married     |                                | −0.0254          | 0.1067    | −0.0401 | 0.0847   |
| Household Size  |                                | −0.1219          | 0.0499    | **     | 0.0225    | 0.0379           |
| High Income     | (<$35,000)                     | −0.0697          | 0.1513    |         | 0.0677    | 0.1303           |
|                | Median income ($35,001–$80,000)| −0.4851          | 0.1332    | ***   | −0.3383   | 0.1135           | ***   |
| Without Children| With children                  | 0.5184           | 0.1384    | ***   | 0.0993    | 0.1131           |
| Other Working Status | Working full time       | 0.1621           | 0.1156    |         | 0.7249    | 0.0926           | ***   |
|                 | Working part time              | 0.3402           | 0.1486    | **     | 0.6560    | 0.1234           | ***   |

Notes ** $p < 0.05$, *** $p < 0.01$. This table shows differences in demographic backgrounds of the above two groups compared to class I.
4. Discussion

Many studies have investigated consumer preferences and WTP for specific sustainable attributes such as local, organic, fair trade, etc. [3,11,27,28]. This study is different from the majority of existing studies because it examines consumer preferences for sustainable agriculture programs. Based on our findings, we make several recommendations on sustainable agriculture programs. First, sustainable agriculture programs should encourage farmers to play a more active role. Although the underlying reason for consumers to encourage inclusiveness may require further studies, previous studies have documented that consumers are motivated to empower farmers. For instance, Hvitsand [29] argued the development of community supported agriculture (CSA) in Norway, as an alternative system to industrialized agriculture and a globalized food system, is driven by the movement of empowering producers and local communities. Second, sustainable agriculture programs should design communication of sustainable agriculture science with farmers and, if possible, fund sustainable agriculture science study as a part of the program mission. Educating farmers about the science of sustainable agriculture is important not only because consumers are willing to pay a premium for such program practices, it is also crucial for promoting sustainable agriculture practices. Mishra et al. [30] studied farmers in Kentucky and found that a lack of knowledge about sustainable farming and associated technology significantly reduces the adoption of sustainable practices. Furthermore, sustainable agriculture programs should have a set of concrete measurements of sustainability and communicate farmers’ sustainable practices to downstream markets. Because sustainable agriculture attributes are largely non-verifiable, provision of the sustainable measures farmers used increases the credibility of the sustainable claims.

Although our results indicate that marking promotions compared to helping farmers produce more sustainably, which supposedly is the focus of sustainable agricultural programs, does not induce consumer WTP premium, this result does not suggest that programs should not take into account the importance of marketing. Instead, our finding should be interpreted as showing that marketing and facilitating sustainable production are not statistically different to the majority of consumers.

5. Conclusions

We conducted two online CEs with U.S. consumers and employed the mixed logit model and the latent class logit model to identify consumer preferences for sustainable attributes and sustainable farm program features. Although we used canned sweet corn as a targeted product, our research provides useful information for designing new sustainability programs for the vegetable industry and beyond.

On average, consumers had a high WTP for sustainable agriculture. We found consumers valued sustainable certification about the same as organic certification. Consumers preferred the certification that encourages farmers’ engagement, while the WTP premium for an independent certification is minimal. Consumers expressed a consistent preference for programs that encourage farmers’ engagements in both versions of CEs. Furthermore, programs promoting science in sustainable agriculture and programs with concrete measurements of sustainable practices were preferred by consumers.

Three segments of consumers were identified based on their preferences and demographic backgrounds in the latent class analysis. The latent class analysis also confirmed that encouraging farmers’ engagement, promoting science, and the majority of the consumers valued concrete measurements of sustainability. As expected, consumers with higher education were more likely to support promoting science on sustainability, and consumers with higher income and education levels were generally less price sensitive.

As a final note, this study is also not without limitations. Because the derived consumers’ WTP are hypothetical, and it might be subject to potential hypothetical bias. However, previous studies have proved the validity of hypothetical CES, and we believe that the main findings, such as consumers’ preference for farmers’ engagement, promotion of science, and concrete measures of sustainable agriculture practice, are robust.
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References
1. Hamzaoui Essoussi, L.; Zahaf, M. Exploring the decision-making process of Canadian organic food consumers: Motivations and trust issues. *Qual. Mark. Res.* 2009, 12, 443–459. [CrossRef]
2. Aertsens, J.; Mondelaers, K.; Verbeke, W.; Buyssse, J.; Van Huylenbroeck, G. The influence of subjective and objective knowledge on attitude, motivations and consumption of organic food. *Br. Food J.* 2011, 113, 1353–1378. [CrossRef]
3. Hemmerling, S.; Hamm, U.; Spiller, A. Consumption behaviour regarding organic food from a marketing perspective—A literature review. *Org. Agric.* 2015, 5, 277–313. [CrossRef]
4. Hu, W.; Woods, T.; Bastin, S. Consumer acceptance and willingness to pay for blueberry products with nonconventional attributes. *J. Agric. Appl. Econ.* 2009, 41, 47–60. [CrossRef]
5. Yue, C.; Alfnes, F.; Jensen, H.H. Discounting Spotted Apples: Investigating Consumers’ Willingness to Accept Cosmetic Damage in an Organic Product. *J. Agric. Appl. Econ.* 2009, 41, 29–46. [CrossRef]
6. Yue, C.; Tong, C. Organic or Local? Investigating Consumer Preference for Fresh Produce Using a Choice Experiment with Real Economic Incentives. *HortScience* 2009, 44, 366–371. [CrossRef]
7. Brooks, K.; Lusk, J.L. Stated and revealed preferences for organic and cloned milk: Combining choice experiment and scanner data. *Am. J. Agric. Econ.* 2010, 92, 1229–1241. [CrossRef]
8. Van Loo, E.J.; Caputo, V.; Nayga, R.M.; Meullenet, J.-F.; Ricke, S.C. Consumers’ willingness to pay for organic chicken breast: Evidence from choice experiment. *Food Qual. Prefer.* 2011, 22, 603–613. [CrossRef]
9. Marette, S.; Messéan, A.; Millet, G. Consumers’ willingness to pay for eco-friendly apples under different labels: Evidences from a lab experiment. *Food Policy* 2012, 37, 151–161. [CrossRef]
10. Uchida, H.; Roheim, C.A.; Wakamatsu, H.; Anderson, C.M. Do Japanese consumers care about sustainable fisheries? Evidence from an auction of ecolabelled seafood. *Aust. J. Agric. Resour. Econ.* 2014, 58, 263–280. [CrossRef]
11. Feldmann, C.; Hamm, U. Consumers’ perceptions and preferences for local food: A review. *Food Qual. Prefer.* 2015, 40, 152–164. [CrossRef]
12. Onozaka, Y.; Nurse, G.; Thilmany McFadden, D. Defining Sustainable Food Market Segments: Do Motivations and Values Vary by Shopping Locale? *Am. J. Agric. Econ.* 2010, aaq152. [CrossRef]
13. Dragusanu, R.; Nunn, N. The Effects of Fair Trade Certification: Evidence from Coffee Producers in Costa Rica; National Bureau of Economic Research: Cambridge, MA, USA, 2018.
14. Dragusanu, R.; Giovannucci, D.; Nunn, N. The economics of fair trade. *J. Econ. Perspect.* 2014, 28, 217–236. [CrossRef]
15. Hainmueller, J.; Hiscox, M.J.; Sequeira, S. Consumer Demand for Fair Trade: Evidence from a Multistore Field Experiment. *Rev. Econ. Stat.* 2015, 97, 242–256. [CrossRef]
16. McFadden, J.R.; Huffman, W.E. Willingness-to-pay for natural, organic, and conventional foods: The effects of information and meaningful labels. *Food Policy* 2017, 68, 214–232. [CrossRef]
17. Carlsson, F.; Martinsson, P. Do hypothetical and actual marginal willingness to pay differ in choice experiments?: Application to the valuation of the environment. *J. Environ. Econ. Manag.* 2001, 41, 179–192. [CrossRef]
18. Lusk, J.L.; Schroeder, T.C. Are Choice Experiments Incentive Compatible? A Test with Quality Differentiated Beef Steaks. *Am. J. Agric. Econ.* 2004, 86, 467–482. [CrossRef]
19. List, J.A.; Gallet, C.A. What experimental protocol influence disparities between actual and hypothetical stated values? *Environ. Resour. Econ.* 2001, 20, 241–254. [CrossRef]
20. Revelt, D.; Train, K. Mixed logit with repeated choices: Households’ choices of appliance efficiency level. *Rev. Econ. Stat.* 1998, 80, 647–657. [CrossRef]
21. McFadden, D.; Train, K. Mixed MNL models for discrete response. *J. Appl. Econom.* 2000, 15, 447–470.
22. Croissant, Y. *Mlogit: Multinomial Logit Models.* 2020. Available online: https://cran.r-project.org/web/packages/mlogit/index.html (accessed on 4 September 2020).
23. Boxall, P.C.; Adamowicz, W.L. Understanding heterogeneous preferences in random utility models: A latent class approach. *Environ. Resour. Econ.* 2002, 23, 421–446. [CrossRef]
24. Greene, W.H.; Hensher, D.A. A latent class model for discrete choice analysis: Contrasts with mixed logit. *Transp. Res. Part. B Methodol.* 2003, 37, 681–698. [CrossRef]
25. Nylund, K.L.; Asparouhov, T.; Muthén, B.O. Deciding on the Number of Classes in Latent Class Analysis and Growth Mixture Modeling: A Monte Carlo Simulation Study. *Struct. Equ. Model. Multidiscip. J.* 2007, 14, 535–569. [CrossRef]
26. Dias, J.G. Latent Class Analysis and Model Selection. In *Proceedings of the From Data and Information Analysis to Knowledge Engineering*; Spiliopoulou, M., Kruse, R., Borgelt, C., Nürnberger, A., Gaul, W., Eds.; Springer: Berlin/Heidelberg, Germany, 2006; pp. 95–102.
27. Kottala, S.Y.; Singh, R. A review of sustainability, deterrents, personal values, attitudes and purchase intentions in the organic food supply chain. *Pac. Sci. Rev. B Hum.it. Soc. Sci.* 2015, 1, 114–123. [CrossRef]
28. Cecchini, L.; Torquati, B.; Chiorri, M. Sustainable agri-food products: A review of consumer preference studies through experimental economics. *Agric. Econ.* 2018, 64, 554–565. [CrossRef]
29. Hvitsand, C. Community supported agriculture (CSA) as a transformational act—distinct values and multiple motivations among farmers and consumers. *Agrocol. Sustain. Food Syst.* 2016, 40, 333–351. [CrossRef]
30. Mishra, B.; Gyawali, B.R.; Paudel, K.P.; Poudyal, N.C.; Simon, M.F.; Dasgupta, S.; Antonious, G. Adoption of Sustainable Agriculture Practices among Farmers in Kentucky, USA. *Environ. Manag.* 2018, 62, 1060–1072. [CrossRef]

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