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Do You Really Want to Know? Exploring Desired Information Transparency for Local Food Products

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Abstract: Food system communicators are challenged to inform the public about food consumption in a way that addresses consumer interests and values. Consumers are increasingly concerned about the environmental risks of food production and may be seeking local food as a more sustainable option than conventional food. Online food purchasing is expanding the options and information available to consumers. Identifying the value of environmental impact measures accompanying local food online provides insight into food marketing strategies for different audiences. The purpose of this research was to predict the importance of environmental impact measures for individuals purchasing local food online given their information seeking, subjective norms, and perceived connection between local food and climate change mitigation. Data were collected using a web-based survey of 906 respondents from Florida, Georgia, and Alabama. Findings revealed respondents tend to think local food contributes to climate change mitigation, and environmental impact measures should account for their information seeking, subjective norms, and perceived connection between local food and climate change mitigation. Transparency about local food environmental impacts may inform consumer decision making about food consumption. This study adds to the literature on perceived risk related to agri-food systems and calls for an exploration of information seeking with online grocery purchasing.

Keywords: food marketing; sustainable consumer behavior; food information services; agri-food sustainability



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1. Introduction

Climate change is among the most pressing current global concerns related to food production as increasing temperatures contribute to more frequent droughts, irregular precipitation, floods, heat waves, and other extreme events [1]. Agriculture contributes to climate change by releasing at least an estimated 21 percent of the total global emissions of greenhouse gases, which is primarily caused by deforestation, livestock production, and the management of soil and nutrients [2]. There are multiple opportunities for agricultural systems to lessen the environmental impacts of intensive farming, including reducing greenhouse gas emissions. Sustainable agriculture is one solution that simultaneously increases production and income, maintains ecosystem services, and protects the environment while adapting to climate change [3]. The United Nations identified sustainability as a key component to the health and wellbeing of the world in the 2030 Agenda [4]. By focusing on people, planet, and prosperity, the agenda is aimed at increasing food access while positively impacting intertwined ecosystems. One potential outlet for obtaining these goals within food production could be local food. Local food systems with shorter supply chains have beneficial impacts from environmental, social, and economic points of view and may be more sustainable compared to the conventional agri-food system [5]. This study addressed whether consumers want to be informed about agricultural production processes that impact the environmental sustainability of food systems, specifically in the context of purchasing food through online shopping platforms.

The steady growth of the local food industry [6] must be considered alongside the increasing popularity of online grocery shopping channels [7]. Research into how consumers prefer local food products to be presented online is warranted due to the growing demand for local food provided through grocery stores [6]. Due to uncertainty about where food products originate and how they are transported, a level of risk analysis is required for the consumer to understand the environmental effects of food production [8]. There may be a need for transparency about the environmental impacts associated with agriculture [8] so the consumer can make informed food-purchasing decisions. Therefore, the present study utilized a Risk Information Seeking and Processing (RISP)-informed model to predict consumer preferences for environmental impact measures when purchasing a local food product online.

Information seeking and subjective norms from RISP were hypothesized as foundational variables in this regression model. The addition of a new variable, the perceived connection between local food and climate change mitigation, may provide a more thorough understanding of individuals who engage in local food consumption [9]. This is relevant to an online grocery context because consumers must choose between different food products, which has implications for how food continues to be produced and subsequent food system sustainability [10]. After investigating some of the variables that influence consumer preferences for environmental impact measures accompanying local food products, suggestions are provided on how to best present local food products on an online grocery platform. With a growing number of options for consumers to purchase food, agricultural producers and food system communicators must understand how to position their products to meet the needs of these diverse audiences while providing relevant information about how the products are grown and produced [11].

1.1. Local Food Purchasing in the U.S.

There is no universally accepted definition of local food due to differing interpretations of what “local” means. The 2008 U.S. Food, Conservation, and Energy Act defined a local food product as one that is marketed within an area “less than 400 miles from the origin of the product, or in the state in which it is produced” [12]. In the scientific literature, local food systems are generally understood through three domains: geographical proximity (such as the distance between food production and consumption), relational proximity (e.g., the relationship between/among food system actors), and proximity in values (e.g., place of origin, freshness, and traceability), with geographic proximity constituting the basis for defining local food systems [13]. Food miles, or how far food travels from the point of production to consumption, is central to existing research finding that consumers associate local food with distances of 10 to 200 miles from its origin [14].

Consumers in the U.S. have shown an increased interest in local food, although it remains a small part of the national food economy [15]. While the demographic profile of local food consumers is diverse, they do share similar motivations for buying local at farmers’ markets or in conventional grocery stores: seeking freshness, support for the local economy, and knowing the source of a product are common reasons for which consumers buy local food [12]. Previous research has also explored the importance of local food in defining the culture of specific geographical locations [16]. While culturally significant, local food can contribute to a robust and diverse economy. In 2020, U.S. farmers produced and sold USD 9 billion of local food commodities to consumers, retailers, institutions, and intermediaries [6]. In addition to purchasing local food through direct-to-consumer channels including farmers markets, consumers can find local food available at large grocery retailers and supermarkets [13]. Grocery retailers are intermediaries who purchase products from farmers and then provide consumers access to purchase the products. Notably, the growth of local food sales through direct channels has reached a plateau, while local food sales through intermediated grocery channels are growing rapidly [17].

Recognizing consumer interest in intermediated grocery channels as a source of local food, the recent rise of online grocery shopping is impactful to the local food market. U.S.

online grocery market sales in 2021 reached nearly USD 98 billion via pick-up, delivery, and ship-to-home channels [7]. During the COVID-19 pandemic, e-commerce platforms experienced a significant increase in web traffic, demonstrating increased consumer interest in more visible and easier-to-use online mainstream retail platforms providing local food options [18]. Online grocery shopping introduces diversified competition for agricultural producers as shoppers choose products from pictures and receive their groceries through delivery or pick-up rather than attending local food outlets like farmers' markets [19]. Grocery retailers can, however, provide a unique shopping experience to consumers seeking out local food who also value the convenience and variety of online grocery shopping [19].

The growing demand for local food coupled with the trend of online grocery purchasing creates a need for research into consumer preferences for how local food items are presented online. As companies across industry lines respond to environmental concerns, global awareness about balancing economic development and environmental conservation has motivated the acceptance of sustainable food consumption patterns [20]. There is conflicting evidence on whether local food systems are more sustainable than conventional food systems [21–23], but the consumer perspective is the focus for food system marketers. Consumers associate local food with ecological sustainability due to more sustainable production methods [14]. Local and regional food products are generally more sustainable than conventional food products in various contexts, and consumer demand can drive the supply-side system to a more sustainable one [24]. Online grocery stores represent choice environments in which consumers decide between different food products, a decision that has implications for how food is produced and the environmental impacts resulting from production [10]. Subsequently, understanding how to market local food products online to provide consumers with the information needed to make ecologically sustainable purchase decisions is paramount.

Much of the research on consumer purchasing of local food has focused on the role of demographics to explain perceptions and attitudes toward local food, with conflicting results [9]. However, to gain a more nuanced understanding of the local food producer, there is a need to examine variables within a local food context including information seeking [25] and subjective norms [11,14]. There is also a need to investigate variables beyond demographics that influence consumers' desire for environmental impact measures when they consider online local food.

1.2. Risk Information Seeking and Processing Model

The RISP model was used as a theoretical framework to analyze factors that affect whether consumers desire environmental impact measures when purchasing local food online. RISP combines components of Eagley and Chaiken's Heuristic-Systematic Model of information processing and Ajzen's Theory of Planned Behavior to predict an individual's response to risk messaging based on the interaction between their information processing motivations and capabilities and the message's characteristics [26]. While originally applied within health communication to understand individuals' responses to health risk messages and preventive behaviors [26], the RISP model has been recently applied within a food purchasing context. In a systematic literature review, Frewer et al. [8] identified the need for effective risk communication about food issues as the result of various conditions, including the environmental impacts of producing and transporting food. Additionally, previous research utilized and augmented the RISP model to understand consumers' information-seeking behavior and need when faced with food safety concerns [27]. RISP has also been applied to understanding consumers' information seeking in relation to food science technologies [28]. Additionally, consumers are increasingly disengaged or uncertain about industrialized food production and distribution, and many are concerned about adverse consequences, such as greenhouse gas emissions and a lack of transparency surrounding existing food systems [29]. The effects that supply chain procedures have on the environment, such as the emission of greenhouse gases [30], are often not made transparent to consumers purchasing a food product. Therefore, this framework is appropriate for

exploring consumer interest in the environmental impacts of food because of increasing concerns about environmental and health risks associated with food supply activities [31].

With a focus on information seeking and processing behavior, the framework examines seven main variables that influence an individual's information seeking and interpreting. While RISP has been used to explore how individuals respond to specific and immediate health risks, it was also previously applied to environmental risks that do not pose direct harm to one's health and well-being [32]. Likewise, the present study explores perceived impersonal risk due to uncertainty surrounding the environmental impacts of food production and transportation. The RISP model's development has been a continuous process that invites researchers to explore and build upon the individual variables and collective model as a whole [33,34]. Therefore, information seeking and subjective norms were utilized from the RISP model because they were hypothesized to be relevant variables in consumer preferences for how local food is presented online. Other variables in RISP that may be relevant to consumer desire for food-sourcing transparency were not addressed due to survey length and the exploratory nature of this initial application of RISP to an online local food context.

Individuals are motivated to seek information about risk-related topics by a variety of factors, one being information sufficiency, or the amount of information needed to deal adequately with a given risk [26]. Information seeking has a strong influence on consumer knowledge and attitudes toward local food, so those actively searching for additional information may develop stronger attitudes, in turn facilitating behavior and possibly creating habits [35]. Increased knowledge resulting from information seeking reinforces already existing values, in turn supporting local food purchase behavior [25,35]. Individuals who engage in more information seeking about agri-food sustainability issues may have greater topic knowledge about sustainable food behavior and want to engage in further information seeking, whereas those with poor topic knowledge may avoid opportunities to seek information due to a lack of confidence [36]. For consumers to learn about the environmental impacts of food and adopt more sustainable purchasing behavior, diverse information seeking styles must be targeted and accounted for [37].

Informational subjective norms are the perceived social normative influences motivating an individual's desire for information sufficiency [26]. Subjective norms may be among the most important motivators of effortful information seeking and processing for impersonal risks because of an individual's sensitivity to how others think they should behave [38]. Likewise, subjective norms may be especially impactful in information seeking about environmental risk because more immediate perceived personal impacts are not as strong as perceived impacts on the environment or society [32]. An individual's willingness to maintain a socially desirable image and fulfill others' expectations about their own information level may motivate more active information seeking about a risk issue [34]. Subjective norms have also been found to directly impact the behavioral intention of users in online shopping [39]. However, there are few studies exploring the role of subjective norms and information seeking in preferences for the inclusion of environmental impact measures associated with online local food.

1.3. Expanding the RISP Model: Sustainability in an Agri-Food Context

The connection between climate change and agriculture is a major issue facing the current generation. Specifically, the conventional food system is perceived as a source of environmental risk and uncertainty due to a lack of information transparency about product origin and distribution [40]. Local food production encourages sustainability through slowing biodiversity loss, enhancing ecosystem health, and improving the economic position of farmers [41]. There are some scholarly concerns about the local food trap, or the idea that all local food is good and always better than conventional food despite the true sustainability of production methods [42]. A related debate has arisen over whether local food processes result in a lower carbon footprint than the global transportation of food products solely because local food has fewer food miles [23,43–45].

Yet there are multiple contexts in which food miles may indeed be a significant component within a sustainable food system [21]. With the inclusion of additional components to food miles, the true environmental impact of food can be better understood [46], and in sum, local food tends to be more sustainable than conventional food [24]. Research has shown that consumers with a high level of concern for the environment have a more positive attitude toward local food [11]. In addition, consumers associate local food with ecological sustainability due to more environmentally friendly production methods, fewer food miles, and fewer associated greenhouse gas emissions [14]. With increasing public concern about the contributions of food production to climate change and the negative impacts that agriculture can have on sustainability, individuals are paying more attention to the environmental and social consequences of food production [47]. However, it is uncertain whether consumers see local food as a potential solution to mitigate climate change. Improving communication about food product sustainability requires research to gauge an audience's existing attitude toward ecological risks related to climate change and their attitude toward information seeking with respect to the issue [34]. Previous research suggests that attitudes toward the environment may predict food choice and sustainability-related behavior, especially when a product is clearly associated with reduced environmental impacts, including fewer food miles [31]. There is a need for further investigation into existing consumer awareness of the link between local food products and sustainability [48]. Therefore, consumer perception of the connection between local food and climate change mitigation is a new concept that may enhance an RISP-informed prediction of preferred environmental impact measures when shopping for local food online.

1.4. Transparency of Information about Local Food Products

The local food industry increasingly provides information about products to differentiate from their competition. Marketing efforts are shifting from the promotion of food products to the promotion of food attributes, including information about where food originates [49]. Consumers expect quality-assured local food products, and credence attributes including traceability, brand, and food safety are believed to positively impact the perceived utility of local food products [41]. Interest in the origins of food products and the transparency of the food system is developing alongside concerns toward environmental and health issues associated with food [50]. Online local food marketing can be made more effective through the identification of whether customers find informational elements about product sustainability important in their decision making. Transparency within food systems refers to a shared understanding of and access to factual, timely, and relevant information about food products [51]. This concept is relevant to examining consumers' desire for environmental impact information about the production and distribution of a local food product [5].

There are numerous informational measures that may accompany a local food product to communicate the product's impact on the environment. Potential measures include transport-related emissions, land use, seasonality, agricultural inputs, food packaging, and biodiversity impacts [23]. Consumers struggle with evaluating the environmental impacts of products, and research should explore if and how the environmental impact dimension needs to be communicated to consumers to promote environmentally sustainable food choices [52]. Three environmental impact measures explored in the present study include water inputs, carbon dioxide emissions, and food miles associated with a local food product. Using food miles as the sole measure of a food's environmental impact is likely too simplistic [21,53], so additional measures were accounted for. Water scarcity and climate change, including greenhouse gas emissions, are environmental areas of concern included in the UN's Sustainable Development Goals [54]. This supported the inclusion of water inputs and carbon dioxide emissions in this study.

Furthermore, online grocery stores may encourage customers to transfer their environmentally conscious intentions into concrete choices through condensed information about the sustainability of products using labels, icons, or other information displays [24].

Individuals who engage in information seeking frequently may benefit from the provision of extra information about local food items [11], and the effect of local food on the environment could be highlighted to positively influence attitude toward local food. The effects of such information schemes on consumer decision making must be tested prior to their implementation by industry [55] or grocery retailers, in this case.

As consumer demand for local food continues to grow alongside a desire for the convenience of e-commerce platforms, food system marketing specialists need to understand how to best position local food online in consideration of variables beyond audience demographics. Therefore, this research sought to predict the importance of environmental impact measures for individuals making an online local food purchase given their information seeking style, subjective norms, and perceived connection between local food and climate change mitigation. This research was guided by the following objectives and appropriate corresponding hypotheses:

1. To describe respondents' information seeking, subjective norms, perceived connection between local food and climate change mitigation, and perceived importance of receiving environmental impact measures when purchasing local food online.

H1. *Respondents will have a higher perceived importance of receiving environmental impact measures when purchasing local food online.*

2. To determine if information seeking and subjective norms predict the importance of receiving environmental impact measures when purchasing local food online.

H2. *Based on the previous literature, respondents' information seeking and subjective norms will significantly impact the importance of receiving environmental impact measures when purchasing local food online.*

3. To determine if the addition of the perceived connection between local food and climate change impacts the reduced model predicting the dependent variable from only information seeking and subjective norms.

H3. *The inclusion of perceived connection between local food and climate change will significantly impact the reduced model's prediction of the dependent variable.*

2. Materials and Methods

An online Qualtrics survey was used to address the research objectives. This research was part of a larger study exploring communication practices about climate change and water issues with the U.S. public. Non-probability opt-in sampling was used to recruit respondents geographically representative of the U.S. public according to the 2020 U.S. Census from three Southeastern states: Florida, Georgia, and Alabama. Respondents were adults aged 18 and older. Given the novel nature and design of this research, a non-probability sample was utilized to allow for flexibility of the experimental design and future scalability given the context and scope of climate change [56,57]. Qualtrics was contracted to obtain the sample, and quotas were established to align respondents with census data based on sex, age, and race/ethnicity. In agricultural communication research and public opinion research, non-probability samples are commonly accepted as a sampling method [56]. The University of [State] Institutional Review Board (IRB #00005553) approved the survey design and items. The instrument was pilot-tested for content validity with 50 individuals who were representative of the sample. The data collection was paused after the soft launch to ensure the appropriate design of the scales and the reliability of all scales. The Cronbach's alpha coefficients for all scales were found to be reliable ($\alpha > 0.70$), and no changes were made after the pilot test was conducted.

Four sections from the instrument were utilized in this study: information seeking, subjective norms, the perceived connection between local food and climate change mitigation, and the importance of receiving environmental impact measures when purchasing local food online. Given the complexity of defining local food within the context of climate change, the respondents in the current study were given the following statement and definition in order answer each of the scale items: *There are multiple ways to think about climate change. As you consider the food system as a possible contributor to climate change, please keep this definition of local food in mind: a food product that has travelled less than 275 miles from its origin.* In line with previous studies, information seeking was measured as the intent to seek information based on a Likert-type scale [34]. The information-seeking scale was adapted from a climate change context [34] to the present context of local food. The five-point scale asked respondents to indicate their level of agreement (1 = strongly disagree; 2 = disagree; 3 = neither agree nor disagree; 4 = agree; 5 = strongly agree) with six statements related to their intent to seek information about local food: *I plan to seek information about local food in the next month, I intend to look for information about local food in the next month, I will look for information related to local food in the next month, I have sought information about local food previously, and I have no interest in information about local food.* The last item was recoded to match the positive wording of the other items. A scale for information seeking about local food was created using the average of the six items ($\alpha = 0.904$).

Respondents' perceived subjective norms regarding seeking information about local food were measured with five Likert-scale items adapted from previous research [34] on a five-point scale (1 = strongly disagree; 2 = disagree; 3 = neither agree nor disagree; 4 = agree; 5 = strongly agree). The respondents indicated their level of agreement or disagreement with each of the following statements: *It is expected of me that I seek information about local food,* *Most people who are important to me think I should seek information about local food,* *Others expect me to seek information about local food,* *My family expects me to seek information about local food,* and *People in my life whose opinions I value seek information about local food.* A scale for subjective norms regarding seeking information on local food was created using the average of these five items ($\alpha = 0.95$). To elucidate the findings, real limits were assigned. The real limits of the Likert-type scales were 1.00–1.49 = strongly disagree, 1.50–2.49 = disagree, 2.50–3.49 = neither agree nor disagree, 3.50–4.49 = agree, and 4.50–5.00 = strongly agree.

The respondents' perceived connection between local food and climate change mitigation was measured with four Likert-scale items on a five-point scale (1 = strongly disagree; 2 = disagree; 3 = neither agree nor disagree; 4 = agree; 5 = strongly agree). The scale was researcher-developed. Respondents indicated their level of agreement or disagreement with the following statements: *Buying local food is one way to minimize climate change,* *Local food is better for minimizing climate change than non-local food,* *Grocery stores can minimize climate change by offering local food for consumers to purchase,* and *To reduce climate change, people should buy local food instead of non-local food.* A scale was created using the average of these four items ($\alpha = 0.926$). To confirm reliability, an expert panel with members from natural resource conservation, survey design, and communication studies reviewed the survey items for content accuracy and face validity. The Cronbach's alpha coefficient for this scale was also found to be reliable ($\alpha > 0.70$) after the survey was pilot-tested.

The importance of receiving environmental impact measure information about online local food products was measured using four Likert-scale items on a five-point scale (1 = strongly disagree; 2 = disagree; 3 = neither agree nor disagree; 4 = agree; 5 = strongly agree). The scale was researcher-developed. Respondents indicated their level of agreement with the importance of each of the following informational measures that may accompany a local food product: food miles, water inputs, CO₂ emissions, and a local food label. A scale was created using the average of these four items ($\alpha = 0.91$). Reliability was confirmed through the same expert panel with members from natural resource conservation, survey design, and communication studies. The Cronbach's alpha coefficient for this scale was reliable ($\alpha > 0.70$) after the initial pilot test.

To address the three research objectives, data were analyzed using SPSS 26. The data analysis was first completed descriptively with frequencies and means and then inferentially using hierarchical multiple regression. The linear regression assumptions were met, and multicollinearity was not present between the predictors used in the regression model. A hierarchical multiple regression was used to examine the predictive utility of the RISP-based variables (step 1) and then expanded to include the construct of the perceived connection between local food and climate change mitigation (step 2). This determined whether the expansion of the RISP constructs to include the perceived connection construct added significantly to the predictive model measuring the importance of environmental impact measures.

The respondents' information seeking and subjective norms were used in the first regression step to predict the outcome variable due to their theoretical basis in the RISP model [26]. Although these two scales were used to predict a new outcome variable, there is existing support for using RISP variables to predict preferences for risk-related communication [32,33]. Information seeking is a relevant variable influencing attitudes toward local food [25], and social norms are identified as impactful in environmentally responsible motivations for purchasing local food [14]. The respondents' perceived connection between local food and climate change mitigation was added in the second step because of its exploratory nature and to isolate its predictive utility [58].

A total of 906 responses were obtained after accounting for attention check filters. The respondents' ages ranged from 18 to 88. The average respondent was a white female with a four-year college degree and a family income from USD 25,000 to USD 49,999. Geographic locations were spread between Florida (34.1%), Alabama (31.6%), and Georgia (34.3%). Detailed demographics of survey respondents can be found in Table 1.

Table 1. Demographics of respondents ($N = 906$).

Characteristic	<i>n</i>	%
Sex		
Male	423	46.7
Female	483	53.3
Age		
18–34 years	206	22.7
35–54 years	286	31.6
55+ years	414	45.7
Race *		
White	693	76.5
Black	130	14.3
Asian	55	6.1
American Indian or Alaska Native	20	2.2
Other	42	4.6
Ethnicity		
Hispanic	153	16.9
Non-Hispanic	753	83.1
Education		
Less than 12th grade	27	3.0
High school diploma	196	21.6
Some college	206	22.7
2-year college degree	116	12.8
4-year college degree	232	25.6
Graduate or professional degree	129	14.2

Table 1. Cont.

Characteristic	<i>n</i>	%
Family Income		
Less than USD 24,999	195	21.5
USD 25,000–USD 49,999	236	26.0
USD 50,000–USD 74,999	191	21.1
USD 75,000–USD 149,999	218	24.1
USD 150,000–USD 249,999	48	5.3
USD 250,000 or more	18	2.0
Geographic Location		
Florida	309	34.1
Georgia	311	34.3
Alabama	286	31.6
Political Affiliation		
Republican	337	37.2
Democrat	271	29.9
Independent	200	22.1
Non-affiliated	88	9.7
Other	10	1.1

Note. * $n > 906$ for race because respondents could select multiple races.

3. Results

3.1. Objective 1

For the first part of objective one, the respondents indicated their level of agreement with the items on the information seeking scale [34]. The mean information seeking about local food was ($M = 3.27$, $SD = 0.92$). The majority of respondents agreed (33%, $n = 299$) or strongly agreed (24.3%, $n = 220$) that they have an interest in information about local food. Out of all six items on the scale, respondents tended to agree less that they had sought information about local food previously. Respondents disagreed (23.3%, $n = 211$) or strongly disagreed (9.8%, $n = 89$) that they had sought local food information previously.

Next, respondents indicated their level of agreement with items on the subjective norms scale [34]. The mean perceived subjective norms about local food ($M = 2.63$, $SD = 1.05$) were lower than the mean intent to seek information about local food. Respondents tended to disagree (31.2%, $n = 283$) or strongly disagree (19.2%, $n = 174$) that others expect them to seek information about local food.

To address the third part of objective one, respondents indicated their level of agreement with the items on the perceived connection between local food and climate change mitigation scale. The majority of respondents agreed (46.2%, $n = 419$) or strongly agreed (21.6%, $n = 196$) that grocery stores can minimize climate change by offering local food for consumers to purchase. Only a few respondents disagreed (6.6%, $n = 60$) or strongly disagreed (2.4%, $n = 22$) that local food is better for minimizing climate change than non-local food as found in Table 2. Overall, respondents tended to agree that they perceive a connection between climate change mitigation and local food ($M = 3.69$, $SD = 0.85$).

For the last part of objective one, respondents indicated their level of agreement with items related to the importance of receiving environmental impact measure information about local food when purchasing a local food product online. Respondents tended to agree that all four measures of food miles, water inputs, carbon dioxide emissions, and a local food label were important to include alongside a food product available online ($M = 3.61$, $SD = 0.92$). Most respondents agreed (49.3%, $n = 447$) or strongly agreed (24.6%, $n = 223$) that inclusion of a local food label is particularly important; therefore, Hypothesis 1 was accepted.

Table 2. Perceived connection between local food and climate change mitigation (N = 906).

Item	Strongly Disagree %	Disagree %	Neither Agree nor Disagree %	Agree %	Strongly Agree %
Buying local food is one way to minimize climate change.	2.5	7.6	25.5	46	18.3
Local food is better for minimizing climate change than non-local food.	2.4	6.6	29.7	43.7	17.5
Grocery stores can minimize climate change by offering local food.	2.5	5.4	24.2	46.2	21.6
To reduce climate change, people should buy local food instead of non-local food.	3.3	6.8	30.7	42.2	17

3.2. Objectives 2 and 3

A hierarchical multiple regression was used to address the second and third objectives. For objective two, the respondents' information seeking and subjective norms about local food were entered into Model 1 to determine if these variables explained a significant amount of variance in the importance of environmental impact measures associated with online local food. Model 1 explained 35% of the variance in the importance of receiving environmental impact measures when purchasing local food online, $F_{(2,903)} = 242.87$, $R^2 = 35\%$; thus, Hypothesis 2 was accepted. See Table 3.

Table 3. Hierarchical multiple regression predicting the importance of environmental impact measures from information seeking, subjective norms, and the perceived connection between local food and climate change mitigation.

Variable	The Importance of Receiving Environmental Impact Measures		
	Model 1 β	Model 2 β	Model 2 95% CI
Constant	1.659	0.815	
Information Seeking	0.488 **	0.313 **	(0.248, 0.378)
Subjective Norms	0.135 **	0.120 **	(0.068, 0.172)
Perceived Connection for LF and CC		0.394 **	(0.332, 0.455)
R^2	0.350	0.447	
F	242.869 **	242.558 **	
ΔR^2		0.097	
ΔF		157.664 **	

Note. N = 906. CI = confidence interval. ** $p < 0.01$.

For objective three, in the second hierarchical regression block, the variable of the perceived connection between local food and climate change mitigation was added (LF and CC) and tested for its additive effect on the model. With the addition of this variable, the beta coefficients for information seeking and subjective norms decreased. There was a significant change in R^2 moving from Model 1 to Model 2, $\Delta R^2 = 0.097$, $F_{(1,902)} = 157.664$. Therefore, the addition of the perceived connection between local food and climate change mitigation strengthens the prediction of the importance of providing environmental impact measures about local food production; therefore, Hypothesis 3 was accepted. The inclusion of this variable helps to account for variation in how an individual views the importance of environmental impact measures. Additionally, the interaction between the factors and environmental impact had no significant effect on the model.

4. Discussion

This study sought to explore the components of a conceptual framework for delivering online local food production information to consumers based on RISP model concepts of information seeking and subjective norms [26] and a new variable of the perceived connection between local food and climate change mitigation. As interest in sustainable food consumption continues to grow worldwide [20], consumers are increasingly concerned about environmental risks associated with food supply activities and feel disengaged with the industrial food system [31]. The findings from the current study indicate that consumers may want to know more about the environmental impacts of local food when purchasing food online. Relatedly, providing accurate and relevant information on the environmental impacts of food can promote public engagement and enable more sustainable consumption choices [37]. The growth of local food sales through intermediated grocery channels [17] and the rapid rise of online grocery shopping [7] create an opportunity to understand consumer preferences for how local food products should be marketed online. The findings from this study indicate a significant perceived importance of receiving this information about local food when purchasing food online. The results of this research support the inclusion of environmental impacts for consumers interested in purchasing local food online.

There are several limitations associated with this research. Non-probability opt-in sampling was used to recruit respondents for the web-based survey. While there are important implications for consumers in Florida, Georgia, and Alabama, the results from this research are not generalizable to the entire U.S. Additional limitations associated with this sampling method include the respondent pool comprising only individuals who have Internet access, as well as attracting certain types of individuals due to the nature of online Qualtrics surveys [59]. Additionally, while probability samples are still considered the most accurate representation of a population, non-probability samples are a viable option for engaging with populations who utilize multifaceted communication methods rather than phone or mailed communication only [57].

RISP-based variables of individual information seeking and perceived subjective norms were used in the hierarchical regression model because they were previously acknowledged as influential in consumer local food attitudes and purchasing behavior [25,37]. Respondents tended to neither agree nor disagree that they perceive subjective norms about local food, further suggesting that additional RISP variables may help account for variation in the importance of receiving local food production information. Additionally, this raises interest in the level of importance subjective norms have for online grocery shopping. The results related to perceived subjective norms may have more relevancy to online grocery shopping perceptions rather than local food purchasing behaviors. Lastly, the local food environmental impact measures selected for this study—food miles, CO₂ emissions, and water inputs—are not all-inclusive of measures that impact food product sustainability.

The current research adds to the body of literature surrounding RISP and provides a starting point to further explore the nuances of including local food environmental impact measures directed toward online customers. The information seeking and subjective norms scales adapted from a climate change context in previous research [34] were found to be impactful in predicting consumer preference for the inclusion of environmental impact information about local food. According to the findings of the current study, the complete regression model including information seeking, subjective norms, and the perceived connection between local food and climate change mitigation indicated that individuals with greater intent to seek information about local food find the inclusion of environmental impact measures to be more important. This supports previous research that information seeking about local food can help shape knowledge and attitudes toward local food [25,35], and those who engage in more information seeking about the agri-food system tend to want to engage in further information seeking [36]. However, perceived subjective norms about local food were not as strong as expected in this study, despite subjective norms possibly serving as a key motivator of information seeking about impersonal environmental risks

because of sensitivity to others' opinions [38]. This could be because those who partake in more frequent information seeking may be less influenced by social pressure [11].

The perceived connection between local food and the climate change mitigation variable strengthens the predictive model measuring the importance of environmental impact measures associated with local food. To identify whether individuals believe environmental impact measures are important to include in online local food displays, their perceived connection between local food and climate change mitigation should be accounted for. However, the results from the research indicated that when the perceived connection was included in the predictive model, information seeking and subjective norms did not have as large of an impact compared to the reduced model using only these two variables to predict the outcome. While information seeking and subjective norms are still significant to include in the predictive model, they do not have as large of an effect when the perceived connection is also included. Respondents tended to agree that they perceive a connection between local food and climate change mitigation, suggesting there is consumer awareness that purchasing local food may be more environmentally sustainable than non-local food. Based on these findings, grocery retailers should recognize that consumers are interested in purchasing local food products from grocery stores and consumers believe that grocery stores can minimize climate change by offering local food items. This provides further evidence that it is advantageous for grocery retailers to provide a unique shopping experience to consumers seeking out local food who also value the convenience and variety of online grocery shopping [19]. Particularly as mainstream grocery retail platforms see significant web traffic from customers [18], there are unique opportunities for both grocery retailers and agricultural producers to benefit from increasing consumer interest in local food available online.

The evolving e-commerce context for local food requires investigation into consumer considerations when purchasing local food online, one of which is the desired amount of transparency about local food production. As consumers are increasingly concerned about environmental and health risks associated with food system activities, food product transparency may help with product quality assurance [41]. The present research supports this because the complete regression model predicts that consumers with higher information seeking and subjective norms about local food, and a higher perceived connection between local food and climate change mitigation, find information about the environmental impacts of local food to be more important. Furthermore, transparency about how food products affect the environment can be highly effective from a local food marketing stance. Communication practitioners should frame environmental impact measures in a clear, consumer-focused style that shows how a food product performs in relation to food system sustainability. This strategy may allow consumers to evaluate the ecologically sustainable measures of a product and empower them to make informed decisions about their food consumption [10].

The prediction of desired local food environmental impact measures from information seeking, subjective norms, and the perceived connection between local food and climate change mitigation has not been previously explored. This is a key area of understanding because the task for agricultural marketing practitioners is to effectively position local food products according to the nuanced preferences of their audiences. Based on the results of the current study, an individual's information seeking, subjective norms, and perceived notions about local food and climate change mitigation can lead to differences in desired information about local food production. This supports existing research that communication strategies about local food must be considered from an audience segmentation approach because consumers experience local food differently and purchase it for different reasons [9]. The need to illustrate the environmental benefits of local food is underscored because consumers tend to believe that local food is better for minimizing climate change than non-local food. Therefore, to address public concerns about the adverse effects of conventional agricultural processes [47], this research emphasizes the importance for online grocery displays to illustrate the environmental impact measures of local food. Grocery

retailers and marketers should ensure the accuracy of selected environmental impact measures to the greatest extent possible. A plan should be developed for estimating the impact measures as the local food item moves from farm to the grocery retailer.

5. Conclusions

The local food market has a prime opportunity to further expand its consumer support base by optimizing how local food products are displayed on online grocery platforms. Additional research is needed to inform the best informational and visual practices for online grocery retailers and marketing specialists as the quickly evolving e-commerce industry changes how shoppers select food items. Consumer preferences for other impact measures of local food within social and economic dimensions should also be explored. For example, the identification of whether customers want to be informed about whether, and the extent to which, local food items promote community development, foster social inclusion, provide rural job opportunities, and contribute to farm profitability.

Recommendations for future research include the exploration of other RISP variables that may improve the ability to predict the importance of local food environmental impact measures for customers shopping online. The lower impact of information seeking and subjective norms on the predictive model when the perceived connection between local food and climate change mitigation is included necessitates the investigation of additional variables that can account for variance remaining in the model. Specifically, perceived hazard characteristics such as the cognitive evaluation of a risk and the affective, or emotional, responses induced by perceptions of risk may be pertinent to how individuals handle information about local food production. The consideration of sociodemographic factors, referred to as “individual characteristics” in the RISP model, may provide mediating or moderating variables in the model that were not included given the scope of this study. The application of RISP within the context of perceived risk due to uncertainty surrounding environmental impacts associated with food production warrants further research. Measuring consumer preferences for other environmentally sustainable indicators when purchasing local food online is necessary because some individuals tend to make automated decisions when they are presented with too much information or information they find irrelevant.

Most of the research presented in the current study focused on informing consumers about the environmental sustainability of local food products. Life cycle analysis research measuring the true environmental impacts of agricultural production in relation to food system sustainability continues to evolve. It is essential for agricultural marketers to translate that research into digestible information for consumers, thereby ensuring consumers are informed and provided with facts necessary to make ecologically sustainable food purchases.

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