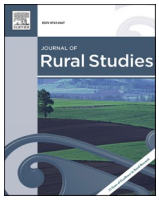
Journal of Rural Studies 103 (2023) 103135

Contents lists available at ScienceDirect

Journal of Rural Studies

journal homepage: www.elsevier.com/locate/jrurstud



Towards a unified definition of local food

Sara Brune *, Whitney Knollenberg, Carla Barbieri, Kathryn Stevenson

Department of Parks, Recreation, and Tourism Management, North Carolina State University, 2820 Faucette Drive, Campus Box 8001, Raleigh, NC, 27695, USA

ARTICLE INFO

Keywords:
Local food consumers
Interpretations local food
Place-based food
Local food meanings

ABSTRACT

Despite the growing popularity of local food, there is still no unified definition used across the board. The lack of unified definition of local food can prevent effective marketing, policymaking, and research efforts. Given the inconsistencies on local food definitions, we sought to fill this gap by surveying consumers' understanding of local food in North Carolina (NC, USA) departing from three categories of definitions found in the literature; local food defined in terms of: (1) market outlet (e.g., food bought directly from the farmer); (2) locality or political boundaries (e.g., food produced within the country); and (3) distance (e.g., food produced within 100 miles of commercialization). Informed by our study results, we propose defining local food in terms of the specific locality where is produced (e.g., county or state) as opposed to defining local food in terms of distance or market outlet. While the meaning of local food will remain contested among activists, governmental entities, and researchers, this study confirms that a shared meaning among consumers is emerging that should be incorporated across policy making, marketing, and research efforts.

1. Introduction

In the United States, the demand for local food more than doubled in less than a decade, growing from $5 billion in 2008 to $11.7 billion in 2014 (Packaged Facts, 2015). Local food consumption has increased as consumers seek greater transparency in the food chain and closer relationships with producers (Feldmann and Hamm, 2015). One of the most compelling arguments in favor of local food consumption is to support local economies and rural development, incentivize farmland conservation near urban areas, and increase the financial viability of local farms (Low et al., 2018; Starr et al., 2003). Local food consumption can also benefit the environment by reducing the distance food travels and the associated packaging and storing needs (Kemp et al., 2010) and help preserve endangered local genetic resources as well as cultural heritage (Scaramuzzi et al., 2021). In short, emerging interest in local food derives from a concern with sustainability goals such as socio-economic justice and environmental protection (Allen, 2010).

The increasing awareness of the benefits of local food consumption has prompted interest from food retailers, policymakers, and researchers (Martinez, 2016; Nie and Zepeda, 2011). The preference for local food may continue to increase with changes in the social fabric (e.g., migration from urban to rural areas) and major world events (e.g., the COVID-19 pandemic) altering food supply chains (Schmidt et al., 2020).

Despite the growing popularity of local food, there is still no unified definition used across the board (Cappelli et al., 2022; Enthoven & Van den Broeck, 2021; Ostrom, 2006; Pearson et al., 2011). For instance, the U.S. Department of Agriculture (USDA) defines local food as the 'direct or intermediated marketing of food to consumers that is produced and distributed in a limited geographic area' (USDA, n.d.), excluding specific reference to a given distance or territorial boundaries. Conversely, the US 2008 Food, Conservation, and Energy Act (the Farm Bill) defines local food as marketed within an area that is less than 400 miles from the origin of the product, or in the State in which it is produced. The inconsistency regarding distance or locality in defining local food, even within government entities continues to confuse stakeholders involved in local food systems (Enthoven & Van den Broeck, 2021).

Not having a unified definition of local food thwarts its marketing, policymaking, and research (Braaten and Coit, 2010). For example, food retailers often offer local food as a marketing strategy to avoid associations with globalization and industrialization (Blake et al., 2010). As consumers do not associate conventional food retailers with a market outlet for local food (Bloom and Hinrichs, 2011), adequate labeling may help bridge this gap (Khan and Prior, 2010). Nonetheless, creating trustworthy labels—like in the case of organic food—is difficult without a definition, complicating the identification of local products at stores and meeting consumers' expectations (Feldmann and Hamm, 2015;

* Corresponding author.
E-mail addresses: sbrunea@ncsu.edu (S. Brune), whitney_knollenberg@ncsu.edu (W. Knollenberg), carla_barbieri@ncsu.edu (C. Barbieri), kathryn_stevenson@ncsu.edu (K. Stevenson).

https://doi.org/10.1016/j.jrurstud.2023.103135
Received 15 December 2022; Received in revised form 10 August 2023; Accepted 23 September 2023

Onozaka et al., 2010). Authorities may also face difficulties regulating and standardizing labels because of this lack of definition. Consequently, with increased oversight and regulation of the various aspects of local food, a definition may facilitate the implementation of policies supporting local food (Braaten and Coit, 2010).

Apart from affecting marketing and policymaking, a lack of a conceptualization of local food deters research. Local food definitions are used interchangeably in the literature ranging from concepts based on the type of market outlet, the distance between producers and consumers, or based on locality or political boundaries within which food is produced and consumed (Bazzani and Canavari, 2017; Lang et al., 2014), inconsistency that weakens the research scope and meaning (Cappelli et al., 2022; Eriksen, 2013). For instance, reducing local food to distance or food miles may unavoidably deem local food inadequate to reduce carbon emissions (Coley et al., 2009), while overlooking other local food attributes that are attractive to consumers such as supporting local farmers and rural economies and the ethical implications of food production (Chambers et al., 2007; Edwards-Jones et al., 2008; Onozaka et al., 2010). Reaching a unified definition of local food would help make this research more actionable and responsive to community needs. For instance, coordinated research based on a unified understanding of local food can support small farms whose financial viability depends on effective marketing. (Ahearn et al., 2018; Khan and Prior, 2010).

Given the inconsistencies on local food definition and considering that pursuing a unified definition can advance its marketing, policymaking, and research, we sought to fill this gap by surveying consumers' understanding of local food in North Carolina (NC, USA). Specifically, we measured consumers' preferences departing from three categories of definitions found in the literature; that is, local food defined in terms of: (1) market outlet (e.g., food bought directly from the farmer); (2) locality or political boundaries (e.g., food produced within the country); and (3) distance (e.g., food produced within 100 miles of commercialization). Our study joins the few attempts to quantify which of these three local food attributes resonates most with consumers (Adams and Adams, 2011) and takes a step further by pioneering the examination of its preferences among consumers' sociodemographic indicators (Durham et al., 2009). Although several stakeholders in food systems should be involved in negotiating the meaning of local food, elucidating what consumers perceive as local food is a starting point to move towards a unified definition (Blay-Palmer et al., 2016). Building upon consumers' understanding of local food, we propose a definition that can support more cohesive research and effective policymaking. Our study results also provide marketing intelligence that can help to entice consumers to buy local food.

2. Three categories of local food definitions

Reaching a unified definition of local food can be challenging as producers, consumers, and other members of the food system hold conflicting objectives and values within food systems (Enthoven & Van den Broeck, 2021; Ostrom, 2006). For example, for farmers, the way local food is defined may limit or expand their competitive advantage against products from other regions or countries (Bloom and Hinrichs, 2011; Ostrom, 2006). Even though it is particularly important to assess consumers' definition of local food as they can influence local food systems with their purchasing and voting decisions (Adams and Adams, 2011), some argue that consumers' conceptualizations are hard to reconcile (Durham et al., 2009; Lang et al., 2014). For instance, consumers may have flexible definitions of local food contingent on their regional availability, seasonality, and accessibility to nearby outlets (Ostrom, 2006). Consumers may also consider local food as that produced within an arbitrary mileage (e.g., 100 miles) or in their home state, but this may be inconsistent with varying state sizes where 100 miles may be within their state or a neighboring state (Lang et al., 2014).

Three categories of local food definitions can be found in the literature. A first category emphasizes the importance of shortening the supply chain to reconnect producers and consumers through direct marketing (Feldmann and Hamm, 2015; Martinez et al., 2010; Mount, 2012; Selfa and Qazi, 2005). This direct-marketing focused definition restricts local food commercialization to alternative market venues such as farmers' markets, community-supported agriculture, or sold directly to restaurants, schools, or hospitals (Edwards-Jones et al., 2008; Feagan, 2007; Pirog et al., 2001). While alternative markets and small-scale exchanges may enhance farmers' revenues (Hardesty and Leff, 2009), placing local food as opposing industrialized systems of food production and distribution may limit access to local food for certain populations (Hinrichs, 2000; McGuirt et al., 2014). Thus, to improve local food accessibility, the need for scaling-up local food marketing through conventional food system infrastructure, such as supermarket chains has been emphasized (Bloom and Hinrichs, 2011; Enthoven & Van den Broeck, 2021; Mount, 2012).

The second category of definitions relies on distance ('food miles') as the key feature of local food (Adams and Adams, 2011; Chambers et al., 2007; Rose et al., 2008). A notable example is delimiting local food to that produced within 100 miles of the consumer, as (Smith and MacKinnon, 2007) popularized in their bestseller book *The 100-Mile Diet: A Year of Local Eating*. 'Food miles' conveys the distance food travels between the point of production to the final consumer and the associated carbon emissions and packaging needs (La Trobe and Acott, 2000). While miles traveled emphasizes the reduction of carbon emissions, it fails to incorporate the full scope of other impacts of local food, notably ignoring its effect on biodiversity, governance, and food sovereignty (Coley et al., 2009; Edwards-Jones et al., 2008; Farris et al., 2019; Schmitt et al., 2017). Despite the reductionist approach of 'distance traveled' to define local food, many researchers and food retailers favor its use because of its straight forward applicability (Eriksen, 2013; Pearson et al., 2011).

The third category of local food definitions relies on locality or political boundaries, such as food produced within a state or country (Eriksen, 2013). This spatial approach often brings attention to the preservation of local environmental and sociocultural attributes of a determined area (Allen, 2010; Scaramuzzi et al., 2021). At the same time, positioning food and place as intimately linked (Feagan, 2007), also alludes to the socioeconomic and political decisions surrounding food within a demarcated geographic context (Ostrom, 2006). Yet, authors warn that emphasizing political boundaries in defining local food may lead to patriotic hostility to foreign products and 'narrow nativist sentiments' (Hassanein, 2003; Hinrichs, 2003). Nonetheless, achieving an integrated vision of food systems' sustainability by incorporating varied stakeholders at regional and local levels remains the main objective of advancing local food systems (Schmitt et al., 2017).

2.1. Assessing consumers' local food definition

Although studies have identified three categories of definitions (market outlet, distance, and locality), no single study has compared the preference for these three categories of local food definitions among consumers (Durham et al., 2009). Quantitative studies to distill what consumers perceive as local food have been descriptive, and usually rely on ordinal rankings which limit testing for statistical significance or determining consumers' preference for a distinct category of local food definition (Khan and Prior, 2010). Thus, quantitative studies with larger, representative samples so that the results can be generalizable to a wider population are needed (Chambers et al., 2007).

Another knowledge gap that warrants further scrutiny relates to the criticism on the local food movement as being exclusive and reserved for the white, wealthy, and educated while neglecting disadvantaged populations (Allen, 2010; DuPuis and Goodman, 2005; Guthman, 2008; Hinrichs, 2000). Following this trend, local food related research has mainly relied on samples over-represented by wealthy consumers (Enthoven & Van den Broeck, 2021). Thus, research to move towards a unified definition of local food should incorporate a heterogenous

consumers' sample drawing an inclusive socioeconomic profile in terms of race, urban-rural continuum, and political leanings, beyond the wealthy and highly educated (Guthman, 2008; Hinrichs, 2003; Lang et al., 2014). Broadening the respondents' sample can also inform ways to appeal to a new base of consumers (Adams and Adams, 2011; Lang et al., 2014).

Investigating different psychographic factors (e.g., lifestyles, values) influencing behaviors, such as the different ways consumers engage with food systems, can also contribute to a more sophisticated understanding of the general public's conceptualization of local foods (Adams and Adams, 2011). For example, (O'Kane, 2016) found that farmers, gardeners (growing food for the household in a garden), and members of community-supported agriculture (CSA) have different levels of engagement and appreciation for various food systems elements (e.g., organic, seasonal, direct purchase from producers). Further beyond, constructing a diverse range of consumers to investigate their local food definition should also include consumers who are part of governmental (e.g., food stamps) or non-government (e.g., food banks) food assistance programs (Allen, 2010; DuPuis and Goodman, 2005; Hinrichs, 2000).

Seeking to address the aforementioned knowledge gaps and needs, we investigated how local food is defined among consumers with different demographics and psychographic factors in North Carolina (NC, USA). We seek to expand the understanding of whether sociodemographics (e.g., sex, age) and psychographic factor in terms of food systems' engagement (e.g., CSA member versus a gardener) determine conceptualizations of local food. Elucidating a local food definition from a wide range pool of consumers can inform effective policymaking and marketing that will also increase inclusivity of the local food movement. In summary, this paper advances our understanding of local food by composing an inclusive definition departing from the three common categories (market outlet, distance, locality) that is built upon the perceptions of a wide spectrum of consumers beyond local food buyers.

3. Methods

This work is part of a large research project investigating the effect of farm visits on families' knowledge and behaviors towards local food. Guided by the project's overarching aim, we sampled families in NC visiting farms during the weekends (2018–2019) and those whose children visited farms through school field trips (2019–2021). All sampled families were composed of at least one adult and at least one child between 9- and 13-year-old. This work focuses on the adults' responses as we seek to delineate the definition of local food from the consumers' perspective. Farms visited were selected from a comprehensive list of 43 farms offering hands-on agricultural (i.e., u-pick), recreational (e.g., playgrounds), and educational (e.g., a guided tour) activities to the public that the office of Agritourism Marketing at the NC Department of Agriculture and Consumer Services provided. The final seven farms selected were located across the NC western, piedmont, and eastern regions and were all within a 30-min drive of multiple schools to facilitate school field trips.

3.1. Survey procedures: Instrument and data collection

To address the study purpose and informed by the extant literature, we developed a survey instrument to gauge participants' understanding of local food, local food purchasing behavior, food system's engagement, and sociodemographic information. We measured preferences for six definitions of local food (Chambers et al., 2007; Durham et al., 2009; Farris et al., 2019; Lang et al., 2014; Ostrom, 2006) with a five point Likert-scale (1 = *strongly disagree*, 5 = *strongly agree*) using the prompt "Local food refers to foods": (1) produced in your county, (2) produced in NC, (3) produced in the US, (4) produced within 50 miles of where you live, (5) produced within 100 miles, and (6) food bought directly from the farmer. We measured respondents' local food purchasing behavior through six items (e.g., "how likely are you to shop at a farmers' market"). We followed (O'Kane, 2016) categorization (being a farmer, a gardener, or a member of a CSA) to measure food system's engagement and we queried whether the respondent received support from a food assistance program (Allen, 2010; DuPuis and Goodman, 2005; Hinrichs, 2000). Sociodemographic information collected included sex, age, level of formal education, race or ethnicity, annual household income, political leanings, and whether the respondent lived in a rural area.

We used interception procedures to approach families apparently fitting the sampling criteria (composed of at least one adult and one child between 9 and 13 years old) at the entrance of each farm during fall 2018 and spring 2019. After informing the adult(s) about the survey and confirming survey criteria, we requested their informed consent. The surveys were self-administered using iPads loaded with the instruments in a Qualtrics (web-survey platform) offline application. School-based data collection took place during the 2019–2020 and 2020–2021 academic years via partnerships with 32 fourth through sixth-grade teachers who volunteered for the study after we sent an invitation email through the North Carolina Department of Public Instruction listserv. After training participating teachers on the research protocol, they invited their students' parents to participate in the survey (either online or printed) through the communication channels they routinely use (e.g., classroom messaging apps). Surveys for parents were available in English and Spanish, which two Spanish-speaking members of the research team checked for accuracy. Researchers manually added completed paper surveys to the Qualtrics database.

3.2. Sample profile and data analysis

We obtained a total of 1049 adults' responses: 421 surveys during family farm visits and 628 after school field trips to farms across NC. After data cleaning using listwise deletion for cases that had incomplete responses related to local food definitions, we ended with 975 useable cases (391 from family visits; 584 from school-based visits). Most respondents were women (79%) and either between 30 and 39 (41%) or 40 and 49 (46%) years old. Respondents' race/ethnicities were White (68%), Asian (10%), African Americans (7%), and Latin/Hispanics (7%). Most respondents were highly educated either holding a 4-year college degree (30%) or higher (28%); over a quarter (28%) had some college education or a technical degree. Consistently, most respondents (57%) reported a high annual household income before taxes of at least US$75,000, which is above the NC median household income of $56,642 (U.S. Census Bureau, 2020). Similar proportions of respondents reported living in a rural area (23%) as opposed to a city or town (25%). In terms of political leaning, 25% reported conservative leanings, 17% reported liberal leanings, while the rest reported being libertarian (1.5%), independent (16%), other (4%), or preferred not to respond (37%). Regarding respondents' engagement with food systems, 11.7% were farmers, 55.3% gardeners, and 7.1% CSA members; 12.2% of respondents reported receiving food assistance.

To evaluate consumers' preferences for the six local food definitions, we first ran Wilcoxon Signed Rank Tests using Bonferroni correction for multiple tests ($p < 0.05/15 = 0.003$). Since the preferences towards locally sourced products shifted with the COVID-19 pandemic (Schmidt et al., 2020) and our sample includes respondents before and after COVID-19, we examined whether there was a statistically significant relationship between the time of data collection and respondents definitions of local food using a Fisher's exact test ($p < 0.05$). We then ran six linear regressions ($p < 0.05$) to estimate the effect of sociodemographic characteristics and psychographic factors regarding engagement with local food systems (independent variables) on inclinations towards each local food definition (dependent variables). To do so, we first dummy coded categorical independent variables (Table 1). We also summed individual scale items for the six local food consumer behavior items to generate a composite score that could range from six (responded 1 =

Table 1
Independent variables included in regression analysis.

Independent Variable	Description	Response Coding
Sociodemographic characteristics		
Sex	Self-identified as male, female, or another category, collapsed into binary variable	Male = 1, Other = 0
Age	Reported age in years	Discrete variable
Race or ethnicity	Self-identified as American Indian, Asian, African American, Hispanic/ Latino, Native Hawaiian/Pacific Islander, White or other. Collapsed into binary variable	People of color = 1, White = 0
Education Level	Respondent has college degree or above	College degree = 1, Other = 0
Political leaning	Reference category is Independent, Libertarian Other, and Prefer not to Respond	
Liberal	Self-identified as liberal or moderate liberal	Liberal = 1, Other = 0
Conservative	Self-identified as conservative or moderate conservative	Conservative = 1, Other = 0
Locale	Respondent lives in rural versus non-rural area	Rural = 1, Other = 0
Income	Reference category is middle income $25,000-$100,000[a]	
High income	Yearly household income above $100,000	High income = 1, Other = 0
Low income	Yearly household below $25,000	Low income = 1, Other = 0
Psychographic factors (food systems engagement)		
Local food buyer	6 item-Likert-scale to determine if respondent is a local food buyer	Discrete ranging from 6 to 30
Gardener	Grow foods for the household in a garden	Yes = 1, No = 0
Farmer	Someone in their household is farmer	Yes = 1, No = 0
CSA member	Someone in their household is a CSA member	Yes = 1, No = 0
Financially supported	Receives support from a food assistance program	Yes = 1, No = 0

[a] Middle class income range for North Carolina (Sauter, 2020).

very unlikely to all variables) to 30 (responded 5 = *very likely* to all variables). We tested for multicollinearity using the variance inflation factor (VIF <5).

4. Results

4.1. Preference for local food definitions

Overall respondents agreed with all definitions tested except with the one defining local food as produced in the US for which only 34.8% agreed with ($M = 2.99$; Table 2). Over one third of respondents strongly agreed with defining local food as produced in their county of residence (41%; $M = 4.21$) or bought directly from the producer (43%; $M = 4.14$). On average, local food definitions based on distance, either food produced within 50 miles ($M = 4.06$) or 100 miles ($M = 3.52$) were comparatively less popular than definitions based on political boundaries. Overall, the means for each definition indicate that NC consumers prefer definitions of local food based on locality or political boundaries at sub-national level.

Wilcoxon Signed Rank tests yielded respondents' two most agreeable definitions and the most disagreeable definition of local food (Table 3). Produced in county and in NC where the top definitions that respondents significantly agree the most, with no significant differences between them. Food bought directly from farmer and produced 50 miles away followed with no significant differences between them. Food produced 100 miles away received a significantly higher ranking than that produced in the US ($z = -12.779$), the latter appearing as the least ranked with scores significantly lower than all the other definitions of local food.

4.2. Difference before and after COVID-19

Fisher's exact test revealed that the proportions of respondents who agreed with the local food definitions produced in county ($p = 0.346$), produced in NC ($p = 0.095$), bought directly from farmer ($p = 0.194$), produced 50 miles away ($p = 0.132$), and a 100 miles away ($p = 0.394$) before and after the COVID-19 pandemic were not statistically different. Yet, the proportion of respondents that agreed with defining local food in terms of produced in the US was significantly higher (37.5%) before COVID-19 than after COVID-19 (28.5%; $p = 0.007$).

4.3. Relationship between respondents' characteristics and their definition of local food

Regression analyses resulted in six significant models indicating the predictive power of respondents' characteristics and engagement in local food systems on the six different local food definitions tested (Table 4). Starting with the three definitions based on political boundaries, results indicate that when it comes to considerations of local food as that 'produced in your county' [$F(14, 821) = 5.87$, $R^2 = 0.091$, $p < 0.001$; VIF = 1.19], living in a rural area ($\beta = 0.155$, $p = 0.018$) or being a local food buyer ($\beta = 0.046$, $p < 0.001$) predicted agreeing with this definition. For defining local food as that 'produced in North Carolina' [$F(14, 821) = 7.87$, $R^2 = 0.118$, $p < 0.001$; VIF = 1.19], being a local food buyer ($\beta = 0.056$, $p < 0.001$), or being a CSA member predicted agreeing with this definition ($\beta = 0.225$, $p = 0.028$). Finally, being non-white ($\beta = 0.273$, $p = 0.001$), being a local food buyer ($\beta = 0.044$, $p < 0.001$), being a CSA member ($\beta = 0.335$, $p = 0.031$), or being a farmer ($\beta = 0.369$, $p = 0.003$) predicted agreeing with the local food definition as that produced within the US [$F(14, 820) = 8.61$, $R^2 = 0.122$, $p < 0.001$; VIF = 1.19], while having a college degree ($\beta = -0.259$, $p = 0.004$), being a liberal ($\beta = -0.368$, $p < 0.001$) or being a gardener ($\beta = -0.153$, $p = 0.049$) predicted disagreeing with this definition.

Regarding the two definitions based on distance, being a male respondent ($\beta = 0.266$, $p < 0.001$), having a college degree ($\beta = 0.143$, $p = 0.030$), liberal ($\beta = 0.216$, $p = 0.005$), a local food buyer ($\beta = 0.054$, $p < 0.001$), or a gardener ($\beta = 0.177$, $p = 0.002$) predicted agreeing with local food as that produced within 50 miles [$F(14, 818) = 11.07$, $R^2 = 0.159$, $p < 0.001$; VIF = 1.19]. On the contrary, only being non-white ($\beta = -0.151$, $p = 0.017$) predicted respondents disagreeing with local food as that produced withing 50 miles. Only being a local food buyer ($\beta = 0.027$, $p = 0.002$) or being CSA member ($\beta = 0.435$, $p = 0.003$) predicted

Table 2
Respondents' stated level of agreement with local food definitions.

Definitions: Local Foods Are …	*Strongly Disagree*	*Disagree*	*Neutral*	*Agree*	*Strongly Agree*	Mean	Standard Deviation	*n*
produced in county	1.5%	4.7%	6.4%	46.0%	41.4%	4.21	0.87	971
produced in NC	1.0%	2.8%	7.1%	57.8%	31.3%	4.15	0.75	968
bought directly from farmer	1.7%	5.9%	12.7%	36.5%	43.2%	4.14	0.96	969
produced 50 miles away	2.3%	4.1%	9.9%	52.5%	31.2%	4.06	0.88	968
produced 100 miles away	2.7%	17.1%	19.9%	46.5%	13.8%	3.52	1.01	970
produced in the US	4.6%	38.8%	21.9%	22.4%	12.4%	2.99	1.14	970

Table 3
Respondents' ranking of local food definitions (z-values).

Definitions: Local Foods Are …	Produced in county	Produced in NC	Bought directly from farmer	Produced 50 miles away	Produced 100 miles away	Produced in the US	Mean	Rank
Produced in county	–	−1.885	−2.277	−4.145[a]	−14.860[a]	−20.509[a]	4.21	1
Produced in NC	–	–	−0.765	−2.981[a]	−15.765[a]	−21.361[a]	4.15	1
Bought directly from farmer	–	–	–	−1.913	−13.487[a]	−19.006[a]	4.14	2
Produced 50 miles away	–	–	–	–	−16.126[a]	−19.429[a]	4.06	2
Produced 100 miles away	–	–	–	–	–	−12.779[a]	3.52	3
Produced in the US	–	–	–	–	–	–	2.99	4

[a] Critical value adjusted with Bonferroni correction for multiple comparisons (0.05/15 = 0.003).

considering local food as that produced within 100 miles [F (14, 822) = 2.98, R^2 = 0.048, p = 0.001; VIF = 1.19]. Finally, being a local food buyer (β = 0.064, $p < 0.001$) or a gardener (β = 0.139, p = 0.029 predicted agreeing with local food being defined as that bought directly from the farmer [F(14, 821) = 9.060, R^2 = 0.134, $p < 0.001$; VIF = 1.19] whereas reporting a low household income (β = – 0.535, $p < 0.001$) or being farmer (β = – 0.253, p = 0.015) predicted disagreeing with this definition.

5. Discussion

Our findings support evidence indicating that consumers in general do not consider distance between the place of consumption and production the most defining feature of local food (Bazzani and Canavari, 2017; Durham et al., 2009; Ostrom, 2006). Rather, consumers' inclination for definitions based on political boundaries (i.e., 'local food is produced in your county or state') may be related to consumers' sense of place or loyalty (Durham et al. (2009), which adds to the growing consensus on using locality or political boundaries to define local food (Bosona and Gebresenbet, 2011; Dunne et al., 2011; Futamura, 2007; Granvik et al., 2017; Hinrichs, 2003). Although local food is an evolving concept, our findings suggest advocating for adopting a unified definition as that produced, commercialized, and consumed in a particular locality, either at the county or state level, but not broadly as originated from the US, as that definition is the most popular in aggregate. Although we recognize that some stakeholder groups may not fully agree with this definition (e.g., producers, retailers), incorporating consumers' local food conceptualizations helps advance the messaging and labels of local food campaigns to promote their consumption (Lang et al., 2014). Our study also reveals that although preferences for local food may change, for the most part, people's definitions of local food are somewhat stable in the face of disruptive events like the COVID-19 pandemic. However, respondents were less likely to consider food produced in the US as local food, supporting previous studies where the COVID-19 pandemic is associated with changes in the relationship with food (Paganini et al., 2020; Schmidt et al., 2020).

5.1. Socio-demographic characteristics as predictors of consumers' local food definitions

The low levels of variance explained by our models suggest weak explanatory power across characteristics of consumers. This was certainly true among the most popular definitions of local food (i.e., as produced within one's county or within the state), suggesting some level of consensus across demographic groups. Indeed, the only significant predictor in either of these models in terms of socio-demographics was stronger agreement among people from rural areas compared with suburban or urban areas in defining local food as food from one's county. Rural dwellers' distinct preference for a county based definition may be associated with difficulties in sourcing local food within a 50 miles radius (e.g., food deserts) of their residence as opposed to urbanites who might have access to a wider range of food outlets (e.g., supermarkets) nearby (Blanchard and Lyson, 2007; Sharkey, 2009). Similarly, low-income respondents were less likely to agree with defining local food as that bought directly from farmers, which may be linked with the cost, time, and transportation barriers low-income consumers associate with direct-marketing such as farmers' markets and CSA schemes (McGuirt et al., 2014, 2019). Thus, a local food definition based on political boundaries may be more inclusive for both consumers residing in across the rural-urban and income continuum (Lang et al., 2014).

Patterns regarding defining local food based on distance may point to some sociodemographic trends related to why people might value local foods. Communication around local foods that emphasizes distance often conveys the benefits of local food in terms of reducing carbon emissions and environmental protection (Coley et al., 2009). Reception to this framing may help explain the patterns we detected around both defining local food in terms of the largest geographic area—produced in the United States—and the shortest distance offered—less than 50 miles. More specifically, produced in the US was the least popular definition overall, but particularly among liberal, highly educated, and white consumers. Similarly, white, liberal, and highly educated consumers were more likely to agree with defining local foods as produced within 50 miles. These same demographic groups typically prioritize environmental issues (White et al., 2019), which might explain their likeliness to agree with a 50-mile distance definition. The one outlier in this explanation is sex, as men tend to display lower commitments to environmental issues than women (Coley et al., 2009). Future research should continue to examine these trends, as well as noting that definitions by county and state resonated with nearly all groups equally and were the most preferred.

5.2. Engagement with food systems as predictors of consumers' local food definition

When it comes to consumers' engagement in food systems, being a Local food buyer was the only consumer characteristic that predicted agreeing with all six local food definitions. Such a broad understanding—or accepting multiple definitions—of local food may be associated with their rooted engagement with and knowledge of the complexities of local food systems, such as regional availability, and seasonality (Lang et al., 2014; Ostrom, 2006). Further, it may be that supporters of local foods were just more likely to agree with any definition. Gardeners' preference for proximity and direct market exchange may relate to a more direct experiential connection to agriculture and people. This personal connection and identity-building practice may make gardeners more likely to think of local food as something grown by someone they know, or close to home (O'Kane, 2016). CSA members seemed to have a broader understanding of local food as they tended to agree with local food as that produced in NC, produced in the US, and within 100 miles. This may reflect marketing and use patterns typical of CSAs schemes in urban areas where members are interested in accessing

Table 4
Linear regression of respondent's sociodemographic characteristic and food systems engagement on six local food definitions.

Variable	Produced in same County[a]		Produced in North Carolina[a]		Produced in the US[a]		Produced within 50 miles[a]		Produced within 100 miles[a]		Bought Directly from farmer[a]	
	B	SE	*B*	SE	*B*	SE	*B*	SE	*B*	SE	*B*	SE
Demographic characteristics												
Male[b]	0.072	0.071	0.055	0.062	−0.150	0.094	0.266 ***	0.069	0.119	0.087	0.030	0.077
Age	0.000	0.004	−0.005	0.004	−0.008	0.006	0.001	0.004	−0.006	0.005	−0.003	0.005
People of color[b]	−0.103	0.065	−0.035	0.056	0.273 **	0.085	−0.151 *	0.063	0.029	0.079	−0.065	0.070
College degree[b]	0.082	0.067	−0.056	0.059	−0.259 **	0.089	0.143 *	0.066	−0.035	0.083	0.056	0.073
Liberal[b]	0.109	0.078	0.068	0.069	−0.368 **	0.104	0.216 **	0.077	0.019	0.097	0.068	0.085
Conservative[b]	−0.119	0.071	−0.067	0.061	0.011	0.093	−0.111	0.069	−0.033	0.086	−0.109	0.076
Rural area[c]	0.155 *	0.070	0.030	0.061	0.150	0.093	−0.133	0.069	−0.070	0.086	−0.074	0.076
High income[d]	0.046	0.067	0.045	0.065	−0.078	0.088	0.087	0.065	0.146	0.082	−0.003	0.072
Low income[d]	0.008	0.125	−0.095	0.076	0.033	0.165	−0.073	0.123	0.032	0.153	−0.536 ***	0.135
Food systems engagement												
Local food buyer	0.046 ***	0.007	0.056 ***	0.006	0.044 ***	0.009	0.054 ***	0.007	0.027 **	0.009	0.064 ***	0.008
Gardener	0.110	0.059	−0.034	0.051	−0.153 *	0.078	0.177 **	0.058	0.131	0.072	0.139 *	0.064
Financially supported[e]	−0.164	0.100	−0.035	0.089	−0.023	0.133	−0.083	0.098	−0.068	0.123	−0.087	0.109
CSA member	0.110	0.117	0.225 *	0.103	0.335 *	0.155	0.197	0.115	0.435 **	0.144	0.101	0.127
Farmer	0.042	0.095	−0.043	0.083	0.369 **	0.126	−0.064	0.093	0.105	0.117	−0.239 *	0.103
_cons	3.022	0.252	3.065	0.220	2.415	0.332	2.612	0.248	2.985	0.310	2.779	0.274
R^2	0.091		0.118		0.122		0.159		0.048		0.134	

[a] Prompt "local food refers to food …"; *p < 0.05; **p < 0.01; ***p < 0.001.
[b] Male = 1, People of color = 1, College degree or higher = 1, Liberal = 1, Conservative = 1.
[c] Rural = 1: respondents who reported living in a rural area.
[d] High income: household income >100,000 = 1, Low income: household income <25,000 = 1.
[e] Financially supported = 1: respondents who reported receiving support through a food assistance program.

local, fresh, and seasonal food, but are not necessarily interested in nurturing a sense of community with agricultural systems (Pole and Gray, 2013). These differences in local food definitions between gardeners and CSA members reveal how consumers' life experiences are associated with their ontological considerations.

With this study we were unable to capture any trends regarding how consumers receiving support through a food assistance program (Financially supported) understand local food. This may be explained by consumers benefitting from governmental programs such as the Supplemental Nutrition Assistance Program (SNAP) having limited mechanisms to purchase local foods, for example at farmers' markets, or face considerable price and transportation barriers (Low et al., 2018; McGuirt et al., 2014). These results suggest that more research (e.g., relying on qualitative approaches) targeting Financially supported consumers is needed to understand their local food conceptualizations and how to craft a compelling message to foster local food systems' engagement, as well as creating mechanisms to facilitate their access to local food (Hinrichs, 2003).

Finally, farmers' tendency to agree with the definition of local food as that produced in the US may be in line with their interest in broadening their market (Ostrom, 2006). Conversely, farmers' tendency to disagree with defining local food in terms of that "bought directly from the farmer" may indicate their familiarity with the intricacies of direct-to-consumer marketing and their desire to upscale local food commercialization (Bloom and Hinrichs, 2011; Mount, 2012). Although direct-to-consumer marketing may be more efficient in promoting local food consumption than labels (Brune et al., 2021), developing effective labels can play an important role in advancing local food systems (Mugera et al., 2017). As consumers seek information and direct exchange with farmers and their agricultural practices, labels that describe the products locality of production and convey the benefits of local food are necessary to breach the gap between consumers' expectations and farmers' marketing capability (Ostrom, 2006), especially if there is a desire to scale-up local food consumption (Bloom and Hinrichs, 2011; Enthoven & Van den Broeck, 2021; Mount, 2012).

5.3. *Adopting a unified local food definition: Practical and scholarly implications*

Our findings indicate that in NC, marketing strategies emphasizing subnational political boundaries such as "produced in your state" are more likely to impact purchasing behaviors among consumers looking to buy local food products than marketing messages emphasizing the proximity (e.g., promoting the 100-miles diet; (Hu et al., 2012). This study bolsters the efficacy of interventions such as those advanced by Colorado, Florida, Mississippi, New York, North Carolina, and Wisconsin seeking to strengthen local food systems at the state level (Hood et al., 2012; Lang et al., 2014; Martinez, 2016). Yet, a similar study with a representative sample of the US population is necessary to extrapolate these findings.

Distance-oriented local food definitions are less popular overall, with a slight preference among high income, liberal, and white consumers. This trend suggests that a distance-oriented definition could also be polarizing similarly to other issues in the US with clear patterns in politics, race, and income (e.g., climate change, genetically modified foods). We suggest that a focus on definitions with high agreement and little sociodemographic variation in preferences may be the most promising pathway for broad engagement with local foods. Such approach may also benefit from emphasizing support for local farmers and economies, as we also found general support for defining local food as that directly bought from the farmer. This framing may also advance the conservation of cultural landscapes and environmental resources (Hood et al., 2012; Ostrom, 2006).Yet, the emphasis on direct-to-consumer marketing when promoting local food may alienate low-income consumers who face considerable barriers to purchase directly from farmers (e.g., farmers' market access) and it underscores

the importance of promoting local food though conventional outlets such as supermarkets (Hinrichs, 2000; McGuirt et al., 2014).

Regarding policy implications, local governments can take advantage of consumers' inclination towards political boundaries to define local food to advance a place-based approach. A place-based approach involves implementing context-specific measures that incorporate the input of diverse agencies such as farmers' markets and schools, and most importantly, organizations representing low-income residents in need of food assistance to facilitate their engagement with local food systems (Enthoven & Van den Broeck, 2021; Jones and Bhatia, 2011). Thus, adopting a unified definition of local food based on political boundaries entails devising policies that delimit 'place' as an inclusive space where stakeholders can negotiate local food systems' governance such as county and state-level councils (Hassanein, 2003).

All encompassing, a unified political-bounded understanding of local food may energize spatially embedded stakeholders to engage in policy changes necessary to achieve sustainable food systems in their communities (Ostrom, 2006). It is worth mentioning that a unified definition of organic foods facilitated establishing organic standards but rather than energizing the organic foods movement, it led to the consolidation of large agri-food corporations in which the organic and local food movements "parted ways" (Ikerd, 2017, p. 6). Since the local foods movement often seeks to promote stakeholders embedded spatially to work together to shape their desired food systems (Futamura, 2007; Randelli and Rocchi, 2017), agreeing on a local food definition may provide a base to facilitate this work among stakeholders. Although a unified definition cannot by itself guarantee the work among stakeholders will be enabled, research into what consumers understand by local food is still bound to help advance marketing, research, and policymaking. In short, a strong and cohesive local food systems governance with a place-based emphasis can expand the benefits offered to local communities (Scaramuzzi et al., 2021).

Our study results also carry scholarly implications. First, scholars should recognize the inconsistency of local food understandings among the public, and especially when reaching consumers, thus the need to state up-front a definition rather than merely referring to local food. Second, scholars should continue efforts to identify a reconciliatory definition of local food as its consistent utilization across studies is crucial to provide common ground for future research that enables aggregating knowledge, comparison across studies, and developing meta-analyses. Adopting such a unified definition of local food can also prevent conflation of different terms (e.g., alternative food networks and local food) which might bear different motivation for consumers (DuPuis and Goodman, 2005). Lastly, we suggest researchers consider using a locality/or politically-boundaries based definition of local food (county or state) when researching issues related to local food as it may elicit more accurate representations, thus measurements, than distance or market-outlet based definitions.

5.4. Study limitations and insights for future research

Among the limitations of this study is a potential selection bias as our sample contains respondents with a higher education level than the NC average as well as a high proportion of female respondents. As women and highly educated individuals seem to be more willing to fill out the surveys, notoriously in local food studies (Berg and Preston, 2017; McGuirt et al., 2014), future studies should consider to expand its reach across the sex/gender and educational continuum. Thus, future research should seek to evaluate the three categories of local food definition across states with varied socio-demographic characteristics to better understand consumers' preferred local food definition (Enthoven & Van den Broeck, 2021; Farris et al., 2019). Third, we focused on consumers' perspectives because their key role in moving towards a unified definition (Blay-Palmer et al., 2016). Yet, another promising research path is using the three categories of definitions to assess producers, retailers, restaurant owners, and other food systems stakeholders' perceptions to continue to find common ground.

6. Conclusion

Advancing local food has been deemed central to attaining sustainability goals such as socio-economic justice and environmental protection (Allen, 2010). Yet, the term local food is broadly utilized among stakeholders which leads to controversy and confusion (Enthoven & Van den Broeck, 2021). The lack of clarity about what local food entails is also prevalent among consumers which is especially detrimental for small farms and their ability to successfully market local food and its attributes (Ahearn et al., 2018; Khan and Prior, 2010). By prolonging the disagreement about the local food definition, we hinder the potential to produce a compelling message to substantially educate consumers and mobilize them to connect and negotiate with producers the policy changes needed to promote sustainable food systems (Ostrom, 2006). Thus, achieving a unified understanding of local food has the potential to strengthen marketing, policymaking, and research efforts (Braaten and Coit, 2010). Toward such end, our study results contribute to the practice and scholarship of local food by assessing local food definitions among consumers by provide implications for managers, policymakers, and scholars.

Informed by our study results, we advocate for using a local food definition that is centered on common understanding across different groups of consumers. We propose defining local food in terms of the specific locality where is produced (e.g., county or state) as opposed to defining local food in terms of distance. By focusing on a locality-bounded definition, we also move towards building common ground among local food systems stakeholders. The consistent use of a unified definition enables clearer communication between researchers, practitioners, and policymakers as well as clear-cut recommendations. While the meaning of local food will remain contested among activists, governmental entities, and researchers, this study confirms that a shared meaning among consumers is emerging that should be incorporated across policy making, marketing, and research efforts.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Carla Barbieri, Kathryn Stevenson, Whitney Knollenberg reports financial support was provided by National Institute of Food and Agriculture.

Data availability

The authors do not have permission to share data.

Acknowledgements

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported by USDA-NIFA grant 2017-67023-26224 (2017–2022).

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