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Consumer Perceptions about the Value of Short Food Supply Chains during COVID-19: Atlantic Canada Perspective

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Abstract: The recent global COVID-19 pandemic has revealed weaknesses in the global food system, with short food supply chains (SFSCs) and long food supply chains (LFSC) being impacted differently. This raises the question as to whether the pandemic has contributed to a greater interest in and demand for locally produced foods. To answer this question, a study was undertaken to explore how consumers perceive SFSCs in delivering social, economic, and environmental benefits and whether these perceptions have been enhanced during the pandemic. A survey was carried out among consumers in Atlantic Canada who purchase food from SFSCs. Based on 80 valid responses, the findings revealed that consumers perceive SFSCs to deliver more social benefits post-pandemic than they thought SFSCs did before the pandemic. Supporting the local economy, food safety, freshness, and product quality are key motivators of shopping from SFSCs. Consumer perceptions about the sustainability of SFSCs did not vary much based on sociodemographic factors. Also, the COVID-19 pandemic did not significantly alter consumer spending and frequency of shopping from SFSCs. This may affect the SFSCs’ ability to expand operations beyond current levels and suggest the complementarity between SFSCs and LFSCs for more sustainable consumption patterns. The study provides valuable insights into the attractiveness of the local food businesses and the effect of unexpected events such as COVID-19 on consumer behaviors.

Keywords: sustainability; consumer perceptions; food supply chains; Atlantic Canada; COVID-19

1. Introduction

The reliance on the global food system, spearheaded by large retail chains, is significant for many Western countries, including Canada [1,2]. The COVID-19 pandemic presented unexpected circumstances and challenges to the food supply system [3,4]. It was more challenging for global food supply chains due to border restrictions and the closure of food production facilities during the initial stages of the pandemic [2,3]. In many Western countries, such as Canada, food production relies on seasonal employees. However, during COVID-19, such employees faced health and travel restrictions that resulted in labor shortages in primary production, processing facilities (such as meat), and distribution systems [2,5,6]. On the demand side, food supply chains were under pressure due to unexpected shifts in consumer demand [7,8]. The initial reaction of consumers to the pandemic left some store shelves empty due to hoarding and panic buying, which resulted in a shortage of food items such as flour, pasta, and frozen foods [7,9]. In addition, due to health concerns, the demand for immune system-strengthening foods increased [4]. Another difficulty was the closure of many other establishments where food was available, including restaurants, cafés, and bars, driving consumers to grocery stores for food, again putting stress on food supply chains [10].

Although the sudden changes in supply and demand conditions during the early stages of COVID-19 were largely short-lived [11,12], the pandemic raised questions about
the sustainability of food supply chains in times of a global crisis. The pandemic may have long-term effects on consumer perceptions of local and global food supply chains. The COVID-19 pandemic impacted short food supply chains (SFSCs) and long food supply chains (LFSCs) differently [13,14]. Thus, how the COVID-19 pandemic has influenced consumer perceptions toward SFSCs and local production is an active area of research; this can have important implications for chain actors and policy guiding local food systems.

Some prior studies suggest that the supply and demand shocks during COVID-19 disproportionately affected the global food system and increased the popularity of local production and SFSCs [14–16]. The movement toward local has been a trend for many years for reasons such as increased transparency, better flavor, and eating based on seasonality [17]. In addition, there is a growing perception that local foods are fresher, natural, organic, and less expensive [18,19]. Many consumers turned to local businesses to support during the pandemic, as these supply chains did not face the same struggles (labor shortages, border interruptions, trade disputes) as LFSCs [20]. “Local” can have various definitions, depending on context and who is being asked. Following the definition provided by the Canadian Food Inspection Agency (CFIA), for this study, local refers to food sold within the province or territory it is produced or sold within 50 km of the province or territory of origin [21].

Sustainability is commonly conceptualized along three dimensions: environmental, social, and economic [22]. Existing research provides some evidence about the impact of COVID-19 on the sustainability of food supply chains and motivating factors for shopping from SFSCs. However, no cohesive study has examined how consumers perceive SFSCs and how an unexpected event such as the pandemic has impacted perceptions about the sustainability of SFSCs and LFSCs. While one strand of the literature considers SFSCs as an alternative to LFSCs, others highlight the complementarity, co-existence, and convergence of SFSCs and LFSCs [23,24]. According to Thomé et al. [25], SFSCs and LFSCs co-exist in several ways: uncooperatively, competitively, cooperatively, or in a coordinated manner.

Against this backdrop, the study aims to analyze consumer perceptions of SFSCs in Atlantic Canada, a region with a diverse agricultural sector, including seafood and dairy. Specifically, the study seeks to (1) explore consumer (pre-pandemic) perceptions about the economic, environmental, and social sustainability of SFSCs and (2) analyze changes in the value of SFSCs following the COVID-19 pandemic. The agriculture sector in Atlantic Canada stands out from the rest of the country as it is the cornerstone of rural communities and, unlike central and western Canada, consists mainly of small and medium businesses [26]. A cross-sectional survey was carried out among consumers in Atlantic Canada who have experience in shopping from local businesses. Multiple statistical methods were used to understand consumer perceptions and predict the attractiveness of the local food business in Atlantic Canada. The study provides valuable insights into the degree of loyalty consumers have toward SFSCs and the opportunities for local businesses to benefit from such trends [27]. The study also expands our understanding of how unprecedented events impact consumer perceptions and behaviors about the economic, social, and environmental sustainability of SFSCs. Finally, in light of recent demographic changes, dietary habits, local food movement, and sustainability concerns, the study aims to provide evidence about the demand for and attractiveness of local food systems post-COVID-19.

2. Review of Related Literature

2.1. Food Supply Chains: Overview

Food supply chains encompass a complex production, handling, processing, distribution, and marketing system and may involve multiple actors with specific roles [28]. Due to the complex relationships and geographic scope, food supply chains have
faced many sustainability challenges [29]. The unprecedented global pandemic exacerbated the complexity of food supply chains. For example, supply chain disruptions and shifts in consumer buying behavior led to food supply and demand shocks in Canada [2]. Although most of the shocks were short-lived, the pandemic exposed the vulnerability of the food supply system [30]. The most notable weaknesses of the Canadian (or Northern American) food supply chain were cross-border restrictions and labor shortages, especially in primary production and processing sectors [30]. This resulted in severe food shortages and inflation, and Canada was one of the countries that recorded the largest increase in permanent stockouts during the pandemic [31].

Food supply chains can be classified as long or short. LFSCs generally involve more intermediaries and are complex; they usually have international partnerships and complex distribution systems [32]. Although the definition could vary depending on the context, SFSCs usually involve a short physical distance between producers and consumers, fewer intermediaries, and increased cultural and social proximity between consumers and farmers [33]. Sometimes the term “alternative food networks” is used to describe SFSCs to highlight the environmental and social benefits of the latter against the globalized food supply chain [34]. SFSCs may operate in different models: farmers’ markets, pick-your-own, on-farm sales, community-supported agriculture, or through an intermediary [33]. In addition, with increased web-based sales, SFSCs may include direct internet sales that could involve non-local sales [35]. Generally, producers and consumers are the two most important actors defining SFSCs.

2.2. Past External Events on Consumer Perceptions and Shopping Behavior during COVID-19

The study was carried out during the COVID-19 pandemic; therefore, it is necessary to explore how past unexpected events have had the potential to shape consumer perceptions. While there are only a few studies on how pandemics, epidemics, or other unusual events affect consumers regarding supply chains, they could provide useful insights to the present study. A study analyzing the impact of Japanese consumers’ meat demand after BSE (mad cow disease) and Bird flu showed that while those events led to a fall in demand for beef and chicken, the demand for pork and fish increased [36]. Also, the same study noted that the BSE impact was only related to the beef market share; BSE had a more persistent impact than Bird flu. Another study focused on Influenza A, H1N1, or what is commonly referred to as swine flu. The study found that only 7% of participants had stopped or reduced pork consumption due to the swine flu pandemic [37]. Similar findings were identified in Guinea during the 2014–2016 Ebola incidence; many consumers still chose to consume wildlife even though it had a higher chance of causing Ebola transmission [38]. These few studies suggest that the impacts of a pandemic are short-lived among many consumers. In addition, consumers experienced other events, such as financial crises, that impacted shopping decisions. Other studies suggest that as the future becomes more uncertain, individuals become more rational in purchasing decisions [39].

The COVID-19 pandemic brought about unexpected conditions for many people globally. One study predicts that the “at home” lifestyle will lead consumers to more convenient consumption behaviors [40]. The pandemic also uncovered vulnerabilities in many food supply chains, prompting some customers toward national/regional food suppliers [30]. A study in Austria found that before the pandemic, consumers had positive attitudes toward supermarkets, but this became more negative during the pandemic [41]. For example, perceptions toward supermarkets changed due to a lack of stock which upset customers who desired to stock up [41]. The same study also found that dropping levels of supermarket customer satisfaction were matched directly with the start of the pandemic. This may suggest that individuals are becoming less fond of the traditional LFSCs and seeking alternatives. E-commerce also became more critical during the pandemic, where the pandemic forced the retail sector to make considerable advancements. The increased stockouts caused by international border restrictions and
demand led many to focus on local food businesses [2]. A study in Romania found that 60% of participants wanted to continue buying directly from SFSCs even after the pandemic [42]. In Canada, 95.6% of respondents reported shopping at a farmers’ market during the pandemic [20]. Possible motivations may include the difficulty of purchasing meat and pre-packaged goods [15].

There have also been changes in diets amongst consumers due to the COVID-19 pandemic. A multi-country study in the USA, New Zealand, Great Britain, and Ireland found that vegetable and fruit consumption increased in a similar manner as saturated fat [43]. Also, the demand for alcohol [44] and comfort foods increased throughout the pandemic [45]. These buying habits, especially at the beginning of the pandemic, were sudden and thus caused additional challenges for food supply chains and stockouts [4]. The dietary changes suggest changes in consumer preferences and buying behavior [42].

The pandemic has caused changes amongst consumers and within supply chain logistics. It is reported that some consumers stocked food they may need, but some of the food was disposed of due to spoilage, while others were starving due to a lack of access [46]. The pandemic also uncovered weaknesses in supply chains. One issue relates to social sustainability, especially the treatment of seasonal workers. Mistreatment was observed in many countries, including Canada. Mistreatment included inadequate housing, crowded housing, and exploitation [47,48]. Border restrictions also made it difficult for seasonal workers to cross international borders, prompting countries to implement initiatives to stop or lessen the impacts of this problem [2]. One example is the Pick for Britain Campaign, which aimed to recruit British residents to cover these jobs. However, this campaign failed as only 5% to 11% of the needed positions were filled [49]. This emphasizes the dependence of, in this case, the British food industry on migrant workers, while at the same time, such migrant workers are often not treated well.

In summary, the debate about the sustainability of SFSCs versus LFSCs is inconclusive. Furthermore, discussion about the long-term impact of the COVID-19 pandemic on consumer perceptions will continue to attract attention. Due to variations in government restrictions and the impact of the pandemic, evidence may vary across time and geography [35]. Thus, context-specific studies are paramount to expanding our understanding of consumer behavior and the impact of the pandemic on consumer perceptions of SFSCs. Figure 1 shows the conceptualization of the present study. It highlights consumers’ (pre-pandemic) perceptions about SFSCs, how difference in shopping behaviors and sociodemographic factors influence such perceptions about the value of SFSCs before and during COVID-19. Various studies, such as in China [50], Spain [51], and France [52], reported the role of demographic factors in explaining perceptions toward sustainable production and consumption. More specifically, the study provides three hypotheses:

**H1.** Consumers exhibit positive perceptions toward SFSCs in delivering economic, environmental, and social sustainability benefits.

**H2.** The COVID-19 pandemic increases the value of SFSCs in delivering economic, environmental, and social benefits.

**H3.** Socioeconomic variables and shopping behaviors predict the difference in perceptions about the value of SFSCs in delivering economic, environmental, and social benefits.
3. Materials and Methods

3.1. Study Design and Sampling

The study uses a quantitative approach to achieve the research objectives. The study population included consumers in Atlantic Canada who had experience shopping with local businesses, including farmers’ markets, and were 18 years or older. Minors (under 18 years) were excluded from the study because they typically do not do their own or family grocery shopping. There are no other exclusion criteria, as the goal was to understand consumer perspectives. The study used various strategies to recruit the participants—online (via survey tool, Opinio) and farmers’ market attendees. The recruitment was conducted orally by the first author. The participants were given the option to receive a paper questionnaire or provide an email for which the link to the online questionnaire would be sent. Farmers market attendees have been used in other studies, such as in Italy [53,54].

A cross-sectional structured questionnaire was distributed to consumers of SFSCs to gain insights into how consumers perceive SFSCs and whether their perspectives of SFSCs have changed since the COVID-19 pandemic. The questionnaire was pre-tested to ensure that the questions were clear and understandable [55]. The overall structure and thought process behind drafting questions were guided by the literature [56].

The questionnaire consisted of four different sections. The first section gathered information about demographic characteristics, such as age, family size, income, and gender, which have been shown to impact perception and behavior [42,51]. The second section focused on buying behavior (e.g., types of products frequently purchased from SFSCs, and average spending on groceries from SFSCs) [51]. The third section focused on current perceptions about the environmental, social, and economic sustainability of SFSCs [57], and the final section focused on pre- and post-pandemic perception changes (i.e., before March 2020, when COVID-19 was declared a global pandemic by the World Health Organization). Consumers’ perceptions were measured using a Likert scale, which is a popular choice in many consumer studies. For example, Poelman et al. [10] used a 5-point Likert scale to compare eating habits pre- and post-lockdown. The sustainability questions were drawn from the criteria developed for the SKIN [58] and Strength2Food [53] projects. Their measures provide a well-rounded view of all three pillars of sustainability. Therefore, most of the indicators measuring sustainability, including environmental indicators such as GHG emissions, energy use, carbon footprint, ecological soundness of production methods, food miles, and food waste, were adapted from this study. Also, the demographic questions came from pre-existing surveys and findings [42,59]. After obtaining research ethics approval, data collection was carried out in January and February 2022.

Figure 1. Conceptual framework.
Ideally, around 150 participants were expected to participate. However, only 105 responses were received, of which 25 were found to be incomplete. Thus, the final analysis included 80 valid responses.

3.2. Data Analysis

The survey data were analyzed using various applied statistical methods. Descriptive statistical methods were used to summarize respondent demographic characteristics. Factor analysis (Principal Component Analysis, using the oblique rotation technique) was performed to determine the latent factors (constructs) influencing consumer perceptions of SFSCs. A One-Way ANOVA was used to test whether relationships between the constructs that were identified in the factor analysis and various variables related to sociodemographic factors, shopping behavior, and perceived benefits of SFSCs. The Levene statistic was applied to report the F- and p-values when the assumption of homogeneity of variances holds. However, when this assumption did not hold, the test statistic and corresponding p-values were reported based on the Robust Tests of Equality of Means (Brown–Forsythe). The factor analysis and ANOVA were carried out using SPSS (version 27.0). A correlation analysis was carried out to assess any potential changes in perceptions toward SFSCs following the COVID-19 pandemic.

Multiple regression analysis was performed in Stata (version 16.1) to identify factors that influence consumer perceptions of SFSCs. Specifically, the stepwise regression method was used to examine the effect of sociodemographic, dietary, and shopping behavior on the four constructs measuring the perceived benefits of SFSCs and how COVID-19 changed (if any) such perceptions toward SFSCs. Due to the smaller sample size, we chose the forward stepwise regression (vis-à-vis backward stepwise regression). This approach provides a more parsimonious model by sequentially identifying the most relevant factors [60]. Furthermore, this approach would allow us to exclude statistically irrelevant predictors automatically. Variables with a significance level of 0.2 or lower were considered for inclusion in the final model.

4. Results

4.1. Descriptive Analysis

Of the 105 survey responses, only 80 were included in the data analysis as the remaining were not residents of Atlantic Canada or were incomplete. Table 1 displays the key demographic characteristics of the study participants. Most participants (35%) were between the ages 46 and 65, followed by the 26–45 age range (31%), with the above 65 age category representing 9%. The respondents were dominantly female (at 71%). Most respondents lived in the Halifax Metro area (41%), while others lived in Cape Breton, Eastern Shore, and Yarmouth. About 49% of the respondents classified their residence as a small town or rural; about 18% were from an urban location. In addition, 21% of the participants reported an annual household income above CAD 150,000; most of the participants had a university degree, diploma, or certificate. Finally, 35% of the participants lived in two-person households without children, while one-person households accounted for 26% of the respondents (Table 1).

| Demographic Factors | Frequency | Percent | Std. Dev |
|---------------------|-----------|---------|----------|
| Age (year)          |           |         |          |
| 18–25               | 20        | 25      | 0.941    |
| 26–45               | 25        | 31.3    |          |
| 46–65               | 28        | 35      |          |
| Above 65            | 7         | 8.8     |          |
| Gender              |           |         |          |
| Male                | 23        | 28.7    | 0.455    |

Table 1. Demographic Characteristics of Respondents (n = 80).
Female 57 71.3

Location
Halifax Metro 33 41.77 2.453
Bay of Fundy and Annapolis Valley 11 13.92
Eastern Shore 1 1.27
Northumberland Shore 19 24.05
South Shore 2 2.33
Yarmouth and Acadian Shores 1 1.27
Cape Breton Island 1 1.27
Other (outside NS, within Maritimes) 11 13.92

Type of residence
Urban core 14 17.5 0.76
Suburban 26 32.5
Small town or rural 39 48.8

Household income
Less than CAD 35,000 12 15.19 1.783
Between CAD 35,000 and CAD 49,999 13 16.46
Between CAD 50,000 and CAD 74,999 15 18.99
Between CAD 75,000 and CAD 99,999 7 8.86
Between CAD 100,000 and CAD 149,999 15 18.99
CAD 150,000 + 17 21.52

Education
High school diploma or equivalent 12 15 1.319
Registered apprenticeship or other Trades certificate or diploma 2 2.5
College, CEGEP, or other non-university certificate or diploma 14 17.5
University degree, certificate, or diploma 31 38.8
Advanced university degree (graduate) 21 26.3

Household structure
1 person 21 26.3 2.342
2 people (no children) 28 35
3 people (no children) 5 6.3
3 people (including children) 10 12.5
4 people (no children) 4 5
4 people (including children) 6 7.5
5 or more people (with or without children) 6 7.5

Table 2 summarizes the buying behavior of the study participants. Most participants do all the grocery shopping for their households and have a regular diet with no preferences. The majority of the respondents (67.5%) prefer a supermarket as their business of choice for fresh produce and live less than 10 km away from their outlet choice. The majority of participants spend over CAD 35 per visit at an SFSC, such as a farmers’ market. The primary motivator for shopping at SFSCs was supporting the local economy, followed by produce freshness and quality.

Table 2. Buying behavior (n = 80).

| Shopper information                                      | Frequency | Percent |
|----------------------------------------------------------|-----------|---------|
| Yes, I do all of the grocery shopping                    | 29        | 36.71   |
| Yes, I do most of the grocery shopping                   | 21        | 26.58   |
| Yes, I do about half of the grocery shopping             | 21        | 26.58   |
| NO, I rarely grocery shop for my household               | 8         | 10.13   |

Diet preferences

| Consumer with no dietary preferences                     | 59        | 73.8    |
| Vegetarian (diet free of meat, fish, and fowl flesh)     | 4         | 5       |
Pescatarian (diet free of land animal flesh but eats eggs, fish, and milk products) 1 1.3
Raw foodist (diet consisting mainly of raw fruits, vegetables, legumes, sprouts, and nuts) 1 1.3
Flexitarian (vegetarian who occasionally eats meat and fish) 15 18.8

Frequency of purchases from SFSCs (past one year)
- Frequently 24 30
- Sometimes 25 31.3
- Rarely 26 32.5
- Never 5 6.3

Business of choice for fresh produce
- Farmers markets 8 10
- CSA 2 2.5
- On-farm 3 3.8
- Local business 13 16.3
- Supermarkets 54 67.5

Distance from the business of choice
- Less than 10 km 58 72.5
- 11–20 km 12 15
- 21–40 km 9 11.3
- 41–60 km 1 1.3

Purchases from SFSCs per month
- Less than once per month 32 40.5
- Once per month 23 29.11
- Multiple times per month 24 30.38
- Total 79 100

Spending per visit
- CAD 15 or less 17 21.3
- Between CAD 16 and CAD 25 22 27.5
- Between CAD 26 and CAD 35 16 20
- More than CAD 35 25 31.3

Main motivator for shopping at SFSCs
- Freshness of the food 16 20.25
- Higher quality of food 16 20.25
- Safer food 2 2.53
- Interpersonal connections to producers/farmers 6 7.59
- Supporting my local economy 28 35.44
- Supporting animal welfare 1 1.27
- Supporting the environment 2 2.53
- Other 8 10.13

4.2. Consumer Perceptions of SFSCs in Delivering Economic, Environmental, and Social Benefits

Figure 2 displays the questions about economic perceptions toward SFSCs compared to LFSCs (1 = strongly disagree, 2 = disagree, 3 = indifferent, 4 = agree, and 5 = strongly agree). The highest mean score (4.6) was found for the statement “SFSCs are more important in preserving the value of small farms” followed by “SFSCs are more important in supporting the profitability of small and medium farms”. The statement with the lowest mean is “SFSCs are more important in reducing economic uncertainties”, with the statement “SFSCs are more important in improving harmony with other sectors of the economy in the region” being only slightly higher. A higher score means alignment toward a strong agreement with the statement.
Figure 2. Consumer perceptions about the economic sustainability of SFSCs vis-à-vis LFSCs.

Figure 3 shows the mean values of environmental perceptions toward SFSCs compared to LFSCs. The highest mean was found for the statement “SFSCs are more important in reducing food miles” followed by “SFSCs are more important in reducing resource use (such as fossil fuel or packaging)”. The statements “SFSC are more important in reducing energy use” and “they are promoting less polluting production methods” have ranked the lowest with a mean value of 3.85.

Figure 3. Consumer perceptions about the environmental sustainability of SFSCs vis-à-vis LFSCs.

Figure 4 displays responses to questions about social perceptions toward SFSCs in comparison to LFSCs. The highest mean score was 4.56 for two statements; “SFSCs are more important in enhancing the recognition of local producers” and “in promoting the
connection between producers and consumers”. Statements with the lowest mean values were “SFSCs are more important in fostering social inclusion” and “SFSCs are more important in community education”.

**Figure 4.** Consumer perceptions about the social sustainability SFSCs vis-à-vis LFSCs.

Figure 5 displays general perceptions of SFSCs regarding product quality, health, and food safety. The highest mean was found regarding the statement “SFSCs are more important in increasing food product quality”. Conversely, the statement “SFSCs being more important in contributing to Canadian food safety” had the lowest mean value.

**Figure 5.** Consumer perceptions about the quality, health, and food safety aspects of SFSCs.
4.3. Changes in Consumer Perceptions during COVID-19 about the Sustainability of SFSCs

Survey participants were asked about their level of agreement with several statements regarding changes in perceptions about SFSCs following the COVID-19 pandemic. As reported in Figure 6, the highest mean (3.69) is found for the statement indicating that “the pandemic has increased the social perception of SFSCs”, followed by the statement “the pandemic has increased the local economy perception of SFSCs”. The lowest mean value (2.73) relates to the statement that “the pandemic has altered consuming habits to be healthier and that the pandemic has increased shopping frequency”.

Figure 6. Changes in consumer perceptions during COVID-19 about the sustainability of SFSCs.

The initial factor analysis resulted in a single factor for each category: environmental perception, social perception, economic perception, and post-COVID-19 perception (Table 3). The loadings for all four factors were above the minimum acceptable level of 0.5. The Kaiser–Meyer–Olkin (KMO) that tests the sampling adequacy was highly significant (Bartlett’s test of sphericity, <0.001). The internal consistency of the items was checked using Cronbach’s alpha, and all have a value above the acceptable level (0.70).

Table 3. Factor analysis results.

| Factors/Items | Loading | Cronbach’s Alpha | KMO |
|---------------|---------|------------------|-----|
| Economic factor |         |                  |     |
| SFSCs are more important in supporting the profitability of small and medium farms. | 0.777 | 0.843 | 0.772 |
| SFSCs are more important in increasing the recirculation of community income. | 0.693 |      |      |
| SFSCs are more important in generating local employment. | 0.766 |      |      |
| SFSCs are more important in reducing economic uncertainties | 0.753 |      |      |
| SFSCs are more important in improving the harmony with other sectors of the economy in the region | 0.822 |      |      |
| SFSCs are more important in preserving the value of small farms | 0.7 |      |      |
| Environmental factor | 0.906 | 0.838 |
|----------------------|-------|-------|
| SFSCs are more important in reducing resource use (such as fossil fuel or packaging). | 0.779 |
| SFSCs are more important in reducing food waste. | 0.751 |
| SFSCs are more important in promoting less polluting production methods (e.g., organic farming). | 0.88 |
| SFSCs are more important in reducing GHG emissions and carbon footprint. | 0.913 |
| SFSCs are more important in reducing energy use. | 0.884 |
| SFSCs are more important in reducing food miles | 0.764 |
| Factor related to post COVID-19 Perceptions | 0.901 | 0.824 |
| The COVID-19 pandemic has increased my frequency of shopping from short food supply chains | 0.845 |
| I am spending more money now at SFSCs compared to prior to the starting of the COVID-19 pandemic | 0.773 |
| The pandemic has altered my consuming habits as I now seek healthier foods from short food supply chains than prior to the starting of the COVID-19 pandemic | 0.821 |
| Compared to before COVID-19, the pandemic has increased my perception of short food supply chains in playing a substantial role in the local economy | 0.864 |
| Compared to before COVID-19, the pandemic has increased my perception of short food supply chains in preserving our environment | 0.81 |
| Compared to before COVID-19, the pandemic has increased my perception of short food supply chains in doing good for our society | 0.792 |

As seen in Table 4, the construct “environmental perception” was strongly associated with consumers’ motivation to support SFSCs ($p = 0.007$), frequency of purchase per month from SFSCs ($p = 0.017$), perceived food safety ($p = 0.013$), and healthy ($p < 0.001$). The social dimension of SFSCs was highly correlated with gender ($p = 0.012$), frequency of purchase per month from SFSCs ($p = 0.022$), food safety ($p < 0.001$), and the healthiness of foods purchased from SFSCs ($p < 0.001$). Likewise, perceptions about the economic sustainability of SFSCs are strongly associated with the frequency of purchases per month from SFSCs ($p = 0.003$), food safety ($p < 0.001$), and the healthiness of foods purchased from SFSCs ($p < 0.001$). The correlation analysis indicates that a post-COVID-19 change in perceptions was correlated with age ($p = 0.023$), motivation to support SFSCs ($p < 0.001$), the frequency of purchase per month from SFSCs ($p = 0.006$), food safety ($p = 0.006$), and the healthiness of foods purchased from SFSCs ($p = 0.004$).
Table 4. ANOVA test on consumer perceptions.

| Demographic factors             | Environmental Perceptions F-Value | Social Perceptions F-Value | Economic Perceptions F-Value | Post-COVID-19 Perceptions F-Value |
|---------------------------------|----------------------------------|---------------------------|-------------------------------|----------------------------------|
| F-Value | p-Value | F-Value | p-Value | F-Value | p-Value | F-Value | p-Value |
| Age | 0.503 | 0.682 | 1.470 | 0.222 | 1.409 | 0.247 | 3.356 | 0.023 |
| Gender | 0.777 | 0.381 | 6.594 | 0.012 | 2.534 | 0.116 | 0.476 | 0.492 |
| Income | 0.355 | 0.878 | 0.139 | 0.983 | 0.214 | 0.956 | 0.917 | 0.475 |
| Education | 0.245 | 0.912 | 1.181 | 0.326 | 0.707 | 0.589 | 0.827 | 0.513 |
| Residence | 0.611 | 0.546 | 0.116 | 0.890 | 0.079 | 0.924 | 2.544 | 0.085 |
| Household Structure | 0.872 | 0.520 | 1.485 | 0.196 | 0.402 | 0.876 | 1.474 | 0.199 |
| Diet preferences | 0.388 | 0.817 | 0.424 | 0.791 | 0.435 | 0.783 | 1.354 | 0.258 |
| Shopping behavior | | | | | | | | |
| Distance from SFSC | 0.717 | 0.545 | 0.326 | 0.807 | 0.565 | 0.640 | 0.863 | 0.464 |
| Retail outlet choice | 0.750 | 0.561 | 1.342 | 0.263 | 1.313 | 0.273 | 1.087 | 0.396 |
| Spending amount | 1.716 | 0.171 | 1.949 | 0.129 | 2.688 | 0.052 | 1.454 | 0.234 |
| Motivation to support SFSCs | 3.046 | 0.007 | 1.230 | 0.298 | 1.557 | 0.163 | 4.257 | <0.001 |
| Monthly frequency of purchase | 4.293 | 0.017 | 4.039 | 0.022 | 6.340 | 0.003 | 5.432 | 0.006 |
| Perceived benefits of SFSCs | | | | | | | | |
| Food safety | 5.496 | 0.013 | 6.463 | <0.001 | 14.084 | <0.001 | 3.952 | 0.006 |
| Healthy foods | 15.285 | <0.001 | 6.544 | <0.001 | 9.715 | <0.001 | 4.284 | 0.004 |

Tables 5–8 present the coefficients, $R^2$, and adjusted $R^2$ of the best-fitted regression model based on the forward stepwise regression procedure. The full model included 11 predictor variables related to sociodemographic factors (age, gender, education, income, dietary style, and neighborhood), shopping behavior related to SFSCs (shopping distance, frequency of transaction, and amount spent per visit), and perceived benefits of SFSCs compared to LFSCs (contribute to food safety and promote healthy diet).

Table 5. Factors influencing perceived environmental benefits of SFSCs.

| Variables | Coef. | Std. Err. | t | p > | t | VIF |
|-----------|-------|-----------|---|-----|---|-----|
| SFSCs promote healthy diet (1 = SD, 5 = SA) | 0.448 | 0.093 | 4.850 | 0.000 | 1.48 |
| SFSCs contribute to food safety (1 = SD, 5 = SA) | 0.248 | 0.081 | 3.060 | 0.003 | 1.45 |
| Shopping distance (1= 10 km or less, 5 = 61 km or more) | 0.226 | 0.121 | 1.870 | 0.066 | 1.08 |
| Spending per visit | 0.128 | 0.074 | 1.730 | 0.088 | 1.07 |
| Dietary lifestyle (1 = no specific dietary preference, 0= have specific dietary preference) | -0.319 | 0.193 | -1.660 | 0.102 | 1.04 |
| _cons | -3.027 | 0.399 | -7.590 | 0.000 | - |
| $R^2$ | 0.536 | | | | |
| Adj. $R^2$ | 0.503 | | | | |
| Prob > F | 0.000 | | | | |

* SD = strongly disagreed; SA = strongly agreed.
Table 6. Factors influencing perceived social benefits of SFSCs.

| Variables                                           | Coef.  | Std. Err. | t     | p > |t| | VIF |
|-----------------------------------------------------|--------|-----------|-------|-----|---|-----|
| SFSCs contribute to food safety (1 = SD, 5 = SA) a   | 0.208  | 0.098     | 2.120 | 0.038 | 1.52|
| SFSCs promote healthy diet (1 = SD, 5 = SA)          | 0.288  | 0.107     | 2.710 | 0.009 | 1.42|
| Gender (1 = male, 2 = female)                        | 0.452  | 0.218     | 2.080 | 0.042 | 1.09|
| Education (1= Some high school, 6 = Advanced degree) | −0.105 | 0.073     | −1.440| 0.155 | 1.01|
| _cons                                               | −2.138 | 0.614     | −3.480| 0.001 |     |
| R²                                                   | 0.344  |           |       |       |     |
| Adj. R²                                             | 0.307  |           |       |       |     |
| Prob > F                                            | 0.000  |           |       |       |     |

* SD= strongly disagreed; SA = strongly agreed.

Table 7. Factors influencing perceived economic benefits of SFSCs.

| Variables                                           | Coef.  | Std. Err. | t     | p > |t| | VIF |
|-----------------------------------------------------|--------|-----------|-------|-----|---|-----|
| SFSCs contribute to food safety (1 = SD, 5 = SA) a   | 0.406  | 0.079     | 5.120 | 0.000 | 1.6 |
| Purchase frequency (1= < once per month, 3 = multiple times per month) | 0.273  | 0.105     | 2.610 | 0.011 | 1.43|
| SFSCs promote healthy diet (1 = SD, 5 = SA)          | 0.173  | 0.095     | 1.830 | 0.071 | 1.19|
| Dietary lifestyle (1= No preferences, 0= have specific preferences) | −0.382 | 0.186     | −2.050| 0.044 | 1.1 |
| Spending per visit (1 = CAD 15 or less, 4 = > CAD 35) | 0.140  | 0.074     | 1.910 | 0.060 | 1.04|
| _cons                                               | −2.742 | 0.364     | −7.520| 0.000 |     |
| R²                                                   | 0.546  |           |       |       |     |
| Adj. R²                                             | 0.513  |           |       |       |     |
| Prob > F                                            | 0.000  |           |       |       |     |

* SD = strongly disagreed; SA = strongly agreed.

Table 8. Factors influencing perceptual changes in the sustainability of SFSCs post-COVID-19.

| Variables                                           | Coef.  | Std. Err. | t     | p > |t| | VIF |
|-----------------------------------------------------|--------|-----------|-------|-----|---|-----|
| SFSCs promote healthy diet (1 = SD, 5 = SA) a        | 0.208  | 0.114     | 1.830 | 0.072 | 1.64|
| Age (1= 18–25 y, 4= 65+ y)                          | −0.264 | 0.106     | −2.480| 0.016 | 1.45|
| Purchase frequency (1= < once per month, 3 = multiple times per month) | 0.217  | 0.126     | 1.710 | 0.091 | 1.22|
| SFSCs contribute to food safety (1 = SD, 5 = SA)      | 0.228  | 0.095     | 2.390 | 0.019 | 1.1 |
| Spending per visit (1 = CAD 15 or less, 4 = > CAD 35) | 0.159  | 0.088     | 1.820 | 0.074 | 1.06|
| Neighbourhood (1 = Urban core, 3 = small town/rural) | 0.228  | 0.130     | 1.760 | 0.084 | 1.06|
| _cons                                               | −2.347 | 0.551     | −4.260| 0.000 |     |
| R²                                                   | 0.384  |           |       |       |     |
| Adj. R²                                             | 0.330  |           |       |       |     |
| Prob > F                                            | 0.000  |           |       |       |     |

* SD = strongly disagreed; SA = strongly agreed.

As shown in Table 5, the stepwise procedure resulted in a model with five predictor variables, which explain about 54% of the variation in the dependent variable (i.e., perceived environmental benefits of SFSCs). The VIF also indicated that collinearity is not a problem. The predictor variables “SFSCs promote healthy diet” and “SFSCs contribute to Canadian food safety” strongly correlate with the perceived environmental benefits of SFSCs compared to LFSCs. In addition, shopping distance and amount of spending showed a positive relationship with the perceived environmental benefits of SFSCs. None of the demographic variables were significant in predicting the perceived environmental benefits of SFSCs.
Table 6 presents the second model related to the social benefits of SFSCs. The four predictor variables were identified and explained 34% of the variance in the dependent variable. Collinearity is not a concern with all VIF values 1.52 or less. Again, two predictor variables, “SFSCs promote healthy diet” and “SFSCs contribute to food safety,” showed a strong relationship with the perceived social benefits of SFSCs compared to LFSCs. Also, such perceptions differ by gender, with female participants perceiving SFSCs as having more social benefits than LFSCs.

The next model relates to the economic benefits of SFSCs. As shown in Table 7, five predictor variables are identified based on the stepwise procedure. The variables explain about 55% of the variation in the dependent variable, and the VIF analysis indicates that collinearity is not a problem. In this model, food safety and variables related to shopping behavior showed a positive association with the economic benefits of SFSCs compared to LFSCs. Also, dietary lifestyle was strongly correlated with economic benefits, with those with no specific dietary preferences having a negative perception of the economic benefits of SFSCs vis-à-vis LFSCs (Table 7).

The final model (Table 8) focuses on factors influencing changes in the importance of SFSCs during COVID-19 in enhancing economic, social, and environmental sustainability compared to LFSCs. The stepwise procedure identified six predictor variables, explaining 38% of the variation in the dependent variable (changes in perception during COVID-19). Food safety and age had shown a strong correlation with changes in perception post-COVID-19. The study participants perceive that SFSCs provide more benefits to food safety than LFSCs. However, there was a difference in perception by age group, with older respondents having a negative perception of such changes compared to their younger counterparts.

5. Discussion

This section discusses the main findings and compares them with the results in other studies. Generally, there is a strong trend toward local foods among consumers in Atlantic Canada. The factors that drive such a trend are discussed below.

5.1. Perceived Economic, Environmental, and Social Sustainability of SFSCs

This study demonstrates (and partially supports H1) that support for the local community and economy is the key motivator to buy from local businesses for more than 35% of the study participants. Tourism can be a case in point in the study context where SFSCs can play a role [61]. This could be the case in Nova Scotia, where the wine industry, for example, attracts 112,000 visitors annually and generates CAD 43 million in tourist revenue [62]. Freshness and higher product quality were ranked as other motivators for spending money on local foods, consistent with other studies [53,63]. Furthermore, although consumers in this study perceive SFSCs as economically sustainable, such perceptions appeared to be associated with the significance of SFSCs in preserving the value of small farms rather than being the source of a price premium. This is in contrast to a study of fishmongers and farms in the UK and Norway [64], where SFSCs offered higher price premiums than LFSCs. The same study also showed farmers’ markets and pick-your-own operations offering the highest price premiums compared with prices received from the regular retail chain; nevertheless, such a premium price made no significant economic impact due to smaller sales. The role of SFSCs in generating local employment ranked third in the present study, somewhat in contrast to other studies [58]. This may suggest the importance of context in analyzing the value of SFSCs.

Among all the indicators measuring environmental sustainability, the statement about SFSCs reducing food miles had the highest mean score, whereas the statement about reducing emissions and carbon footprint had the third lowest mean, again partially supporting H1. These findings are consistent with other studies, including in Italy, where SFSCs were not perceived to have a better carbon footprint than LFSCs [53,64]. In the present study, participants considered SFSCs to reduce food miles. Interestingly, while
there is no clear answer about whether SFSCs are more environmentally sustainable in practice [53,64,65], all six indicators measuring the environmental sustainability of SFSCs had a mean value of 3.85 or more, meaning that consumers in the Atlantic region value SFSCs for preserving the environment. In contrast, a similar study in Italy did not find SFSCs more environmentally friendly [53]. Also, consumers in Atlantic Canada perceive that SFSCs play an important role in reducing food waste and energy use. This is consistent with the findings from France [52].

The consumer perceptions of social sustainability had the highest mean, indicating that the social pillar is the most substantial benefit consumers in Atlantic Canada consider about SFSCs. Two statements with the highest mean were “SFSCs are more important in enhancing the recognition of local producers” and “SFSCs are more important in promoting the connection between producers and consumers”. Consumers also perceive SFSCs as enhancing trust and promoting connections between producers and consumers. Nevertheless, the statement “SFSCs are more important in fostering social inclusion” scored the lowest with a mean of 3.81.

5.2. How Has COVID-19 Influenced Consumer Perceptions about the Sustainability of SFSCs?

Previous studies show how pandemics and epidemics, such as BSE and Bird flu, affect consumer perceptions. Those findings suggest that the impacts of BSE and Bird flu on consumer shopping behavior were relatively short-lived [36–38]. Although it is too early to understand the long-term implications of the COVID-19 pandemic, in the present study, all statements measuring post-pandemic impacts had a mean value below 3.7. The lowest mean values pertain to buying behavior, where most consumers in the survey indicated that they did not plan to spend more money on SFSCs nor increase the frequency of shopping from SFSCs. These findings differ from a study in Romania, where 60% of the research participants indicated they would continue to shop from SFSCs even after the pandemic [42]. Also, the study participants indicated that the pandemic did not significantly alter their consumption habits. A possible reason may be the low COVID-19 cases in Atlantic Canada compared to other provinces in Canada and elsewhere.

When comparing perceptions of pre-and post-COVID-19, the results show no clear evidence; the statements measuring changes in perceptions had mean values below 4.0 (on a scale of five), somewhere between neutral and agreed, and thus partially supporting H2. It is, however, apparent that the pandemic has not led to increased spending and frequency of shopping and altered healthier eating habits. This may be because consumers may doubt the SFSCs’ ability to meet demands. Therefore, the pandemic may have pushed the movement and increased consumer perceptions toward local foods; however, this does not significantly alter the buying habits and shopping patterns related to SFSCs. In the study context, among the three sustainability dimensions, the social dimension drives the trend toward SFSCs.

5.3. Factors Predicting the Value of SFSCs toward Sustainability

Three categories of factors were employed to analyze consumer perceptions toward SFSCs: sociodemographic factors (age, gender, education, income, dietary style, and neighborhood), shopping behavior (shopping distance, frequency of transaction, and amount spent per transaction), and perceived benefits of SFSCs compared to LFSCs (access to fresher and tastier foods, and safe and healthy diet). Consistent with consumer theory [66], the perception that local foods are fresher and tastier (quality), healthy and safer, and care for the environment predicted consumer perceptions of SFSCs in Atlantic Canada.

Both the ANOVA (Table 4) and the regression analysis (Table 5) show that food safety and the desire for a healthy diet had a strong influence on consumer perceptions of SFSCs in enhancing environmental sustainability. Shopping behavior (i.e., shopping distance and amount of spending per visit) significantly affects consumer perceptions about the contribution of SFSCs to the environment. Accordingly, those consumers who
spent more per visit and traveled a longer distance to purchase positively perceived the role of SFSCs in enhancing environmental sustainability. However, the contribution of SFSCs toward environmental sustainability remains inconclusive in the literature. For example, Malak-Rawlikowska et al. [64] suggested SFSCs have a greater carbon footprint than longer chains but noted the difference as being not severely large. A justification why SFSCs may still have a higher carbon footprint may be associated with consumers driving in small cars making emissions per unit higher. Jarzebowskiet al. [58] assessed the environmental sustainability of SFSCs and reported that SFSCs have lower GHG emissions and food miles; however, this study did not look at emissions per unit of customer travel. Another study expanded from food miles and emissions and analyzed food waste, pollution, resource waste, and biodiversity and found no apparent difference between SFSCs and LFSCs [67]. In the present study, none of the sociodemographic variables had a significant predictive power regarding the value of SFSCs toward environmental sustainability.

Similarly, the ANOVA (Table 4) and the regression analysis (Table 6) revealed that food safety and the desire for a healthy diet significantly affected consumer perceptions about the contribution of SFSCs. However, our findings did not identify shopping behavior as a top motivator to purchase food from SFSCs. Furthermore, among the sociodemographic variables, only gender (female) positively correlated with consumer perceptions about the social sustainability of SFSCs.

The economic sustainability dimension appeared to be driven by factors such as food safety, frequency of purchase from SFSCs, dietary style, spending amount, and the need for a healthy diet. The analysis revealed that the frequency of monthly purchases from SFSCs was correlated with the economic sustainability of SFSCs. Interestingly, none of the demographic factors (except dietary lifestyle), such as age, gender, education, and income (Table 4), had any significant correlation with the economic sustainability of SFSCs. In fact, income and neighborhood status had the weakest correlation with the perceived economic benefits of SFSCs. On the other hand, spending per visit, consumer perceptions about food safety, healthy diet, and dietary lifestyle have significant relationships with the economic sustainability of SFSCs.

Finally, the study analyzed the factors contributing to (any) changes in perceptions about the sustainability of SFSCs following the COVID-19 pandemic. This is, in fact, an active area of research that has attracted a lot of attention. Unsurprisingly, food safety had the most substantial effect on changes in perceptions toward SFSCs post-COVID-19. Also, factors related to shopping behavior (spending per visit and purchase frequency) and food safety were found to be important indicators of the change in perceptions, partially supporting H3. In addition, post-COVID-19 perceptions of SFSCs differed by age, with older people showing a less favorable perception about the sustainability of SFSCs post-COVID-19. Nevertheless, most other sociodemographic factors, such as gender, income, education, and neighborhood, did not affect post-COVID-19 perceptions of SFSCs.

6. Conclusions

In today’s world, sustainability is becoming more important in various areas of life, including the food industry. The recent global pandemic has shown some weaknesses in the global food system, with SFSCs and LFSCs being impacted differently. While many studies have focused on the industry perspective of SFSC sustainability, there has been no coherent study looking at consumer perspectives on the sustainability of SFSCs, especially following the COVID-19 pandemic. Using primary data from Atlantic Canada, this study explored how consumers perceived SFSCs in delivering social, economic, and environmental benefits and whether these perceptions have been enhanced (or not) due to COVID-19.

Findings revealed that consumers perceive the social benefits delivered by SFSCs as being more substantial than economic and environmental factors. The study also revealed that consumers’ value toward SFSCs is primarily motivated by supporting the local
economy, freshness, product quality, and food safety. Most importantly, such perceptions do not vary by sociodemographic factors except gender (regarding the social dimension) and age (related to post-COVID-19 perceptions). Finally, the study analyzed the impact of the COVID-19 pandemic on consumer perceptions toward SFSCs. Overall, indicators measuring post-COVID-19 perceptions leveled up toward being indifferent, and changes in post-COVID-19 perceptions are primarily influenced by food safety.

The study provides important implications for actors involved in SFSCs, especially producers. First, the findings show that freshness, product quality, and food safety are the main attributes consumers appreciate for buying local produce. Also, consumers recognize that SFSCs offer the opportunity to connect producers and consumers, reduce food miles, and preserve small farms. Therefore, producers and other actors involved in SFSCs need to build and design their production and marketing strategies based on these consumer-recognized benefits. Second, consumers do not consider that SFSCs would contribute to reducing economic uncertainties and thus are unlikely to increase spending or shopping visits beyond the current level. Therefore, producers need to explore market conditions when considering expanding their investment in SFSCs. One way to expand their market option is to work with LFSCs. The study also provides valuable insights into the attractiveness of SFSCs and the effect of unexpected events on consumer perceptions of economic, social, and environmental sustainability.

Finally, we acknowledge that the study population was predominantly women. Indeed, this may be because most SFSCs are more likely to have female customers than men. Nonetheless, future studies may design a more controlled study balancing male and female participants. Also, people were asked to compare their attitudes toward SFSCs before and after the pandemic. Therefore, the current situations might impact their perceptions before COVID-19. Finally, while the findings provide new and valuable insights, the sample is small and not statistically representative of the three Maritime provinces as most of the study participants are from Nova Scotia.

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