

Exploring Chefs' Behaviours and Attitudes Influence Public Awareness of Sustainable Food
Practices

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Abstract

The dominant food system is having a major impact on our planet causing extreme environmental change from greenhouse gas emissions to deforestation along with inadequate and unhealthy diets for much of the world's population. Chefs are important actors in food systems, who have the capacity to influence consumer awareness and food choices, and thus have a role to play in helping to shift towards a more sustainable food system. However, existing research on this topic is limited. Drawing upon environment studies literature and primary research, including interviews with chefs working in restaurants and culinary teaching institutions in the Kingston, Ontario area. This study explores how chefs' behaviours and attitudes can influence sustainable food practices. This study expands on initial research on this topic by providing a community-based research project focused on Eastern Ontario. My findings demonstrate that chefs have knowledge and skills to make decisions that can impact consumers choices and practices. Chefs emotional and symbolic relationships towards food drives their sustainability motives, as this creates community and meaning behind what they do. Thus, when chefs have access to resources on sustainability (environmental, social, economic impacts of food) and sustainable food practices and techniques, they can be motivated and inspired to contribute to food system change. However, current policies shaping who produces food, how food is produced, and how food waste is managed limit chefs' abilities to change processes and practices within the food system.

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Introduction

More specifically, the production of food is currently having a huge impact on our planet causing extreme environmental change from greenhouse gas emissions to deforestation. There are many aspects contributing to the state of the current food system. There is limited access to highly nutritious, quality food due to the current food production techniques such as the use of pesticides that pollute our food with chemicals and toxins. This along with political economic features of the global food system has ultimately led to an over consumption of packaged and fast foods in Canada and other our societies (FAO, 2019; Hawkes, 2006). Rapid urbanization encourages these types of eating habits and leads to a more sedentary way of living (FAO, 2019). These eating habits have become new societal norms due to the way food is being produced and sold. It is important that we understand our food system and how it works in order to make a change for our planet as well as for our own health. Chefs have an important role to play in enacting change and influencing consumers' awareness of the foods we eat and the importance of understanding our current food system.

The impact chefs have in promoting sustainable food practices is only starting to be explored. Thus, research is very limited and underdeveloped, especially in Canada. In this thesis research, I will explore the ways that chefs can contribute to more sustainable food practices and behaviours. I will analyze chefs' attitudes and behaviors toward integrating sustainability into their restaurants and teaching in culinary schools, and how this may influence broader food choices and behaviours. This will be done through analyzing data collected from interviews conducted with chefs working in local food and service industry in Kingston, Ontario as well as chefs from culinary teaching institutions in the broader region. I aim to answer the question "How do chefs' behaviours and attitudes influence the public' awareness of sustainable food

practices?” The hope is that this research can help to bring greater awareness and understanding of the role chefs play in the food system.

Literature Review

Overview of the food system.

A recent report from the FAO (2019) indicates that diet-related diseases are a major contributor to poor health in both high and low-income countries around the world (FAO, 2023). This report states that the increase in urbanization has driven major changes to the agrifood system. There is now an abundant availability of inexpensive, convenient, pre-prepared and fast foods which are energy dense and high in fats, sugars, and salts (FAO 2023). It has become increasingly difficult to afford healthy alternatives such as fruits and vegetables, that are crucial for a healthy diet. In fact, according to the FAO report *The State of Food Security and Nutrition in the world 2023*, “almost 3.2 billion people worldwide would not afford a healthy diet in 2020. The cost of a healthy diet increased globally by 6.7 percent between 2019 and 2021, with a notable single year increase of 4.3 percent in 2021”. Thus, individuals are increasingly resorting to energy dense foods that are pre-prepared and highly processed, which are contributing to diet related diseases (FAO 2023). For example, many individuals in high- and low-income countries are suffering from malnutrition and obesity due to the unaffordability of healthy foods that are required for our body to function properly. Individuals are forced to consume pre-prepared processed foods that have very little nutrients in them, thus impacting the state of their health. FAO (2023) defines a healthy diet as

a variety of nutritious and safe foods that provide dietary energy and nutrients in the amounts needed for a healthy and active life. A healthy diet is based on a wide range of unprocessed or minimally processed foods, balanced across food groups, while it restricts the consumption of highly processed foods and drink products; it includes whole grains, legumes, nuts, an abundance and variety of fruits and vegetables, and can include moderate amounts of eggs, dairy, poultry and fish, and small amounts of red meat.

This is not a new issue; in the late 1960's, governments around the world attempted to resolve hunger with the green revolution which resulted in producing higher yields of food with an increasing use of chemicals (Holt-Giménez, 2019). Holtz- Giménez (2019) & Barber (2014) argue that the green revolution led to overproduction of agricultural products, increasingly reducing the amount of nutrients that go into our food. As a result, the food being consumed is low in nutrients and often highly processed, and as a result millions of people are suffering from diet-related diseases including malnutrition, overweight, and obesity (Holt-Giménez, 2019; Willett et al., 2019; Barber 2014). This highlights the importance of integrating local and sustainable food production practices into our food system.

It is vital that healthy food items are more affordable and available to high- and low-income households to decrease the amount of highly processed and pre-prepared foods are being consumed. This would also influence the number of individuals being impacted by diet-related diseases and increase overall health. This report suggests that addressing this issue requires “strengthening food environments and changing consumer behaviour to promote dietary patterns with positive impacts on human health and the environment” (FAO et al., 2023). While systemic changes to promote equitable food access are needed, individual throughout the value chain also have a role to play in promoting healthier dietary patterns to improve consumer behaviours and human health.

The Global Panel on Agriculture and Food Systems for Nutrition (2016) define a healthy diet as “a diversity of foods that are safe and provide levels of energy appropriate to age, sex, disease status and physical activity as well as essential micronutrients.” For healthy diets to be sustainable foods need to be produced and prepared in ways that does not compromise the natural environment and uses limited amounts of greenhouse gases (Béné t al., 2019). Integration

of sustainable practices are required to limit the impact the food system has the environment and its natural resources. According to the FAO (2018) report on Sustainable Food Systems, a food system is defined as:

The entire range of actors and their interlinked value-adding activities involved in the production, aggregation, processing, distribution, consumption, and disposal of food products that originate from agriculture, forestry or fisheries, and parts of the broader economic, societal, and natural environments in which they are embedded (FAO 2018).

A sustainable food system is a food system that provides food security and nutrition while considering economic, social, and environment factors to ensure future generations are not compromised. In this sense the food system needs to remain profitable and provide value for all stakeholders which includes but are not limited too; “wages for workers, taxes for governments, profits for enterprises, and food supply improvements for consumers” (FAO 2018). It needs to benefit the society and promote socio-cultural improvements which could include “nutrition and health, traditions, labor conditions, and animal welfare” (FAO 2018). Lastly it should have a positive impact on the environment including its natural resources which include but are not limited to “biodiversity, water, soil, animal and planet health, carbon footprint, water footprint, food loss and waste, and toxicity” (FAO 2018).

The United Nations released a 2030 agenda for Sustainable Development in 2016 that further builds on the 17 Sustainable Development Goals which holds governments responsible for their sustainable goals which includes hunger and food security (Duncan et al., 2021). To move towards a more sustainable food system, it requires combine productivity and quality, which leads to an emphasis on food security and nutrition, thus influencing human health (Duncan et al., 2021).

Sustainable food system practices

Many food system actors are already making changes in their daily practices to shift to more sustainable practices including farmers, consumers, and policy makers. For example, farmers have begun transitioning from monocropping to agro-ecological farming practices which consists of growing a diverse variety of crops (Béné et al., 2019). This type of farming improves biodiversity and soil fertility, decreases agro-chemical inputs, and can increase efficiencies and yields (Burlingame 2019). Some farmers have begun using regenerative farming methods as well including seed saving and seed collecting in an effort to rebuild indigenous farming methods (Duncan et al., 2021). There are many different sustainable farming techniques that modern farmers are transitioning to; these include but are not limited to agroecology, permaculture, climate smart agriculture, ecological intensification, and sustainable intensification (Duncan et al., 2021). Policies have also begun to be implemented into agriculture to ensure sustainable practices are being utilized. For example, the Common Agricultural Policy (CAP) is a reform that gives farmers money to diversify their crops and maintain permanent grassland (Burlingame 2019). As of 2018 Europe had approximately 306,500 organic operators and organic sales accounted for €30.7 billion (Burlingame 2019).

Consumers can choose to change their diets to ones with lower environmental impacts. There has been a recent increase in consumers turning to more sustainable foods by transitioning away from meat-based diets to plant-based diets which are most often composed of fresh foods important for nutrition (Burlingame 2019). Sustainable diets consist of food that protect and respect biodiversity and ecosystems, that are culturally acceptable, economically affordable, and nutritionally adequate (Baldwin 2015).

Chefs have the power to influence sustainable food practices as chefs are key actors creating and promoting food products to the public. I now review some common sustainable food

practices that chefs have begun to utilize in their businesses include sourcing local food and organic food, more sustainable energy use, minimizing food waste and disposables, developing sustainability focused menus, and engaging in community outreach (Huang et al., 2023).

Sustainable food system practices used by chefs and restaurants.

Chefs can decide where they source their food from, the types of food products they buy, and techniques used to cook food. These decisions have a huge impact on the environment and control the demand for certain products. For example, production of local foods has a huge impact on our environment as foods out of season are either being transported far distances or using large amounts of energy to produce these crops in large greenhouses (Higgins-Desbiolles & Wijesinghe, 2018; Pereira et al., 2019; Fusté-Forné, & Noguer-Juncà, 2023; Lazzarini et al., 2017). Local food has a significantly shorter travel time reducing the carbon footprint of the food products production, transportation, and distribution (Huang et al., 2023). The agricultural sector is one of the main drivers of climate change (Willett et al., 2019; Barber 2014). Willett et al. argues that the agriculture industry is responsible for up to 30% of the greenhouse gas (GHG) emissions globally.

Organic food are food products produced with no chemicals and have not been genetically modified which reduces the amount of pesticides entering the environment and in turn increases the soil nutrients and protects biodiversity (Huang et al., 2023). Local and organic food is not only better for our environment, but is also has better health outputs, retaining nutrients in food, decreasing the risk of health issues mentioned above. Montgomery & Biklé (2021) argue that the use of chemicals in conventional agriculture consist of high levels of pesticides and lower levels of nutrients that leads to diet related diseases. Restaurants sourcing their products from farms using these techniques are producing foods with low nutritional value

due to the farming techniques that deplete the food ingredients of their nutrients (Pereira et al., 2019; Montgomery & Biklé 2021). Comparatively, sustainable agriculture practices that use organic fertilizers such as compost that enhance the nutrient levels in the crops, thus making them healthier for human consumption.

When chefs decide to source their food locally, not only are they supporting their local economy, but they are also utilizing healthy and nutritious food that has a low environmental footprint (Barber 2014). This emphasizes the importance of farm to fork cooking, sourcing food ingredients locally from organic and sustainable farms and further connecting consumers to the farms where the food came from. For instance, more and more restaurants are beginning to advertise the farms that their ingredients come from either on their website or right on their menu. This is beneficial for the chef as well as for the farm. The chef is getting good quality ingredients that taste good and have health benefits, while the farms are getting a consistent outlet to sell their food (Pesci & Brinkley 2022). In addition to this consumer will see the farms being mentioned and it encourage them to look them up and, in some cases, they may inquire about buying their food from them (Pesci & Brinkley 2022). This shows how chefs could help to promote sustainable food practices and influence consumer behaviours.

In terms of energy use, restaurants are one of the most energy-intensive commercial buildings between the back of house and front of house operations (Huang et al., 2023). It is important for the businesses environmental and economic sustainability to have energy managing equipment such as efficient lighting, HVAC, and kitchen appliances and equipment (Huang et al., 2023). Chefs can contribute to such sustainability efforts.

Disposables are commonly seen in the restaurant industry with takeout containers and supplier's packaging. To decrease restaurant's dependency on disposables it's crucial the

businesses transition to compostable containers for takeaway and delivery orders (Huang et al., 2023). In addition to takeout disposables, it is important businesses work with their suppliers to decrease the amount of packaging required for delivery of products, for examples reusing delivery boxes (Huang et al., 2023).

Food waste has a huge environmental impact, and the restaurant industry crates vast amount of food waste every year. The UNEP (2021) stated that 244 million tonnes of food get wasted in the global foodservice industry annually; this type of food waste occurs during post-harvest, processing, production, procurement and storage and consumption. It is crucial restaurants precisely predict guests turnout and preferences and communicate with local suppliers and stipulate their perishable foods to control and manage their food waste (Huang et al., 2023). In addition to managing their purchasing practices it is also important restaurants utilize sustainable cooking practices which include cooking with the whole product known as “nose-to-tail” cooking to reduce the amount of food going to waste (Huang et al., 2023).

Other sustainability practices include restaurants changing their menus to feature more sustainable menu items to increase their social and environmental sustainability. Providing sustainable menu items including vegetarian/vegan menu items and food products that have sustainable labels may reduce their carbon and environmental footprint and influence customers eating habits and awareness of these foods (Huang et al., 2023). In addition to offering a sustainable menu engaging in community outreach increases restaurants social sustainability. It is valuable for restaurants to engage with their community to support, enhance and protect their local culinary culture. This involves restaurants participation in educational and charity projects which shows their commitment to sustainability and teaches the public about their values as a business (Huang et al., 2023).

Consumer trends and plant versus meat-based diets

In recent years there has been a significant jump in consumer purchasing food away from home rather than cooking home cooked meals. Studies indicate that up to 50% of food expenditures are being spent on takeout food and food away from home (Bertoldo et al., 2021; Richardson & Fernqvist, 2022). In this context, chefs may have an especially important role to play in helping to change consumer behaviours by offering and promoting sustainable food choices and practices through healthier menu options that utilize sustainable products (Fusté-Forné & Noguera-Juncà, 2023; Garcia et al., 2023; Moreau & Speight, 2019; Richardson & Fernqvist, 2022; Zanella, 2020). Many studies and reports argue that the high consumption of meat products is having devastating impacts on the environment through the use of greenhouse gases and large amounts of land needed for livestock production (Batat, 2020; Chi et al., 2019; Pereira et al., 2019). In fact, the production of livestock accounts for 80% of the greenhouse gas emissions emitted from the agricultural sector (Sahin & Demir 2023). Knowing this, the authors propose that chefs should implement more plant-based meals into their menus, with the goal of influencing consumers consumption patterns (Batat, 2020; Chi et al., 2019; Pereira et al., 2019).

While this is all true chefs need to consider the social aspects of removing meat from people's diets. Meat based diets are very important to many cultures, where communities have been eating meat sustainably for many years (Gbejewoh et al., 2022). It is important to keep this mind when suggesting the change in diets and ensure socio-cultural aspects of meat-based diets are not being disregarded. Meat-based diets can be sustainable if they are being sourced locally and ethically which has been seen in various locations. For example, Inuit of Inuit Nunangut sustain themselves off a fish and meat-based diet and have been proven to be very healthy with very low incidences of health diseases (Ropars & Kenny 2023). This diet is not only sustainable

and healthy it is also extremely important to their culture as it boosts mental and emotional well being and encourages community and strengthens cultural heritage (Ropars & Kenny 2023).

Another example of this can be seen in Buchons in Lyon, France. Buchons are types of restaurants that are the opposite of fine dining, which offer home cooked meals that offer meat-based meals. These restaurants use the French cooking style known as nose to tail which utilizes every part of the animal that can be cooked, minimizing the amount of food going to waste (Les Bouchons Lyonnais; Gordon 2023). In addition to this most Buchons source all their ingredients from local farms, ensuring that everything they serve travelling a very small distance and is of good quality since they know where it is coming from (Les Bouchons Lyonnais; Gordon 2023).

When chefs recommend a switch to plant-based foods and creating dishes they need to keep in mind the types of meat alternatives they are using. Some plant-based products have become increasingly popular among consumer but are worse for our health, and many include ingredients that still need to undergo long-term research to understand the health impacts they have on the human body (Gbejewoh et al., 2022). In recent years the vegan movement has become very popular in our society creating a discourse that has demonized the consumption of any meat products (Niederle & Schubert 2020). It important to note that there are sustainable ways to consume meat such as consuming meat from organic and grass-fed farms. Conversely, some of the meat alternatives are being produced as ultra processed foods that are convenient but have adverse impacts on individuals' health (Fardet & Rock 2020; Macdiarmid 2022). These products also tend to require unsustainable production techniques that could be contributing to greenhouse gas emissions; for example, many of these products utilize palm, oil, sugar, and maize syrup which are grown in monocultures. Monocultures have huge impacts on the environment,

as they contribute to biodiversity loss and utilize fertilizer and pesticide deteriorating the land and soil (Fardet & Rock 2020; Macdiarmid 2022; Niederle & Schubert 2020).

Animal based products are rich in amino acids and micronutrients that are vital for growth and cognitive development in children as well as they provide important macro and micronutrients required for vulnerable groups (Pingali et al., 2023). Many plant-based foods are considered to be incomplete proteins due to the distribution of amino acids, thus many people need a certain number of animal-based products to ensure they stay healthy and get the required nutrients in their body (Pingali et al., 2023). In addition to the protein content in plant-based products they also include innutritious ingredients that are high in saturated fats, carbohydrates and sodium which have adverse health effects (Fardet & Rock 2020; Pingali et al., 2023). Despite this, plant-based meat alternatives do have some benefits as they are low in cholesterol which can help reduce some health diseases (Pingali et al., 2023; Gbesjewoh et al., 2022), and they have lower environmental footprints than some livestock production, thus Plant-based products are not all bad, but should be consumed in moderation.

When creating dishes and developing menus chefs should be conscious of the ingredients they are using and how they are engaging with and influencing consumer food trends. Plant-based diets do not need to include ultra-processed meat alternatives. There are various other ingredients that are minimally processed that can be utilized such as, fruit, vegetables, nuts and wholegrains (Macdiarmid 2022). These types of plant-based diets are much better for individuals' health and can help to mitigate the risk of health diseases. However, these ingredients have lower energy intakes, so centering diets around a mix of plant-based meals and meat-based meals could be beneficial and could help to reduce the current environmental impact the agricultural sector is having on our planet. This is something that chefs should consider when

developing their menus as their decisions have the potential to influence their consumers food habits and behaviours.

Government and industry policies and regulations are a barrier to chefs' ability to transition to sustainable food practices, whether it be in culinary institutions or local restaurants. How food is produced, distributed, and sold affects the food products chef purchase and use in their establishments. One of the biggest challenges for chefs is where to source their food, they can only choose from what is on the market. Large corporations have control over most of the food system influencing all aspects of production (quantity, quality, farmer's wage), and farmers often end up having little choice but to enter contracts with these firms (Lencucha et al., 2020). The farmers are attracted to these contracts because it allows them access to inputs (e.g. pesticides), loans and the market which has led to an increase in farmers using environmentally harmful farming practices such as monocropping and concentrated feeding operations. This can contribute to an increase in yield, but at the expense of the nutritional value of the food and environmental sustainability (Lencucha et al., 2020; Fanzo & Davis, 2021). Large companies have also taken over the role that governments used to play in providing extension services to farmers. Corporations (and in particular input suppliers) provide farmers with opportunities to improve their productivity and develop new skills and techniques, thus further controlling the farming techniques they use and the commodities they grow (Lencucha et al., 2020). At the same time, public subsidies only cover specific crops which usually include cash crops such as corn, soy, and maize. This means if farmers grow other crops (e.g. crops with nutritional value such as fruits and vegetables) they will not receive financial support and crop insurance (Fanzo & Davis, 2021). These types of crops being produced have been shown to be one of the main causes for diet related disease and health conditions such as increased cardiometabolic risk and obesity

(Fanzo & Davis, 2021). Although the commodities the farmers are producing are generating negative impacts on the environment and human health, many farmers continue to work these jobs due to the absence of alternatives (Lencucha et al., 2020).

Globalization and trade liberalization has also shaped food and agriculture policies. Globalization has expanded consumers access to fresh foods all year round in wealthy markets across the globe (Fanzo & Davis, 2021). Trade liberalization has allowed for food to be more accessible and at a low price, although fresh fruits and vegetables continue to cost more than processed foods on average (Fanzo & Davis, 2021). Subsidy policies impact food prices, as farmers produce energy-dense crops that are used to produce highly processed foods (Fanzo & Davis, 2021). Trade liberalization promotes the specialization of crops which causes countries that are producing these crops to be vulnerable to global trade patterns which include price shocks, political polarizations, and change in trade priorities (Fanzo & Davis, 2021).

In terms of restaurants and food that has already been prepared, there are government policies and health standards that make it difficult for chefs to divert and donate food that does not go to use. In the past Food safety standards have prevented the redistribution of unsold and surplus food and state that food products that are mislabelled or damaged should be discarded (Filimonau & De Coteau, 2019; Thyberg & Tonjes, 2016). These standards mandate the disposal of food, encouraging the disposal of food rather than providing prevention strategies. In the past, policies left chefs liable for any illnesses that could occur and does not provide any tax reliefs for donation (Filimonau & De Coteau, 2019). Chefs working in the food industry did not have the necessary means to redistribute surplus and unsold food. Although, in recent years, there has been recent progress towards policies that allow redistribution agencies to accept donations of misbranded non-standard food that is suitable for consumption. There has been a recent increase

in charities connecting with food supply chains to rescue and redistribute surplus food (e.g. second harvest, too good to go). One example of a Canadian organization that supports the donation of surplus food from the restaurant industry is the Leftovers Foundation. The Leftovers foundation goal is to help redistribute surplus food to those who are experiencing hunger to ensure everyone in their community has access to food while preventing food waste (Leftovers, 2023). They accomplish this by connecting vendor who have surplus edible food to service agencies who are in need food donation for client who are experiencing hunger and help redistribute the food (Leftovers, 2023).

In terms of culinary teaching institutions, policy shapes how curriculum is developed and taught to students, influencing the extent of information students are being taught regarding sustainability. Only recently, in 2016, the Canadian government updated the Culinary Skills Program Standard to include sustainability. The document states that graduates of any culinary skills program should be able to “apply basic knowledge of sustainability, ethical and local food sourcing and food security to food preparation and kitchen management, recognizing the potential impacts on food production, consumer choice and operations within the food service industry.” (Ministry of Advanced Education and Skills Development, 2016). Thus, graduates should have the skills to make food choices based on sustainable practices and with these updates are beginning to learn more consistently about sustainability. How chefs aim to teach and integrate sustainability are shared more in the Results section.

Summary

As illustrated in the literature review above, chefs have the potential to influence consumers food practices and behaviours through promoting sustainable food practices such as

buying local, using seasonal ingredients, and integrating plant-based meals into their existing diets. Bertoldo et al. (2021) & Richardson & Fernqvist (2022) argue that in recent years celebrity chefs have gained popularity in the public allowing them to establish and influence food trends by providing cooking advice, and recipes allowing them to promote sustainable practices among consumers. Social media has allowed for chefs to share their opinion without being filtered, sharing a glimpse into their lives and the food and beverage industry (McBride & Flore 2019). Chefs can be referred to as “guardians of knowledge, of heritage, of traditions” (Mcbride & Flore 2019; pp 1) since they have the knowledge and skill to bring traditions to life, keeping history alive and well (Mcbride & Flore 2019). Social media platforms have helped to keep these traditions alive and relevant in our society since they are able to share their narratives with the world. McBride & Flore (2019) argue that chefs are not only using food to keep traditions alive, but they are also using food to address social, political, and environmental issues through the creation of dishes that express their opinions. This is a new era for chefs, and they are beginning to partner with scientists and technological innovators to discover new ways to provide quality food for the increasing population (Mcbride & Flore 2019). Chefs have entered a new phase, where they are engaging with the public and have the potential to influence the public's awareness of sustainable food practices which could impact consumers own personal attitudes and behaviours towards food.

Most of the literature looked at in this review comes from the United States and Europe; very few sources were based in Canada, with limited information on how chefs may seek to engage in promoting change. There has been some progress in culinary schools to teach new chefs about our current food system and new ways to create dishes that can be sustainable. As of 2016, the Ontario Ministry of Colleges and Universities made it mandatory that all culinary

college programs need to include some type of sustainability in their teachings. Some schools have made significant progress while others have made very little. George Brown College was the first to implement a Bachelor of Honours in food studies in Canada which combined culinary training with an extensive food studies education (Scott & Stahlbrand 2022). Many other schools are making progress by requiring a sustainability course to be taken, while others are integrating sustainable techniques into their everyday teachings. For example, St. Lawrence College located in Kingston, Ontario does not include a mandatory sustainability course, however they have an optional part-time online program offered called Sustainable Local Food, which explores sustainable food and farming (St Lawrence 2024).

Although there has been some progress occurring inside and outside of these institutions, I hope that my research will help with strengthen the pre-existing research in this area. I aim to gain a better understanding of chef's role in promoting sustainable food practices and their influence they have on consumers behaviours, focusing specifically on the community in Kingston, Ontario.

Methods

This research was cleared by the General Research Ethics Board (GREB) through Queen's University to conduct in person and virtual interviews over the winter term of 2023-2024. Interviews were conducted with two different groups: a) chefs teaching in culinary programs b) chefs cooking in restaurants. The study involved interviews with four chefs within Kingston, Ontario as well as four chefs teaching in culinary institutions in the surrounding region. Each group was asked a separate set of questions, which followed a specific order (see appendix I). These two different groups were interviewed to gain a deeper understanding from those working in the culinary industry. This method enabled the gathering of firsthand information about the current practices and progress from chefs working in local restaurants and chefs training future chefs to understand what sustainable practices are being used in restaurants and those being taught to the next generation of chefs. The goal of these interviews was to advance the understanding of chef's roles in promoting sustainable food practices and the impacts they can make within the food system, and to further develop the connections chefs have with consumers within the food supply chain.

Each participant was recruited through the utilization of my personal networks with local restaurants in Kingston and culinary institutes in the region that were gained through my current employment at local restaurants and previous education at George Brown College in the Culinary Management Program. Connections were easily made in recruiting participants in the restaurant sector and culinary training programs to participate in my study. In addition, during interviews with chefs, recommendations were requested for other colleagues or food industry experts they thought would be interested in participating in the study. Although the sample size is small (n=8), this approach allowed access to a diverse population of local restaurants in the Kingston area as

well as individuals who work in culinary institutions in various roles. A small sample size was appropriate due to the limited time to conduct this study and to allow for the analysis of the findings. An advantage of this small sample is that it provided me the ability to gain in-depth information on the restaurant practices in the Kingston area, which supported the in-depth analysis conducted.

The interviews were semi-structured open-ended and organised around sustainable practices implemented in their restaurants or institutions to allow for flexibility; each interview catered to the individual's specific experiences in the food service industry. The semi-structured interviews allowed for participants to freely express their ideas and use their experience to contribute to what they found important (Centre for Society and Mental Health, 2023). The interview questions acted as a guide, with prompts to direct responses to the specifics of the study. A list of predetermined open-ended questions was asked to the participants in a consistent order that allowed for free conversation. This research took place in Kingston with some interviews outside the Kingston area as per locations of the culinary institutions. The interviews were conducted between January and February 2024 by the researcher. The data collection process was concluded when eight interviews were completed as enough information was obtained for the study. Most of the interviews were done virtually, online on zoom and lasted 45-60 minutes in length.

Participants interviewed were audio recorded and the recordings were transcribed in full following the interviews. With the chef's consent photos were taken of some of the chef's kitchens and sustainable food practices that were unique to their kitchen. The purpose and intent of these photos is to increase the understanding of unique food practices being used in the

restaurants and offer a visual representation. All participants had the choice to be confidential; however, all participants chose to allow the use of their names in this study.

Following transcription, thematic analysis was undertaken. This allowed for identifying components of sustainable food practices used in local restaurants and culinary institutions by focusing on emerging themes and patterns within the data set (Kiger & Varpio 2020). I read the interview transcripts with the goal of identifying attributes of sustainable food practices that are being used in local restaurants as well as practices and techniques being taught in culinary institutions in each source of data. The themes that were identified emerged from the interviews themselves (i.e. inductively) and were also shaped by theories and concepts I gained from reading relevant academic papers. I went back and forth between academic journals and the interview transcripts to identify the major themes that emerged from my study to determine how chefs' behaviours and attitudes influence public awareness of sustainable food practices from the perspective of local Kingston chefs working in the industry as well those working in culinary institutions.

Thematic analysis is beneficial for analyzing qualitative data as it involves exploring acquired data for repeated patterns that can be analyzed further through interpretation and the construction of themes and can be used to understand a variety of data sets (Kiger & Varpio 2020). Thematic analysis allows for the analysis of personal individualized experiences that accentuate social, cultural, and structural perspectives (Kiger & Varpio 2020). Thematic analysis is suitable for research that aims to comprehend experiences, thoughts, and behaviours (Kiger & Varpio 2020). Within this analysis an inductive approach can be taken by drawing on themes that appear in the data, which may not always reflect the questions posed to the participants (Kiger & Varpio 2020). My research utilizes this type of framework using an inductive approach to

understand the individual experiences of the chefs through examining themes that appeared in the data and drew out social, cultural, and structural perspectives. This type of analysis was crucial for this study to be able interpret chef's behaviours, experiences and thought to generate themes that emerged throughout the data.

Using an inductive approach, this study analyzed two sources of qualitative data- interviews and academic journals to identify how local restaurant and culinary institution chefs' behaviours and attitudes influence public awareness of sustainable food practices. Finally, after the inductive analysis, I used Batat (2020) to group the themes into major categories of sustainable food experiences, described further in the Results section.

The participants are now described in more detail.

Teaching chefs

Lucy Godoy is originally from Brazil; she completed her undergraduate bachelor degree of Culinary Arts in the United States. She started a degree as a curriculum developer for a culinary school in Brazil before going back to school and completing a master's degree at the University of Toronto with a thesis on "Teaching Sustainability to Culinary Students: Graduating Sustainability-Minded Chefs?" She is now working as a professor and a coordinator of the Culinary Management program at George Brown College.

Lori Stahlbrand started her career in journalism for CBC before turning her focus to food studies where she co-wrote the book Real Food for Change and started Food Plus, an organization which developed certifications for local and environmentally and socially sustainable products. Several years later she went back and completed her PhD at Wilfred Laurier University with a thesis on "Going the Distance so our Food Doesn't Have To: Case

Studies of Creative Public Procurement at Canadian and UK Universities”. She went on to worked for Toronto Food Policy Council and she now works at George Brown College where she co-developed their Honours Bachelor of Food Studies.

David Fairbanks completed his culinary training at Algonquin College and has a MSc in Global Food Security and Nutrition. He has worked in restaurants for many years holding sous chef and executive chef positions. While working in these positions his head chef recruited him to teach at Algonquin College, he began teaching part time, gradually working to full time and he has now been teaching for 17 years and is now the coordinator of Bachelor of Culinary Arts and Food Science program.

Ryan Whibbs completed his culinary degree through an apprentice program at Fleming College and went on to get his red seal and apprentice overseas. He then became interested in food history and went on to complete an undergraduate degree in history at Trent University and then a master’s degree and PhD in York University with a thesis “God sends Meate but the Devil sends Cookes: Cooks working in French and English Great Households, c.1350-c1650. From there he went on to teach at George Brown College and became the coordinator of the Culinary Apprenticeship Program and the Culinary Management program. He now works as a professor at the Southern Alberta Institute of Technology.

Restaurant chefs

Bellen Tong graduated from Queens University with a bachelor’s degree in mechanical engineering before realizing she wanted to change career paths to culinary arts. She pursued a baking and pastry arts degree at George Brown College and a master’s certificate in Hospitality Management. She is now a co-partner of Miss Bao restaurant and Cocktail Bar located in

Kingston, Ontario with the primary focus of being to promote as little waste as possible with hopes to eventually becoming zero-waste in the future. In addition to this she also works as a Chair in strategy and Business Development for Leaders in Environmentally Accountable Foodservice (LEAF).

Jamie Hodges completed his culinary training in Australia and became a qualified chef in 2001 so that he could travel and work since cooking is a transferable skill all over the world. He ended up settling in Kingston and opened The Everly Restaurant & Lounge with his partner where he works as the head chef.

Brad Long started working in in food industry part time while he focused on other goals, and he eventually fully transitioned to working full time and then decided to go to college and get a degree in Culinary Management at George Brown College. He started working in restaurants while he was in school and later became chef and opened his own restaurant in Toronto. The restaurant remained open for many years before closing it and relocating to the rural area of Sharbot lake. He is currently opening a restaurant called Belong Café which primarily focuses on selling local food.

Michelle Lehman did not engage with the food service industry until later in her life. After she had kids, she started a small catering company with her friend, this ran for a couple years before it wasn't feasible anymore. She continued to work in the industry working at Farm Boy for several years. She now works at local restaurants in the Rideau Lakes area. She currently works as a cook at the Yellow Canoe in Merrittville and works seasonally as the chef at No.9 Gardens in Morton.

Results

The results show that chefs understand sustainable food practices as encompassing emotional, social, and symbolic relationship to food and the environment. These aspects of sustainability were expressed through six main themes that are perceived by chefs as the foundations for influencing public awareness of sustainable food practices. These are; community, motivations/inspirations, leadership/agency, knowledge/skills, government/industry leaders, and policy.

I used Batat's (2020) article *Pillars of sustainable food experiences in the luxury gastronomy sector: A qualitative exploration of Michelin-starred chefs' motivations*, to classify these themes into two main categories: internal and external factors. The internal factors are those that are influenced by the chefs' feelings and thoughts. In comparison, the external factors are those that affect the chef's operations that are out of their control (Batat 2020). The internal (community, motivation/inspiration, leadership/agency, and knowledge/skill) and external factors (government and industry leaders and policies) collectively influence the behaviours and attitudes of chefs to promote sustainable food practice within their community. Each of these themes will be explained in the sections to follow.

Internal Factors

Community

The first theme revealed the concern chefs have for creating community and the influence this has on fostering positive and sustainable food practices and experiences. Seven out of eight chefs interviewed mentioned the importance of creating community in relation to sustainability and influencing the behaviours of others. Three of the four chefs interviewed that work in culinary

institutions emphasized the importance of bringing people together and creating strong community ties through food experiences.

A restaurant can be a space for social development in some ways, there is a concept in sociology called the third place or the third space. The third place refers to a place that's not a domestic space, it's not your home, it might have a bit of business, but it also has a bit of home... Places that you go and buy food, but there are also music nights, they act a bit more as a community hub... Approaching a restaurant as a third space integrates it into the local community. (Ryan Whibbs, Professor at the Southern Alberta Institute of Technology)

Lucy Godoy, Professor at George Brown College explained "At the end of the day, what food is for me is creating community connections, meaningful, purposeful connections that can motivate and inspire people to do great things and to be the better versions of themselves".

Chefs specifically working in local restaurants highlighted the importance of working with the local producers in the area to instill a sense of community and support the local economy. All the chefs emphasized the importance of supporting local farmers, which validates the importance of sustainable practices, as well as provides healthy and nutritious food for their consumers. Most of the chefs make an effort to influence the public's awareness through advertising the farms that they source their ingredients from in the community, creating stronger community ties and supporting the farmers which allows them to continue running for years to come. For example, as Brad Long, the owner and chef of Belong Restaurant explained "I tell people where I buy my ingredients, give them the name and phone number and address of that farm so that they will go and support them too I just made my supply chain stronger and more sustainable because it will be there again next year". As Jamie Hodges explained "Supporting local farms by spending money locally to support local families suppose to ordering globally, supporting local helps the local environment develop and flourish and become self sustaining" (Jamie Hodges, Owner and Chef of The Everly Restaurant and Lounge).

Another aspect relates to how restaurants act an outlet for advocacy in the community creating strong connections and relationships between business owners and community members through the act of cook and preparing food. Chefs working in local restaurants emphasize the importance of connecting and educating community members on the food practices that they utilize in their business to endeavour to achieve a sustainable future. Most chefs stressed the significance of promoting and advertising the sustainable practices they use to engage the community to increase their awareness on the impact the food system has on the environment. This community engagement can occur in many ways such as participation and attendance in panel discussions with local business owners, keeping up to date with social media posts that advertise these practices and participating in community programs that focus on sustainable food practices. For example, Bellen Tong explained, “We engage in the Bin Exchange Program, where suppliers bring their ingredients to us in reusable bins and containers. We also participate in panel discussions and advertising on social media to help spread the word about the practices we use” (Bellen Tong, Co-Partner of Miss Bao Restaurant and Cocktail Bar). Similarly, Michelle Lehman said, “Its critical to communicate the importance of sustainable practices used in the establishment to your clientele to teach them new things through advertising and promoting local farms and community centered events such as cooking classes” (Michelle Lehman, cook at Yellow Canoe Café and No9 Gardens).

Motivation/Inspiration

Chefs working in the local economy and in culinary institutions both stated that chefs’ behaviours and attitudes towards sustainable food practices depend on individuals’ motivations and where they get their inspiration from. In culinary institutions there is potential for having conversations with students about chefs in the industry who are making changes and playing a

leadership role in the industry. For example, as Lucy Godoy, Professor at George Brown College explained “It’s about motivation, it’s about building community, moreover, building a meaningful, trustful relationship with students where students feel that their voice matters and that their experience is relevant”. She continued to say “It’s about being inspired by other people like chef Douglas McMaster, with Silo having his plan and idea of affordable food. That’s what drives me.”

Three of the four chefs teaching in culinary institutions stressed the importance of understanding how food can be seen as a symbol and used to communicate various concepts to consumers/clientele. The sustainable food practices that chefs are using can be illustrated through the creation of dishes and menus. For example, Ryan Whibbs, Professor at Southern Alberta Institute of Technology explains, “There is starting to be a lot more efforts towards a unified approach to culinary tourism. A lot of what is happening is this development of storytelling, local food to starting to learn how to communicate local food without standing there and lecturing people”. Lori Stahlbrand, Professor at George Brown College explains “Chefs are in a unique position because they’re kind of seen as neutral, they have this area of expertise, but they’re sort of neutral politically... I think they have a lot of credibility”.

The results show that chefs believe that inspiration and motivation drive their behaviours and influence the food practices they use in the kitchen. This impacts the influence chefs have on public awareness of these issues. Chefs believe that one of the biggest challenges to using or teaching about sustainable food practices was navigating between the new and old ways of thinking. Chefs have different opinions and behaviours on food practices and responsibilities, and some are reluctant to change their views. As some interviewees explained, the traditional way of running a kitchen is very much based on a master and apprentice dynamic, which can

make it difficult to invoke change and bring about new ideas into a kitchen. This is why many chefs emphasize the importance of motivation and inspiration. Chefs need to be inspired and motivated to want to make change happen. When chefs have a motive, they are inspired to change their food practices to more sustainable practices and often have a desire to share what they are doing and learning to the public. As Brad Long, owner and chef of Belong restaurant said, “I’m trying to tell people what I’ve learned and what I’ve learned what not to do in order to make sure we have food for future generations”.

Leadership/agency

Findings show that chefs believe they have an important leadership role to play in engaging and educating the public on sustainable food practices to increase the awareness on this issue. All the chefs stated that promoting different food practices they use help to advocate for sustainable practices. Some of these practices were, being open-sourced and advertising the suppliers they source ingredients from, advertising that they compost all organic waste within the establishment, and advertising that they reuse food byproducts to make new food products. As Brad Long, owner and chef of Belong restaurant said: “I advocate for open source of what my supply chain is, where it comes from and from who”. David Fairbanks, professor at Algonquin College explained:

Before we compost, we look at it from a food waste perspective... we look at the menu, we look at what we’re producing that day and have a discussion about what else we could use this for and then we start looking at the product we have left over... not blindly putting it in the compost.

Chefs have the knowledge and experience to be agents of change within the food system. They have the power to navigate through the current food crisis by taking the lead and make changes to current practices to be more sustainable. For example, buying local, and advocating

for issues surrounding food security can be influential in getting the public to be more aware of the environmental crisis and food insecurity. Chefs have the power to influence people's food practices by sharing their experiences, working in the industry, and advising to people about how sustainable practices can help improve and limit the impact humans have on the environment.

One course is called Agents of Change, which is going to look at examples of Chefs around the world who are doing exciting things, who are taking the leadership role, either around sustainability and local food production, going more plant-based, around feeding the hungry and food security and food sovereignty, all sorts of issues. ... There are a lot of chefs around the world who are playing this leadership role. I think increasingly chefs are being asked to play this role (Lori Stahlbrand, professor at George Brown College).

Knowledge/skills

The results show that chefs have extensive knowledge and skills about the food system and how to cook and prepare food. Their actions can have a significant impact on the general public's behaviours and attitudes towards sustainable food practices. Chefs are viewed and valued as experts who are knowledgeable on food, various food practices and techniques as well understand how the food system operates.

We're the ones that are supposed to know food and ingredients. We're supposed to know a lot of ingredients, we're supposed to know a lot of recipes, a lot of styles, a lot of techniques. Have a lot of experience with what people like and don't like ... we have social media accounts, we do television shows, we do cooking competitions, we advertise and market and lure people into our restaurants and feed them (Brad Long, owner and chef of Belong Restaurant).

Chefs also contribute to setting food trends and setting expectations for the food industry. All the chefs emphasized the impact they have within the food industry and the impact their actions have on the environment and planet. For example, where they source their food from

increases the demand for that product, or how they prepare a dish and the amount of waste they produce contributes to overall food waste produced in the industry. As Lucy explained:

The whole concept of throwing food out just so it looks a certain way. Yes, it is criminal. It is criminal to people from a social perspective, it is criminal to the environment because the repercussion of doing so impacts the environment directly by landfills by means of decomposing or runoff.

The findings show that the public observes the practices chefs are using, and follow their lead, in the sense that they trust chef's have been properly trained and educated and believe chef's actions are accurate, reliable, and trustworthy. Chefs are making changes and innovations in the industry to shift the current practices to be more sustainable so we will be able to feed future generations. As these changes begin to happen, chefs believe that the public's attitudes and behaviours will also change. Chefs have the power and knowledge to change the current food trends and demands, which helps to influence consumers food practices to a certain extent. For example, all four chefs I interviewed that work in restaurants are advertising new sustainable food practices such as buying local and ways to reuse food byproduct. As Brad Long, owner and chef of Belong restaurant said: "We're the ones that end up very often on that label of the package ...or they make up a fake Chef Boyardee and you put a drawing of a chef with the funny tube hat on their head and people go oh it must be good it's from a chef".

External factors

Government /industry leaders.

All chefs stated that government and industry leaders' policies and regulations are the main barrier preventing them from changing all their current practices to sustainable food practices. Although all chefs emphasized the significance of utilizing sustainable food practices, they stated that the industry leaders that currently control the food system limit their ability to make

changes. The current industrial food system is heavily controlled by the government and industry leaders who control the production and distribution of food. For example, culinary institutions are training students based on the curriculum which has only recently been changed to include sustainability as a required topic. For example, Lori Stahlbrand said: “I think there needs to be more food literacy and more of an introduction to food systems in the curriculum. I think as time goes on and we evaluate our curriculum we need to make sure that there is more of this in the courses”.

Chefs working in the restaurant sector understand the impact the industry leaders have on their ability to use sustainable food practices and try utilizing as many as they can, while promoting it to the public to educate on what they know and what they are doing. For example, most of the chefs interviewed that work in restaurants screen their suppliers and ensure they are ordering from fairtrade and environmentally conscious companies and farms, since this is something, they can control. As Bellen Tong, co-owner of Miss Bao Restaurant and Cocktail Bar said: “Everyone has to eat; we have a responsibility. We do our best to serve seasonal food products, minimize packaging, screen our suppliers, minimize food waste”.

Findings indicate that there are some things beyond control of the chefs working in the restaurant sector regarding the implementation of sustainable food practices and reducing the impact the food industry has on the planet and the climate change crisis. Only a few industry leaders and corporations are in charge of controlling how the dominant food system operates in terms of industrial food production and how food is being produced and by whom. This industrial food system is producing food that is ultra processed and unsustainable. Chefs state that there needs to be a system change to overcome these challenges and help reverse the impact the food industry has on the planet and people. For example, David Fairbanks, Professor at

Algonquin College said: “We have strong heartfelt conversations about sustainability, what it could be. Everything from the menu that gets produced all the way down to the packaging”.

Lucy continued:

I grew up eating organics, they weren't called organics. Canned food was very expensive, and it was a luxury. Now you go back home (to Brazil) and it's the opposite. We are exporting everything that's good and people are paying very cheap for what is killing them.

Policies

Chefs indicated that the policies that are in place limit the amount of impact they can have on the environment. Policies in place impact how the food system operates and how food products are being produced and the techniques and practices being used. As mentioned above, chefs can have an impact on consumer purchases by promoting products and practices they use in their kitchens. Supporting sustainable practices such as buying local can help to support policies in place in a community rather than policies that are in place globally that chefs may not know as much about. As Jamie Hodges, owner and chef of The Everly Restaurant and Lounge explained “Buying local allows you to see the policies in place, whereas buying overseas you can't see the policies you are supporting.”

Policies in place make it hard for people to go out and support sustainable practices based on financial means. The government policies that are used in the industrial system allow food to be easily accessible and cheap, however it is made using unsustainable and less nutritious practices. Chefs recognize the impact the food system is having on our society and how it impacts people's individual health and that they have a role to play in educating the public. Along with educating the public on these issues chef also acknowledge that they need to advocate for these issues and promote sustainable food practices that individuals can control,

such as managing our food waste and buying from sustainable and organic producers. Lori Stahlbrand said:

Ultra processed foods and the fact that we have rising rates of obesity and heart disease and diabetes, it's directly connected and those become public health concerns. But yet the food system is often at the root of it ... I think we need to think of food as a public good in an era of rising hunger.

Lucy continued:

Restaurants can play different roles. Certain regions have major linguistic barriers, and so ethnic restaurants can help bridge the gap and teach people and show them how to shop in North American grocery stores ... some restaurants are doing this already and they're opening themselves up to being able to get grants and all kinds of support from other elements and actors in the food security realm.

Policies related to income, employment, housing, and transportation can all influence who can afford and access food and who cannot. Chefs believe they have a major part to play in restructuring the food system that ensures everyone has access to healthy, nutritious sustainable food in the future as our population continues to grow. Chefs acknowledge that some policies in place may be 'band-aid solutions' to make consumers believe they are doing what they are doing their part to help and makes them feel good about what they are doing. For example, David said:

I think an unintended consequence of composting is it may reduce the underlying issues of food waste. It's called the licensing effect, which, although an action [like composting] is intended to do something good, certain practices [such as not exploring alternative options, and continued wasting of food] may continue since composting may offer the most attainable way to address a challenging and complex issue. However, composting is not necessarily a solution to food waste, and there are options in which food products could be utilised or diverted before resorting to composting.

Chefs recognize the part they must play to educate future chefs as well as the public on the ways the dominant food system functions and policies that prop it up so they can understand ways to make a viable impact.

Discussion

This study explored the attitudes and beliefs that chefs working in culinary institutions as well as in local restaurants have on sustainable food practices, including assessing how they influence public opinion and the role they play in advocating for sustainability as important actors in the food system. To my knowledge, this is one of the first studies to explore attitudes and beliefs about sustainability among culinary professors. Previous studies about culinary institutions explored students' opinions on sustainability, but none of them focused on professors teaching students.

Overall, this study found similar themes pertaining to food sustainability between chefs working as professors and those working in restaurants. However, there was variability in the extent in how and to what extent the groups of chefs promoted sustainability in their careers. Chefs working in restaurants indicated that the utilization of sustainable food practices are dependent on the price, knowledge, motivation, and consumer demand for the products, which also influences their capacity towards educating the public on these practices. For chefs working as professors in culinary institutions their sustainable food practices depended on their own experiences, motivations, knowledge, and beliefs. Chefs working in the culinary institutions teach sustainability to their students based on their own personal influences and experiences (e.g. where and how they were trained, professional job experiences).

The findings of this study indicate four critical insights pertaining to motivations, knowledge, policy, and understanding of sustainability.

Motivations

First, chefs need to be motivated and inspired to promote sustainable food practices, as chefs rely on other people working in the industry (such as restaurant owners, farmers and food

retailers) to help advocate for sustainability practices. This research contributes to earlier works in the restaurant sector (e.g. Bertoldo et al., 2021, McBride & Flore 2019) that explored chef's attitudes towards supporting and promoting sustainable food practices. Between the restaurant and teaching chefs, over 90% of chefs stated that when chefs have a motive, they are inspired to transition to sustainable practices and share these practices with the public. Bertoldo et al. (2020) findings are similar, indicating 90% of students believe it is important to understand the environmental impacts of the food ingredients they cook with to help combat climate change. Unlike Bertoldo et al., but similar to Peski & Brinkley (2021) I found that chefs were inspired to make changes within their own practice when other actors in the food industry make changes and advocate for sustainable practices. For instance, when other chefs and farmers use and advocate for sustainability practices, such as using zero waste techniques, sourcing food from local small-scale farmers and supporting sustainable farmers, it influences others to want to transition to sustainable practices.

My results showed combination of the two studies cited above. All chefs involved in this study agreed that it is important to understand the environmental impact of food and emphasized the importance in sourcing sustainable products, however, they also stated that there needs to be a drive or motivation for them and their students and employees to care about these things. Therefore, the results suggest that when chefs are given access to resources on sustainability (environmental, social, economic impacts of food) and sustainable food practices and techniques they can utilize in their work, they can be motivated and inspired to contribute to addressing the climate change crisis. Chefs can influence public opinions, motivating people to make changes to their current food practices. In this sense chefs can be perceived as leaders in the food industry.

Knowledge and Skills

Second, chefs' knowledge and skills to make decisions impact consumers choices and practices, as chefs are perceived to be experts about food and how the system operates, and the public tends to follow policies and practices that chefs and restaurant utilize. This research contributes to earlier work in the restaurant sector (e.g. Chi et al., 2019, Barber, 2014) that explored the power chefs have in influencing food culture. All the chefs interviewed accentuated the impact they have within the food industry and recognized the impact their actions have on the environment. All the chef's acknowledged that they have the knowledge and skill to change and alter food trends and demands which influence consumer food choices and practices.

All chefs working in culinary institutions that were interviewed highlighted their responsibility to properly train students on sustainable culinary skills and knowledge; however, this depended on the prior training and influences the chefs have had in their career. The chefs believed it was their responsibility to train and provide new chefs entering the industry with the skills and knowledge they need to change and advocate for new, more sustainable food system. This knowledge will give chefs the opportunity to change current food trends and demands to more sustainable ones (local and organic food purchases, decreasing disposables and engaging in community outreach, etc). (Huang et al., 2023). Most of the chefs working in restaurants that were interviewed saw it as their responsibility to utilize their skill and knowledge to promote sustainability practices to the public; however, they found that finances sometimes restricted how much they could do within their business. The chefs believed it was their responsibility to use what they know to educate the public, however the majority of the chefs utilized practices that they could market and make a livelihood from. For example, while they source as much as their ingredients as local as possible, they also need to serve what the consumers are demanding.

Thus, while chefs in restaurants can influence sustainable trends and markets, there can be tensions.

Barber (2014) findings are similar to the results of my study, suggesting that chefs have the ability to create and shape markets which influences the food culture. With the creation of new innovations and cooking styles chefs recognize they have the power to use their knowledge and skills to get the public to rethink and change their eating patterns and habits (Barber 2014). An example Barber (2014) points out is the farm-to-table movement that has been gaining traction in the past few years, as an increase of people are becoming aware of where their food is coming from. This has pushed more people to care about where their food comes from paying more attention to labels on food and in some cases even buying directly from farms.

The results of my study also aligned with the findings of Chi et al. (2019), which identified the important role chefs have in using their skills and knowledge to create healthy and sustainable meals that are flavourful and affordable for the public. Chefs have extensive knowledge on ingredients and more recently have become aware of the impact the production of food has on the environment. Similar to many of the chefs I interviewed, Chi et al. (2019) demonstrates many restaurants are making an impact by using their skills to implement sustainable practices and food choices such as, providing plant-based meals and sourcing local and sustainable meat products.

Overall, the results from this study demonstrate how chefs can use their knowledge and skill to influence food trends, and impact consumers purchase choices and food practices. Therefore, public awareness of chefs food practices has the potential to shift behaviours and buying trends and demand of food products in the market.

Navigating food policy

Third, industry leaders and government officials that have a big influence on policies in the industrial food system can pose challenges to chefs' ability to change processes and practices within the food and beverage industry. The result of this research contributes to earlier findings (e.g. Fanzo & Davis, 2021; Lencucha et al., 2020) that demonstrated that food and agricultural policies have limited shifts towards a more sustainable food system. The findings in this study support this research and illustrate how current policies influence what is being taught to new chefs/students, and who produces food, how food is produced, and how food waste is managed.

Between the two groups of interviewees (chefs teaching in culinary institutions and chefs working in local restaurants) most indicated that the policies and legislation put into place by government officials and industry leaders restricted the extent to which they can practice sustainability, thus impacting the influence they have on the public. The results from this study were similar to the findings of Lencucha et al. (2020), which showed that industry and government leaders control all aspects of production spanning quantity, quality, and farmer's wages. For example, farming subsidies influence what farmers produce and the farming practices they use, which have been shown to generate negative impacts on the local environment as well as the health of those who consume the products (Lencucha et al., 2020). These policies in turn shape what type of food products are being sold on the market, impacting the choices chefs when creating dishes.

The findings from this study also align with the findings from Fanzo & Davis (2021), showing how globalization and trade liberalization have increased the accessibility of food around the world. This has resulted in innutritious foods being cheap and affordable, while nutritious foods are more expensive and less affordable (Fanzo & Davis, 2021). All the

interviewees who work in culinary institutions emphasized the importance of understanding the impact trade and globalization has had on our society and how it contributes to our current hunger and food insecurity problem. The accessibility of food poses challenges to what chefs can afford to buy in bulk and what they are able to support, as well as individual access to healthy food. At the end of the day chefs have to sustain their business and this sometimes results in chefs buying imported food items that may be less expensive and easier to source in quantities they need. They need to be able to purchase enough of the food item for their business or institution, which can sometimes result in resorting to imports that come larger farms or firms that utilize less sustainable practices.

These findings also support the findings of waste management strategies in Filimonau & De Coteau (2019) and Thyberg & Tonjes (2016) with respect to how government policies and health standards may prevent chefs from diverting and donating surplus and unsold food. Waste management policies support and prioritize disposal techniques (e.g. garbage/landfill and compost disposal) over recycling techniques (e.g. reducing and redistributing byproducts and excess food) (Thyberg & Tonjes, 2016). Health standards restrict mislabelled and damaged products from being used and redistributing unsold and excess food leaves chefs liable, (Filimonau & De Coteau, 2019). Many of the interviewees that work in local restaurants emphasized how these policies prevented them from redistributing their excess food products, although they stressed that they took all the possible steps before throwing it to waste (e.g. using for staff meals, repurposing some scraps for new food items such as soup stocks). All the interviewees working in the culinary institutions expressed similar challenges, however they have more leeway to redistribute surplus food items to other departments and students at the school. Since meals are not being made for service, but for grading, there are typically a lot of

leftovers. Schools are able to package the meals and surplus food items and donate it to students who are experiencing hunger (e.g. some schools offer programs where you sign up and receive a basket of food).

With respect to curriculum, all the interviewees who work in culinary teaching institutions highlighted that the Ministry of Education updated the Culinary Skills Program Standard to include sustainability. The chefs stated that although this is progress there is still more work to be done, sustainability learning needs to be more widespread within the culinary programs. The inclusion of sustainability into the curriculum is giving students a base understanding of the concept, however the food system is complex and there needs to be more food literacy included into the curriculum to teach new students as well as older chefs who may be less educated. Everyone teaches differently and different chefs have different understandings and knowledge levels on sustainability. It is therefore important that all teaching chefs have a similar education and base understanding to ensure students are receiving a balanced and equal level of training. Students need to have a broad understanding of the food system and how it operates to understand the importance of using sustainable practices and have a motive to promote them to the public.

Understanding sustainability

Fourth, chefs reflected an integrated understanding of sustainability in food systems spanning emotional, social, and symbolic relationships to food and the environment, as they emphasized the importance of bringing people together and creating strong community ties through food experiences. This research contributes to earlier works in the restaurant sector (e.g. Higgins-Desbiolles & Wijesinghe, 2018, Batat, 2020, Pereira et al., 2019) that studied the social relationship chefs have towards food and how this influences their social sustainability practices.

To my knowledge, this study is one of the few that has explored the emotional and symbolic relationships that chefs have to food and the environment and how they influence their strong community ties. In the past few years, there has been research just starting to scrape the surface on the idea of the emotional and symbolic relationships to food (Pereira et al., 2019).

Between the two groups of teaching and restaurant chefs, most interviewees stressed the importance of bringing the community together through food experiences and creating social, symbolic, and emotional relationships to food. Batat's (2020) findings are similar to my study, showing that chefs emphasized the importance of participating in the community and bringing people together through food which can impact their personal and social well-being, for example hosting free training programs to teach people how to cook healthy and affordable meals (Batat 2020). The findings from my study align with Pereira et al. (2019), who found that using indigenous knowledge and traditional foods can help to bring communities together and reconnect to land and culture of the food creating emotional and symbolic relationships to the food and environment. Pereira et al. (2019) further highlighted that reconnecting with the land and traditions of a food ingredient origin can bring more meaning to the food and bring people together to experience food in a new light. My study similarly found that chefs believed it is crucial to create social, emotional, and symbolic relationships to food in order to achieve sustainability. Chefs understand the creation of community and strong connections in the value chain to achieve an equitable food system which they viewed as one of the most important factors of sustainability. This can be done through engaging in community events and educating the public on the value of food and the impact food production on the environment. This type of education could help individuals in the public develop a greater connection and symbolic relationship to the food they eat. Nearly all the chefs interviewed stressed the significance of

promoting sustainability practices to the public through panel discussions, local food events and programs and posting on social media platforms. These activities allow chefs to create strong ties with their community, while helping to create a socially sustainable food system.

These findings illustrate how chef's emotional and symbolic relationships towards food drives their sustainability motives, as this creates community and meaning behind what they do. Chefs find it crucial to connect and educate their community members on sustainable food practices (social, environmental, economic) that they utilize in their business and teaching to endeavour to achieve a sustainable and just food system.

Conclusion

This study supports the inclusion of chefs as valuable actors and stakeholders in promoting sustainable food practices to the public. This could be done through the development of new kitchen innovations and techniques that represent sustainability and help to combat the food and climate crisis. The chefs working in culinary institutions and working in restaurants who participated in this study understand sustainable food practices as encompassing emotional, social, and symbolic relationship to food and the environment. Majority of the teaching and restaurant chefs believe that they have a leadership role to play in engaging and educating the public on sustainable food practices to increase the awareness on impact our food choices have on the climate crisis. Although, the teaching and restaurant chefs acknowledge that industry regulations and government policies limit the extent of changes they can make in the transition to a sustainable food system (e.g. subsidies controlling what is grown and sold on the market, private firms controlling outputs used on the farm, health regulations controlling what food can be redistributed). The chefs also address and acknowledge the responsibility they have to promote sustainable food practices which have the potential to shape consumers food behaviors and buying trends. There are slight differences in teaching and restaurant chefs' experiences regarding promoting sustainable food practices to increase public awareness. Restaurant chefs have to balance sustainable food practices (which sometimes cost more) with the economic viability of their business. Teaching chefs utilize sustainable food practices that they believe will best benefit their students, who will be the next leaders in the restaurant sector. Opportunities exist for all chefs to engage with the public to educate and increase awareness of the multi-faceted impacts the dominant food system is having on our environment and society.

Limitations and future research

One of the challenges in this study was getting restaurant chefs to participate in this study with the limited timeline to complete this project. Time constrained the amount of time I had between reaching out and following up to set up interviews. Chefs are busy with their own work. It was difficult to find times that fit within my timeline, but also worked within their own schedule. In the future it would be beneficial to have more time to organize the recruitment phase to ensure time is not limited and interviews do not feel rushed.

In addition to this, it was difficult to contact culinary teaching institutions in the Kingston area. Most interviews were completed with chefs located in the Toronto area. Allocating more time for recruiting would also be beneficial for finding more participants in the Kingston area. It could allow for other means of recruitment other than email (e.g. posters) to help get the word out to different parts of the community (e.g. farmers markets, community sustainability events). With more time, this study could have integrating focus groups which could have been valuable to engage all chefs to communicate with others with similar beliefs, supporting their experiences. This could allow for a deeper understanding of what different chefs value as sustainability and the importance of educating the public.

Due to the allotted time for this study, there was a small sample of chefs interviewed. Having more time allocated to this study could have allowed for a larger sample size. This could have expanded the research to gain a greater understanding of the sustainable practices used by different restaurant actors in the Kingston community. For example, having time to interview a larger sample could have enabled interviews with restaurant suppliers/ local farms which could help get a better understanding of the sustainable practice's chefs are supporting.

A larger sample would give this study a better understanding of the impacts Kingston chefs has on sustainable food practices within their local community.

Moving forward, future research could investigate corporate restaurants chains and their ability to integrate sustainability practices into their restaurants and what challenges and barriers that they face. All the chefs interviewed owned small independent restaurants; thus, they have flexibility and ability to make decisions about practices that are used in their establishment. However, finances and efficiency are huge factors depicting the decisions they make. The chefs need to have the financial means to buy local wholesale products or have other items that allow the establishment to use sustainable practices, such as a composter. Some practices such as preparing fresh dishes take more time and labor, thus the chefs need to be able to have financial means to pay their employees for their additional labour. Corporate chains may have more financial means to adopt practices, but they may also have more restrictions and policies they must follow. The larger demand and bigger operations may impact the type of food they serve and what goes into the preparation. These are important questions for future research.

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Appendices

Appendix I

	Local Chefs in Restaurant
Question 1	Can you tell me how you got started as a chef?
Question 2	What factors influence the food choices you make for your restaurant?
Question 3	What does sustainability mean to you as a chef? To what extent does sustainability influence the food choices you make for your restaurant?
Question 4	Do you believe that the restaurant industry has an impact on the environment? Could you elaborate on this and to what extent you address this in your position.
Question 5	How would you describe the relationship with your suppliers? To what extent does this influence the types of food/cuisine you offer?
Question 6	What role do you think chefs like yourself might play in helping to promote more sustainable food practices?
Question 7	How do you think chefs might engage more with the public and enhance public awareness of food sustainability? Do you think restaurants can be an outlet for advocacy in the community?

	Chefs working in culinary institutions
Question 1	Can you explain how you got started in culinary teaching
Question 2	What does sustainability mean to you? To what extent is this integrated into your teaching programs?
Question 3	What role do you think culinary institutes play in promoting sustainable food practices?
Question 4	Do you think new chefs/ current students view sustainable food practices as part of their future roles in the food industry?
Question 5	Do you think that the restaurant and food industry have an impact on the environment? How so? How is this being taught to students?
Question 6	How is food waste being managed in your school? Are students being taught techniques to help combat food waste in the kitchen?
Question 7	Has curriculum changed over time to teach students more about food and sustainability? Can you give examples?
Question 8	Are students aware of where the foods they are learning to cook come from? To what extent does curriculum incorporate traditional food sources and practices that reflect your location?
Question 9	what ways do you think chefs help incentivize young chefs to advocate for food sustainability issues?



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How Chef's Behaviours and Attitudes Influence Public Awareness of Sustainable Food Practices

Thank you for your interest in this research project. Your time and help are truly appreciated. This document provides some basic information about the research project and what you can expect as a participant. If anything is unclear or you would like more information, please contact the research team. Contact details are listed on the last page of this document.

What is this research project about?

Through a series of interviews, we aim to gather information from local chefs working in local restaurants in Kingston and in culinary institutions to understand the role chefs can play in influencing sustainable food practices in communities.

What is being asked of me?

You are being invited to participate in an interview to contribute your experience and knowledge about sustainable food practices and how chefs working in the food industry are helping to spread awareness around these practices and contributing to food security in their local communities. With your consent, photos will be taken of the restaurant kitchen and any unique sustainability practices that you utilize in your kitchen.

The interview will be approximately one hour in length but may vary depending on the degree and sharing that occurs. Interviews can be conducted in person or over zoom based on your preference and location. Participation is voluntary and you can decline to participate in the research or any aspect of the research at any time without penalty.

Are there any benefits or risks I should be aware of?

This research aims to generate new knowledge about the use of sustainable food practices by chefs in the local economy as well as in teaching institutions and how they may help to improve food security. The outputs of this research will contribute to informing future sustainable food practices. While there may be no direct benefit to you for participating in this study, you may benefit from the opportunity to share your perspective and have your voice heard on this topic.

With your consent, interviews will be [video](#) and audio recorded (on zoom) or only audio recorded if taking place in-person. To mitigate any privacy risk, after the interview has been conducted any video file will be deleted and the audio file will be deleted after the interview has been transcribed. If you do not wish to have your video recorded during a virtual interview you can turn off your camera.



We will only identify you by name in research outputs with your consent and will only include direction quotations from your interview with your consent. If you choose to remain confidential we will make every effort to protect your identity by removing personally identifying attributes in written outputs.

How should I expect to be treated?

Participation in the interview is entirely voluntary; you may refuse to participate, withdraw at any time, and not answer any questions asked without any negative consequences for yourself. You can withdraw your consent at any time by leaving the interview in progress, or by contacting a member of the research team and requesting to be omitted from the research after the interview has been completed.

Any withdrawal of your consent will result in your responses no longer being considered following the withdrawal date confirmed by the researcher which will be approximately March 2024. It will not be possible to remove your responses from interview recordings or from any findings already published.

What will happen to the information after it is collected?

The results of this study will be distributed in my Undergraduate thesis and may also be shared in public reports, academic journals, and conference presentations.

Your confidentiality will be protected to the extent permitted by applicable laws. Only the members of the research team listed below will have access to original interview recordings and identifiable materials. Unless you give permission for your name to be used, you will be identified by a pseudonym or ID code in transcripts and other written outputs. The file linking this code to your name will only be available to research team members.

All raw data, including the code file and transcripts, will be stored and encrypted on password protected computers belonging to the research team and the Queen's OneDrive cloud for a minimum of five years following completion of the research, after which they will be destroyed.

The Queen's General Research Ethics Board (GREB) may request access to study data and/or all other study materials used in this research to ensure that we (the research team) have or are meeting our ethical obligations in conducting this research. GREB is bound by confidentiality agreements and will not release any personal information.

If you have any questions about the research project, please contact Kristen Lowitt, Principal Investigator.



If you have any ethics concerns, please contact the General Research Ethics Board (GREB) at 1-844-535-2988 (Toll free in North America) or email chair.GREB@queensu.ca. Use 1-613-533-2988 if outside North America. Please note that GREB communicates in English only. This study has been reviewed for ethical compliance by the Queen's University General Research Ethics Board (GREB).

You have not waived any legal rights by consenting to participate in this research.

Thank you again for your time and assistance.

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Name of Participant _____
(please print)

By signing this form, I agree to the following:

- I have read the details of this research project and agree to participate in the research.
- I understand that my participation in this study is voluntary and that I may withdraw at any time for any reason without penalty.
- I understand that I may ask questions of the researcher(s) at any point during the research process.
- I understand that the information I provide will not be attributed to me individually in research outputs unless I give consent for my name and age range to be used.
- I understand that my interview will only be recorded with my consent.

I agree to have this interview video recorded:	YES	NO
I agree to have this interview audio recorded:	YES	NO
I agree to be identified by name in research outputs:	YES	NO
I agree to have my quotes used in research outputs:	YES	NO
I agree to have photos taken:	YES	NO

Participant's Signature

Date

Name of person conducting the consent discussion

Signature of person conducting the consent discussion

Date



Verbal Consent Script

Study Title: How Chef's Behaviours and Attitudes Influence Public Awareness of Sustainable Food Practices

Participant Study Number/ID: _____

I confirm the following:

- I have explained all aspects of this study to the participant as outlined on the letter of information.
- I answered all of the participant's questions to their satisfaction and the participant had sufficient time to consider their participation in this study.
- The participant was informed that they may choose to stop their participation at any time for any reason without penalty.
- The participant was informed that their legal rights would not be affected by consenting to participate in this study.
- The participant verbally agreed to participate in this study and to follow the study procedures.
- The participant was offered a copy of the Letter of Information for their records.
- The participant consented to the use of:
 - Audio Recording
 - Video Recording
 - Photos
 - Use of Quotes

Signature of the person conducting Printed name
the verbal consent discussion

Date