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Perspective

The case for a Canadian national school food program

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Abstract

Canada is one of the only member countries of the Organization for Economic Cooperation and Development (OECD) without a national school food program. Good nutrition impacts children's health, wellbeing, and learning; and school food environments offer an important setting to promote health and other food system sustainability behaviours that can last a lifetime. We present an overview of national and international evidence, with a focus on promising practices that support the establishment of a national school food program in Canada. School food programs have been shown to benefit health and dietary behaviour and critical food literacy skills (learning, culture, and social norms) that support local agriculture and promote sustainable food systems. Finally, we make recommendations for key elements that should be included in a national school food program for Canada.

Keywords: school food programs, children, Canada

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Introduction

Once children reach school age, they spend more of their waking hours in school than in any other environment. High-quality nutrition impacts children's health, wellbeing, and learning, and school environments have been "identified as a focal point for intervention" (Ritchie et al., 2015, p. 647) as part of a systems approach to support the health of children and youth (Institute of Medicine, 2012) that can last a lifetime. Yet, Canada is one of the only member countries of the Organization for Economic Cooperation and Development (OECD) without a national school food program (Koç & Bas, 2012). School food programs (SFPs) include, but are not limited to, lunch, breakfast and/or snacks served in the school environment, with or without integration into curriculum, and have the potential to contribute to child, family, community, and environmental health and well-being in a variety of different ways (Oostindjer et al., 2017).

SFPs may be able to improve access, quantity, quality and sustainability of foods for school-aged children and youth. Available evidence confirms SFPs can be an effective response to food insecurity (Roustit, Hamelin, Grillo, Martin, & Chauvin, 2010). SFPs have the potential to increase student access and consumption of healthy foods, reduce the risk of chronic disease, as well as increase school attendance, behavior, and educational achievement (Bundy, Drake, & Burbano, 2012), and improve cognition and mental well-being (Hoyland, Dye, & Lawton, 2009). Furthermore, SFPs have the potential to improve child food literacy and strengthen local food systems (Powell and Wittman, 2018). In this paper we present an overview of national and international evidence that supports the establishment of a national SFP in Canada. We highlight evidence from high-income countries around the world, with a focus on promising practices that offer a model for a national SFP for Canada. Finally, we make recommendations for key characteristics that should be included in a national SFP for Canada (see Table 1 below).

Historical context of school food programs (1850–present)

Historically, there is great variability in the driving forces leading countries to introduce SFPs and as such, the models that exist vary significantly. For example, the United States (U.S.) offers their national SFPs through the U.S. Department of Agriculture in partnership with state agencies and local schools, often through a means-tested approach. Other countries either take a whole-of-government approach (i.e. Italy and Brazil) or the Ministry of Education operates SFPs, paired with private funds (from families) to offset costs (i.e. France and Japan) (Harper, Wood, & Mitchell, 2008). As result, there is variation in the cost of providing a school meal, based on several factors such as "prices, availability, and procurement methods" as well as the level of government subsidy (Aliyar, Gelli, & Hamdani, 2015, p. 11). In contrast, what school food provisioning currently exists in Canada is the responsibility of individual provinces and territories. The Federal government provides transfer payment funding to support health and education in the provinces which is allocated to meet various provincial priorities. The scope of

provincial and territorial funding often falls short on funding initiatives related to school food due to competing priorities (Martorell, 2017).

Nationally mandated SFPs in high-income countries were typically introduced as a response to hunger or in preparation for war (Oostindjer et al., 2017; Levine, 2010). The U.S. national SFP was also conceived as a market for surplus agricultural commodities during the depression (United States Department of Agriculture Food and Nutrition Service, 2017). According to Oostindjer et al. (2017), the development of SFPs in high-income countries follows three phases, the third of which is just taking hold today. In the first phase, from about 1850 through to about the 1970s, SFPs were established and maintained primarily to reduce hunger. They focused on provision of sufficient calories with minimal focus on food quality. Beginning in the 1970s, in some parts of Europe, and in the 1990s and 2000s, in the US and United Kingdom (UK), a shift towards improving food quality began, creating the second phase of SFPs. This second phase, which is ongoing in many countries and regions, shifted the focus towards dietary guidelines and policies for SFPs, with the intent of improving the nutritional quality of food served. The third phase, which is only in its infancy in most countries, is a response to increased rates of childhood obesity and chronic diseases and the larger societal context of food systems, climate change and environmental degradation. This phase is focused on incorporating broader food-system and societal issues into food programs and policies and integrating them more closely with curricula and the school environment.

Health and dietary behaviour and school food policies and programs

Many SFPs are designed to support childhood nutrition, but there is wide variation in the policies and guidelines programs are expected to follow in order to support healthy eating. In Canada, over the past decade school food policies or guidelines have been implemented by various provinces and territories. The intent of the policies or guidelines is to improve school food environments and support healthy eating while outlining requirements or recommendations for serving and/or selling food and beverages in the school environment, although almost all are voluntary. After New Brunswick (McKenna, 2003), British Columbia (BC) was one of the first provinces to introduce mandated standards for food served in schools (The Guidelines for Food and Beverage Sales in B.C. Schools, 2005), closely followed by Nova Scotia in 2006 (Government of Nova Scotia, 2006), and Ontario in 2010 (Government of Ontario, 2010). Since the release of Nova Scotia's policy in 2006, intake of sugar-sweetened beverages (SSBs) and overall energy intake have decreased, and dietary intake has improved among students in that province (Fung, McIsaac, Kuhle, Kirk, & Veugelers, 2013).

Several international reviews focused on changes in the availability and intake of healthy foods (especially vegetables and fruit) and unhealthy foods (SSBs or potato chips, for example) have found that policies improving the food environment in schools can be effective at changing food choice (Cohen, Richardson, Parker, Catalano & Rimm, 2014; Evans, Christian, Cleghorn,

Greenwood, & Cade, 2012; Taber, Chriqui, Powell, & Chaloupka, 2013). For example, in the US, studies have found that stricter nutritional guidelines in schools are associated with greater availability and intake of healthier foods, particularly vegetables and fruit (Evans, Christian, Cleghorn, Greenwood, & Cade, 2012; Jaime, & Lock, 2009; Taber et al., 2013), or reduced body mass index (BMI) (Taber et al., 2013). Overall, healthy food policies have been found to be associated with healthier food choices and intakes (Cohen et al., 2014; Greenhalgh, Kristjansson, & Robinson, 2007), especially in the U.S.

Research on the health and dietary behaviour impacts of SFPs in high-income countries finds modest positive effects overall, including higher vitamin intakes and increased vegetable and fruit consumption in some cases (especially in younger children) (Kristjansson et al., 2007; Van Cauwenberghe et al., 2010). Research that compares the nutritional quality of food consumed at school that was brought from home versus food acquired through SFPs has found that SFPs provide healthier food overall (Caruso & Cullen, 2015; Evans, Cleghorn, Greenwood, & Cade, 2010; Hubbard, Must, Eliasziw, Folta, & Goldberg, 2014; Hur, Terri, & Reicks, 2011; Johnston, Moreno, El-Mubasher, & Woehler, 2012; Neilson et al., 2017; Stevens & Nelson, 2011; Taylor et al., 2012). Studies have also found that SFPs can increase vegetable and fruit consumption (Bontrager et al., 2014; Joshi, Azuma, & Feenstra, 2008;) and can reduce disparities in vegetable and fruit consumption between children from higher versus lower socio-economic status households (Ahmadi, Black, Velazquez, Chapman & Veenstra, 2014; Longacre et al., 2014).

In the UK, a two-year pilot of free school meals in two local authorities, where free school meals were made universal to all primary school children, was compared to a third, where free school meal entitlements were extended to a larger number of students (a higher income threshold was applied in this district) (Kitchen et al., 2010). In the extended entitlement (not universal) authority, no impacts were seen on children's eating habits, whereas in the universal entitlement authorities, there were reductions in the consumption of potato chips and soft drinks and an increase in vegetables consumed at lunch. Parents in the universal pilot areas also had more positive perceptions of the school meals for health compared to food brought from home and thought that their children were more willing to try new foods.

Evidence has been emerging over the last couple of decades on the benefits of multi-component school food interventions and especially of those that focus on younger children (prior to adolescence) (Greenhalgh et al., 2007; Hollar et al., 2010). Multi-component interventions include the introduction of healthy foods in meals, integrated with curriculum, and often with parent involvement (Van Cauwenberghe et al., 2010). In the U.K., where a school meal intervention was implemented and integrated with curriculum on healthy and sustainable eating, significantly higher vegetable and fruit intake was seen among participants (Jones et al., 2012), suggesting important benefits of these types of more comprehensive interventions.

Furthermore, families can struggle to introduce healthy foods for a variety of reasons, including food availability, time scarcity, palatability of new foods, and affordability (Daniel, 2016; Engler-Stringer, 2009; Fielding-Singh, 2017; Slater, Sevenhuysen, Edginton, & O'Neil,

2012). Research in Canada has demonstrated that socio-economic status affects dietary intake for school-aged children (Ahmadi et al., 2014). Introduction of healthy foods in the context of a universal SFP has the potential to reduce this burden on families.

Aspects of mental health, such as stress and anxiety (among both child beneficiaries and their parents) are also important to consider when evaluating the health impacts of SFPs (Alaimo, Olson, & Frongillo, 2001). There are numerous parent- and family-focused websites and news articles that discuss the issues families face in trying to provide healthy school lunches for their children (Quotient Technology Inc., 2012; Belisle, 2016; Waverman & Beck, 2016; The Lunch Lady, 2016; Carlson, 2015; Loney, 2016). Provision of healthy school lunches is challenging for families for many reasons, including long working hours or poverty (Bauer, Hearst, Escoto, Berge, & Neumark-Sztainer, 2012; Griggs, Casper, & Eby, 2013). Parents may rely on highly processed foods, low in key nutrients but high in nutrients of concern (salt, sugar, and fat), to deal with time, poverty, and/or low-incomes (Slater et al., 2012).

Research examples from Canada

In a comprehensive school health intervention in Alberta, participating schools implemented a healthy eating policy (along with other food environment changes), resulting in a significant increase in consumption of vegetables and fruit, and decreased energy intake in intervention schools. Students also exhibited lower obesity rates compared to students elsewhere in the province (Fung et al., 2012).

In another study, the Child Nutrition Council of Manitoba offered a Vegetable and Fruit Snack Program (2008-2015) to schools across the province. This led to a significant increase in vegetable and fruit consumption and positive impacts on student behaviour and other indicators, such as attendance and social interaction (Child Nutrition Council of Manitoba, 2017).

In Ontario, a multi-component school fruit and vegetable program for First Nations youth improved their exposure to, and preference for, a variety of vegetables and fruit and enhanced their nutrition knowledge; however, it did not impact intentions or self-efficacy, which is likely due to high food insecurity rates and community-level barriers to healthy eating (Gates et al., 2011).

Learning and school food programs

Another purpose of school food programs (SFPs) is to support learning in the school context. Studies focused on SFPs and academic achievement, attendance, tardiness, and drop-out rates point to their other important impacts. Attendance and tardiness appear to be most affected, but some studies have found improvements in academic achievement with the introduction of SFPs (Alaimo, Olson, & Frongillo, 2001; Anderson, Gallagher, & Ritchie, 2017; Florence, Asbridge,

& Veugelers, 2008; Hollar et al., 2010; James, & Groff, 1997; Kleinman et al., 2002; Meyers, Sampson, Weitzman, Rogers, & Kayne, 1989; Murphy et al., 1998; Pollitt, Gersovitz, & Gargiulo, 1978; Symons et al., 1982; Turner & Chaloupka, 2015). Levy (2013) argues that arriving at school on time may be an important benefit of breakfast programs in particular and found positive associations between healthier diets in children overall and academic attainment. Two studies by Bro and colleagues, on teens considered to be "at risk", found that breakfast eaten before class (at school) improved attention during class (Bro, Shank, Williams, & McLaughlin, 1994; Bro, Shank, McLaughlin, & Williams, 1996).

Researchers from the U.K. two-year pilot of free school meals in three local authorities, discussed in the previous section, also measured changes in academic performance and only found improvements in the two regions where the free school meals were universal (Kitchen et al., 2010). The universal regions showed significant improvements in academic attainment, especially for children from the least affluent families and with lower prior attainment, leading the authors to speculate that the universal program may have reduced educational inequalities. Interestingly, the authors did not find differences in attendance between either the universal entitlement or increased entitlement groups and controls, thereby leading them to conclude that the attainment improvements were due to increased productivity at school (rather than improved attendance).

Oostindjer et al. (2017) argue that it is particularly important for SFPs to take an education-integrated approach. An education-integrated approach includes involving children in growing and preparing food, teaching them about sustainability in the food system (such as waste issues), and healthy behaviours along with provision of school meals. Using various international examples, they explain that integrated approaches are lacking in Sweden and the U.K., where evaluations have shown that meal programs are not viewed as positively by participants. They argue, "The lack of integration of food education with practice…results in under-utilization of the full potential of food and eating as source of learning" (p. 3948). In Italy, Japan, and Finland, where food programs have taken an education-integrated approach and there is more opportunity to integrate school meals with curriculum (food and nutrition, science, cultural learning, and more), the programs are viewed more positively.

Research examples from Canada

Evidence from Canada strongly supports the benefits of SFPs on improving learning-related outcomes. In Ontario, the Toronto District School Board introduced a school-based program called *Feeding our Future* that offered nutritious meals to all students regardless of their ability to pay (Easwaramoorthy, 2012). Evaluation of the program found improved student behaviours and attitudes, reduced tardiness, reduced incidence of disciplinary problems, and improved ability to stay on task (Easwaramoorthy, 2012), similar to the results of the *Kids Eat Smart Foundation Newfoundland and Labrador Evaluation* (Goss Gilroy Inc., 2013). The *Feeding our*

Future study showed students who ate the morning meal were less likely to be suspended and more likely to attend school regularly. Also, a greater proportion of high school students who ate the breakfast on most days were on track for graduation, compared with students who ate it only on a few days or not at all. Finally, a greater proportion of students who ate breakfast on most days at school achieved or exceeded provincial standards in reading, compared to those who never had the morning meals or ate them only a few days a week.

As discussed above, the vegetable and fruit snack programs intervention by the Child Nutrition Council of Manitoba showed positive impacts on student behaviour, attendance and social interaction (Child Nutrition Council of Manitoba, 2017). In Nova Scotia, research has identified a strong association between diet and academic performance, including evidence that school breakfast programs may potentially help to reduce food insufficiency, improve nutritional status and support academic performance in mathematics (McIsaac, Kirk, & Kuhle, 2015). These findings reinforce the findings of earlier studies in the province (Florence, Asbridge, & Veugelers, 2008). Finally, data from Prince Edward Island found that students with higher academic performance (average grades above 90 percent) were more likely to consume milk, vegetables, and fruit daily than were those who reported lower grades (MacLellan, Taylor, & Wood, 2008).

Culture, social norms and school food practices

In some countries, SFPs also have additional social and cultural education mandates. Some research has shown that SFPs contribute to positive behaviours including teaching about culinary heritage and social norms around food and eating (Larson & Story, 2009; Moffat & Thrasher, 2014; Oostindjer et al., 2017). In some countries, school meals are typically provided in a more traditional home meal-type setting where children sit together around tables with their teachers, and emphasis is placed on socialization (learning norms and values related to mealtimes for example), and about how to minimize food waste (Harper, Wood, & Mitchell, 2008; Oostindjer et al., 2017). Teachers may link the meal to learning about cooking, farming, and food cultures and thereby integrate the social and academic learning with consumption of the midday meal.

In countries such as Italy, Finland, France, and Japan, children sit around tables in groups at the midday meal (often with a teacher or other adult). Children serve themselves (or are served by other children) and are taught about table manners and aspects of their country's food culture (and are sometimes introduced to foods from other parts of the world) (Cather, 2016; Finnish National Board of Education, 2008; Harlan, 2013). In Finland, the meal program is considered a key aspect of the education system and is integrated closely with curriculum, including learning objectives related to social relationships, norms around eating, and appropriate behaviour. Research has shown some benefits of this type of social learning incorporated into school meal programs (Benn & Carlsson, 2014; Kubik, Lytle, Hannan, Perry, & Story, 2003; Tanaka & Miyoshi, 2012).

In lower-income countries, there is evidence that SFPs increase girls' attendance at school (Gelli, Meir, & Espejo, 2007), however, in high-income countries such as Canada, there is little known about whether SFPs contribute to gender equity. We know that women continue to do the majority of household food work in Canada (Slater et al., 2012). Hence, it could be argued that integrating SFPs with curriculum and hands-on learning with regards to growing and preparing food could contribute to a more equitable distribution of food labour in households, once participating children reach adulthood. Research on cooking programs with elementary school-aged children have found significant increases in cooking self-efficacy, improved attitudes towards cooking, and greater preference for vegetables and fruit, especially among boys (and children who had the least cooking experience prior to the cooking intervention) (Cunningham-Sabo & Lohse, 2014).

Research examples from Canada

Several studies in Canadian provinces have reported findings that support the role of SFPs in promoting a positive food culture and social norms. In BC, students who participated in Project CHEF, a hands-on cooking and tasting program offered in Vancouver public schools, reported an increased familiarity and preference for the foods introduced through the program. A significantly higher percentage of students exposed to Project CHEF reported an increase in skills such as: cutting vegetables and fruit, measuring ingredients, using a knife, and making a balanced meal on their own. They also reported a statistically significant increase in confidence making the recipes introduced in the program including fruit salad, minestrone soup, and vegetable tofu stir-fry (Zahr & Sibeko, 2017).

Food literacy and environmental education

Focusing SFPs on the provision of healthy and sustainable foods (vegetables and fruit, pulse crops, and locally produced foods as just a few examples) along with the promotion of sustainable food behaviours through school gardening and learning about how to reduce food waste, may work in a mutually reinforcing way (Oostindjer et al., 2017). These mutually reinforcing behaviours within school environments may then spill into life away from school (Suarez-Balcazar, Kouba, Jones, & Lukyanova, 2014). Stone (2007) and Weaver-Hightower (2011) both argue that food is not often used as a tool for education on environmental issues, about social and political systems, or about agriculture, yet it has great potential to be used for all of them. Food literacy education programs show how children can be involved in growing and preparing food, along with learning about how the food system works, and its critical environmental and social challenges, in age-appropriate ways to integrate learning with a meal program (Cullen et al., 2015). This integration allows students to learn greater appreciation for

food (especially food they have grown or prepared themselves), a greater willingness to try new foods (Dohle, Rall, & Siegrist, 2014; Morris, Neustadter, & Zidenberg-Cherr, 2001), and an understanding of how food systems intersect with other aspects of their lives.

Oostinjer and colleagues (2017) argue that the "emerging integration of school meals with classroom curricula aligned with food cultural learning and establishing an optimal food and social environment may facilitate learning of healthy and sustainable food behaviors" (p. 3950). An example from the U.K. is the Food for Life Partnership Program, which has a focus on sustainable eating behaviours and found a significant improvement in child participants' vegetable and fruit consumption (Jones et al., 2012). Brazil is also known worldwide for its SFPs with significant focus on food-system sustainability (Morgan & Sonnino, 2008).

Research examples from Canada

From 2010-2016, the Think&EatGreen@School project in B.C. worked to "build connections to create healthy, sustainable school food systems" (Rojas, Black, Orrego, Chapman, & Valley, 2017) by providing its entire school community "with opportunities to be involved in all aspects of the food cycle, to learn how to regain the right to participate in the decisions that shape the food system of public schools and educational institutions, and by extension, the food system of the City of Vancouver" (Rojas et al., 2011, p.773). In Ontario, emerging literature supports school gardens as a means to connect or reconnect children to the natural world in which they can form their own relationships with life and understand the origins of food (Harrison-Vickers, 2014).

The BC Farm to School Hubs program is part of a network formed in 2007 administered by the Public Health Association of BC and funded by the BC ministry of Health. In 2014, 50 new farm to school programs were developed across the province, towards the goals of bringing healthy, local food to schools, hands-on experiential learning opportunities for students, and fostering school and community connectedness. In a program evaluation, food literacy training was highlighted as the dominant activity emerging from the regional hubs, especially growing food in school gardens as a method to achieve other curricular learning outcomes and promote healthy lifestyle habits. For example, a school garden program at Smithers Elementary produces 35 types of edible plants, used in curriculum about climate change, food consumption, health and well-being, water quality, and food production. Other gardens work with elders and traditional knowledge keepers to cultivate native and traditional plants and share harvested foods in school programs (Powell & Wittman 2018).

Strengthening local and sustainable food systems through school meal procurement

Globally, government-sponsored institutional meal programs support redistributive and developmental goals such as food security, environmental sustainability, and economic growth in relation to local food systems. Farm to school programs, in particular, aim to increase the locally sourced share of sustainable and healthy foods procured, prepared, and/or eaten in schools by students. For local farmers, investment in agricultural production for target markets such as school meal programs can facilitate increased productivity, market access, better quality crops, and risk-mitigation strategies (De Schutter, 2014).

Strengthening local economies through investment in regional food production and distribution systems is a pillar of both the Federal Ministry of Agriculture and Agri-Food Mandate Letter in 2016 and provincial strategies, such as the 2015 BC Provincial Agrifood and Seafood Strategic Growth Plan. The BC plan includes goals for increasing within-province purchases of BC products by $2.3 billion (or 43 percent) by 2020, with a proposed action for achieving this goal to "encourage the development and adoption of buy local policies for food retail, food services, and public sector institutions" (British Columbia Ministry of Agriculture, 2015). Farmers and food processers who participate in local school meal programs indicate the benefits of structured school food procurement contracts for mitigating market volatility, for increasing market diversification and expansion and also as a mechanism for increased awareness of local agriculture among consumers (Izumi, Wright, & Hamm, 2009; Izumi, Wright, & Hamm, 2010; Wittman & Blesh, 2017).

In the U.S., the 2010 *Healthy, Hunger-Free Kids Act* modified nutrition guidelines for school meals, and established the USDA Farm to School program to connect local farmers to school nutrition programs. As of 2013, more than 12,000 farm-to-school programs were active in 50 U.S. states (Buckley, Conner, Matts, & Hamm, 2013). The USDA Farm to School program promotes targeted procurement of local foods for school meals; staff training; school kitchen equipment; and school garden and curriculum development (Benson, Russell, & Kane, 2015). U.S. schools purchased $789 million in local foods from farmers, ranchers, and food processors/ manufacturers during the 2013-2014 school year, as 4.8 percent of the total $16.4 billion budget for the national lunch and breakfast programs in 2014 (United States Department of Agriculture Food and Nutrition Service, 2016).

Brazil's national school meal program requires 30 percent of food served in schools to be sourced from local family farmers, with additional incentives for foods produced using organic and agro-ecological production methods. This 2009 policy change to the national school meal program was part of the larger Zero Hunger (Fome Zero) policy umbrella for increasing food access and nutrition that involved support for sustainable agriculture and local agricultural development (Wittman & Blesh, 2017).

Public institutions face several structural challenges in growing school meal programs, including increasing the procurement of local foods (Foodshare, n.d). While charitable models of

food provision struggle with issues of stigmatization and inconsistent service delivery (Raine, McIntyre, & Dayle, 2003), individual schools and school districts also have limited capacity to plan, procure, and deliver a meal program that meets nutritional guidelines and local food preferences with limited food preparation and storage infrastructure and human resources (Powell & Wittman, 2018). School meal programs often require long-term contracts with large institutional suppliers, who achieve economies of scale in food safety documentation and price that challenge the sourcing of seasonal local offerings.

Research examples from Canada

While there are limited Canadian data on the environmental, sustainability, and economic development impacts of SFPs, what does exist highlights the importance of ensuring best practices around food procurement and provision as part of a broader focus on food literacy and environmental sustainability in schools (Powell & Wittman, 2018). For example, BC has issued Sustainable Schools Best Practices Guides to help green-team leaders (e.g. students, teachers, administrators, support staff, parents) lead the school community through environmental actions in the areas of energy, waste, water, school grounds, and transportation (Government of British Columbia, n.d.).

The national organization Farm to Cafeteria Canada operates in several provinces. In BC, Farm to School BC was established in 2007 as a network administered by the Public Health Association of British Columbia (PHABC), a non-governmental organization that has multiple funding partners, including the Ministry of Health. PHABC, the BC Healthy Living Alliance, and other organizations support salad bar and produce availability-focused farm to school expansion initiatives throughout the province. The ongoing Farm to School Regional Hubs program also aims to increase and strengthen farm to school procurement to increase the provision of local foods in school meal programs (Powell & Wittman, 2018; Public Health Agency of British Columbia, 2017).

The Alternative Avenues to Local Food Procurement project, Ecosource and Roots to Harvest worked with teachers, students and food service providers in parts of Ontario to create and trial various approaches to incorporate local food procurement into SFPs, while engaging students in food literacy. This project has identified eight *Ingredients for Success* or guidelines for implementing local food procurement projects (Jones, Mitchell & Bailey, 2015). Jones et al. (2015) also highlights key challenges to local food procurement in the Canadian context which include the school calendar and resulting availability of local food in a Northern climate, the significant lack of knowledge that currently exists around what is available, when and how to access local foods, the volume of purchases which can be small when done at the individual school level, and higher costs associated with many local foods.

In Nova Scotia, the main provider of school food in the province, Nourish Nova Scotia, recently released an evaluation report on Nourish Your Roots, a fundraising initiative that sells

boxes of fresh, seasonal, and local produce to families of students. The first-year evaluation demonstrated that the fundraiser supported schools and local farmers, while also increasing awareness of the benefits of vegetables and fruit among participating families (Stewart, 2015).

Table 1: Key characteristics for a national SFP for Canada

Key Characteristic	Underlying Principle
1. Universal	SFPs welcome all students in a school community. They are offered at no cost or subsidized cost to families, and administered in a non-stigmatizing manner. In a shared cost model, payment is made in a way that ensures privacy.[1] Programs are promoted to ensure that all students have access to healthy food in school daily.
2. Health Promoting	SFPs are consistent with nutrition policies that focus on the provision of whole foods, and in particular vegetables and fruit. Nutrition policies that mandate the provision of a variety of vegetables and fruit (such as requiring lunches to include a minimum of two servings daily with variation) help to simplify the task for schools and districts. Focusing on the foods that fit within a healthy diet also provides an important modelling opportunity.
3. Respectful	Programs respect local conditions and needs so as to be culturally appropriate and locally adapted. Programs in diverse inner cities will look different from those in remote Northern communities, for example, and involvement by stakeholders with local experience is critical to success.
4. Connected	Programs are connected to local communities and work towards drawing upon local food resources where possible, supporting local producers and creating economic multipliers. Programs also engage the broader community including parents, grandparents, local businesses, and community leaders to foster sustainability.
5. Multi-Component	Programs use an education integrated approach with curricula to incorporate food literacy (from the farm to the fork to food waste), nutrition education, and food skills. Students are involved with SFPs through hands-on food preparation, budgeting, management, and other learning to foster experiential learning (learning by doing).
6. Sustainable	Programs are sustainable financially and in terms of capacity-building and in response to societal changes. This means ensuring that SFP staff and volunteers receive adequate training to ensure they understand their role in teaching and role modeling for students. Funding at the local level is stable and partnerships to support the program are created. Critical to the success of SFPs is regular monitoring and evaluation, and adaptability as circumstances change. This includes ensuring financial transparency and accountability for programs at the federal and more local levels.

[1]Payment is made in such a way as to ensure that children do not know who pays for the program and who receives a subsidy.

Conclusion: Key characteristics of a national school food program for Canada

Greenhalgh et al. (2007) state in their review on SFPs around the world: "Programmes are more likely to be effective when designed in partnership with the local community and interventions are piloted" (p.861). With this in mind, we put forward key characteristics that we believe must be part of a national SFP for Canada in Table 1. These characteristics are consistent with the research review presented in this paper, and in particular with the third phase of SFPs outlined by Oostindjer et al. (2017) in their comprehensive review of the evolution of school feeding around the world. A third phase of SFPs is a response to increased rates of childhood obesity and chronic diseases and the larger societal context of food systems, climate change, and environmental degradation, which are all issues that are very much of concern in Canada today (Oostindjer et al., 2017). SFPs in the third phase focus on incorporating food-system and societal issues into food programs and policies and generally integrating them more closely with curricula and the broader school environment, in addition to a strong focus on nutrition.

First, universality is important because it preserves the dignity of all students (both those who can pay and those who cannot) and creates a social environment that is most conducive to introducing unfamiliar foods (Kristjansson et al., 2007). Second, health promoting means that school food policies and the programs that follow them are consistent with the best evidence on optimum nutrition for children. The third and fourth characteristics, referring to a program that is connected and respectful are consistent with the most successful programs currently in operation across Canada, which reflect the diversity that exists in food cultures and geographies as highlighted in the examples put forward in this review. The importance of being multi-component has been highlighted time and again throughout our review, and is critical to being part of the third phase of SFPs as outlined by Oostindjer et al. (2017). The final characteristic, that it is sustainable, while not directly addressed in this review to date, must underpin the others. Provisions for on-going funding, staffing, and training must be part of a national program. Also important for sustainability is that local adaptations are regularly evaluated and modified to meet changing environments.

National organizations have been calling for a Canadian SFP (Conference Board of Canada, 2013; Food Secure Canada, n.d.). Yet, challenges faced by current ad hoc SFPs in communities across Canada must be considered when visioning the policy implementation of a national SFP. Schools and meal providers report a wide range of barriers to achieving a universal food program including small purchasing volumes, isolation and lack of capacity for evaluation (Jones et al., 2015), as well as lack of human and physical infrastructure for procuring, preparing, and serving regular meals (Powell & Wittman 2018). A national SFP could mitigate many of the barriers experienced when individual communities attempt to provide such programming on their own through practices such as knowledge and best practices sharing, community kitchen and locally centralized catering services, local food hubs, and group purchasing contracts. The shining lights of school food in Canada could serve as models for smaller or less experienced communities.

The time is right for Canada to establish a national SFP informed by the best evidence from around the world, as well as the hundreds of ad hoc programs that have been operating across Canada over the last few decades. While Canada is a laggard overall when it comes to establishment of a national SFP, it could be at the forefront of movement towards phase three of national SFPs (Oostindjer et al., 2017), through a curricular integration approach with a focus on chronic disease prevention, food systems, and sustainability. Such a program has the potential to support the health and learning of our children, transform our food systems, and foster the use of locally-produced food for strong economies, while cultivating community and environmental health (Sumberg & Sabates-Wheeler, 2011).

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