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# Health and Grades: Nutrition Programs for Kids in Canada

*Should Canada have a universal, national student nutrition program? The evidence suggests there is a better way to target food-insecure children.*

Rosalie Wyonch and Abby Sullivan

## About The Authors

**Rosalie Wyonch**
is a Policy Analyst at the C.D. Howe Institute.

**Abby Sullivan**
is a Researcher at the C.D. Howe Institute.

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*Daniel Schwanen*
*Vice President, Research*

## The Study In Brief

In many parts of Canada and around the globe, elementary and high-school students gain access to nutritious foods via school-based student nutrition programs. Funded by governments, corporations, foundations and the public, these programs are designed to ensure school-age children have access to the necessary nutrition they need to learn.

Canada is the only G7 nation without a national student nutrition program.

This *Commentary* investigates the potential short-and long-term impacts of student nutrition programs, including their relation to student performance and health and whether a government-supported and universal national student nutrition program should be established, including in targeted communities. It investigates the potential short- and long-term effects of student nutrition programs through rigorous assessment of available studies from Canada and other developed nations and analysis of the effects of a school nutrition program in Toronto. Although policies supporting student nutrition programs in some countries go back nearly a century, there is a rather surprising lack of consensus in existing research about their effects.*

School nutrition programs have multiple objectives: ensure children consume enough quality energy, minimize the percentage of food-insecure children through free or subsidized meals and improve nutrition and overall health. How SNPs meet these objectives may put achieving individual goals at odds. With diverse objectives and disparate methodologies and metrics deployed to assess their impact, and with program structures differing from country-to-country, the lack of consensus in the literature becomes understandable. These challenges and the paucity of credible evidence about the long-term effects of nutrition programs overall, led us to investigate the design of the programs themselves.

The fundamental goal of school nutrition programs is to feed hungry children. There is quite strong evidence of the benefits of eating breakfast over not doing so, but evidence of the effect of breakfast programs in terms of wider goals of student performance and health is, mixed and inconclusive. Moreover, the success of any nutrition program depends on the logistics and execution of the program. These insights lead us to conclude that:

- Providing a healthy breakfast is an effective measure to improve academic performance and cognitive functioning among undernourished populations. The long-term effects of eating breakfast on the performance of school children who do not have physical signs of severe undernourishment are less certain.
- At the same time, there is a lack of statistically significant evidence that nutrition programs improve overall learning ability or school attendance in high-income countries.
- There are persistent challenges in provisioning high-quality student nutrition programs, many of which stem from inconsistent access to the necessary resources. The temptation to expand a program to cover more students at the expense of improving the program for those already receiving it should be resisted. Scaling a nutrition program that does not meet nutritional standards consistently or that suffers from systemic operational challenges almost certainly would be of little benefit to students generally. Instead, the program should remain targeted at the most at-risk children, who are most likely to benefit, until it is functionally scalable.
- To balance the need for universal access while also keeping the program targeted, priority should be given to schools in neighbourhoods with a high percentage of households on social assistance or with low incomes. If a school does have a nutrition program, it should be available to all children within the same peer groups (classes or grades), not restricted to children in need.

* For more information about the studies considered, see online Additional Resources.

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**In many parts of Canada and around the globe, students access nutritious foods via school-based programs. Indeed, Canada is the only G7 country without a national program, partly as a result of its provincially run school systems.**

National programs outside Canada vary widely in scope and design, features that affect their effectiveness. Funded by governments, corporations, foundations and the public, these programs are designed to ensure school-age children have access to the necessary nutrition they need to learn, something malnourished children will struggle with. Nutrition programs are also about health per se: they provide meals for low-income or food-insecure children who might not have access to enough healthy food. They teach children about nutrition and making healthy choices, potentially affecting nutrition over the course of their life.

This *Commentary* investigates the effects of nutrition programs on student performance and health. Not surprisingly, current literature that sheds light on the relationships among food security, health and academic performance finds that food security is an important component to good outcomes in these areas. We then explore the effectiveness of nutrition programs at improving these metrics. Many of the research studies evaluating student nutrition programs have been conducted in other countries, some with vastly different contexts, and report mixed results, making comparison difficult. Moreover, many such studies also rest on shaky methodological grounds. Thus, caution should be taken when applying results from different countries to the Canadian context.

A wide-ranging literature review on the relationship between childhood nutrition and cognitive function finds that food insufficiency is a serious problem affecting children's ability to learn (Taras 2005). To dig further into the effects of student nutrition programs in a Canadian context, we analyze school-level data from the Toronto District School Board (TDSB). Our analysis suggests that programs that focus on more at-risk areas, are community-based, and where the use of funds is controlled locally, have the best chance of success. It should be noted that we find little statistically-significant evidence from the TDSB program that breakfast programs improve test scores, attendance or learning ability. This might be due to the persistent challenges in provisioning high-quality student nutrition programs, many of which stem from inconsistent access to the necessary resources. These challenges and the paucity of credible evidence about the long-term effects of nutrition programs overall, led us to investigate the design of the programs themselves. We show that program and policy design can matter a lot to the success of a program. We recommend policies to improve existing nutrition programs, but we also point to some issues that would arise with their expansion to a universal, publicly funded program. Our analysis suggests that programs that focus on more at-risk areas, are

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community-based, and where the use of funds is controlled locally, have the best chance of success.

## The Role of Nutrition and Nutrition Programs in Student Success

Good nutrition is an essential part of a healthy lifestyle for children. It can promote positive health outcomes and may also guard against health problems caused by a nutritionally deficient diet. Canada, like many high-income countries, struggles with issues related to obesity and other chronic disease. Similarly, there are households that suffer with food insecurity – the inability to access enough healthy food consistently to meet their needs.[1]

Nutrition, food security, weight and mental health are all complex and interrelated issues, and these health outcomes are also associated with household wealth and socioeconomic status. In the following sections, we discuss existing research that illuminates aspects of the complex interactions among health, wealth and academic performance and the evidence linking these to student nutrition programs.

### Nutrition, Wealth and Cognitive Performance

Among children, food insecurity has been linked to poorer health status and educational outcomes. A study using nationally representative data in the United States found that food insecurity between kindergarten and grade three was associated with significantly lower mathematics scores, controlling for relevant socioeconomic and demographic variables. Additionally, food-insecure girls (but not boys) had higher weights and body mass indexes (BMIs) than did food-secure children (Jyoti, Frongillo, and Jones 2005).

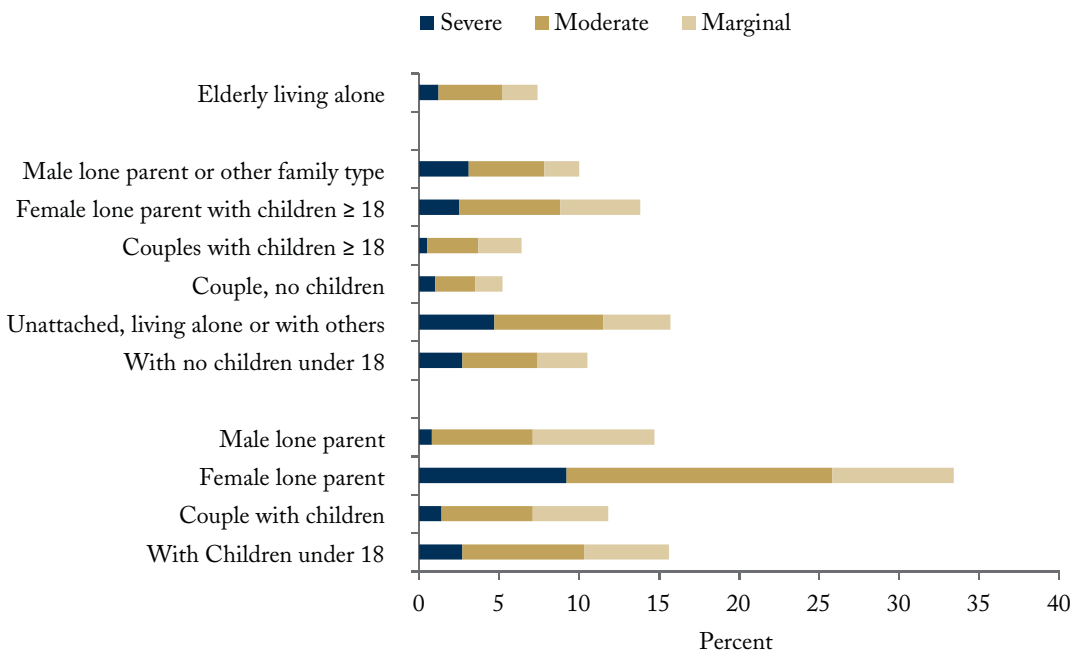
These results are mirrored in Canadian survey data. Overall, about 12 percent of Canadian households experienced at least marginal food insecurity in 2014, and about one in six youths under age 18 live in such a household (Tarasuk, Mitchell, and Dachner 2016). Low-income and female-headed lone-parent households are much more likely to be food insecure (Figure 1). In 2014, 43.9 percent of low-income households and 60.9 percent of households receiving social assistance experienced food insecurity. Low-income youth were shorter than their high-income counterparts. In low-income households, food-insecurity is associated with a higher prevalence of obesity in boys than in food-secure households (Mark et al. 2012).[2] Survey results from Nova Scotia reveal that children with a low-quality diet and engaging in little physical activity are more likely to do poorly on tests of academic performance in English Language Arts (McIsaac, Kirk, and Kuhle 2015).

Food insecurity also might be associated with higher adverse mental health outcomes. In the United States, food insecurity in adolescence is associated with a higher likelihood of past-year mood, anxiety, behaviour and substance disorders, after controlling for other socioeconomic indicators (McLaughlin et al. 2012). A study of children in Nova Scotia found that students from households with lower socioeconomic status and from single-parent families had a higher prevalence of being diagnosed with an internalizing disorder (depression, anxiety associated with trouble sleeping, excessive worrying and so on). The

1 Statistics Canada defines "food insecurity" as occurring in households that were uncertain of having, or unable to acquire, enough food to meet the needs of all their members because they had insufficient money for food. Depending on the extent of the experience, households are classified as either moderately food insecure or severely food insecure.

2 These are comparative averages and do not account for control variables. It is worth noting that income is not necessarily a guarantor of food security, nor is low income a sure sign of food insecurity (see Cook and Frank 2008; Fram, Bernal, and Frongillo 2015; Nord, Jemison, and Bickel 2000).

**Figure 1: Food Insecurity by Household Composition**




Source: Tarasuk et al.

prevalence of such a disorder was lower among students who were physically active and had normal bodyweight, while the quality of the students' diet was not significantly associated with these disorders (McMartin et al. 2012).

The mechanisms that connect food insecurity, health and cognitive performance are not clearly understood, but it is likely that food insecurity negatively affects people through both physical/nutritional and psychological stress. There is some evidence that food insecurity is associated with lower future health status in women, but there is stronger evidence that poor health can lead to future food insecurity (McLeod and Veal 2006). Children are particularly vulnerable to risks associated with poor diet, which can stunt growth and impede both physical and cognitive development. Cognitive development, such as language comprehension and memory, has been shown to be negatively affected by nutrient deficiencies and high-sugar and low-iron foods that characterize food-insecure diets (Ke and Ford-Jones 2015).

It is therefore not surprising to see that many school administrators and educators are concerned about the impact of poor nutrition on school children's behavior and performance.

## The Role of Breakfast in Student Success

The effects of eating breakfast on academic achievement and health show mixed but generally positive results. Providing a healthy breakfast is an effective measure to improve academic performance and cognitive functioning among undernourished populations. This is not surprising given that nutrition and medical studies indicate that eating breakfast provides a significant portion of the daily caloric and nutrient intake that is especially important for children (Deshmukh-Taskar et al. 2010).

However, the majority of Canadian children and adolescents do not meet national dietary guidelines for dairy products or for fruit and vegetable consumption, and their overall diet quality is poor (Garriguet 2006, 2009).[3] As it is, children consume about one-third of their daily energy intake during school hours, and this food is nutritionally poorer than food consumed outside school hours (Tugault-Lafleur, Black, and Barr 2017) A TDSB study of students in grades 7–12 found that girls, students from lower socioeconomic backgrounds, and students from single-parent households were also more likely to skip breakfast (O'Reilly, Rosolen, and Archer 2015).

Having said this, the long-term effects of eating breakfast on the performance of school children who do not have physical signs of severe undernourishment are less certain (Greenhalgh, Kristjansson, and Robinson 2007; Oostindjer et al. 2017; Taras 2005). Indeed, low- and middle-income healthy eight-to-ten-year-old children in Texas showed no improvement in measures of attention, impulsivity, short-term memory, cognitive processing speed or verbal learning whether or not they had breakfast (Iovino et al. 2016).[4]

Results from the TDSB indicate that eating breakfast most days is associated with slight improvements in learning skills[5] (Figure 2) and higher academic achievement[6] for students in grades 7 and 8 (Figure 3). A comprehensive review of 45 studies published between 1950 and 2008 examining the effect of breakfast on cognitive performance found that breakfast consumption is more beneficial than skipping breakfast, although the kind of breakfast consumed has little effect (Hoyland, Dye, and Lawton 2009). The review also found some evidence that habitual consumption of high-quality breakfasts has additional benefits – generally stronger for children with low initial nutrition status or low IQ – but cautions that the 45 studies were generally of low quality because of such defects as poor experimental design, non-significant results, weak statistical methods and/or missing variables. Studies of school breakfast programs suggest they have positive effects. "These effects could, however, be an artifact of the increased school attendance that such provision encourages" (Hoyland, Dye, and Lawton 2009 p.237).

In a review of 19 studies on the effects of breakfast on behaviour in children and adolescents, 11 demonstrated positive effects, although once again the review's authors caution that many studies lack scientific rigour and that the high-quality, randomized-control-trial studies included in the review did not find any behavioural benefits (Adolphus, Lawton, and Dye 2013). Overall, the evidence suggests breakfast has beneficial effects on children's on-task behaviour in classrooms, mainly in those younger than age 13.[7] Similar to other studies, the review finds some evidence that habitual breakfast consumption improves school grades or test scores.

Few studies have been undertaken of the effects of eating breakfast on achievement by older children. One study using TDSB data found that increasing the frequency of eating breakfast by about once per week was associated with a 2 percent increase in the average marks of grade 11 and 12

3 This is the case in many high-income countries – see Gu and Tucker (2017); Serra-Majem et al. (2004); Vereecken, De Henauw, and Maes (2005); Wong et al. (2015).

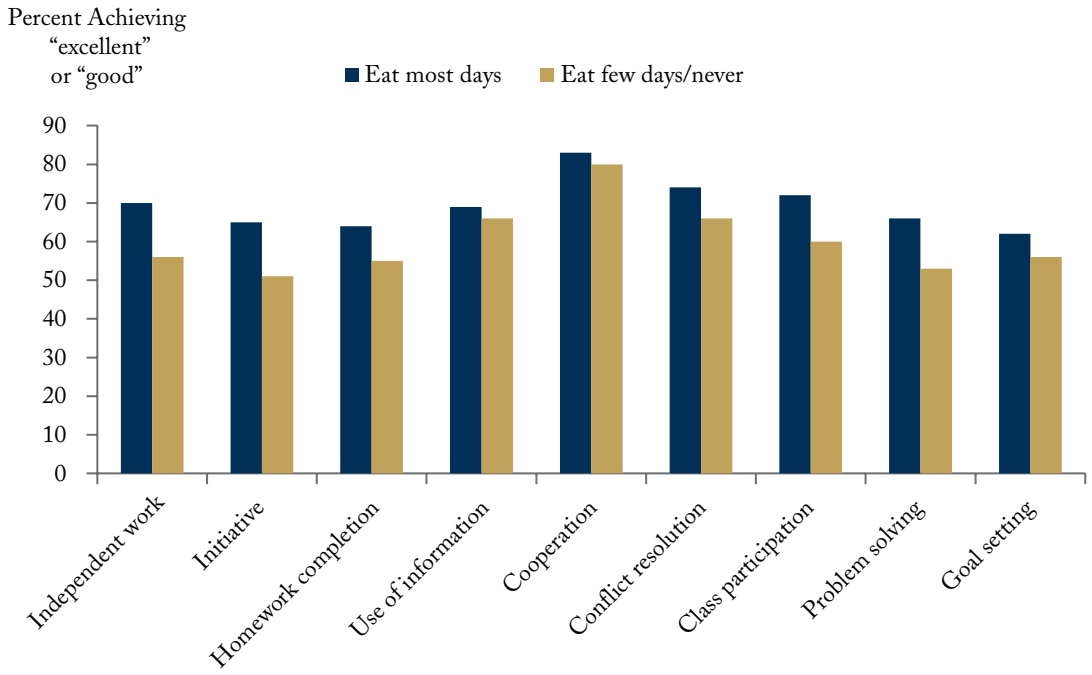
4 This study was conducted in a controlled clinical environment with standardized meals and fasts across participants. It included substantive measurement of health variables, including blood glucose and ketone levels, blood pressure, heart rate and anthropometric measures. Measures of cognitive functioning were standardized psychological tests.

5 Statistically significant differences have been found in independent work, initiative, problem-solving and class participation.

6 The only statistically significant differences are observed in Reading (Levels 3 and 4) and Science (Levels 1 and below).

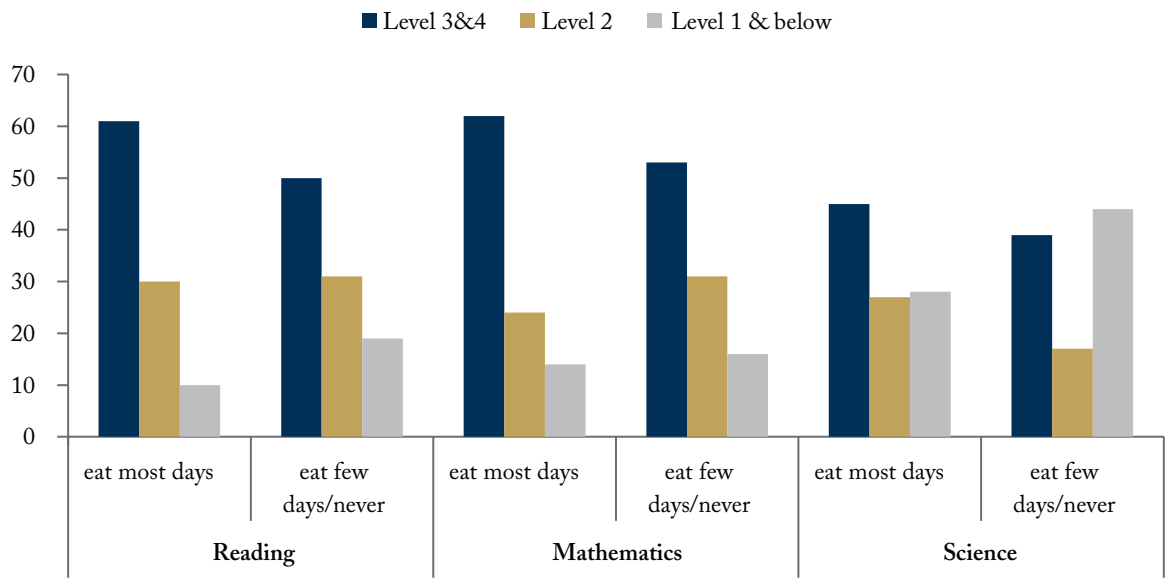
7 The authors caution that some studies do not control for socioeconomic status and therefore do not include an important explanatory variable, which discounts the validity of the results (Adolphus, Lawton, and Dye 2013).

## Figure 2: Grade 7 and 8 Students' Learning Skills




Source: Muthuswamy, 2012. Figure 12.

## Figure 3: Grade 7 and 8 Student Academic Achievement and Morning Meal Participation




Source: Muthuswamy, 2012. Figure 13.

students (Anisef et al. 2017). The study also found additional evidence that breakfast frequency is positively related to the likelihood that students accept a university enrolment offer, but not college.[8]

Overall, there is evidence that eating breakfast has beneficial effects on student achievement, compared to no breakfast. There is some evidence that the frequency of breakfast consumption and the quality of breakfast both play a role in student success, and the benefits of eating breakfast are generally stronger for children initially at a low nutritional status. However, the mechanisms that translate breakfast consumption to either improved behavior or academics are not well understood. This is of critical importance to the success of student nutrition programs that have aims beyond satisfying hunger for food-insecure children. For school nutrition programs to affect attendance, grades and, ultimately, graduation rates, we need to understand the mechanisms that connect the programs to these effects.

## The Effects of Student Breakfast Programs: The Evidence

School nutrition programs have multiple, somewhat contradictory objectives: ensure children consume enough energy, minimize the percentage of food-insecure children through free or subsidized meals and improve nutrition and overall health. Although school nutrition programs initially were targeted at ensuring children got enough food, their aim in developed countries changed over time to focus more on nutritional quality as food scarcity became less prevalent and obesity and chronic diseases related to overall diet emerged as important issues (Oostindjer et al. 2017). This means that, by their nature, these programs are not a one-size-fits-all fix for the myriad policy problems they have been touted as addressing. Youth obesity and food insecurity will not be solved through the provision of school nutrition programs.

There is some evidence that student breakfast programs improve the dietary quality of their participants via a nutritionally substantive meal (Bhattacharya, Currie, and Haider 2006; Crepinsek et al. 2006; Frisvold 2012), but their effect on preventing obesity is inconclusive (Millimet, Tchernis, and Husain 2009). For example, a study evaluating nutrition of grade 5 students in Nova Scotia before and after the introduction of a provincial student nutrition program found that consumption of milk products increased, but there was no change in fruit and vegetable consumption; as well, students were found to consume fewer sugar-sweetened beverages. However, slight improvements in dietary quality and decreases in energy intake do not seem to have had strong spillover effects, as obesity rates continued to rise (Fung et al. 2013). In other studies, breakfast programs had no effect on students' 24-hour dietary intake (Crepinsek et al. 2006) and no spillover effects that improved dietary quality for the household overall (Bhattacharya, Currie, and Haider 2006).

There is also a lack of statistically significant evidence[9] that nutrition programs improve overall learning ability or school attendance in high-income countries, although evidence suggests that students who participate in such programs perform better on tests (Figlio and Winicki 2005; Greenhalgh, Kristjansson, and Robinson 2007; Imberman and Kugler 2014; Kristjansson et al. 2007). This better test performance, however, does not seem to translate into improved grades and is not related to different lengths of exposure to a nutrition program. Imberman and Kugler (2014,

8 Frequency of eating dinner was also associated with the higher likelihood of accepting a university offer.

9 The chance that there is no effect attributable to nutrition programs exceeds, generally, 5 percent. These results might be interpreted as weak evidence of an association, but there is not high confidence in the estimated effect.

697) suggest that these "results are likely due to impacts on test performance from higher calorie intake rather than actual impacts on learning." This hypothesis is supported by a study of school lunch menus in Virginia (Figlio and Winicki 2005), which found that schools threatened with accountability sanctions related to standardized test results increased the caloric content of lunches on testing days. Moreover, schools that increased caloric levels more had relatively larger gains in test scores, although the authors suggest the results should be interpreted with caution due to the small sample size. In another study, however, breakfast had no short-term effect on attention, impulsivity, short-term memory, cognitive processing speed or verbal learning for eight-to-ten-year-old children from low- and middle-income families in Texas (Iovino et al. 2016). Few studies have investigated the long-term effects of nutrition programs.

One study evaluating the effect of a breakfast program in Norway in the 1920s[10] found that a healthy school breakfast increased educational attainment by 0.1 of a year and improved earnings by 2–4 percent (Bütikofer, Mølland, and Salvanes 2016). Duration and age of exposure, however, did not have significant effects, which discounts the possibility of a causal link.[11] More recently, 10-to-12-year-old students receiving a free school meal in Norway were less likely to eat breakfast on weekends and showed no improvement in overall meal frequency compared to students who didn't receive the meal (Næss 2017). Norway, as a result, is one of the few advanced countries without a nutrition program.

There are more examples of evaluations of student nutrition programs related to a specific outcome as opposed to general effects. A study on the implementation of universal school breakfast programs in Boston public schools found that 32 percent of the children who increased their participation in the programs over a six-month period improved their nutrient intake levels (Kleinman et al. 2002).[12] Participation in these programs has also been linked to reduced absences and tardiness, although with little statistically significant evidence to support this effect (Basch 2011; Kleinman et al. 2002).

The uncertainty about the effectiveness of nutrition programs in high-income countries is partly due to a lack of comparable studies.[13] Conflicting results can be found when research focuses on different measures of improvement – nutrient intake, student performance and healthy weight/height have all been reported as indicators, and few studies have investigated all aspects simultaneously.[14] For example, one study found that a nutritionally balanced school meal had positive effects on blood pressure, but also that it increased BMIs slightly (Damsgaard et al. 2014), indicating that, to understand the effects

10 The program – "Oslo breakfast" – ended in the 1950s, when development of the Norwegian welfare state eliminated public worries about the starvation of children. "When social need was no longer seen as pressing, support for the policy collapsed as such meals weighed rather heavily on public budgets." Andersen and Elvbakken, 2007:376).

11 This study use difference-in-difference estimation methods linked to outcomes at the municipal level. If the increase in earnings were due to the nutrition program, then the expected result is that longer exposure or at earlier ages would have a significant positive effect on lifetime earnings.

12 The study classifies any consumption that is 50 percent or less of the recommended daily nutrients as "low nutrient intake."

13 It is also likely that school meal interventions with less favourable results exist, but are not published due to publication biases toward positive results, as with other scientific domains (Oostindjer et al. 2017).

14 It is also difficult to separate the effect of nutrition programs from other public health promotion initiatives. A systemic review of 42 interventions in Europe finds evidence that multi-component interventions that combine food availability with the curriculum and parent involvement had relatively strong effects on dietary improvement in children, but limited effects for adolescents (Van Cauwenberghe et al. 2009).

of nutrition programs, health, performance and anthropometric[15] outcomes should be evaluated together. In a study evaluating the introduction of free school breakfasts served in the classroom or cafeteria in the United States, Schanzenbach and Zaki (2014) found that neither method of program delivery affected household food insecurity or nutrient intake and did not substantially alter whether or how much students ate. Serving breakfast in class increased nutritional intake, both in terms of quality and the likelihood that a child ate breakfast, but it also potentially crowded out classroom instructional time.[16] It is also worth noting that serving breakfast in classrooms increased participation by ten percentage points, but also increased the likelihood of consuming two breakfasts by five percentage points. Breakfast programs did not significantly affect grades or attendance.[17] Breakfast served in class had a positive effect on student behaviour in some minority populations, and decreased the incidence of being overweight in high-poverty urban schools.

Overall there is strong evidence to support the benefits of consuming breakfast, and some evidence of added benefits from consistent consumption of a high-quality breakfast. Benefits of eating breakfast are generally stronger for children initially with a low nutritional status. Similarly, there is some evidence that student breakfast programs improve the consistency and nutritional quality of breakfasts that participants consume. Unfortunately, this does not translate into an increase in energy consumption or improved nutrition overall. There is also no evidence to support student nutrition programs as a means to reduce overall household food insecurity. Given that student nutrition programs have been in existence for quite some time,[18] the lack of evidence to support benefits is surprising.

High-quality studies consistently do not find evidence that nutrition programs positively affect students' behaviour, attendance or overall learning ability in the general population in developed counties.[19] So far, the evidence supports only modest benefits from nutrition programs for the students most in need. The clear benefits of consuming breakfast are a rationale for providing it for students who would not get it otherwise. The literature suggests, however, that providing a free breakfast program is unlikely to translate into broader societal effects in terms of decreased food insecurity, improved population health or human capital accumulation.

## Student Nutrition Programs in Canada

Unlike the United States, which developed a national School Breakfast Program in 1975, Canada does not have an implemented national standard

15 These are measurements of human individuals.

16 The increased calorie and nutrient consumption associated with serving breakfast in class appears to be offset at other times of day. Neither program showed an effect on 24-hour dietary intake.

17 The breakfast in class program had a positive effect on attendance (increasing it by 1.05 percentage points) in year three only. It also increased tardiness significantly in some years, but the magnitude of the effect amounted to less than one day per school year.

18 In the United States, the National Student Lunch Program was initiated in 1946 and the School Breakfast Program was piloted in 1966 and made permanent in 1975 (Currie 2003).

19 High-quality studies might have features such as random-assignment experimental design, a depth of control variables measured and well-defined standard measures.

for school meal programs (Gougeon et al. 2011).[20] Rather than falling under federal responsibility, these programs are left up to the provincial and municipal governments, individual communities, non-profit non-government organizations and school boards (Godin et al. 2017). Ontario, Nova Scotia and Alberta are the first provinces to take collective action towards developing province-wide standards and programs. These programs also demonstrate the inefficiencies that can arise when government funding and guidelines are not aligned. In the remaining provinces, existing school meal programs are organized and funded by non-profit organizations dedicated to supporting child nutrition. These charitable organizations raise revenues through fundraising campaigns, donations from business partnerships, parents and communities, and government grants.

A systemic review of guidelines for school breakfast programs in Canada has found that no guidelines are available from the federal or territorial governments or from four provincial governments – those of Saskatchewan, Prince Edward Island, New Brunswick and Quebec (Godin et al. 2017).[21] In the recommendations that do exist, there is some consistency across guidelines, but also contradictions.[22] Common recommendations include engaging parents and enthusiastic trained volunteers, making the programs essentially cost free for children and their parents and introducing some concept of "universality" regarding program accessibility. There is significant inconsistency in other areas, especially about what foods programs should contain. For example, Ontario recommends against offering products that contain peanuts due to potential allergy concerns, whereas Manitoba's guidelines "do not address or exclude potential food allergens" (Manitoba 2014).

Even when there are guidelines for provisioning student nutrition programs, many programs are non-compliant due to a number of difficulties. Program coordinators in Ontario have reported that many schools struggle with what to serve without proper facilities for food preparation; some also admit not serving the healthiest option due to food cost, uncertainty about nutrition guidelines and interpreting nutritional information on food labels. Many coordinators reported difficulty in maintaining partnerships with stores or community organizations, and unreliable help from school staff and volunteers. The most common reported threat to student nutrition programs was consistent and sustainable funding (Valaitis, Hanning, and Herrmann 2013). In Nova Scotia, foods that offer minimum nutrition and are not permitted as part of the province's nutrition policy were found to be listed in 12 to 45 percent of school menus, showing widespread non-compliance (McIsaac, Kirk, and Kuhle 2015). A 2012 analysis of Alberta schools' adherence to nutrition guidelines for children and youth found about 16 percent of schools were not aware of the guidelines, which had been introduced in 2008. Additionally, 35 percent of schools that were aware of the guidelines did not adopt them for various reasons, with parents' resistance to change cited most often (Downs et al. 2012).

20 While it is true that Canada is the only G7 nation without a national student nutrition program, it is not unique in lacking a national student breakfast program: other G7 nations all have student lunch programs. The UK, for example, established a breakfast program in 183 schools from 2014 to 2016 and has goals to expand the program to 1,700 schools by 2020. Some other advanced countries – including Norway, Denmark, the Netherlands, Belgium and Switzerland – do not have compulsory student nutrition programs (Harper, Wood and Mitchell 2008).

21 The New Brunswick Teachers' Association and the Saskatchewan School Boards Association have issued guidelines in lieu of provincial guidelines.

22 For a comprehensive list of similarities and differences in nutrition program recommendations, see Godin et al. (2017).

Alberta's school nutrition pilot program is an example of where government funding and the suggested guidelines on dollars spent per meal do not align, causing inefficiencies. The funding structure for the pilot was to provide a $250,000 grant to each of 14 selected school districts across the province, which would then decide how – and to whom – they would distribute their funding. Alberta's school districts vary significantly, however, in number of schools, students and demographics – for example, the Calgary Board of Education has roughly 121,000 students, while the Calgary Catholic School District has about 56,000. Thus, as each board received the same lump sum funding for school nutrition programs, the latter school board received more than twice as much funding per student as the former during the pilot. The Alberta government suggested a spending guideline of five dollars per student per day and, as the pilot summary explains, more than five thousand students received a daily nutritious meal as a result of the project. These numbers, however, show a discrepancy between the amounts of funding provided each school district and what it would actually cost to satisfy the government's recommended spending guidelines. At five dollars per meal, to feed five thousand students for a minimum of 180 school days, the program would cost $4,500,000. The government, however, provided a total of only $3,500,000 in funding for the 14 school districts, coming up short of the money needed to meet the recommended spending per capita by about $1 million.

Nutrition programs in Canada suffer from a number of difficulties that might limit their effectiveness in improving students' health and influencing further benefits later in life. The discrepancy between recommendations and funding illustrate inconsistency in student nutrition policy. If funding is inadequate to meet nutrition guidelines and coordinators must make choices about substituting quality for quantity or reducing the program in other ways, then nutrition programs are, by definition, marginally food insecure. Although, technically, any funding should be better than no funding, it is not efficient to distribute equal amounts of funding to different school districts without taking into consideration differences in geographic size and number of students. Due to the lack of consistency in guidelines, funding mechanisms and policy goals across the country, it is not surprising that it has resulted in programs that vary in complexity and scope and show a variety of ambiguous, if generally positive, results.

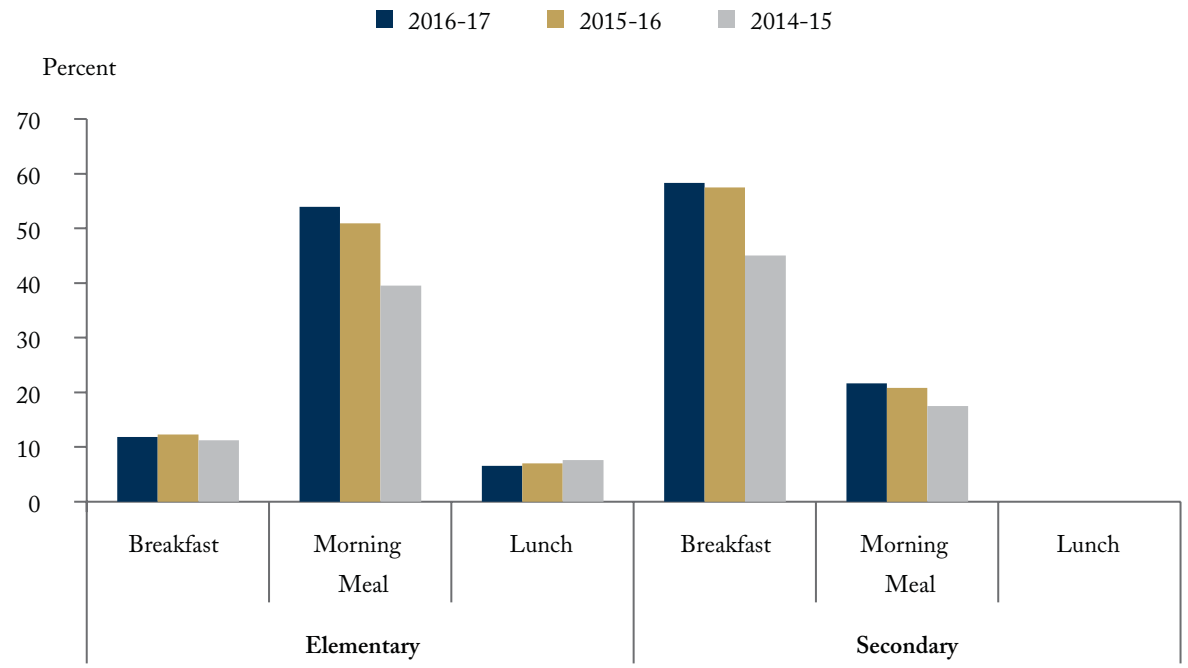
## Evidence from Nutrition Programs in Toronto

Nutrition programs for students are generally thought to be beneficial for a wide range of outcomes. To evaluate whether breakfast programs affect students' learning ability, test scores or attendance, we analyzed data from the Toronto District School Board that cover student performance indicators, socioeconomic information and the provision of nutrition programs.[23]

The first observation is that the majority of schools offer either breakfast or a morning meal (Figure 4). Generally, the morning meal is served during class time and breakfast is served grab-and-go style before classes begin. Lunch programs are far less frequent, which could be due to a lack of cafeteria facilities and the significantly higher resource costs to provision. The second observation is that disadvantaged schools are more likely to provide meals. Simple correlations between the availability of nutrition programs and some behavioural and socioeconomic indicators shows that schools in neighbourhoods with lower median incomes, a higher prevalence of households on social assistance and low levels of education among the adult population are more likely to provide meals for students (Figure 5). Similarly, schools

23 Data cover 473 elementary schools and 120 secondary schools for three academic years (2014-15 to 2016-17).

**Figure 4: TDSB Schools Offering Meal Program**



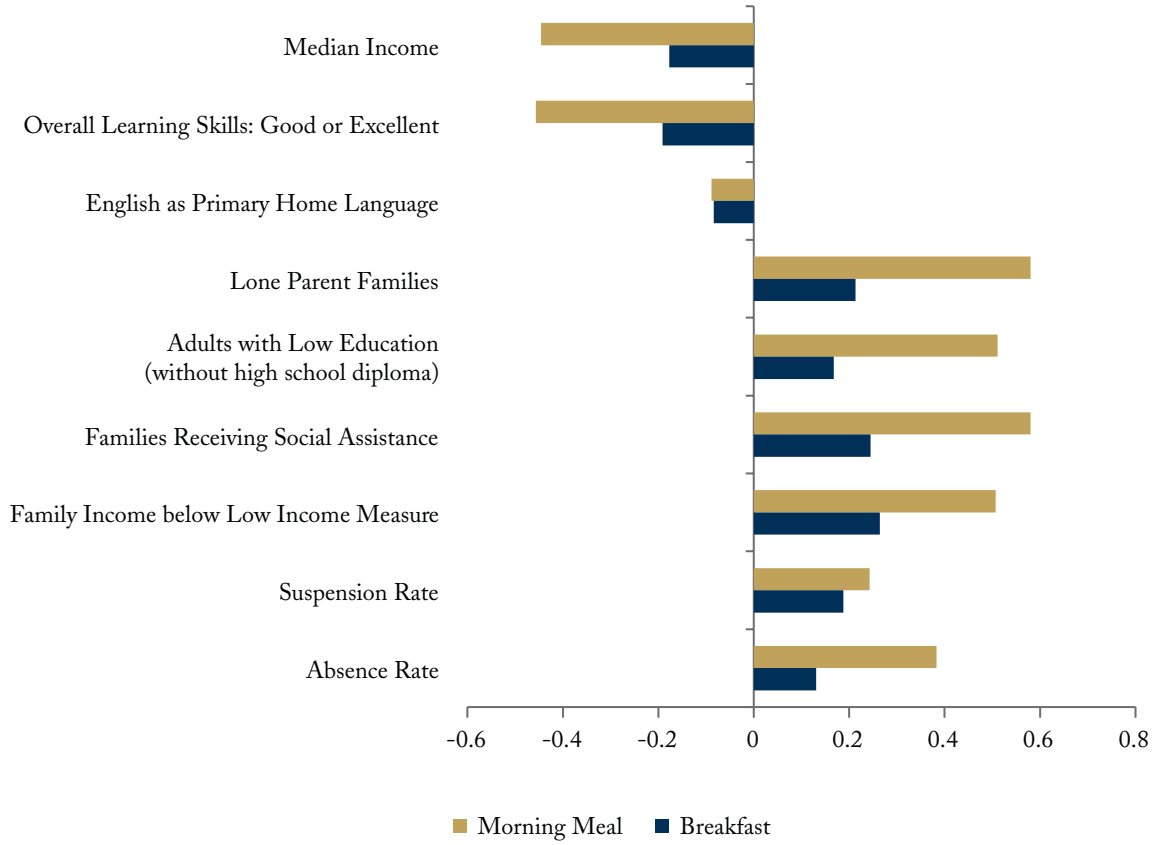

Source: Toronto Distirct School Board, authors' calculations.

with higher suspension and absence rates are more likely to provide meals. These two observations show that nutritional programs in schools within the TDSB are offered in the majority of schools and are also quite well targeted to the most at-risk students.

We also estimated the effect of the introduction of a morning meal on various outcomes of student performance and behaviour while controlling for the relevant socioeconomic variables. We employed two different statistical methods: linear fixed effects and difference-in-difference estimation. For the linear fixed effects models, we tested the association of breakfast programs with performance outcomes, controlling for socioeconomic and demographic characteristics. The fixed effects regressions are standard ordinary least squares linear regressions that control for unobserved school-specific characteristics. The implicit assumption is that unobserved school-specific effects are constant over time. This analysis includes schools that have a morning meal or breakfast program in all, some or no years in the sample.

The difference-in-difference estimation measures the effect of introducing a breakfast program on student performance relative to student performance at schools that do not have nutrition programs. These regressions also control for individual school fixed effects. The "treatment group" is schools that did not have a meal program in the 2014-15 school year but introduced one in the following two years. Elementary schools that did not provide a morning meal in any of the observation years were used as the experimental control or comparison group for the difference-in-difference estimation. We removed elementary schools that offered a morning meal or breakfast program in all years, restricting the sample to 266 schools.

**Figure 5: Correlation of Nutrition Program Provision and Socioeconomic Indicators in Toronto Elementary Schools**




Notes: The analysis is based on Pearson correlation with possible values ranging from -1 to 1. The correlation value indicates the degree of an associated proportional relationship between the variable and morning meal provision. All correlations are significant at a 99 percent confidence level.
Source: Toronto District School Board, unpublished data, authors' analysis.

The results show little evidence that breakfast and morning meal programs have an effect on student performance at the school level. There is some weak evidence that morning meals might be more effective at improving performance than a breakfast program, but none of the results are statistically significant. For example, having access to a morning meal program was associated with about 1 to 3 percent more third grade students achieving acceptable (level 3 or 4) results on the Educational Quality and Accountability Office (EQAO) assessments compared with marginal improvement in math and 6 percent fewer students achieving acceptable scores in writing (Table 1, columns 1 and 2).

The introduction of a morning meal program, however, shows either no effect or marginal decline in students' performance compared to schools that did not offer a nutrition program – again, none of the results are statistically significant (Table 1, column 4). In summary, the results of our analysis are inconclusive, and we found no improvements

**Table 1: Association of Breakfast and Morning Meal Programs with Student Performance**

| | | Fixed Effects – Breakfast (percent) | Fixed Effects- Morning Meal (percent) | Difference in Difference Estimation (percent) | |
|---|---|---|---|---|---|
| | | | | School Implements Morning Meal Program | Treatment Effect |
| Grade 3 | EQAO Math | 0.30 | 1.14 | -7.60 (*) | -2.89 |
| | EQAO Reading | 2.831 | 3.376 | -6.02 | -1.60 |
| | EQAO Writing | -6.49 | 1.72 | -0.21 | -3.85 |
| Grade 6 | EQAO Math | -0.76 | -2.10 | 1.25 | -4.00 |
| | EQAO Reading | -0.85 | 1.94 | 7.56 (*) | -1.73 |
| | EQAO Writing | -1.23 | 0.33 | 3.58 | -2.70 |
| Absence Rate | | -0.19 | -0.16 | -0.19 | 0.00 |
| Suspension Rate | | 0.054 | 0.123 | 0.21 | 0.10 |
| High Learning Skills | | -1.396 | -1.453 | -4.59 (**) | -0.73 |

Notes: control variables included in all specifications: median income of parents in the neighbourhood, the percentage of one parent families, percentage of students with special needs, percent of students that are new immigrants, school fixed effects, time trend. Results are not statistically significant unless otherwise noted. For more on these results and other regression specifications, see the online Appendix.

EQAO scores are the percentage of students achieving acceptable results (level 3 or 4) on the assessment.

*Significant at 95% confidence level

Source: Toronto District School Board, unpublished data. Authors' analysis.

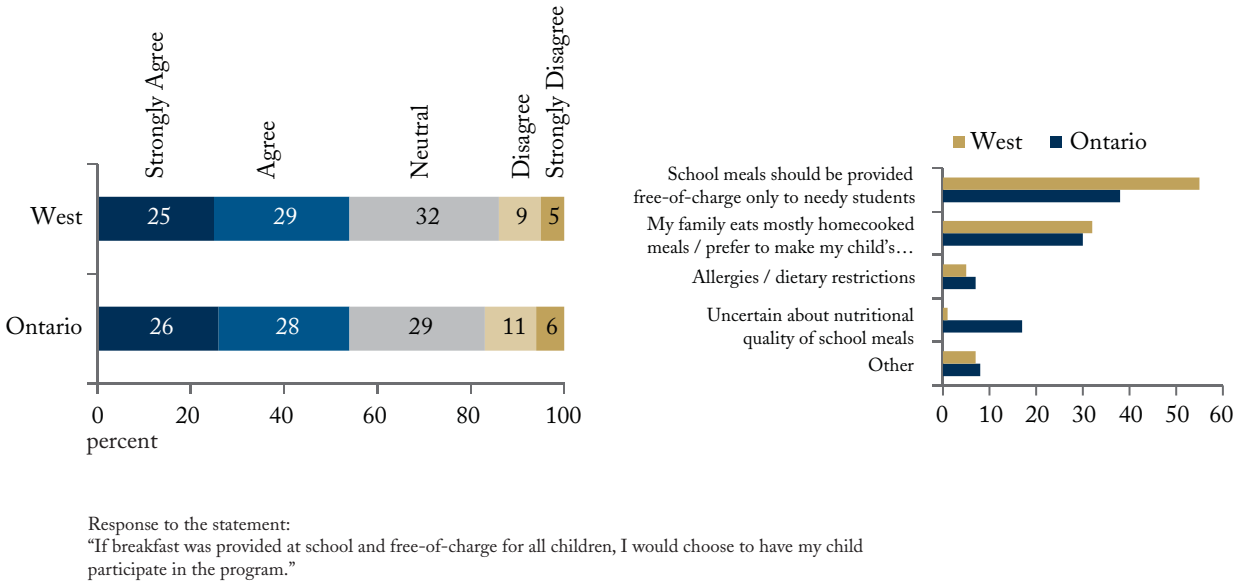
in student performance associated with nutrition programs. Statistically, we cannot reject the hypothesis that meal programs have no effect on attendance, test scores or learning skills.

## Challenges of Providing Nutrition Programs

A student nutrition program designed to alleviate hunger and improve nutrition is distinct from a universally provisioned nutrition program targeted at optimizing health across the whole population. Although a universal program that provides appropriate nutrition for all students would also alleviate hunger, the larger the scope of program goals the more resources (time, funding, staff) are required to implement it successfully.

There are many tensions in the delivery of nutrition programs that make effectively provisioning them a challenge. For example, for student nutrition programs to be effective, they should be available to all students where they are offered. When resources for the program are scarce, coordinators might limit participation to

## Figure 6: Response to Public Perception Survey




Response to the statement:
"If breakfast was provided at school and free-of-charge for all children, I would choose to have my child participate in the program."

Notes: Survey covers households with children. Parents who indicated they would not choose to have their child participate were asked to clarify their hesitation. The survey result does not control for socioeconomic characteristics.

Source: Grocery Foundation (unpublished data).

students who are most in need, reduce the number of days the program is offered or close the program before the end of the school year. Restricting access damages effectiveness because students in need might be stigmatized for accessing the free meal, which discourages participation. Similarly, when making choices about which foods to serve, coordinators might have to choose between the most generally healthy food option and one that does not contain allergens. Issues with menu choices are further complicated by students' differing dietary needs, be they religious, cultural or medical.

Persistent difficulties exist in achieving universality, even under a universal nutrition program. In the pilot study of nutrition programs in the TDSB, 38 percent of students ate breakfast at home and also had breakfast at school, only 26 percent ate only the breakfast at school and 16 percent still did not eat breakfast most days (Muthuswamy 2012). The amount of children eating two breakfasts is more than those who receive breakfast exclusively from the student nutrition program. Whether this increase in energy intake on the part of those who ate breakfast both at home and at school was compensating for food insecurity or low diet quality at home or simply because they wanted to eat two breakfasts is unclear. There is not strong demand for a universal breakfast program in all schools. When Canadian household shoppers were asked about a universal, free-of-charge breakfast, only slightly more than half (54 percent) said they would have their child participate (Figure 6). The main reason for hesitation was that "school meals should be provided free-of-charge

only to needy students," while about a third of those who would not have their child participate simply preferred to make breakfast themselves.[24]

The overall success of a nutrition program tends to hinge on a high participation rate among all students to reach students most in need while avoiding the stigma associated with accessing such a program. If there were more universal breakfast programs consistently serving nutritious food, parents' perception of them as a social welfare program for the needy likely would be diminished, increasing participation rates. The location of a nutrition program also affects participation and effectiveness. Serving meals in the classroom, during regular school hours, results in higher participation rates because students do not have to get to school early and there is little to no stigma in eating the meal, as it is provided in class to all students. The problem with this model is that it requires classroom time to be spent eating the meal.[25] This is justifiable if students' ability to learn and attendance are improved enough to make up for the lost classroom time. The tension between higher participation in nutrition programs at the cost of classroom time suggests that in-class programs should be offered only where the benefits exceed the cost for most students.

There are also some general challenges to offering student nutrition programs effectively and consistently. Most schools do not have appropriate food preparation and storage spaces, which limits the amount of fresh and unprocessed options they can offer. The time and work associated with managing a program, combined with inconsistent community/funding partnerships and a lack of volunteers, has many student nutrition program coordinators reporting an overwhelming workload and worries that no one would replace them if they were to leave the school (Valaitis, Hanning, and Herrmann 2013). These challenges in provisioning nutrition programs with scarce and sometimes inconsistent resources are a major reason programs fall short of guidance standards, where they exist (Downs et al. 2012; McIsaac, Kirk, and Kuhle 2015; Valaitis, Hanning, and Herrmann 2013).

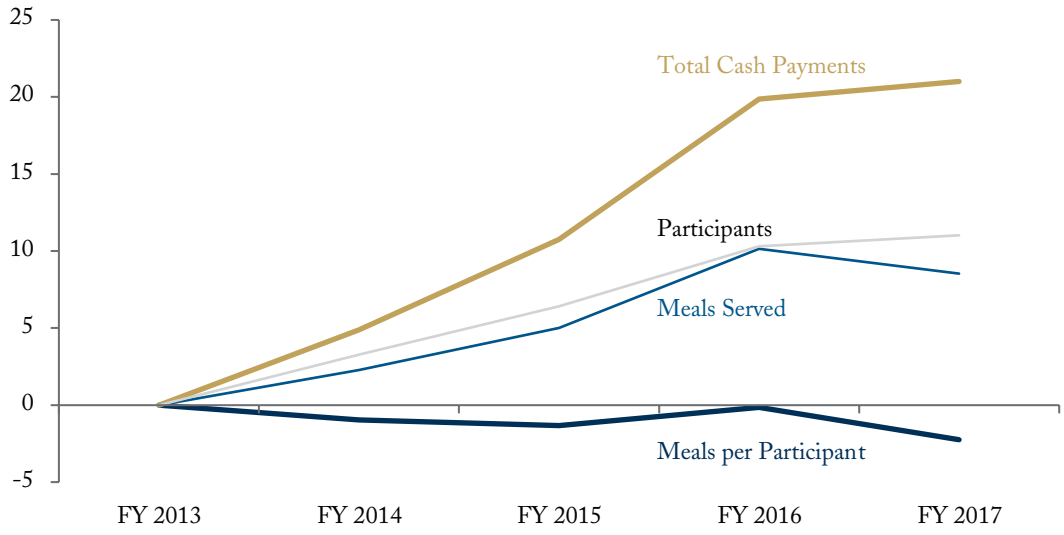
## Funding Breakfast Programs

Consistent access to funding is an ongoing challenge for student nutrition programs. In Toronto, the provincial and municipal governments fund at most 20 percent of typical costs of programs operating in "designated" (high-risk) areas (de Wit 2012). At an average cost of $1.02 to $1.59 per day per student, it costs about $50,000–$80,000 – not including additional expenses for kitchen supplies and staff – to run a typical breakfast program (282 students and 175 instructional days) in a school in a designated area (Muthuswamy 2012). Government funding for the program would be about $13,000, so the remaining $50,000 or so must be raised locally through fundraising, parental contributions and community donations. This is a significant challenge for any school, but especially difficult in economically disadvantaged areas. An illustration of the difficulty in adequately funding nutrition programs is illustrated in the TDSB pilot study. Parents were asked for a voluntary contribution

24 The data are not detailed enough to determine if the majority of parents who would agree to participate a universal program were geographically clustered. If a large majority in particular areas would have their child participate, this could signal areas of highest need and likelihood of program success. The main hesitation that meals should only be offered to students in need could also be interpreted as a symptom of the ongoing stigma of qualifying for a free meal.

25 A further complication is that teachers have little incentive to give up classroom time for a nutrition program, as there is no lightening of the curriculum, and they receive no compensation for the extra preparation and cleaning required. Some coordinators also report conflicts with school administration, if teachers do not allow students to eat in class, coordinators may have a hard time finding space that is acceptable to students, teachers, school administration and custodial staff (Valaitis, hanning, and Herrmann 2013).

**Figure 7: US School Breakfast Program Index**




Source: https://www.fns.usda.gov/pd/child-nutrition-tables.

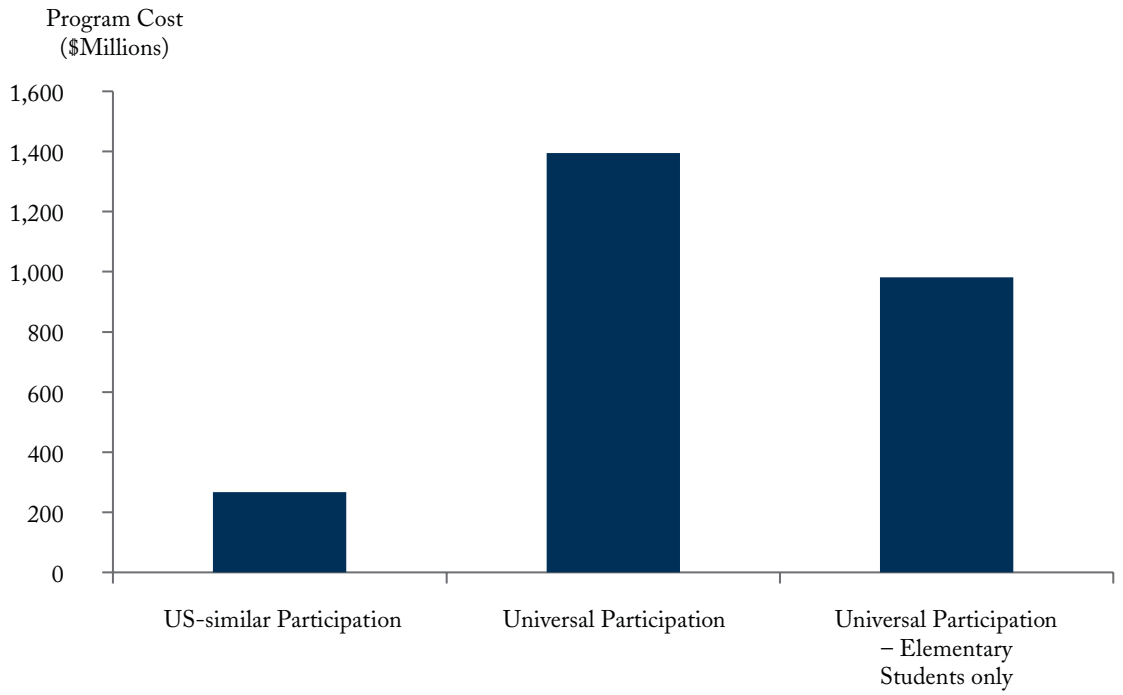
of $20 to meet program costs, resulting in total contributions of only $6,878 across the school board in the 2008-09 school year (Muthuswamy 2012), far short of the amount needed.

In addition, as discussed above in the case of Alberta, funds might be distributed unevenly across schools, for reasons having little to do with geographic or socioeconomic characteristics. This problem does not feature in the funding design of the US School Breakfast Program. In 2014, federal cash subsidies for breakfasts were US$1.62 per free breakfast, US$1.32 per reduced-price breakfast and US$0.28 per paid breakfast. If 40 percent or more of breakfasts served in a particular school are free or reduced-price, each of those meals receives an additional cash subsidy of US$0.31 (Hoynes and Schanzenbach 2015).[26] This method of funding is thus directly connected to the needs of the program's participants. Schools with a high percentage of students from low-income households receive additional subsidization to account for the added difficulty of supplementing the program with charitable donations from the community in these areas. Governments in Canada could improve the efficiency of funds for nutrition programs by restructuring from unpredictable grant funding to a model based on the number of students and their level of need.

Even with predictable and structured funding, the US School Breakfast Program as a whole might suffer from scarce program resources. Cash payments for the program have been growing at a rate of about 5 percent per year, but the number of participants has been consistently growing more

26 About three-quarters of breakfasts served under the program receive this "severe need" payment. As a result, the average cash payment per meal in 2014 was $1.62.

**Figure 8: Estimated Fiscal Cost of A National Student Breakfast Program**




Notes: US SPB participation and costs are sourced from USDA Child Nutrition Tables (FY 2017). Student numbers are sourced from the National Center for Education Statistics for the US, and Statistics Canada (series 37-10-0007-07, 2016) for Canada. US-similar participation is calculated by multiplying program spending ($/student) in the US by the number of students in Canada. Universal participation assumes that programs are funded similarly to US programs on a dollars per participant basis.

quickly than the number of meals served, which translates to fewer meals served to each participant each year (Figure 7). Over time, both dollars per meal served and dollars per participant have been increasing. The result of growing numbers of participants and increasing meal costs is that the federal portion of program costs alone increased from US$3.5 billion in 2013 to US$4.2 billion in 2017. Even with this increased spending per participant and per meal, funding might not be sufficient to give students a high standard of nutrition. An analysis of the program found that only 15 percent of schools offered breakfasts that met all the Student Meal Initiative standards (Fox and Condon 2012), mainly because most schools did not offer a breakfast with enough calories, according to the standard.

To estimate the approximate cost of providing a universal free breakfast in Canadian schools, we mapped the costs of the US program to this country. The student meal programs in the TDSB cost between $0.91 and $2.49 per child per day, depending on type of meal and age (Muthuswamy 2012). Alberta recommends spending $5.00 per student per day. In the United States, about 20 percent of pre-kindergarten to grade 12 students participate in the School Breakfast Program, and spending was US$55.70 per student, or US$290 per participant. A national Canadian program with similar participation (about 20 percent of students receiving 165 meals each year) and similar costs would need funding of about $270 million annually (Figure 8). If, however, the nutrition program were funded with the intent of providing a benefit to all

students, the program would cost about $1.4 billion annually. Since total federal spending on education amounted to about $5 billion in 2016, a federally funded universal national student breakfast program would increase federal education expenditures by about 28 percent.[27] To put this spending in perspective, in fiscal year 2013/14 the average salary for a new elementary school teacher was $51,046, while teachers with 15 years of experience earned $84,677.[28]

## Policy Implications

Issues of food insecurity, poverty and mental and physical health are strong reasons to give healthy meals to children who would not otherwise have them. At the same time, there is a lack of statistically significant evidence[29] that nutrition programs improve overall learning ability or school attendance in high-income countries. There is some evidence that student breakfast programs improve the dietary quality of participants via a nutritionally substantive meal (Bhattacharya, Currie, and Haider 2006; Crepinsek et al. 2006; Frisvold 2012). This does not appear to translate, however, into improved overall nutrition – other research has found the such programs had no effect on 24-hour dietary intakes (Crepinsek et al. 2006) and no spillover effects that improved dietary quality for the household overall (Bhattacharya, Currie, and Haider 2006).

Challenges in the implementation of nutrition programs can have a significant impact on their effectiveness. One such challenge is consistent access to funding. As well, schools might lack appropriate food preparation and storage facilities, and help from school staff and volunteers might be inconsistent or limited. As a result, many programs fall short of nutrition standards, where they exist. We note that any nutrition program that forces coordinators to make trade-off decisions between the quantity and quality of foods offered is inherently marginally food insecure.[30] A food-insecure nutrition program is unlikely to improve food security in the general population.

School nutrition programs have been linked to somewhat contradictory objectives and outcomes: improving student test scores, reducing absenteeism, increasing energy intake, decreasing obesity, reducing food insecurity and improving nutrition. With contradictory policy objectives, it is unsurprising that there is a lack of consensus about their effects in existing research. The lack of statistically significant evidence of the positive effects of nutrition programs, and continuing funding and other implementation challenges lead us to conclude that they are not a silver bullet.

More specifically, the benefits of nutrition programs are most apparent in low-income and otherwise disadvantaged populations; there is no consensus that they have clear benefits for all students. Instead of trying to implement a one-size-fits-all solution to complex and nuanced policy problems, more progress could be made by targeting different policies to specific goals. For example, if the goal is to improve students' learning ability and test scores, then taking class time to feed children in the hope that their increased energy intake will more than compensate for lost class time may be

27 Total provincial and territorial government spending on education was $75 billion in 2016. If funded by provincial and territorial governments, a universal student breakfast program would increase total education expenditures by about 2 percent.

28 Statistics Canada, "Annual statutory teachers' salaries in public institutions, by level of education taught and teaching experience, Canadian dollars, Canada, provinces and territories, 2013/14," table D.2.1; available online at https://www150.statcan.gc.ca/n1/pub/81-604-x/2016001/t/tbld2.1-eng.htm.

29 The chance that there is no effect attributable to nutrition programs exceeds, generally, 5 percent. Results may be interpreted as weak evidence of an association, but there is not high confidence in the estimated effect.

30 A similar argument applies if coordinators restrict access to students most in need or offer the program on fewer days.

counterproductive. Governments instead could provide the same funding to hire more teachers and even decrease class sizes so that students receive more individual attention.[31]

Research showing that nutrition programs have no effect on 24-hour dietary intake and no spillover effects that improve households' nutrition overall, suggest they are not an effective policy to reduce food insecurity per se. In addition, as mentioned above, a nutrition program that is not adequately and consistently provisioned is itself food insecure. About 15 percent of households with children suffer from at least marginal food insecurity, with the highest prevalence in female-headed, lone-parent households (Figure 1). Thus, policies to improve food security in households with children should target those households. Even if evidence existed of positive effects at the household level, the additional cost of offering the program to all students, instead of only to those from food-insecure households, would likely outweigh the benefits.[32]

A similar argument applies to nutrition programs as a policy to reduce childhood obesity: participants in the Toronto District School Board pilot nutrition program who ate two breakfasts outnumbered those who only ate breakfast at school, while 16 percent did not eat breakfast at all, despite access to a universal program (Muthuswamy 2012). Evidence of the effect of nutrition program participation on weight is inconclusive. With more students eating two breakfasts than are getting it exclusively through a breakfast program, and minimal evidence of improved total nutrition, we conclude that there is little strong evidence either to support or to refute the claim that nutrition programs help to reduce childhood obesity.

## Improving Student Nutrition Programs in Canada

The fundamental goal of school nutrition programs is to feed hungry children. There is quite strong evidence of the benefits of eating breakfast over not doing so, but evidence of the effect of breakfast programs in terms of wider goals of student performance and health is, however, mixed and inconclusive. Moreover, the success of any nutrition program depends on the logistics and execution of the program. Two of the biggest barriers to student participation in nutrition programs are the stigma that comes with being eligible for a subsidized meal and the scheduling conflicts involved with having to be at school early enough to eat prior to class, should the program be offered as a breakfast during before-school hours (Basch 2011; Godin et al. 2017; Imberman and Kugler 2014; Kleinman et al. 2002). For these reasons, programs are more successful when they are offered universally to all students, free of charge (Imberman and Kugler 2014).

However, the temptation to expand a program to cover more students at the expense of improving the program for those already receiving it should be resisted. Scaling a nutrition program that does not meet nutritional standards consistently or that suffers from systemic operational challenges almost certainly would be of little benefit to students generally. Instead, the program should remain targeted at the most at-risk children, who are most likely to benefit, until it is functionally scalable.

To balance these seemingly conflicted conclusions – the need for universal access while also keeping the program targeted – priority should be given to schools in neighbourhoods

31 This option can also be targeted to a specific skills goal. For example, increasing the percentage of teachers with formal math training in elementary grades would be a similar option specifically targeted at improving math education and skills accumulation in early years.

32 In this *Commentary*, we do not engage in a formal cost-benefit analysis. Since 85 percent of households with children are food secure and would likely only marginally benefit from a nutrition program, from the perspective of food security the benefits that would accrue to 15 percent of households would have to be sufficient to offset all the costs of the program.

with a high percentage of households on social assistance or with low incomes.[33] If a school does have a nutrition program, it should be available to all children within the same peer groups (classes or grades), not restricted to children in need.

There are persistent challenges in provisioning high-quality student nutrition programs, many of which stem from inconsistent access to the necessary resources. Governments across Canada could improve student nutrition programs by ensuring that program funding and guidelines are compatible. This could be done by funding nutrition programs in a manner similar to that of the US School Breakfast Program, which provides subsidies based on the number of meals served and additional funding to programs in areas where a large percentage of households receive social assistance. This method of funding is directly linked to the needs of the participants, and provides additional subsidization in neighbourhoods where schools might have relatively more difficulty supplementing funding through community donations.

Program coordinators should have consistent access to funding, facilities, volunteers and informational resources. This is by no means a small task, as most schools do not have appropriate food storage and preparation facilities or spaces in which children can eat. It would be unreasonable for provincial governments to make the capital investments necessary to provide these facilities at all schools. Furthermore, nutrition programs have not been conclusively shown to be effective in the United States, where schools provide lunches, have food preparation facilities and there is generally lower social welfare support for low-income households. This lack of conclusive evidence of success, coupled with the different Canadian context, suggests that there is no economic justification for a similar program across Canada.

Having said this, provinces and territories that lack guidelines for the provision of nutrition programs should develop them. At a minimum, guidelines might improve existing programs by offering coordinators some guidance about how programs should be run and what foods to serve. To be effective, these guidelines should be based on prevailing evidence about student nutrition and should leave room for differing regional needs. There might be a role for government or coordinating organizations to assist program coordinators with informational resources, forming sustainable funding partnerships and connecting to reliable volunteer networks.

The limitations of existing school facilities and the inconclusive evidence of the ultimate effect of school nutrition programs suggest that programs should not be scaled up quickly to be offered universally at all schools. Benefits of nutrition programs are most apparent in low-income and otherwise disadvantaged populations, while benefits for all students become apparent only with a program's near-perfect execution. Accordingly, nutrition programs initially should be implemented in low-income neighbourhoods or in areas with a prevalence of food insecurity. Programs then could be refined and improved until they consistently adhered to best-practices that increased the likelihood of benefits to all students. When expanding to new neighbourhoods and demographic settings, community input into the menu selection and form of the program would ensure higher participation and parental support. Further, at schools in which they are offered, nutrition programs should encourage participation

33 Toronto provides an example of community-driven programs at the school board or municipal level targeted to schools in more disadvantaged neighbourhoods. Programs are more likely to be offered in neighbourhoods that have lower median incomes and higher percentages of households on social assistance (Figure 5).

by all students to reduce the stigma for low-income students.[34] Scaling up programs that do not meet nutrition standards would be putting the cart before the horse and is unlikely to be as effective as fewer, well-provisioned programs targeted at the students most in need.

## Conclusion

The fundamental goal of nutrition programs is to feed hungry children. Though they are unlikely to have large impacts on food security or childhood obesity, nutrition programs do have the short term benefit of relieving students' hunger. More specifically, the benefits of nutrition programs are most apparent in low-income and otherwise disadvantaged populations; there is no consensus that they have clear benefits for all students. Programs are most successful, however, when they are offered to all students free-of-charge. These seemingly conflicting conclusions can be balanced: programs should not be offered universally at all schools, but where they are offered they should be universally available to all students within the same peer group.

There is insufficient evidence to support or to refute the claim that nutrition programs are effective at addressing the challenges of food insecurity or childhood obesity or at improving students' learning ability. This is in part because the mechanisms that may translate breakfast consumption into improved behavior or academics are not well understood. As a result, we are unable to, with certainty, draw conclusions about their short- and long-term impacts related to health, academics or other socioeconomic factors.

Instead of trying to implement a one-size-fits-all solution to the complex and nuanced problems to which nutrition programs have been linked, more progress could be made by targeting different policies to specific goals. Given the significant cost of a Canada-wide universal student nutrition program – about $1.4 billion annually – the same resources likely could be used more effectively by targeting policies at the problems they are intended to solve.

34 There is the additional benefit that, if the nutrition program showed positive results for all students who participated, the program would more likely to be scalable.

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