



## **Reimagining How We Feed and Educate NYC's Public School Children**

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### Introduction

Poor nutrition has contributed to the rising burden of diet-related diseases in the United States. These include cardiovascular disease, high blood pressure, type 2 diabetes, obesity, and cancer. A recent report from the Harvard T.H. Chan School of Public Health published in *The New York Journal of Medicine* predicts that by 2030, nearly 1 in 2 adults in the United States will be obese, and nearly 1 in 4 will be severely obese. Moreover, severe obesity is forecasted to become as prevalent as overall obesity was in the 1990s, becoming the most common BMI among women, non-Hispanic black adults, and low-income adults (1). The associated medical treatments will bring healthcare costs to staggering highs.

These future adults are our today's children. Nearly one-third of children and youth in the state of New York are obese or overweight. In the state of [New York, childhood obesity has tripled](#) within the state over the past three decades. Within NYC, 40% of NYC public school students aged 6 to 12 are overweight or obese. These high rates increase health risks among growing children.

In 2016, the direct and indirect costs of chronic diseases as a result of obesity were \$1.72 trillion — [almost 10 percent](#) of the nation's gross domestic product.

The [NYC Healthy School Food Alliance](#) is committed to changing this trajectory. It is proposing a *four-part evidence-based shift in policy across New York City*, advocating for scratch-cooked, minimally-processed lunches in every public school, nutrition education in every grade beginning in Pre-K, gardens in every public school, and more time for children to eat lunch. Only when all four of these changes are implemented in EVERY public school can we save the next generation from diet-related disease and ensure food equity.

**A Four-Part Solution**  
**Change the Food, Change the Mindset,**  
**Grow the Food, and Increase the Time**

**1. Change the Food: Scratch-Cooked Meals for All Children**

**LEGISLATIVE REQUEST: Support Intro 1676 (including the necessary language in the edited draft) which would require the DOE to develop a scratch-cooking implementation plan to transform school kitchens to cooking kitchens, including cost of building or renovating kitchens and up-training staff.**

**Our Children's Health is at Stake**

The influence of school lunch on our children cannot be underestimated. Children spend an average of 6.64 hours per day in school and [consume up to one half of their daily calories](#) at school. [The CDC](#) reports that schools play an important part in reducing obesity and the risk of developing diet related diseases like diabetes and heart disease. When a government organization is responsible for feeding nearly 1 million children a day, there is a responsibility, [if not a legal duty](#), to ensure that its meals are not feeding our health crisis.

The Office of Food and Nutrition Services in NYC relies on hyperpalatable, pre-packaged, ready to heat, branded, longer shelf life foods that are contributing to the global prevalence of obesity and other nutrient-related diseases. Highly-processed or ultra-processed foods contain little or no intact foods, are typically high caloric foods, provide high amounts of sugar, unhealthy fats and salt, and are low in dietary fiber, protein, vitamins and minerals. Ultra-processed foods are not 'real food', they do not contribute to health and well-being, and yet we serve them in our schools (2)(3)(4).

The dangers of highly-processed foods have been documented in peer reviewed journals and highlighted in a slew of [recent research](#). Ultra-processed foods are associated with obesity, diabetes, inflammatory diseases, gastrointestinal disorders, hypertension, coronary and cerebrovascular diseases, and total and breast cancer (4). A recent [study published in JAMA Internal Medicine](#), showed an association between ultra-processed consumption and overall higher mortality risks (5). A 10% increase in the proportion of ultra-processed foods consumed was associated with a 14% higher risk of mortality, regardless of the cause. This research rings a siren call for change away from processed foods.

Children are especially vulnerable to the effects of highly-processed foods; when [introduced at a young age](#), they set kids up for diet-related disease in the long term. A recent study showed that the consumption of ultra-processed foods in pre-school aged children correlated with higher increases in overall blood cholesterol and later at school age (6). These results suggest that ultra-processed food consumption in young children may be an important early dietary determinant of adult cardiovascular disease. When compared to other types of food, the ingredients in ultra-processed foods were associated with addictive food behavior in overweight children, adding fuel to the fire (7). Moreover, ultra-processed foods negatively

impact the oral health of children, leading to tooth decay, gum disease, and tooth loss (8) (9). The relationship that nutrition has to oral and systemic health is integral according to the 2019 Position Paper of the Academy of Nutrition and Dietetics.

### **An Issue of Equity**

School food is not just an issue of health and quality of life; it is an issue of equity. The health crisis hits low-income families hardest, making access to healthy school food one of social justice. Take a look around any school lunchroom and this data comes to life. Those ultra-processed, fast food school lunches aren't eaten by every child in the lunchroom; two-thirds of kids eating school meals don't have the option of bringing packed lunch from home. The lack of accessible, affordable, healthy food for children living in low-income neighborhoods results in diets containing fast foods and convenience store items. These are the children who receive a significant portion of their daily nutrition requirements at school. All of our children deserve better, not just those who are privileged enough to have families with the means to provide lunch from home.

Childhood obesity disproportionately affects low-income communities and communities of color. Indeed, children from food-insecure households are five times more likely to be obese than children from food-secure households (10). They will eat in the absence of hunger, past satiation, and consume five or more snacks per day. In New York City, children living in the Bronx have the highest prevalence of overweight (43% vs. 4% in Brooklyn, 40% in Staten Island, 39% in Queens, 38% in Manhattan). According to the Youth Risk Behavior Survey (YRBS) by the CDC, compared to New York City students, a higher proportion of East and Central Harlem students are overweight and obese. 35% of East and Central Harlem students in grades 9-12 are overweight and obese compared to 28% in NYC. Obesity rates in low income East Harlem are higher than what they are on the wealthier Upper East Side, just a few short blocks away.

### **Healthier Meals Means Better Academic Success**

Healthier lunches not only lead to better health outcomes for children, they also impact brain development and academic success (15) (16) (17). [According to a report from the Brookings Institute](#), when a school contracts with a healthy lunch company, students at the school score better on end-of-year academic tests. On average, student test scores were about 4 percentile points higher. Not only that, the test score increases are about 40 percent larger for students who qualify for reduced-price or free school lunches.

A pilot school-based obesity prevention intervention providing nutritious ingredients, whole foods, and physical activity to six elementary schools over a two-year period, resulted in significantly higher math scores, and slightly higher reading scores (11). Sadly, socioeconomic status, obesity, poor nutrition, and food insufficiency can affect academic achievement at any age. In another study, girls who became overweight at the start of kindergarten until the end of third grade were significantly associated with reduced test scores and increased behavioral problems, while boys who became overweight had fewer behavioral problems but more school absences compared to boys who remained normal weight (12). In its report entitled *Health and Academic Achievement*, the CDC cites evidence that a diet lacking adequate amounts of fruit,

vegetables, or dairy products is associated with lower grades. A diet deficient in certain vitamins and minerals are also associated with lower grades and higher rates of absenteeism and tardiness among students.

### **Mental Health is Also at Stake**

Beyond the physical, a study published in the [American Journal of Public Health](#) found evidence of a significant relationship between unhealthy dietary patterns and poorer mental health in children and adolescents.

Increased consumption of processed foods is linked to a greater likelihood of or risk for anxiety and depression in adults. Although few studies have been performed, there is evidence to suggest that there is also a link between dietary pattern or quality with mental health in children, and that diet may contribute to the early average age for onset of anxiety and mood disorders in children, ages 6 to 13 (13).

In children and adolescents, ages 6-17, poor nutritional quality and high energy intake were independently associated with symptoms of ADHD. For girls, the relationship between food energy intake and ADHD was more pronounced. (14). Intermittent food insufficiency and hunger in children were associated with higher levels of hyperactivity, absenteeism, and tardiness than food-secure children (21).

Food insufficient children ages 6-11 had lower math scores, were more likely to repeat a grade and have difficulty socializing with other children. Food insufficient teenagers were more likely to be suspended from school and have difficulty socializing with other children (22). It cannot be overstated - what we feed our children matters.

### **Conclusion—Scratch Cooking is Critical and Can Be Accomplished in NYC**

For the sake of our children and the health of generations to come, The Office of Food and Nutrition Services must replace its highly processed heat-and-serve meals with scratch-made meals made from whole, nutrient dense ingredients that appeal to the beautiful diversity of this city. Only then will every child have equal access to a healthy future full of opportunity.

Preparing and serving scratch cooked meals in all New York City public schools would show a significant commitment to improving food-related health and academic outcomes. Scratch cooking supports local food sources, reduces packaging, waste, and carbon footprints, provides shared learning opportunities for students, teachers, and staff, and increases trained, skilled workers (18) (19). When professional chefs trained cafeteria staff to prepare healthier lunches in a two-year pilot study in Boston Middle Schools, students increased their consumption of whole grains and vegetables (20).

The scratch cooking pilot program at five public Bronx schools is a model for success. In their final 2019 report entitled *Cooking Outside the Box: How a Scratch Cooking Pilot in the Bronx is Reshaping Meals in the New York City Schools*, researchers from Columbia University Teachers College, Tisch Center for Food, Education and Policy concluded that New York City would be

able to expand and support a scratch cooking program for all its public schools. A return to scratch cooking, after decades of ultra-processed foods in our schools, is a homecoming that has the potential to have a positive impact on each student's diet, health, academic achievement, and sense of community. As stated in the report, our schools should not only feed students, they should feed them well.

## 2. Change the Mindset.

**LEGISLATIVE REQUEST:** Require the DOE to deliver nutrition education as part of its elementary, middle and high school curriculum on an annual basis.

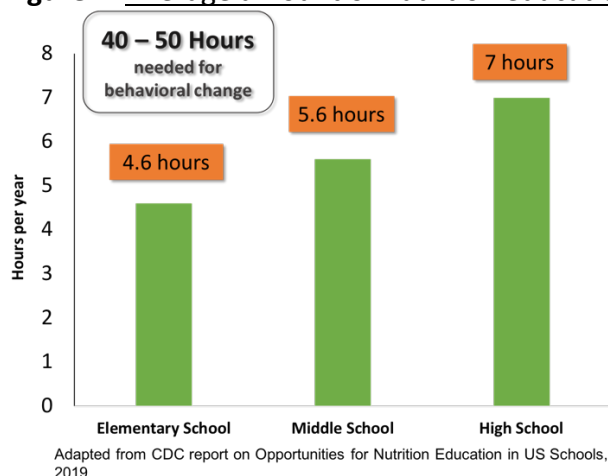
**BUDGET REQUEST:** Continue to fund (\$250K) the Food-Ed Hub at the Tisch Food Center, dedicated to developing policy to bringing food education to all public school children.

The future of school food requires a holistic shift in not only menus, but in education, to widen the scope of the common core to include hands-on nutrition and culinary education.

### Food Education Means Better Health and Academic Outcomes

According to a [National Wellness Policy Study](#), well-implemented nutrition education can do a world of good for our children—helping them obtain healthy weights and BMIs, increase fruit and vegetable consumption, develop positive attitudes towards those foods and improve academic performance (23). It has also shown to have a positive effect in reducing the risk of child and adolescent overweight and obesity while also reducing the risk of undernutrition, iron deficiency and dental caries (24). Yet [research published by the Tisch Food Center](#) shows that nearly half the city's schools lack access to external food and nutrition education programs (25). According to the [report by CDC](#) 40 - 50 hours per year of nutrition education is required to create a change in behavior, compared to an average of less than 8 hours of nutrition education that is currently provided in schools today (Figure 1) (26). This must change.

**Figure 1.** Average amount of nutrition education in US schools per year



## Food Education Means Lower Medical Costs and Longer Life Expectancy

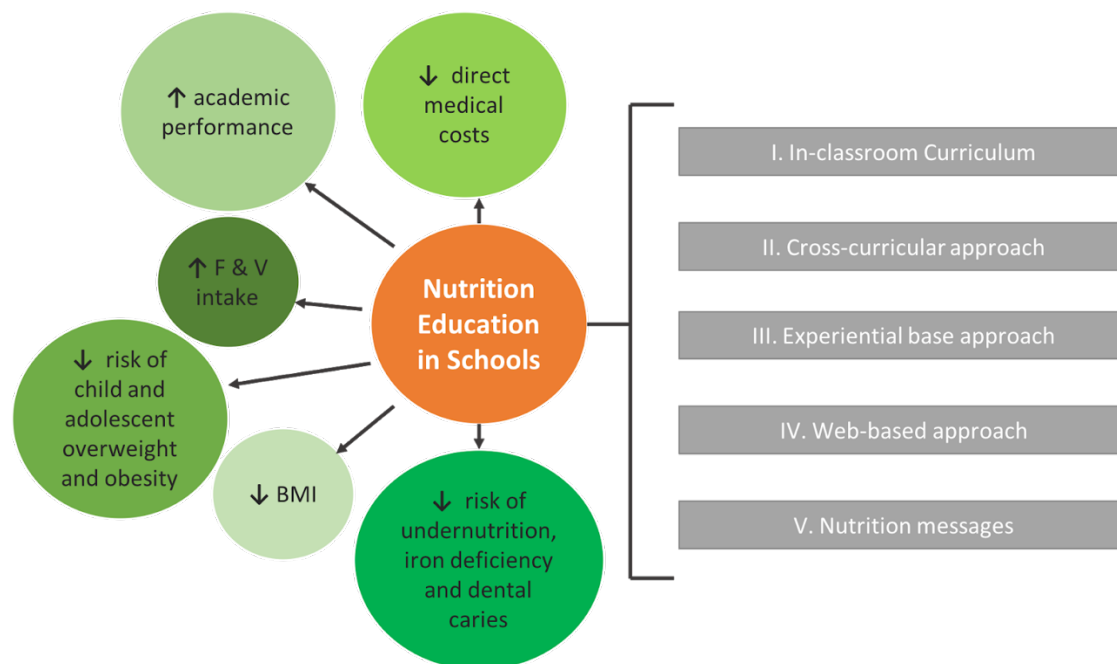
A [modern-day home economics class](#) also makes financial sense. If we invest in our children's nutrition education now, the payoff down the road will be significant. Studies have shown that nutrition ed programs are cost-effective, saving \$900 - \$12,000 for each additional life-year resulting from obesity prevention and were predicted to save \$8 million in [direct medical costs](#) associated with obesity when implemented at elementary school (35). It is important to note that nutrition ed benefits go far beyond obesity prevention and can improve a multitude of medical outcomes such as diabetes, cardiovascular disease and others, hence the medical costs savings are likely to be much greater. This ranks more favorably than other health sector interventions such as pharmaceuticals or taxes/bans on certain food items, according to a recent [McKinsey Global Institute Report \(36\)](#).

## Food Education Implementation Options

Given the busy school curriculum schedules, these 40-50 hours of nutrition education does not need to be accumulated solely from in classroom teachings. In fact, [varied exposure](#) to nutrition information throughout the day and [classes spaced across the entire school year](#) were shown to produce more meaningful effects on behavior (27,28).

In addition to in-classroom curriculum based approaches nutrition education can be taught through cross-curricular approaches (nutrition education provided as an integrated part of the core curriculum class), experiential based approaches (farm to school programs, school garden, cooking and food preparation activities), nutrition messages across the school day and even web-based approaches ([e-learning games](#) and [computer-based tools](#))(27,29,30).

**Figure 2.** Summary of Benefits of Nutrition Education in Schools



### With Food Education, the Younger the Child the Better

Although it is never too late to start educating our children about healthy eating habits and food, the earlier we start the more lasting and profound the changes would be. According to the [WHO](#) nutrition in early life is key for appropriate cognitive development and good health (31). Reversal of health problems has been proven to be much harder and costly than their prevention in the early stages of life. [A study in over 3000 US children](#) showed that the majority of pre-schoolers (over 70%) were exceeding the recommended intake of saturated fats and were below the recommended intake of dietary fiber (32). For this reason, an emphasis on pre-school nutrition education programs is of utmost importance. The USDA evaluation of the [“Eat Well Play Hard”](#) nutrition education program in pre-schoolers showed an increase in vegetable consumption and 1% or fat-free milk intake in children (33). The [“Color Me Healthy”](#) nutrition education program showed an impressive increase of fruit and vegetable snacks intake in preschool children by 20% and 33%, respectively (34).

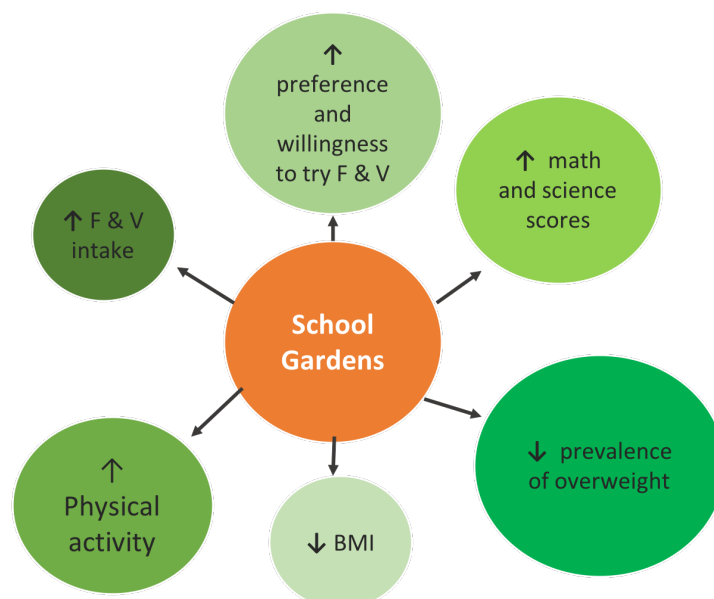
Changing the food without nutrition education is the sound of one hand clapping. Both are critical to affect any meaningful shift in dietary patterns and health outcomes for the next generation.

### 3. Grow the Food.

**BUDGET REQUEST: Allocate funding for a 5-year plan to build gardens and garden staff to support edible gardens in all elementary schools.**

Children grow more than food when they plant gardens. They live healthier, they thrive academically, and expand socio-emotionally as well.

Figure 3. Summary of school gardens benefits





### **Children Who Grow their Food are Healthier**

[Studies demonstrate](#) just how important growing the food is to creating lifelong healthy habits and to show children from a young age how important it is to sustain the earth (37).

A study conducted by the garden-in-school organization [Edible Schoolyard](#) found that “Edible Education” sets students up for healthier habits for life, and supports their growth as activists for a just and healthy food system (38).

[The existing literature](#) cites numerous dietary impacts of school gardening and cooking programs among participating students (39). Common outcomes reported include changes in knowledge in preparing, cooking, and eating healthier food, attitudes and preference for plant-based food, and eating behaviors.

Participation in school gardening and cooking programs have been found to increase children’s exposure to and ability to identify fruits and vegetables. In addition, changes in children’s attitudes have been measured such as increased preference for fruits and vegetables and willingness to try them.

According to the [FoodCorps evaluation](#) performed by the Tisch Center for Food, Education & Policy at Teachers College, Columbia University children in schools that provide frequent hands-on experiences in the school garden have 3 times more fruit and vegetables during school lunch (40). According to another [study at Cornell](#) this effect carries over to increased availability of fruit and vegetables at home as well (41). Interestingly, in one of the studies a [garden-based nutrition education program](#) at school had an even bigger effect on an increase in fruit and vegetable consumption than a nutrition education curriculum without an accompanying garden program (42).

### **Gardens Improve Academic Achievement**

The positive benefits of school garden and cooking programs extend beyond dietary outcomes and have been shown to impact academic achievement. Studies show that school gardens and kitchens are proving to be thriving centers of learning that equip students with knowledge and skills to succeed academically. [A study across 12 school garden programs](#) showed improved math and science scores (43).

### **Gardens Help Children Become More Physically Activity**

Gardening is not only educational and fun but is also hard physical work. It has been shown that access to school gardens and implementation of school garden programs contribute to an increase in daily [physical activity levels](#) among children (44). According to the [WHO](#) children aged 5-17 are recommended to be doing at least 60 minutes of daily moderate to vigorous exercise with higher levels providing greater health benefits (45). Currently, [CDC](#) reports that only 25% of US youth is reaching the recommended amount of daily physical activity (46).

[According to research](#) all of the changes above can translate into tangible health outcomes - schools with gardens and an implemented garden-enhanced education were associated with lower student BMI and lower prevalence of overweight (47).

The USDA supports and encourages gardening in schools by providing sample curriculum and materials for schools to use like the “[Dig in!](#)” and the “[Garden Detective](#)” (48,49). However, there cannot be garden education without a garden! Every school must therefore be given a garden and a garden educator; not just those schools with enough PTA funding to plant one. Whether grow tower, raised beds, or hydroponic farm, this city must fund every school to cultivate a garden for children to grow food.

#### **4. Increase the Time for Lunch.**

##### **LEGISLATIVE REQUESTS:**

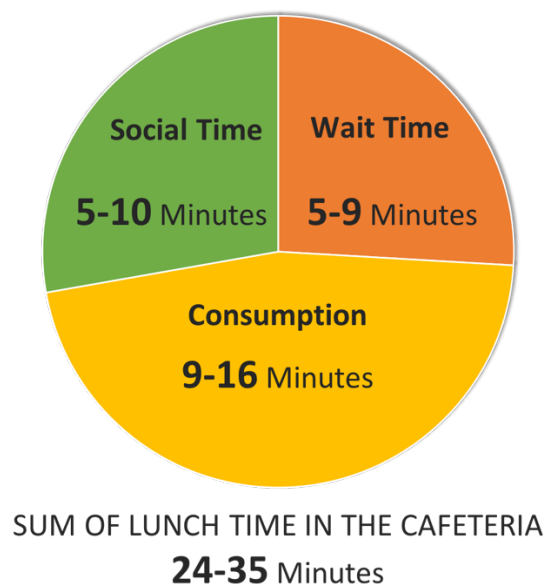
- **Require an audit of the amount of time that students have for lunch in elementary, middle and high school.**
- **Request that state legislators to consider a mandate for longer meal times at schools, similar to their mandate for minimum amounts of physical activity.**

Along with serving healthy food, and providing nutritional education and school gardening, children must be have sufficient time to eat their food, and enjoy the psychosocial benefits of dining with others, particularly when a healthful home food environment is not available.

Unfortunately, current lunch periods provide an insufficient amount of time to eat, forcing many children to go hungry throughout the day. Lunch periods rarely account for, among other things, the time students lose walking from class to their cafeteria or waiting on lines for their food. The low-income children who rely on school meals for a large portion of their daily calories and nutrients are hit hardest, especially those potentially losing SNAP benefits under the current administration.

Between traveling to and from the cafeteria, washing hands, standing in line for food, selecting food, and including recess time (for elementary schools) it is estimated that [many children only have between 10 and 15 minutes to sit down, get settled, socialize, eat their entire lunch, dispense with garbage, return trays, and pack their belongings.](#) And not all children require the same amount of time to eat (52) (70). Researchers in a study of two elementary schools in Washington State determined that the ideal lunch time would be 24-35 minutes accounting for wait time (5-9 minutes), consumption time (9-16 minutes) and social time (5-10). Travel, waiting, service and seating times will vary from school to school (53) (Figure 7).

**Figure 7.** Factors influencing lunch time after students arrive in the cafeteria



In its 2011 report on School Health Guidelines to Promote Healthy Eating and Physical Activity, the CDC stated that the environment in which food is served should enable students to pay attention to what they eat and enjoy the social nature of dining. Meals are enjoyed when students feel relaxed and can socialize without being rushed (50). For safe and healthy eating, the CDC advised “ensuring sufficient time to receive and consume a meal, with at least 10 minutes for *eating* breakfast and 20 minutes for *eating* lunch *after being seated*” with their food. The American Academy of Pediatrics agrees (51). According to The American Academy of Family Physicians, American Academy of Pediatrics, American Dietetic Association and other health professionals, developing healthy eating behaviors requires providing enough time for students to choose meals and sit with friends to enjoy them (54).

Many nutrition experts, parents, and school districts around the country believe that 20 minutes to eat is not enough to properly eat and digest food before heading back to classes (64) (65) (66) (67) (68) (69) (71) (72) (73). Karen LeBillion, teacher, Rhodes Scholar, and author of the book *French Kids Eat Everything* reports that French students spend longer time eating in schools. She posits that a short lunch break is interpreted as an inconvenience and encourages children to eat quickly when eating slowly is healthier.

### **Shorter Lunch Times Means Higher Rates of Obesity and Fewer Fruits and Vegetables Consumed**

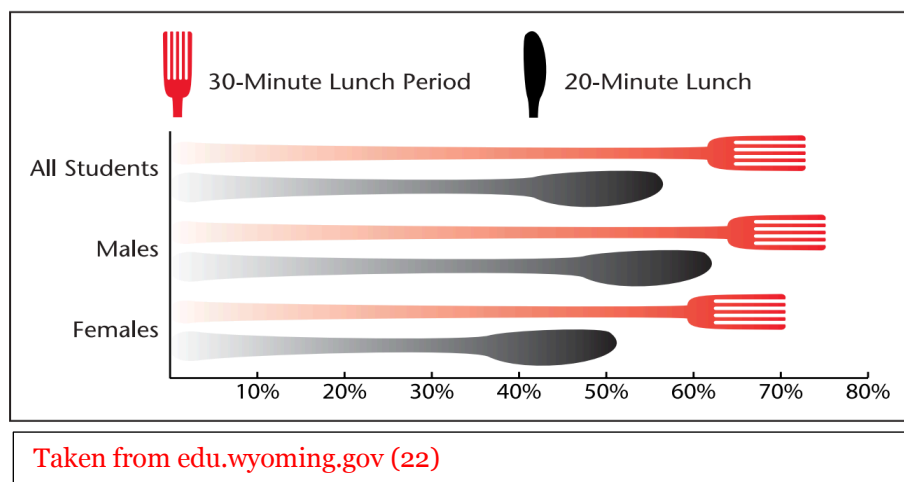
Short lunch times and rushed eating have been associated with detrimental effects on students, including obesity (58). Consuming food too quickly adversely affects gastrointestinal hormones and is associated with a decreased sense of satiety (52). Eating faster at one meal resulted in faster eating and increased energy intake at subsequent meals (57). Training children to eat fast may have consequences later in life. Faster eating was associated with the incidence of

metabolic syndrome in adults (10). Research showed that slowing down the speed of eating lowered the BMI in children ages 9-17 (55). Training obese adolescents to eat more slowly was beneficial in altering satiety hormones and lowering appetite (56). Consuming smaller bites and chewing more provided greater satiety, and may help combat obesity (60) (61).

Indeed, the length of the school lunch period is a key factor in how much food and nutrition children ingest. In a study of 1001 students attending six schools grades 3-8, researchers at the Harvard T.H. Chan School of Public Health found that students who had fewer than 24 minutes to eat, consumed significantly less of their entrees, vegetables, and milk compared to students who had at least 25 minutes (52). Furthermore, students were significantly less likely to select fruit for their trays if they had less than 24 minutes to eat. The researchers concluded that school policies providing for at least 25 minutes of seated time may improve dietary intake. The consumption of vitamins and minerals was also greater when students had 30-minute lunch periods vs. 20- minute lunch periods (53) (Figure 4, 5). Meeting basic nutritional needs provides children with the cognitive energy to learn and achieve.

Increasing the time children have to eat lunch, as well as breakfast at participating schools, has the potential to reduce obesity by allowing time for students to make more thoughtful decisions and try a variety of foods. Lengthening the time schoolchildren have to eat [affords them time to make healthy choices](#) and get proper nutrition before returning to class.

**Figure 4. Percentage of food eaten when the lunch period time is 30 minutes versus 20 minutes**  
**PERCENTAGE OF FOOD EATEN**



**Figure 5. Summary of statistics of increasing lunch period from 20 to 30 minutes**

**When the lunch period time is  
30 minutes versus 20 minutes,  
elementary students**

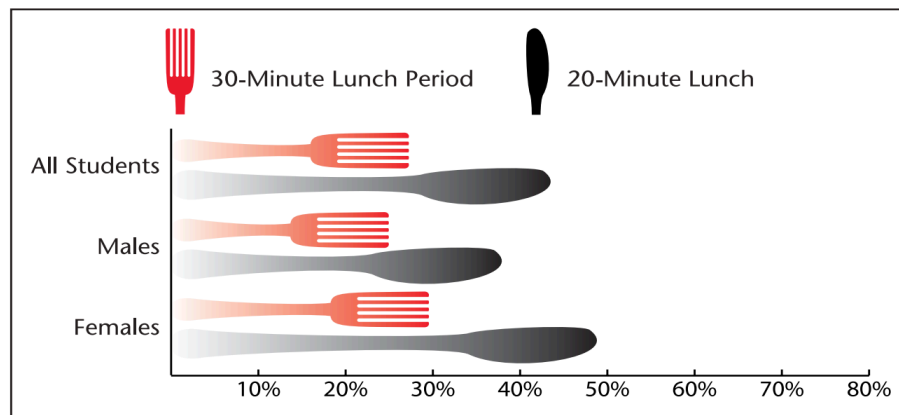
Consume **21 %** more food by weight  
Consume **16 %** more calories  
Consume **56 %** more calcium  
Consume **46 %** more vitamin A

**Longer Lunch Times Decrease Food Waste**

Food not eaten on trays is wasted and thrown into the trash. For those children with home packed lunches, they return home with nearly full lunch bags. Overall food waste decreased from 43.5% to 27.2% when the length of the lunch period for elementary school kids was 30 minutes versus 20 minutes (53) (Figure 6). The above Harvard study also concluded that school policies providing for at least 25 minutes of seated time may reduce food waste (52). In a survey of school cafeteria managers, 44% reported “not enough time to eat” as a factor in plate waste, particularly in middle and high schools (53).

**Figure 6.** Percentage of food wasted when the lunch period time is 30 minutes versus 20 minutes

**PERCENTAGE OF FOOD WASTED**



Taken from [edu.wyoming.gov](http://edu.wyoming.gov) (22)

**New York City Should Take the Lead**

There are currently no national standards for school lunch period lengths. The pleas of health advocates like the School Nutrition Association, a national organization of school nutrition professionals committed to advancing the quality of school meal programs, urging the USDA

and the US Department of Education to develop best practices to ensure all schools provide enough time for healthy school meals is falling on deaf ears (62). Until the federal government sets forth guidelines, it is up to states or school districts to establish the minimum duration for eating.

Across the country, 5 [states have already implemented legislation](#) requiring at least 20 minutes to eat after sitting down, and 6 states have implemented legislation requiring “adequate” time to consume meals. New York state falls into the latter group of states (63). New York City can serve as a role model by improving the sustainability of healthy eating in a supportive school environment.

Allowing children the time they need to eat all of the healthful foods made available through nutrition programs currently available in schools [can reduce students from making poor nutritional choices and unhealthy snacking](#). To encourage healthy eating habits and decrease childhood obesity New York City should therefore enact a similar [mandate for longer meal times at schools](#).

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## Footnotes

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