



## Influence of F&V school intervention on children consumption

### Schools should be in the front line in health promotion

Schools seem to be ideal settings to form children's behaviour. They reach most children for a number of years at a critical age when habits are still being evolved. They are the places where children spend most of their time in contact with qualified personnel to teach and guide. Besides, teachers and other school personnel are often role models for students, and also what is learnt here may have multiple effects by being taken home to influence behaviours in the family.

If we check the evidence, school-based interventions mostly target younger children and there are much less initiatives devoted to improve nutrition in older ages. This is on one hand right as children need to learn about healthy food as early as possible. On the other hand, it is unfortunate as we know that unhealthy dietary habits are more frequent in older age groups. The first paper in the current issue presents an initiative which is facing the challenge of encouraging fruit and vegetable consumption in first-year college students. Transition periods usually bring unhealthy behaviours on their train. Mathews and colleagues are investigating whether gardening can be an efficient strategy to reverse this tendency. The next two papers discuss the value of a cooking and a salad bar program, both designed for younger children.

These papers can inspire those who would like to act and underline the mantra of "war against unhealthy diet starts at home, but schools have a key role to play".

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# Gardening Experience and Fruit and Vegetable Intake Among First-year College Students

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During their first year, college students usually gain unwanted weight. This is related in part to the transition of leaving home and now caring for themselves. During this period, students often consume more convenience and readily available foods that are typically dense in energy and poor in nutrients. Gardening initiatives among children seem promising to enhance their dietary habits and to increase fruit and vegetable consumption. Yet, we don't know if similar initiatives could be effective for older adolescents and college students. The major aim of this study was to examine whether there's a relation between having gardening experiences in childhood as well as recently, and a higher intake of fruit and vegetables (F&V) among a diverse sample of first year college students.

## Gardening intervention: a strategy to encourage F&V consumption

Gardening programs have been used historically to promote sustainable and environmentally friendly farming practices and to encourage active learning in school. Recently, gardening initiatives are being used to enhance children's eating behavior, and specifically to increase F&V consumption<sup>1</sup>. School gardening programs often associate nutrition lessons with opportunities for students to work in a garden<sup>2,3</sup>.

The short-term effects of gardening are known: it increases F&V intake among school-aged participants during or immediately after the intervention period<sup>4,5</sup>. Studies have found that gardening experiences increase both nutrition knowledge and vegetable preferences<sup>2,3</sup>. Other studies have also shown that participating in community gardening once a week can significantly increase F&V intake for adults and children.

However, there's lack of information concerning the long term implications of gardening interventions.

## Gardening experience & frequency and F&V intake among first year college students: Long term effects of gardening

The study included 1,121 first-year students, aged 18 years or older and consuming on average <2 CE (cup equivalents) of fruit or >3 CE of vegetables daily.

Height and weight were measured to calculate participants' BMI and multiple questionnaires were administrated:

- Lifestyle and health-related questionnaires;
- The National Cancer Institute's Fruit and Vegetable Screener;
- Questionnaire including a set of questions about gardening experiences in childhood and in the previous 12 months.

Eleven percent of the participants reported gardening only during childhood, 19% reported gardening only recently, 20% reported gardening both during childhood and recently and 49% reported that they have never gardened. Furthermore, 60% of the students reported that they didn't garden recently, while 31% indicated gardening on a

monthly basis (1 to 3 times/month) and 9% gardened weekly (at least once per week). Figure 1a shows that participants who gardened during childhood and recently, had significantly higher F&V intake (2.5 CE/day) compared with those who never practiced gardening (1.9 CE/day).

Concerning the frequency of recent gardening, it was positively associated with F&V intake. Among the participants who reported not gardening recently, the average F&V intake was 2.1 CE/day, while those who reported gardening monthly had an average F&V intake of 2.4 CE/day, and 2.8 CE/day among those reporting weekly gardening (Figure 1b).

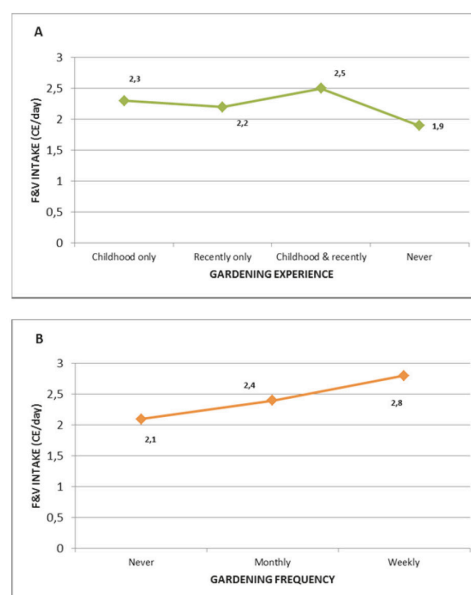


Figure 1: Fruit and vegetable intake by gardening experience (1a) and by frequency of gardening in the past 12 months (1b).

## Policy makers should develop gardening programs at schools to increase F&V consumption among students

The study results support that gardening is a strategy that can increase F&V consumption among college-aged students who don't currently meet national F&V recommendations. To provide a more significant effect on F&V intake, gardening should be practiced at multiple time points and at a sufficient frequency.

Given the positive association between F&V intake in terms of both history of experience and frequency of engagement, policy makers should develop gardening programs at schools, colleges and universities to increase youth and adolescents' exposure to gardening.

**Based on :** J. Loso, D. Staub, SE. Colby, MD. Olfert, K. Kattelman, M. Vilaro, J.Colee; W. Zhou, L. Franzen-Castle, AE. Mathews. Gardening Experience Is Associated with Increased Fruit and Vegetable Intake among First-Year College Students: A Cross-Sectional Examination. *J Acad Nutr Diet* 2017 Nov. <https://doi.org/10.1016/j.jand.2017.09.005>

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# Project CHEF Cooking and Tasting Program Influences Students' Food Preferences

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Childhood obesity continues to be a public health concern, with over 340 million children and youth ages 5 to 19 classified as overweight or obese in 2016<sup>1</sup>. Taste and unfamiliarity with foods<sup>2</sup> have been identified as barriers to children consuming a balanced diet. On the other hand, multiple cooking and tasting sessions can help increase fruit and vegetable consumption in the short term<sup>3</sup> and improve attitudes towards food<sup>4</sup>.

## Project CHEF: A Cooking and Tasting Program at schools

Project CHEF is a one-week cooking and tasting program delivered in Vancouver schools by trained chefs. Students learn in 4 to 5 sessions (2.5 hours each) basic food and kitchen safety rules, knife skills, and how to read and follow a recipe. They cook in small groups after watching recipe demonstrations. At the end of each session, students, parent volunteers, and teachers sit around the table to enjoy what they cooked together.

## Study Design and Participants

Grade 4 and 5 students (9-11 years old) were recruited in an intervention group (n=68) and a comparison group (n= 32) to assess the effect of the program on their food preferences. Using a 4-point scale (3— like a lot, 2— like a bit, 1—don't like, 0— don't know), students reported in a survey adapted from previously published questionnaires<sup>5,6</sup> on preferences at baseline and 2 weeks after taking Project CHEF for:

- 1 fruit (pear),

- 5 vegetables (sweet red peppers, broccoli, swiss chard, carrots),
- 1 grain (quinoa),
- 1 meat alternative (beans).

Parent surveys were sent home at the same time that students were completing their second survey.

## Project CHEF improves students' attitudes towards F&V

Students who participated in Project CHEF reported an increased familiarity and/or preference for the foods introduced through the program, compared to students in the comparison group. Increases were statistically significant ( $p \leq 0.05$ ) for broccoli ( $M=2.61 \pm 0.63$  vs  $2.25 \pm 0.62$ ), swiss chard ( $M=1.96 \pm 0.99$  vs  $0.31 \pm 0.69$ ), carrots ( $M=2.63 \pm 0.54$  vs  $2.31 \pm 0.69$ ) and quinoa ( $M=1.67 \pm 1.22$  vs  $0.72 \pm 1.14$ ).

A higher percentage of students in the intervention group also reported being very likely to try new foods, compared to students in the comparison group (47% vs. 28%). This change was confirmed by parents who observed at home that children were more willing to try new foods after participating in Project CHEF (41% after vs. 28% before exposure to the program).

**Experiential School interventions: an important step to develop healthy food habits in students.** The results suggest that involving students in hands-on cooking and tasting programs (such as Project CHEF) is a great way of introducing them to new foods and can positively influence their preferences (particularly for vegetables and whole grains), an important first step towards developing healthier food habits.



Based on : Zahr R, Sibeko L. Influence of a School-Based Cooking Course on Students' Food Preferences, Cooking Skills, and Confidence. Can J Diet Pract Res. 2017;78:37–41. DOI: 10.3148/cjdp-2016-030. Published at dcjournal.ca on 1 February 2017

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# Salad Bars in New Orleans Schools: Studies to explore student intake of F&V and the individual and school level factors that influence use of salad bars

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Childhood obesity continues to be a public health problem in the United States. Increasing consumption of fruit and vegetables (F&V) is one strategy for offsetting the consumption of energy-dense, sugary and high-fat foods, thereby improving weight status. Many public schools in New Orleans, Louisiana, were provided with salad bar equipment to augment their school lunches through the national Let's Move! Salad Bars to Schools initiative. The value of a salad bar program, however, depends on whether students actually use the salad bar. Few studies have examined their use and how to make that happen more effectively.

Researchers at the Tulane Prevention Research Center in New Orleans set up a multi-part study to examine this gap in the literature. This study was based on

1. surveys with approximately 700 students in 7th to 12th grades, as well as school administrators and food service staff,
2. direct observations in schools to assess food marketing elements, and
3. 24-hour dietary recalls with students.

## Main cafeteria line is primary source for student intake of fruit and vegetables at school<sup>1</sup>

To explore the sources of F&V students consumed via a 24-hour dietary recall, researchers used an interview-assisted web-based platform to report detailed information on all food and drink consumed within the previous 24-hour period. More than 700 students in New Orleans, at schools with and without salad bars, completed the dietary recalls.

- Researchers found that overall, most students – 76% – ate some amount of F&V at lunch. Among those students, most of the F&V were from the school cafeteria main food line – 46% of students at schools with salad bars and 75% of students at schools without salad bars.
- For all students, a sizeable proportion of total 24-hour fruit intake (17.5%) and vegetable intake (23.3%) was consumed during lunch.
- In schools with salad bars, the students who used the salad bar ate more F&V overall than their counterparts who did not use the salad bar. The median intake of F&V from students who used the salad bar was higher (0.92 cups) than that of students whose F&V did not come from the salad bar (0.53 cups).
- The study also found that 15% of students who participated in the study reported that they did not eat lunch in the past 24 hours.

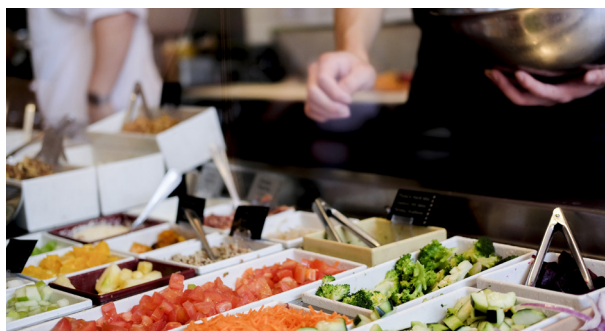
Conclusions: Since students were getting most of their fruit and veggies from the main food line, they were not using the salad bar alone for lunch. With students consuming a sizeable portion of their daily fruit and vegetables during lunch, this suggests that school lunch is an important contributor to overall daily F&V intake. Unfortunately, some youth are not eating lunch at all,

and, therefore, potentially missing essential nutrients. Schools need to be aware so that they can address this issue.

## Students use school salad bars, but not equally<sup>2</sup>

A majority of the 700 New Orleans students surveyed (60%) reported eating from the salad bars in their schools. Not every student had the same results, though. Non-African-American students were twice as likely to use salad bars than African-American students. Researchers also examined students' food preferences and attitudes. Students who had a preference for healthy foods encouraged those around them to eat healthy foods, and those who encouraged their family and peers to eat healthy foods were more likely to eat from their schools' salad bars.

Conclusions: Schools might benefit from targeting specific factors, such as healthy food preferences to increase the use and success of their salad bars. Factors could include more nutrition education for students and increasing exposure to a variety of F&V at early ages.



## Marketing of salad bars matter<sup>3</sup>

Students at secondary schools (also called high schools) in New Orleans with high levels of marketing for the salad bar were nearly three times more likely to use the salad bar compared to students at secondary schools with low levels of salad bar marketing. Among students in both elementary and secondary schools, females used salad bars more often than male students, and adolescents who preferred healthy foods also used them more frequently. Researchers also tracked the schools' environment and marketing practices through in-person visits. Examples of salad bar marketing efforts included signs posted throughout the school to promote the salad bar, notes to parents about the salad bar, and taste-testings of salad bar items.

Conclusions: Schools should be encouraged to promote salad bars with signs and messaging and engage parents in their efforts to improve the school food environment, such as through newsletters or parent-teacher conferences.

### Based on:

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