

Foods Offered in Quebec School Cafeterias: Do They Promote Healthy Eating Habits? Results of a Provincial Survey

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ABSTRACT

Objective: A school environment that encourages students to opt for food with sound nutritional value is both essential and formative in ensuring that young people adopt healthy eating habits. The aim of this paper is to describe the food offered for lunch in the cafeteria service lines in Quebec schools on regular school days.

Methods: A cross-sectional survey was conducted between November 2008 and June 2009 with a representative sample of 207 French-speaking schools in the province of Quebec. The response rate was 71%. The cafeteria food available from the service line was observed directly and systematically by research assistants trained in observational procedures. Bivariate and descriptive analyses were performed.

Results: While most schools offered a vegetable side dish, only 71% of primary schools, 71% of public secondary schools, and 54% of private secondary schools did not offer cold-cut dishes, stuffed pastry, or a fried food on their daily menus. The sandwiches available were rarely made with whole-grain bread. Public secondary schools had more cookies, biscuits, muffins, and chewing gum than private primary and secondary schools. Milk was available in 85% of the primary schools. Most of the schools had eliminated sodas but were still offering fruit cocktails instead of 100% fruit juice.

Conclusion: The school eating environment changed significantly from 2002 to 2009, presumably as a result of the government action plan and the Framework Policy. Improvements must be made with respect to reducing added sugar in beverages and desserts and promoting baked rather than fried snacks. Vigilance is required since many new products are making their way into the market.

Key words: School; food services; child; nutrition; health behaviour

La traduction du résumé se trouve à la fin de l'article.

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In Canada, the prevalence of obesity has nearly tripled in children and teenagers, increasing from 3% to 8% over the last 25 years.¹ In addition to suffering the undesirable social consequences related to discriminatory attitudes towards their condition,² obese children have a greater risk of being obese adults.³ They also risk developing chronic diseases such as diabetes, arterial hypertension, dyslipidemias, certain cancers, and osteoarticular disorders.⁴ Fortunately, healthy eating habits, combined with an active lifestyle, promote the normal physical and psychocognitive development of children as well as constitute a long-term preventive measure in reducing the risk of chronic disease and weight-related issues.^{5,6} In this respect, a school environment that promotes opting for foods with good nutritional value is both essential and formative in encouraging young people to adopt healthy eating habits.^{7,8}

Many Canadian studies have described school food offerings. In 2002, a study conducted in 28 public secondary schools on the Island of Montréal (Quebec, Canada) revealed that, while deep-fat frying had been banned, menus still included a number of processed fried foods that were reheated in the oven before serving.⁹ Another study carried out with 137 primary schools and 41 secondary schools in Québec (Quebec, Canada) reported that at least half of the schools allowed fruit-flavoured drinks, soft drinks, pastries, french fries and chips.¹⁰ In 2004 in Newfoundland, only 46% of the foods available provided good nutritional value and fried foods were commonly served.¹¹ In 2005 in British Columbia, foods of low nutritional value were widely available, especially in sec-

ondary schools.¹² These studies all had methodological weaknesses. Indeed, most of the food questionnaires were filled out by school principals and then mailed back to the researchers, which can result in selection and desirability bias. Moreover, the Quebec surveys were carried out primarily in urban areas, which does not yield a representative picture of the province's schools, since many of them are located in semi-urban and rural areas. Last, these partial profiles were carried out between 2001 and 2004, so they may not reflect the current situation.

In the fall of 2006, the Quebec government launched a government action plan (GAP),¹³ whose purpose was to promote healthy lifestyles and prevent weight-related issues. Schools figure among the environments targeted by the action plan, since they have been recognized as having a major influence on the eating behaviours of young people,¹⁴ who spend many hours there during the week. As a result of the action plan, a *Framework Policy* was implemented in

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schools in 2007.¹⁵ Its priority elements are based on the recommendations of *Canada's Food Guide*¹⁶ and advocate, among other things, low-fat dishes, fruit-based desserts and snacks, and whole-grain products. Moreover, its priority elements suggest that fried foods as well as sweet or sweetened beverages should be removed from school menus.

Once the Framework Policy was implemented, a survey of food offerings and physical activity in Quebec schools (*Enquête sur l'offre alimentaire et l'offre d'activité physique dans les écoles du Québec*) was carried out with a representative sample of Quebec's French-speaking schools in support of the government's efforts to promote healthy eating habits. One of the survey's goals was to record the foods offered by school food services, child-care services, and vending machines; foods available during special events and fundraising campaigns; and the infrastructure and equipment used for physical activities and sports in schools. This paper aims to provide responses to these questions: What food is offered for lunch in the cafeteria service lines on regular school days in primary and public/private secondary schools? Does the menu differ among these various types of institutions?

METHODS

The data presented come from a cross-sectional survey conducted with a representative sample of Quebec French-speaking primary and secondary schools. In order to ensure that the sample was homogeneous with respect to the foods available, vocational-training centres, Aboriginal schools, small schools (primary schools <40 students and secondary schools <100 students), and private vocational schools (e.g., for disabled students) were excluded. Moreover, schools that were hard to reach by car (e.g., on islands) or located more than 250 km from each other were excluded for financial reasons. Those schools (n=22) correspond to approximately 1% of the French-language primary and secondary schools in Quebec.

A two-stage stratified plan was used to build the school sample. In the first stage, all Quebec's administrative regions were stratified, except for Le-Nord-du-Québec, where no school was geographically accessible (n=15). All four metropolitan regions were selected, whereas five of the nine peripheral regions and two of the three remote areas were chosen randomly. In the second stage, the number of schools selected per region was proportional to the number of schools in each of the eleven administrative regions sampled.

Dietitians and nutrition technicians were hired as research assistants. Prior to data collection, they were given a mandatory four-day training on interview techniques and observational procedures, and all participants received a complete training manual. The research assistants spent a full day in each school and interviewed principals, the child-care service managers, and the food service managers. At lunch time, they filled out observation checklists to record all the foods available to students at the cafeteria and documented the context of meals (e.g., natural light in the room, adequate space between tables, clean tables, sufficient time to eat).

Between October 2008 and June 2009, 207 schools (85 primary schools, 66 public secondary schools, and 56 private secondary schools) from the initial selection (n=290) took part in the survey, which corresponds to a 71% rate of response. A total of 66 schools refused to take part in the study (including 21 belonging to 1 of the 3 Montréal school boards), 9 could not be reached, and 8 were

Table 1. Characteristics of Participating and Non-participating Schools

	Participating Schools (n=207)	Non-participating Schools (n=83)	
	Median (IQR)	Median (IQR)	p-value (Mann-Whitney U)
Number of students	353 (631)	392 (552)	0.250
LICO	5 (5)	7 (6)	0.002
SEMI	6 (4)	7 (5)	0.004
	n (%)	n (%)	p-value (chi-square)
Regions			
Metropolitan regions	131 (45.2%)	59 (20.3%)	0.437
Peripheral regions	62 (21.4%)	19 (6.6%)	
Remote areas	14 (4.8%)	5 (1.7%)	

Note: The underprivileged indices (LICO and SEMI) were not compiled for the private schools. LICO corresponds to the proportion of families with children whose income is near or under the low-income threshold. SEMI consists of the proportion of families with children in which the mother does not have a diploma, certificate, degree (which accounts for two thirds of the index weighting) and the proportion of households in which the parents were not employed during the reference week for the Canadian census (which represents one third of the index weighting).

excluded. No significant differences were observed between participating and nonparticipating schools in terms of number of students and geographic area (metropolitan, peripheral, or remote areas). Our results, however, show that low income cut-offs (LICO) and socio-economic milieu index (SEMI) were associated with study participation: significantly fewer disadvantaged schools took part in the study (Table 1). For the purpose of this paper, only schools with cafeteria service were selected (56 primary, 66 public secondary schools, and 55 private secondary schools).

The research ethics committee of the Estrie health and social services centres granted a certificate of ethical acceptability for the project.

Measurements

An observation checklist was used to achieve the study's objective and to describe the various foods offered for lunch in cafeteria service lines on the day of the visit. A dichotomous scale was used to measure whether foods were available in the service line or not (yes/no). The checklist was used to record all the foods and beverages offered to students, including item name, description, method of preparation, and serving size. It was based on the work of Oldenberg et al.,¹⁷ Quebec studies,^{9,10} and the Framework Policy.¹⁵ As well, an interview questionnaire pertaining to school food organization was developed. The checklist and questionnaire were validated beforehand by a committee of experts and then pretested in 42 Sherbrooke schools (Quebec, Canada). Those schools were not included in this study.

Analyses

Descriptive and bivariate analyses (chi-square and Fisher's exact tests) were performed on the three types of schools using SPSS 15.0 statistical-analysis software (Chicago, IL). Medians and interquartile range (IQR) are reported in the case of continuous variables given the asymmetrical distribution of the data. Separate analyses were performed for each type of food and beverage. The data in this study were weighted to take into account the real proportion of primary schools, public secondary schools, and private secondary schools in each administrative region under study. The weighting

Table 2. Dishes and Side Dishes on Daily Menus

Foods on Daily Menus	Primary School (n=56)		Public Secondary School (n=64)		Private Secondary School (n=55)	
	n (%)	95% CI	n (%)	95% CI	n (%)	95% CI
Vegetable side dishes	51 (91.1%)	80.75-97.04	62 (96.1%)	88.17-99.35	51 (92.6%)	82.47-97.94
Cold cuts	5 (9.1%)	6.94-11.66	8 (13.1%)	10.24-16.42	11 (19.9%)	15.36-25.10
Stuffed pastries (e.g., short crust, quiche, vol-au-vent)	7 (13.3%)	10.21-16.92	10 (15.3%)	11.99-19.11	10 (17.6%)	13.53-22.30
Fried or pre-fried foods	4 (7.9%)	6.02-10.14	3 (5.4%)	4.18-6.84	7 (12.5%)	9.56-15.96

Note: CI = Confidence interval. Results differ significantly from: * = primary school, † = public secondary school, ‡ = private secondary school (p<0.05). No notation means that there were no statistically significant differences between types of schools.

Table 3. À la carte Dishes on the Day of the Visit

À la carte Dishes	Primary School (n=56)		Public Secondary School (n=66)		Private Secondary School (n=55)	
	n (%)	95% CI	n (%)	95% CI	n (%)	95% CI
Sandwiches made with white bread, with or without cold cuts	6 (11.3%)†‡	8.65-14.42	52 (79.4%)*‡	69.10-87.51	22 (40.4%)*†	32.16-48.64
Sandwiches made with whole-grain bread, with or without cold cuts	5 (9.3%)†‡	7.09-11.92	41 (61.9%)*	52.68-71.12	25 (45.3%)*	36.45-54.15
Croissant sandwiches, with or without cold cuts	1 (1.1%)†	0.83-1.43	9 (13.5%)*	10.60-16.85	5 (8.7%)	6.62-11.17
Fried dishes (e.g., french fries with gravy and cheese curds or fried chicken burger)	0	–	1 (1.8%)	1.39-2.28	0	–
Stuffed pastries (e.g., short crust, quiche, vol-au-vent)	0	–	4 (6.6%)	5.14-8.32	0	–
Other dishes high in fat (e.g., pizza, hot dog, club sandwich with bacon)	1 (1.8%)	1.36-2.33	7 (10.9%)	8.42-13.38	6 (11.6%)	8.86-14.83
Fried or pre-fried foods (e.g., potatoes, onion rings, chips, or egg rolls)	2 (3.0%)	2.27-3.88	7 (10.6%)	8.18-13.02	4 (7.8%)	5.92-10.04

Note: CI = Confidence interval. Results differ significantly from: * = primary school, † = public secondary school, ‡ = private secondary school (p<0.05). No notation means that there were no statistically significant differences between types of schools.

also included a post-stratification process to ensure that the sample of students is representative of the study population. A threshold of significance of 5% was used for all the hypothesis testing performed.

RESULTS

The median of the proportion of students who ate lunch at school was 76% in the case of primary schools (IQR = 40), 69% for public secondary schools (IQR = 34.7), and 95% for private secondary schools (IQR = 20). In most cases, students ate in a cafeteria (primary = 31%, public secondary = 99%, private secondary = 93%) or in the child-care service in the case of primary-school students (27%). The students may have simply eaten the contents of their lunch boxes, augmented their lunch-box meal with à la carte items, or purchased a complete meal.

The results indicate that 69% of primary schools offered a lunch meal service to students, compared to 100% of public secondary schools and 99% of private secondary schools. Of the primary schools providing a lunch meal service to students, a little more than half (55%) outsourced the service and received ready-to-eat meals that often arrived in small individual boxes. This contrasts with the secondary schools, which prepared and cooked most of their meals on site (public = 88%; private = 89%). In the majority of cases across all types of institutions, menus were planned on a cyclic basis that repeats every four weeks or more.

The daily menu consisted of entrées and side dishes (Table 2). The median number of entrées in the primary schools was 1 (IQR = 1), compared to 2 (IQR = 1) for both public secondary schools and private secondary schools. Most schools offered a vegetable side dish on the daily menu. Moreover, 70.9% of the primary schools, 70.5% of the public secondary schools, and 54.1% of the private secondary schools did not offer cold-cut dishes, stuffed pas-

try, or a fried food on their daily menus. No significant differences were observed in the offering of these foods between the various types of schools.

Some schools also had à la carte dishes; of these, only five primary schools offered whole-grain sandwiches. Significantly more public secondary schools offered sandwiches and subs made with white bread (Table 3).

Generally, the secondary schools offered significantly more desserts and snacks than the primary schools (Table 4). Public secondary schools served more cookies, biscuits, muffins, chewing gum, and throat lozenges than private primary and secondary schools. The number of snack foods, which tend to be salty, was high, especially in the public and private secondary schools.

Milk was available in 85% of the primary schools and in nearly all of the secondary schools. Most of the schools had 100% fruit juice (Table 5), particularly the public secondary schools. A very small proportion sold soft drinks or energy drinks. About one third of the public secondary schools offered sweet or sweetened beverages, coffee, hot tea or hot chocolate, while this proportion was higher in the case of private secondary schools, particularly with regard to sweet beverages.

DISCUSSION

The objective of our research was to describe the food offered in Quebec's primary schools and public/private secondary schools with respect to their contribution to creating environments that promote healthy eating habits. We examined the results in comparison with the national nutritional guidelines published in government documents.

Most of the primary schools had a single daily menu, including either a milk-based or a fruit-based dessert. Their menus were less diverse because they served a smaller number of students, and cafe-

Table 4. Snacks or Desserts on the Day of the Visit

Desserts and Snacks	Primary School (n=56)		Public Secondary School (n=66)		Private Secondary School (n=55)	
	n (%)	95% CI	n (%)	95% CI	n (%)	95% CI
Fruit-based snacks and desserts (e.g., fresh fruit, canned fruit, fruit compote, dried fruit, fruit pulp)	25 (44.2%)†‡	35.55-52.85	65 (98.2%)*	91.19-99.95	51 (93.3%)*	83.27-98.35
Yogurt, Minigo®, Danimal®	18 (32.1%)†‡	25.17-39.03	49 (74.3%)*	63.89-83.04	35 (64.3%)*	54.15-74.45
Other milk-based desserts (e.g., milk pudding, tapioca, milk- or yogurt-based mousse)	11 (20.3%)†‡	15.55-25.05	49 (74.4%)*	64.00-83.11	33 (59.5%)*	49.49-69.51
Desserts based on 10%, 15%, or 35% MF cream (fruit cream or mousse) or cream substitutes (e.g., Cool Whip®)	0	–	4 (6.6%)	5.14-8.32	3 (5.0%)	3.79-6.46
Granola bars	5 (8.1%)†	6.18-10.39	21 (32.3%)*	25.89-38.71	12 (22.0%)	16.86-27.14
Cookies/biscuits	26 (47.0%)†	38.04-55.96	53 (80.0%)*‡	69.75-88.00	35 (64.4%)†	54.24-74.56
Fruit or vegetable muffins or bread	10 (18.0%)†‡	13.89-22.73	56 (84.7%)*‡	74.64-91.96	33 (60.7%)*†	50.64-70.76
Other grain-based desserts and snacks with fruit (≥½ serving of fruit)	5 (8.6%)†‡	6.56-11.02	18 (27.8%)*	22.10-33.50	14 (24.7%)*	19.04-30.36
Other grain-based desserts and snacks <½ serving of fruit	17 (31.0%)†‡	24.26-37.74	44 (66.1%)*	56.81-75.39	39 (70.8%)*	59.34-80.61
Sugar-coated peanuts, nuts, seeds, or dried fruit	0	–	4 (5.7%)	4.44-7.20	1 (1.1%)	0.83-1.43
Chocolate <70% cocoa (including Smarties®)	0	–	4 (6.7%)	5.22-8.45	1 (1.2%)	0.91-1.56
Chewing gum and throat lozenges with sugar or sweetener	0†‡	–	25 (37.3%)*‡	30.17-44.43	7 (12.5%)*†	9.56-15.96
Sweet spreads (e.g., Nutella®, jam, jelly, caramel)	2 (2.7%)	2.05-3.49	6 (8.5%)	6.63-10.69	8 (14.8%)	11.35-18.82
Candies with sugar or sweetener (e.g., jujubes, licorice, fruit-flavoured candy, Fruit-O-Long® fruit rolls)	0	–	3 (4.4%)	3.42-5.56	2 (3.2%)	2.42-4.15
Frozen treats (e.g., Popsicles®, sherbet, ice cream, Fudgsicles®)	1 (2.6%)†‡	1.97-3.36	11 (16.2%)*	12.76-20.14	12 (22.1%)*	16.94-27.26
Dried sausage or meat (e.g., beef jerky)	0	–	1 (0.8%)	0.62-1.02	2 (3.2%)	2.42-4.15
Regular dehydrated noodles	0	–	1 (0.8%)	0.62-1.02	0	–
Snack foods based on grains or on fried or baked vegetables (e.g., chips, pretzels, popcorn, rice cakes, cheese Ritz® crackers)	6 (10.4%)†‡	7.95-13.29	32 (48.0%)*	39.65-56.35	20 (36.6%)*	28.90-44.30

Note: CI = Confidence interval. Results differ significantly from: * = primary school, † = public secondary school, ‡ = private secondary school ($p < 0.05$). No notation means that there were no statistically significant differences between types of schools.

teria profitability is tied to sales. The primary schools also offered fewer cold cuts, stuffed pastries, candy and snacks than the secondary schools, which led us to conclude that the overall menu could adequately correspond to the national nutritional guidelines^{15,16} despite being limited. On the other hand, the secondary schools had a wider variety of foods. As a result, the students could take advantage of an eating environment that promoted healthy diets as long as they made good food choices. In other words, these study results constitute a complete and objective baseline of school offerings in order to guide further promotion interventions. Indeed, a healthy environment must be paired with educational messages¹⁸ such as posters in the cafeteria, nutrition education programs throughout the schools,¹⁹⁻²¹ or even cooking classes taught by food-service personnel²² in order to guide young people towards food choices and basic culinary skills that are best for their health. Wang et al.²³ demonstrated that an obesity prevention program targeting students would prevent about 2% of girls from becoming overweight adults. This rate would translate into reduced costs related to health and loss of productivity, thereby yielding net savings for society.

Our results showed that few schools offered fried foods or oven-reheated pre-fried foods, whereas the 2002 Quebec study revealed that 80% of schools did so.⁹ Soft drinks, which had been available in 2002,¹⁰ no longer had a place in service lines. We can therefore conclude that efforts to build environments that promote healthy eating habits continue to be made by the food services in Quebec schools.

Only 85% of primary schools offered milk on the day of the visit. We viewed this as worrisome, since *Canada's Food Guide* recommends 3 to 4 portions of milk and children have a low dietary intake of dairy products. In addition, there were challenges with respect to cold cuts, which contain fat and sodium; desserts high in fat and sugar; sweet or sweetened beverages, which should be replaced by 100% fruit juice; and whole-grain products, which should be served more often. To help meet these challenges, cooks need training in preparing dishes, desserts, and snacks with higher nutritional value (e.g., using coulis instead of icing on desserts, substituting chicken breasts or hummus for cold cuts, offering pizza on whole-wheat pita bread instead of a traditional crust, increasing the visibility of fresh fruit, and innovating with desserts to replace pastry).²⁴ Moreover, information about new products must be transferred to food services managers to guide them in buying nutritious foods²⁵ (e.g., flavoured milk and vegetable chips).

As a result of its representativeness, this profile of 635,691 students reflects a major proportion (90%) of the province's student population. The foods offered by food services were recorded by trained, experienced research assistants. The fact that the data were objective reduces social desirability bias and errors engendered by self-reported data. These results can therefore be generalized to all French-language schools, except those situated in the northern regions and those associated with the Montréal school board, since its food offering differs from that in the rest of the province and its representatives declined to take part in the study.

Table 5. Beverages Available in Schools on the Day of the Visit

Beverages	Primary School (n=56)		Public Secondary School (n=66)		Private Secondary School (n=55)	
	n (%)	95% CI	n (%)	95% CI	n (%)	95% CI
Pure fruit juice	42 (75.7%)†	64.23-85.02	66 (100%)*‡	–	48 (87.7%)†	76.86-94.71
Milk (3.25%, 2%, 1%, skim)	48 (84.9%)†‡	73.79-92.66	65 (99.2%)*	93.05-100	54 (98.6%)*	90.51-100
Flavoured milk >30 g sugar/250 mL (e.g., Hershey®, Oh Henry!®, Rolo®, and Coffee Crisp® chocolate milkshakes)	0‡	–	5 (7.6%)	5.93-9.57	5 (9.8%)*	7.47-12.56
Diet soft drink	0	–	0	–	1 (1.4%)*	1.06-1.82
Regular soft drink	0	–	0	–	0	–
Other beverages without sugar, with sweetener (e.g., carbonated or uncarbonated flavoured water, sugar-free iced tea)	1 (1.2%)†‡	0.91-1.56	21 (31.8%)*	25.46-38.14	16 (28.4%)*	22.15-35.33
Other beverages with sugar (e.g., punch, cocktail, sweetened iced tea, sports beverages)	6 (10.5%)†‡	8.03-13.42	22 (33.8%)*‡	27.17-40.43	31 (56.7%)*†	46.84-66.56
Coffee, tea (hot)	0†‡	–	24 (35.8%)*	28.88-42.72	23 (41.4%)*	33.02-49.78
Hot chocolate	0†‡	–	25 (37.4%)*	30.26-44.54	18 (32.5%)*	25.44-39.56
Energy drink	0	–	0	–	1 (1.4%)*	1.06-1.82

Note: CI = Confidence interval. Results differ significantly from: * = primary school, † = public secondary school, ‡ = private secondary school ($p < 0.05$). No notation means that there were no statistically significant differences between types of schools.

CONCLUSION

The school eating environment changed significantly from 2002 to 2009, presumably as a result of the government action plan and the Framework Policy. Vigilance is required since many new products are making their way into the market, but not all of them are sound choices. Furthermore, improvements must be made with respect to reducing added sugar in beverages and desserts and promoting baked rather than fried snacks. Changing food offerings has a good chance of changing what children eat at school. Just how that would affect their overall diets and levels of obesity remains to be seen.

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RÉSUMÉ

Objectif : Un environnement scolaire qui favorise la sélection d'aliments de bonne valeur nutritive s'avère essentiel et structurant pour faciliter l'adoption de saines habitudes alimentaires chez les jeunes. Cet article a pour but de décrire les aliments offerts le midi, à la ligne de service, lors d'une journée régulière, dans les écoles québécoises.

Méthodologie : Une enquête transversale a été menée entre novembre 2008 et juin 2009 auprès d'un échantillon représentatif de 207 écoles francophones du Québec. Un taux de réponse de 71 % a été obtenu. Une observation directe et systématique des aliments offerts à la ligne de service a été réalisée par des assistants de recherche formés en procédure d'observation. Des analyses descriptives et bivariées ont été effectuées.

FOODS OFFERED IN QUEBEC SCHOOL CAFETERIAS

Résultats : Bien que la plupart des écoles offrait un légume en accompagnement au menu du jour, seulement 71 % des écoles primaires, 71 % des écoles secondaires publiques et 54 % des écoles secondaires privées ne proposait pas de charcuterie, de mets en croûte ou d'aliment frit. Les sandwiches offerts parmi les mets à la carte étaient rarement constitués de grains entiers. Les écoles secondaires publiques servaient davantage de biscuits/galettes, de muffins et de gomme à mâcher que les écoles primaires et secondaires privées. Le lait était présent dans 85 % des écoles primaires. La majorité des écoles avait éliminé les boissons gazeuses mais offrait encore des boissons sucrées au lieu de jus de fruits purs.

Conclusion : L'environnement alimentaire scolaire a changé considérablement entre 2002 et 2009, probablement à la suite du Plan d'action gouvernemental et de la Politique-cadre. Des améliorations demeurent nécessaires au regard des aliments avec sucres ajoutés ou cuits au four. Une vigilance constante est de mise étant donné que plusieurs nouveaux produits alimentaires font leur apparition sur le marché.

Mots clés : écoles; services alimentaires; enfant; nutrition; comportement de santé