

# Fruit and Vegetable Availability at U.S. Elementary Schools

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## Introduction

Overweight and obesity have risen rapidly among US children and adolescents, reaching epidemic proportions in recent years. A balanced diet high in fruits, vegetables, and other nutrient-dense foods can prevent disease, and children who eat more fruit are less likely to be overweight. However, many US children fall short of dietary goals regarding fruit and vegetable consumption.

Many school-aged children eat lunch at school. Schools that participate in the National School Lunch program must meet nutritional requirements and contribute less than 30% of daily fat and calories. However, the specific foods offered in lunches are not regulated nationally, thus there is much variation in the types of food offered for lunch. Furthermore, many schools offer so-called “competitive foods,” that is, food sold through vending machines, snack carts, and “à la carte” in the cafeteria. Competitive foods are often of minimal nutritional value, with high fat and sugar content. National initiatives are encouraging increased availability of healthy food options in schools, and with these analyses we assessed fruit and vegetable availability in US elementary schools.

## Methods

The Food and Fitness Project was launched in 2007 to assess obesity-relevant policies and practices among US elementary schools and their corresponding schools districts. Our sampling approach involved a two-stage procedure, whereby a nationally-representative sample of school districts was selected, and from within those districts, a sample of elementary schools were selected with probability proportional to size (3<sup>rd</sup> grade enrollment). In addition, we drew a representative sample of private schools serving elementary aged (3<sup>rd</sup> grade) students.

We sent a pen-and-paper survey to school principals beginning in spring 2007. Principals were provided pre-paid return envelopes, and we offered \$100 for completing the survey. Multiple follow-up efforts were made by mail, email, and phone to all non-responders. By fall of 2007, we received responses from 578 public schools (54.5% response rate) and 259 private schools (66.2% response rate). Our sample weights were adjusted to account for non-response.

Analyses presented here are weighted to provide inference to elementary schools in the U.S.

### School Characteristics:

	Public schools (n = 578)		Private schools (n = 259)	
	<i>M</i>	<i>(SD)</i>	<i>M</i>	<i>(SD)</i>
Total students at school	561.9	(236.5)	446.6	(284.3)
Total 3 <sup>rd</sup> grade students	92.7	(47.8)	47.1	(23.8)
Schools with > 40% Non-White students	42.8%		17.7%	
Schools with > 30% free/reduced lunch	66.4%		n/a	

For more information, see: [www.impacteen.org/foodandfitnesshome.htm](http://www.impacteen.org/foodandfitnesshome.htm)

## Results

### School Lunch Meals

Nearly all schools (94.8%) participated in the National School Lunch Program. Among those schools, the following foods were offered:

	Every Day/ Most Days	Some Days	Never
Fresh Fruit	58.7	38.2	3.1
Other Fruit	39.9	52.6	7.5
Vegetables	55.3	41.1	3.6
Pre-made Salads	24.7	37.4	38.0
Salad Bar	17.6	13.9	68.5

### Competitive Foods

17.4% of schools had a snack bar or snack cart selling food to students. 4.2% of schools had vending machines selling food to students. 36.4% of schools offered à la carte options during lunchtime.

Fruit and vegetable availability was calculated as a percent of the overall sample of schools, with availability as follows:

	% of schools that offered each food
<b>Snack Carts</b>	
Fresh Fruit	7.6
Other fruit (e.g., dried fruit)	5.8
Vegetables	6.1
Salads	4.2
<b>Vending Machines</b>	
Fresh Fruit	.5
Other Fruit	.7
Vegetables	.5
Salads (pre-made)	.2

À la carte (as % of overall school sample)	Every Day/ Most Days	Some Days	Never
Fresh Fruit	17.1	10.5	7.8
Other Fruit	10.4	13.5	11.3
Vegetables	12.8	12.1	10.2
Pre-made Salads	8.4	10.0	16.7
Salad Bar	5.3	4.2	25.8

## Results

### Lower-Income vs. Higher-Income Schools

Because obesity rates are elevated in lower-income communities, we compared differences among higher-income schools vs. lower-income schools, using percent of students qualifying for free lunch to create two groups (> 30 free/reduced price lunch considered lower-income). These analyses include only the public elementary schools.

For Vending and Snack Carts, we found no differences by school income group.

Among public elementary schools, lower-income schools were less likely to offer à la carte service (available at 33.3% of lower-income schools, vs. 46.5% of higher-income schools (p < .01). Among only the schools that offered à la carte, lower-income schools were less likely to offer fruit:

	Higher-Income % never offering	Lower-Income % never offering	p
Fresh Fruit	19.8	21.3	<.05
Other Fruit	23.6	35.3	<.05

Lower-income schools were also less likely to offer salad as part of the Lunch Meal.

	Higher-Income % never offering	Lower-Income % never offering	p
Pre-made salad	22.8	44.2	<.001
Salad bar	65.4	71.4	<.01

## Discussion and Conclusions

Given the importance of establishing healthy eating habits early in childhood, schools can play an important role in promoting children’s health. Availability of healthy options such as fruits and vegetables in US school lunches is modest, with much room for improvement. While the majority of schools participated in the National School Lunch Program and offered a lunch meal, few schools offered salads frequently, and many schools did not offer fresh fruits and vegetables on most days. Salads were less-frequently available in lower-income schools.

“Competitive foods” were offered in a small proportion of schools, but where these sales venues existed, healthy options were not widespread. In schools where competitive foods are already being sold, efforts should be made to encourage replacement of less-healthy options with healthier options such as fruits and vegetables. Such efforts are particularly warranted in lower-income schools.

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