

THE STATE OF NUTRITION AND PHYSICAL ACTIVITY IN OUR SCHOOLS



ENVIRONMENT & HUMAN HEALTH, INC.

THE STATE OF
NUTRITION AND
PHYSICAL ACTIVITY
IN OUR SCHOOLS

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This research project involved on-site visits to 62 schools across the State of Connecticut. The Project Investigator visited each school for one day, from before the beginning of the first lunch period until after the end of the last. School districts from all eight Connecticut counties and from each of the nine Connecticut Board of Education Economic Reference Groups (ERGs) participated in this study. In each school district, the project investigator interviewed school principals, teachers, food service directors, cafeteria staff, and students. This report also includes a literature review on the subjects of childhood obesity, school nutrition, and physical activity in schools.

The Board of Environment and Human Health, Inc. and the Project Investigator are especially grateful to the food service directors and cafeteria managers across Connecticut for their critical contributions to, and collaboration in, this research study.

We would also like to thank the local and regional health directors who worked with us and who encouraged their school districts to be a part of this study. Appreciation is also extended to school superintendents, principals, physical education teachers, nutrition education teachers, cafeteria staff, and students for their participation.

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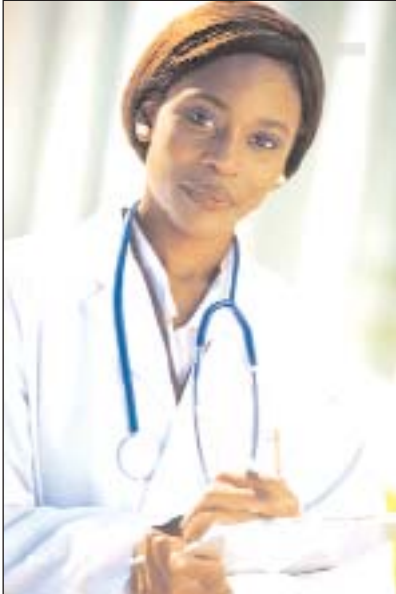
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A STUDY OF NUTRITION AND
PHYSICAL EDUCATION IN SCHOOLS,
PROMPTED BY RISING RATES
OF CHILDHOOD OBESITY



In the United States, obesity and overweight prevalence is estimated to be at least 15 percent for all children and adolescents, and higher than 30 percent in some population subgroups.



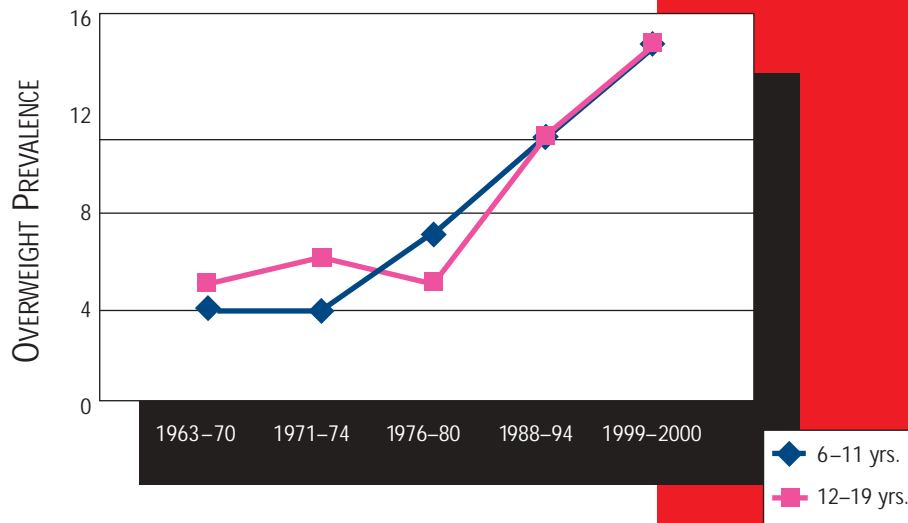
Introduction

In 1998, the World Health Organization determined obesity to be a global epidemic.¹ This epidemic affects not only adults, but also children and adolescents worldwide. In the United States, obesity and overweight prevalence is estimated to be at least 15 percent for all children and adolescents,² and higher than 30 percent in some population subgroups.³ Obesity is now the most serious dietary problem affecting the health of American children.⁴

The most extensive data on obesity and overweight prevalence are provided by the National Health and Nutrition Examination Survey (NHANES). As part of a comprehensive set of body measurements, this survey records height and weight, and reports results in terms of body mass index (BMI), expressed as weight/height² (kg/m²). While defining childhood obesity is problematic due to a lack of a standard definition and vocabulary, it is generally accepted that a child whose BMI is above the 95th percentile for his or her gender and age is overweight or obese.^{5, 6}

Results from the NHANES survey are reported approximately every five years. Figure 1 shows the trend in overweight prevalence for children and adolescents for selected years from 1963 through 2000.⁷ While overweight prevalence was relatively stable from the 1960s through the 1980s, this figure shows a marked increase from the late 1970s to 2000. In fact, overweight prevalence doubled for children aged 6–11 years and tripled for adolescents aged 12–19 years. A further disturbing trend is that the distribution curve of children's weight has become skewed to the right over time, indicating that children who are already overweight are getting fatter.⁸

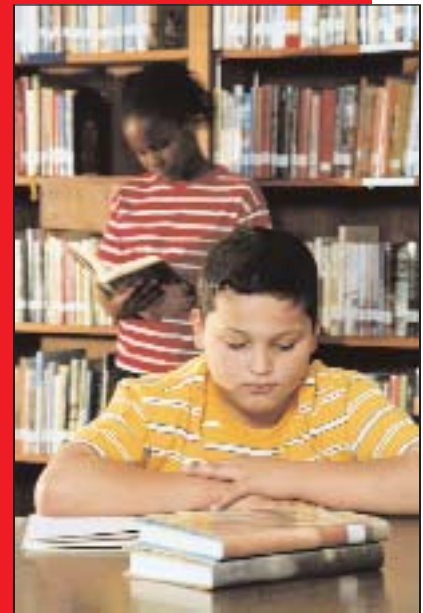
Figure 1. Prevalence of children with BMIs exceeding the 95th percentile for selected periods between 1963 and 2000. (Data source: CDC, 2004).

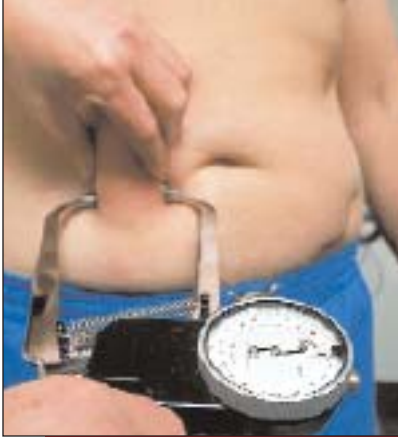


Disparities in prevalence

Between 1976 and 1994, overweight and obesity prevalence increased in both genders, across all races and ethnicities, and across all age groups.^{9, 10} However, disparities in overweight and obesity prevalence do exist based on race, ethnicity, gender, and socioeconomic status.

Data from the NHANES III survey, collected from 1988-1994, demonstrated that Mexican-American boys had a higher prevalence of overweight than did non-Hispanic black and non-Hispanic white boys.^{11, 12} In addition, Hispanic girls and non-Hispanic black girls have shown a higher prevalence of overweight than non-Hispanic white girls.^{13, 14, 15, 16}





Childhood obesity is defined as the presence of excess adipose tissue, while childhood overweight simply means having too much weight.... Regardless of difficulties in precisely defining childhood obesity, it is clear that millions of American children are overweight or obese, and that this problem is increasing at an alarming rate.



What is childhood obesity, and how does it differ from childhood overweight?

Childhood obesity is defined as the presence of excess adipose tissue,^{17, 18} while childhood overweight simply means having too much weight. The BMI described earlier is currently the preferred method for evaluating weight status in children, and a BMI greater than the gender- and age-specific 95th percentile is strongly indicative of obesity in children and adolescents.

It should be noted that only criteria based on measures of fatness or adiposity can classify individuals as obese. Weight-based measures, including the BMI, are only indirect measures of adiposity. This is particularly relevant in populations of children who are growing and developing muscle, and may vary widely even within the same age and gender groupings.¹⁹ Thus, the NHANES survey described previously makes no reference to childhood obesity, and confines its results to childhood overweight prevalence.

However, other researchers have argued that the association between obesity and high BMI is quite strong,²⁰ and in a majority of studies, a BMI greater than the 95th percentile is considered obese.²¹ Regardless of difficulties in precisely defining childhood obesity, it is clear that millions of American children are overweight or obese, and that this problem is increasing at an alarming rate.

What health problems are associated with childhood obesity?

Childhood obesity can lead to a startling variety of negative health effects, both acute and long-term. Prior to adulthood, obese children may develop gallstones, hepatitis, and sleep apnea.²² Obese children and adolescents also have increased risks of childhood hypertension and high cholesterol.²³

Because they carry excess weight, obese children are at increased risk of orthopedic problems.²⁴ They are also prone to psychosocial disorders. Discrimination is common, and overweight children are ranked the lowest of those with whom other children would like to be friends.²⁵

One of the most alarming health outcomes associated with the growing prevalence of childhood obesity is the increase in Type 2 diabetes in children. This type of diabetes has been traditionally termed “adult-onset diabetes” because, historically, the overwhelming majority of cases have been found among adults. Until recently, only 1-2 percent of children were diagnosed with Type 2 diabetes.²⁶ Now, however, reports indicate a steep increase in incidence of this disease.²⁷

One large study in Cincinnati found a 10-fold increase in Type 2 diabetes in adolescents between 1982 and 1994.²⁸ This increase is strongly linked to childhood obesity, as 85 percent of children with Type 2 diabetes are either overweight or obese at diagnosis.²⁹ Overweight and obese children are more likely



Because they carry excess weight, obese children are at increased risk of orthopedic problems.... One of the most alarming health outcomes associated with the growing prevalence of childhood obesity is the increase in Type 2 diabetes in children.





The growing obesity crisis is due to a changing environment, one that researchers have described as “toxic.”



to become overweight or obese adults, and morbidity from obesity in adults may be as great as from poverty, smoking, or problem drinking.³⁰ Obesity is estimated to contribute to more than 280,000 deaths every year in the U.S.,³¹ and the total cost of obesity was estimated to be \$117 billion in the year 2000 alone.³²

What are the factors involved in childhood obesity?

The growing obesity crisis is due to a changing environment, one that researchers have described as “toxic.”³³ For the vast majority of individuals, obesity results from excess caloric intake paired with inadequate physical activity.³⁴

An overabundance of food, much of which is high in fat and sugar, coupled with sedentary lifestyles, is driving these rising obesity rates. In 1997, American children obtained 50 percent of their calories from added fat and sugar, and only 1 percent regularly ate diets that resembled the USDA’s dietary guidelines.³⁵

A study by the Centers for Disease Control and Prevention (CDC) found that 64 percent of young people ages 6 to 17 eat too much total fat, and 68 percent eat too much saturated fat.³⁶ According to another national survey, less than 50 percent of children participate in any physical activity that would promote long-term health benefits.³⁷

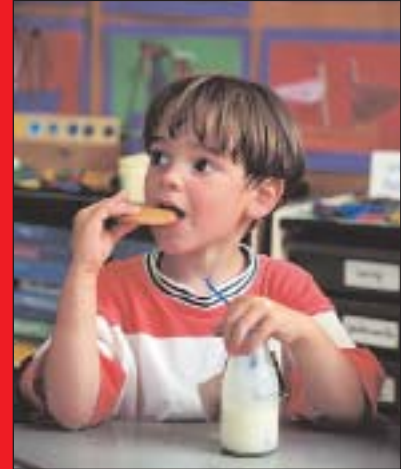
What is the role of the school in childhood obesity prevention?

The school environment has a powerful influence on students' eating behaviors,³⁸ and the Surgeon General has identified schools as key settings for public health strategies to prevent and/or decrease the prevalence of overweight and obesity.³⁹ Children spend a large portion of their time at school, and many of the lifestyle and behavior choices associated with obesity develop during this time.⁴⁰ Researchers have concluded that schools can help prevent childhood obesity by providing appropriate meals, physical activity, and health education.⁴¹

In addition, research has shown that the influence of the school environment on behavior extends beyond the school. Students are exposed to food throughout the school day, and this repeated exposure is likely to influence food selection outside of school, as well.⁴²

A study of the association between adolescents' dietary behavior and food sales at school found that students choosing less healthful foods at school do not compensate by choosing more healthful foods at other times.⁴³ Research has also shown that increased focus on physical education in school can lead to overall increases in the amount of time students spend engaged in vigorous physical activity.⁴⁴

This study evaluates the nutrition and physical activity environments in a cross-section of public schools.



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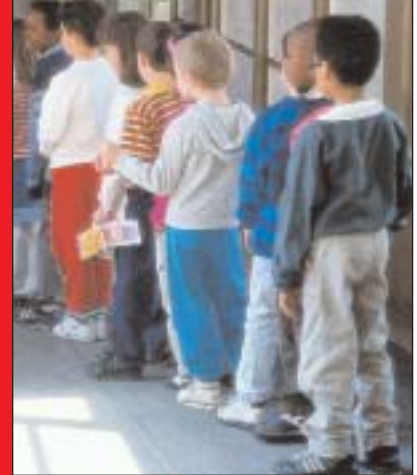
I. School Lunch Periods



Previous research suggests that inadequate time to eat discourages students from purchasing and eating complete lunches. Waiting in line is the most commonly reported factor contributing to student dissatisfaction with lunches. When they do not have enough time to buy and eat lunch, students report buying snacks instead, buying lunch and throwing away a large portion, or skipping lunch entirely. On average, the last student in the lunch line at schools in this study had 13 minutes to eat, with a range of 7 to 25 minutes.

Summary of Findings

- Thirty-four percent of schools included in this study provided the last student in the lunch line with only 10 minutes or less to eat his or her lunch.
- The average time between the last student in line receiving his or her lunch and the end of the lunch period was 13 minutes. This did not vary significantly by level of school.
- As opportunity time to eat decreased, students, cafeteria staff, and lunch monitors were significantly more likely to report that students had insufficient time to buy and eat their lunches.
- When asked what they did when they did not have enough time to buy and eat lunch, students reported buying à la carte snacks, eating from vending machines, bringing lunch from home, skipping lunch entirely, or buying lunch and throwing away a large portion.
- In order to accommodate the entire student body, some large schools scheduled as many as seven lunch periods, and these lunches started as early as 9:25 a.m. Fifty percent of the middle and high schools included in this study scheduled the first lunch period before 11:00 a.m., despite national recommendations that school lunches not begin before this hour.¹
- Providing students with constructive activities at the end of lunch can allow for longer lunch periods without increasing behavioral problems.
- Decreasing wait in line by adding extra serving lines or overlapping lunch waves can allow more students to be served more quickly and can reduce the discrepancy in opportunity time to eat between the first student in line and the last.

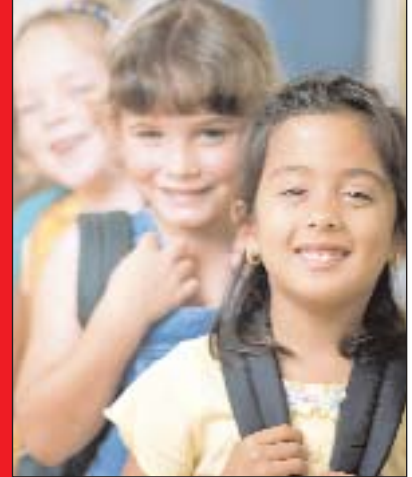


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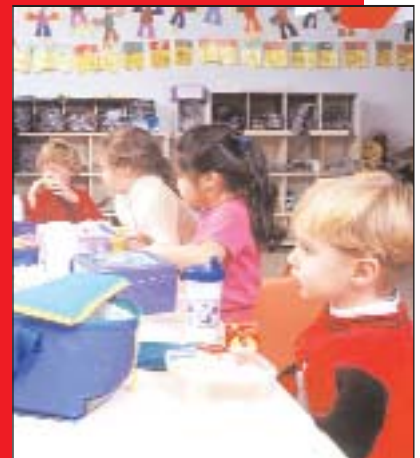


I. Recommendations

- Schools should provide even the last student in line with enough time to buy and eat a complete lunch.
- Schools should work to reduce wait time or to extend lunch periods when lunch lengths are insufficient to provide all students appropriate opportunity time to eat. In schools where students who are first in line have excess time, constructive activities should be provided for those students.
- Administrators should work with lunch monitors and cafeteria staff to determine the length of their students' opportunity time to eat and, based on their school's unique characteristics, create a strategy that will ensure sufficient time. Due to differences between schools in size, number of lunch periods, and cafeteria and food service structure, the length of time allotted to school lunches does not easily lend itself to regulation.



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II. The National School Lunch Program



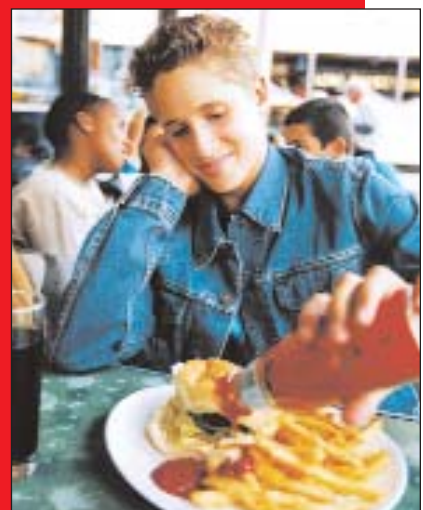
The National School Lunch Program (NSLP) is the largest child nutrition program in the United States. Participation in this program allows schools to receive both cash subsidies and donated foods for every meal served. The meals must meet certain nutritional requirements, and must be offered either free or at reduced prices to eligible children. Each school day, 25 million children receive low-cost or free lunches. Ninety-five percent of the schools in this study participated in the National School Lunch Program.

Summary of Findings

- Ninety-five percent of the schools in this study participated in the National School Lunch Program (NSLP).
- At the schools in this study that participated in the NSLP, an average of 53 percent of students bought a lunch on a typical day.
- Student participation in the NSLP was found to decrease with increasing school level. In elementary schools, an average of 59 percent of students bought a qualifying lunch on a typical day. This value dropped to 54 percent in middle schools, and 44 percent in high schools.
- Most school districts in this study provided little or no financial support to the food service program. The majority of food service programs were nearly one hundred percent financially self-supporting, aside from the subsidies and commodities provided by the NSLP. This means that the money made from selling school lunches and other foods must pay not only for the food itself, but also for staff salaries, benefits, staff training, and kitchen equipment.
- Some school districts concentrated more than others on encouraging students to eat lunches containing all of the required components. This is important, as fruit and vegetable components are those most commonly ignored. Focus on fruit and vegetable consumption did not appear to be related to either school level or Economic Reference Group (ERG). In fact, one of the districts that appeared to be most focused on



In elementary schools, an average of 59 percent of students bought a qualifying lunch on a typical day. This value dropped to 54 percent in middle schools, and 44 percent in high schools.





Oil-fried French fries were so popular at many schools that some lunch monitors reported students buying lunches for the fries only, and throwing everything else away.



encouraging students to eat the fruit and vegetable lunch components was in the lowest ERG. This suggests that with a commitment from the food service staff and administration, all schools can provide students with nutritious lunches, including appealing fruits and vegetables.

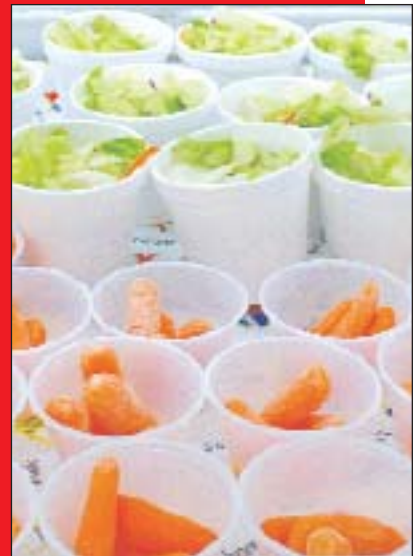
- Food service directors and cafeteria managers reported that, on average, 32 percent of their food came from the federal government commodities program.
- At 63 percent of the schools visited, food service directors or cafeteria managers reported that the commodities they received helped them to provide healthy lunches.
- Fresh fruits and vegetables are currently not available to school food service programs through the federal commodities program. A majority of food service directors and cafeteria managers, including those who felt strongly that the commodities helped them provide healthy lunches, reported this to be a significant gap in the federal commodities program.
- Oil-fried French fries were so popular at many schools that some lunch monitors reported students buying lunches for the fries only, and throwing everything else away.
- Food service directors and cafeteria managers who participated in “Farm-to-School” programs reported that these programs were very successful. The most commonly mentioned programs were those featuring fresh Connecticut apples.

II. Recommendations

- Food service directors and cafeteria managers should meet with student councils and other student groups to involve them in the school lunch program, and to learn from the students about food items that they might like to have for lunch.
- Food service directors and cafeteria managers should make fruit and vegetable choices as appealing as possible. Offering a variety of whole or pre-cut fresh fruits and vegetables is one way to encourage more students to eat these foods.
- Food service directors and cafeteria managers should limit offerings of higher fat vegetables, such as oil-fried French fries, not only because of fat content, but also because offering them may decrease consumption of other, more nutritious foods.
- The federal government should continue to work to include fresh fruits and vegetables in the federal NSLP commodities program.
- Food service directors should take advantage of state and federal programs designed to increase fresh fruits and vegetable offerings in school lunches. District participation in local “Farm-to-School” programs is one way to do this.



The federal government should continue to work to include fresh fruits and vegetables in the federal NSLP commodities program.



III. Cafeteria Foods Sold in Competition with the National School Lunch Program



In addition to the reimbursable meals offered as part of the National School Lunch Program (NSLP), school food service programs often sell a variety of foods and beverages during lunchtime. Such additional items are known as “competitive foods” because they compete with sales of NSLP reimbursable lunches. Competitive foods tend to be low in nutrient density and high in fat, added sugars, and calories, compared with NSLP lunches, which are required to meet federally regulated nutrition standards.

Summary of Findings

- School food service programs often sell a variety of foods and beverages during lunchtime in addition to the reimbursable meals offered as part of the National School Lunch Program (NSLP). Compared to NSLP lunches, which are required to meet federally regulated nutrition standards, competitive foods are relatively low in nutrient density and high in fat, added sugars, and calories.¹
- In the study, the most common foods sold in competition with the reimbursable lunches were ice cream, cookies, potato chips, sweetened beverages, water, and prepackaged baked goods such as donuts, cupcakes, and honey buns.
- While the federal government prohibits the sale of “foods of minimal nutritional value” and the State of Connecticut prohibits the sale of “extra foods,” these regulations do not restrict the sale of many higher-fat and/or higher-sugar snack items, such as potato chips, cookies, prepackaged baked goods, French fries, or sweetened beverages.
- Many food service directors and cafeteria managers argue that without the competitive food sales, they could not afford to run their programs. Since school districts rarely provide significant financial support for these programs, they cannot simply cut off this source of revenue, even if that revenue source is negatively impacting student health.
- While some elementary schools have rules that prohibit the purchase of competitive foods instead of lunch, this was rarely the case at the middle or high school level. In fact, at 92 percent of the middle and high schools in this study, there were no rules whatsoever restricting the purchase of competitive foods either from the à la carte service or from the cafeteria-run vending machines.



Many food service directors and cafeteria managers argue that without the competitive food sales, they could not afford to run their programs.





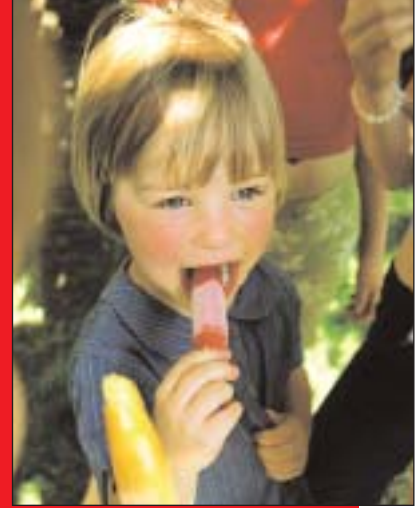
Food service directors reported that 19 percent of elementary students, 47 percent of middle school students, and 57 percent of high school students purchased a competitive food item on a typical day.



- The quantity of foods sold in competition with the NSLP lunches was found to differ by school level. Competitive foods were available à la carte in 100 percent of the high schools included in this study and were available in cafeteria-run vending machines in 63 percent of those schools. All middle schools sold à la carte items, and 45 percent had cafeteria-operated vending machines. Seventy-eight percent of elementary schools sold foods à la carte, but only 22 percent provided cafeteria-operated vending machines.
- Food service directors reported that 19 percent of elementary students, 47 percent of middle school students, and 57 percent of high school students purchased a competitive food item on a typical day.
- At the elementary school level, 29 percent of the directors or managers felt that they were somewhat or completely dependent on the income from competitive food sales to support the school lunch program. This value rose to 70 percent in middle schools, and to 80 percent in high schools.
- Despite these fiscal concerns, the abundance of higher-fat, higher-sugar, and lower-nutrient competitive foods is not healthy. It conveys to children a poor message about nutrition, and may encourage students to choose competitive foods over nutritionally balanced meals.²
- By incorporating à la carte items into NSLP qualifying meals and by increasing the nutritional quality of all the competitive food items offered, schools can improve their nutritional environment.

III. Recommendations

- Sales of competitive foods should be based on nutrition goals for students as opposed to profits. School districts should provide financial support for food service programs if necessary to achieve a healthy nutritional environment.
- The state should prohibit competitive food sales in elementary schools, where most nutritionists do not consider students to be mature enough to make wise food choices.¹⁸
- The state should restrict competitive food sales in middle and high schools to nutritious foods and beverages. Some states have already adopted such regulations. For example, competitive food sales in Hawaii and West Virginia are limited to certain nutritious foods, such as nuts, yogurt and fruit juices.¹⁹ Maine goes even further by prohibiting all food sales that are not part of the school lunch program.²⁰
- School districts and individual schools should lower the price of bottled water so that it costs less than high-sugar alternatives such as partial fruit drinks or sports drinks. Research shows that lowering prices on healthier items may encourage students to purchase them.²¹
- School districts should create nutrition committees, including parents, teachers, food service staff, administrators, and other community members. These committees should work together to promote healthy school nutrition environments. One focus of these committees should be to evaluate the foods sold in competition with the National School Lunch Program.



The state should prohibit competitive food sales in elementary schools, where most nutritionists do not consider students to be mature enough to make wise food choices.



IV. Other Food Available at School



At schools throughout the country, students have access to a variety of foods and beverages throughout the day. Opportunities to eat and drink are often available from student-run stores, school-operated vending machines, or various fundraising activities. Students also may receive food items as rewards or incentives for good behavior or academic performance. Eighty percent of schools in this study provided students with opportunities to eat and drink outside of the cafeteria at lunchtime.

Summary of Findings

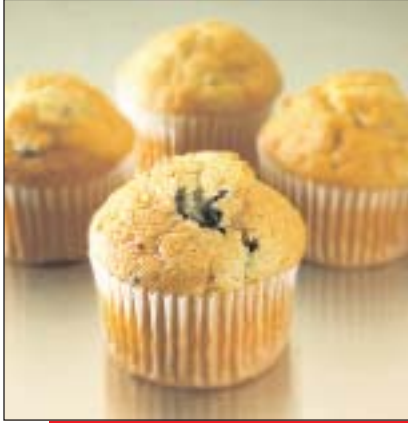
- At 80 percent of the schools in this study, opportunities to eat and drink were not limited to the cafeteria during lunchtime. In fact, students in many schools had access to a variety of food and beverage items throughout the day.
- Food and beverage items were available outside of the cafeteria food service program from many alternate sources, including school-operated vending machines, stores, classroom parties, fundraisers, and food offered to students as rewards for either academic achievement or good behavior.
- There are no nutritional constraints or restrictions whatsoever on foods or beverages available outside of the cafeteria food service program. Federal and State nutrition requirements apply only to the National School Lunch and Breakfast Programs, and, to a lesser extent, other foods and beverages sold during and around lunchtime.
- School-operated vending machines were available at 81 percent of the high schools in this study, and as many as 15 school-run vending machines were observed in a single school.
- Vending machines were operated by particular departments, such as the athletic or foreign language department, by student organizations, such as the Future Business Leaders of America, or by the school administration.
- Soda was the most commonly available item in school-run vending machines. It was offered in 69 percent of the high schools in this study.
- Sixty-nine percent of the high schools in this study had a school store on the premises where the merchandise included food or beverage items. The most commonly offered foods and



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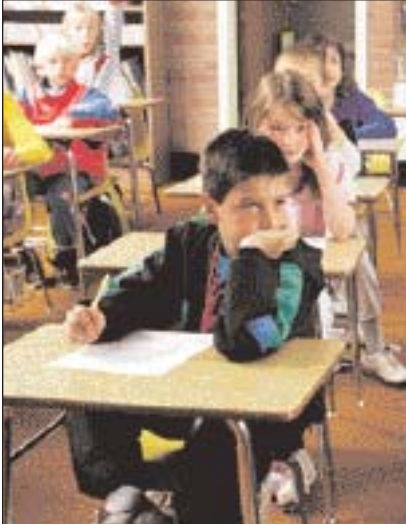


Many of the foods sold for fundraisers, such as candy bars and lollipops, were available on a relatively regular basis, and were often consumed by students in school.



beverages reported at school stores were soda, candy, cookies, and potato chips, all of which are high in fat and/or sugar.

- High school stores were most often run by student organizations, such as the Future Business Leaders of America or the Junior ROTC.
- Just five of the twenty-three middle and K-8 schools in this study operated vending machines, and no elementary schools contained non-cafeteria operated vending machines.
- Just three of the forty elementary and middle schools in this study operated a store that sold food or beverage items. These three stores were operated by student groups such as the student council, and sold items such as candy, granola bars, potato chips, and soda.
- Sixty-one percent of the administrators interviewed in this study reported that their school participated in some type of food-based fundraiser.
- Many of the foods sold for fundraisers, such as candy bars and lollipops, were available on a relatively regular basis, and were often consumed by students in school.
- Over a third of the students in this study reported that they usually came to school without having eaten breakfast. Students who do not eat breakfast often come to school hungry, and may purchase something to eat at school. If the school provides vending machines or school stores stocked with candy and sodas, this is likely to be what the student will choose to eat.
- Just 46 percent of the food service programs at schools in this study provided students with a breakfast option.



School districts should create nutrition committees that include parents, teachers, food service staff, administrators, and other community members.



IV. Recommendations

- The state should impose nutritional requirements on all food and beverage items sold at school, not just those sold in and around lunchtime. Sales of “extra foods,” such as soda and candy, should not be permitted at any time during the school day, at any school level.
- In elementary schools, the state should ban the sale of any foods outside of the School Breakfast Program and the National School Lunch Program. Many nutritionists suggest that elementary school children are not mature enough to make wise food choices.²² Therefore, students this age are best served by eating complete, nutritious meals and snacks, such as those meeting the requirements of the NSLP and the SBP.
- The state should create policies restricting all food sales at the middle and high school levels to nutritious foods and beverages.
- School districts should create policies banning the use of food as either an incentive or a reward for good behavior or academic performance.

- School districts should create nutrition committees that include parents, teachers, food service staff, administrators, and other community members. These committees should work to promote healthy school nutrition environments. One focus of these committees should be to help school districts draft policies that encourage healthy fundraising activities. For example, some school nutrition committees drafted rules limited to non-food items, such as wrapping paper and notecards.
- School districts should create policies that include nutrition standards for foods offered as part of celebrations, birthday parties, or other events.
- School districts should be encouraged to participate in the School Breakfast Program, which is presently available to all schools across the country. This program can help schools offer students complete, nutritious breakfasts instead of just high-fat, high-sugar snacks.



School districts should create policies that include nutrition standards for foods offered as part of celebrations, birthday parties, or other events.



V. Nutrition Education in Schools



Knowledge of good nutrition and healthy eating habits can help students make appropriate food choices. Schools have the ability to provide students with nutrition education, but many schools teach very little nutrition in the classroom, and even fewer schools use the cafeteria as a place to teach good eating habits. Nutrition education is most effective when it is integrated throughout the school curriculum, and when the nutritional messages that children receive from the school food environment are consistent with the information taught.

Summary of Findings

- The U.S. Department of Education recommends that elementary schools provide at least 50 hours of nutrition education per year in order to impact children's eating behavior.¹
- Elementary school teachers participating in this study reported that students in their schools received an average of 3 hours of nutrition education per year, with a range of 0 to 5 hours.
- Middle school teachers participating in this study reported that students in their schools received an average of 6 hours of nutrition education per year, with a range of 0 to 30 hours.
- High school teachers participating in this study reported that students in their schools received an average of 3 hours of nutrition education per year, with a range of 1 to 5 hours.
- A majority of nutrition teachers in this study stated that they did not feel that enough nutrition education was taught in their schools. However, several teachers said that increasing nutrition education in the classroom would not impact students' health unless the school nutrition environment reflected the information they taught.
- Elementary schools were more likely than middle or high schools to provide nutrition education in the cafeteria. At the elementary level, this education included skits, demonstrations, and menu contests. In the middle and high schools using the cafeteria to teach about nutrition, this education included nutrition fairs and cooking demonstrations.



A majority of nutrition teachers in this study stated that they did not feel that enough nutrition education was taught in their schools.





Schools should integrate nutrition education throughout the curriculum, and should utilize the cafeteria environment to teach students nutrition skills.



V. Recommendations

- School districts should provide nutrition education to students in all grade levels, and this education should afford students the skills they need to make healthy food choices.
- Schools should integrate nutrition education throughout the curriculum, and should utilize the cafeteria environment to teach students nutrition skills.
- School districts should create nutrition committees, including parents, teachers, food service staff, administrators, and other community members, to work together to promote healthy school nutrition environments. One focus of these committees should be to create school food policies that reflect and reinforce nutritional messages taught in the classroom.
- The state should impose regulations restricting the sale of foods high in fat and added sugar in schools. This, too, will help to create an atmosphere where the school food environment is consistent with the nutritional messages taught in the classroom.

VI. Physical Education (PE) and Physical Activities in Schools



Physical activity is on the decline in our country and in our schools. Lack of physical activity is a key contributor to the childhood obesity epidemic. Schools can provide students with opportunities to be physically active throughout the school day, and can teach children skills and habits that will allow them to be physically active for their entire lives. Unfortunately, physical education and physical activity have been decreasing in our schools in recent years, despite the fact that they are especially critical given children's poor eating habits.



None of the schools included in this study met the physical activity recommendations put forth by *Healthy People 2010*...

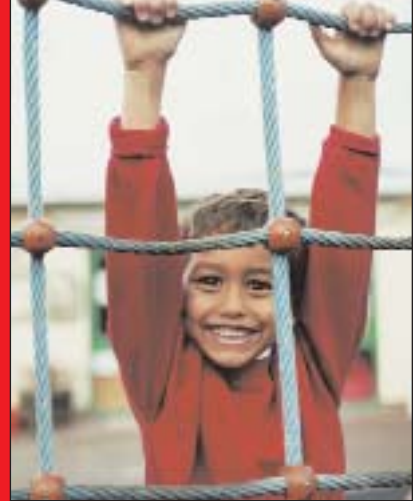


Summary of Findings

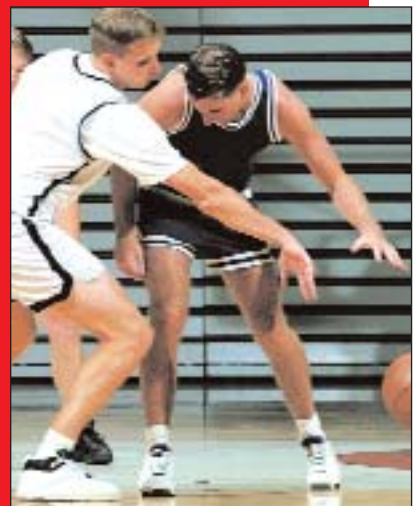
- In elementary schools included in this study, students received an average of 59 minutes of physical education per week or less than one-half the nationally recommended time. Middle school students received an average of 92 minutes per week, which is also less than one-half the recommended time, and high school students averaged 65 minutes per week, which is less than one-third of the physical education time recommended.
- None of the schools included in this study met the physical activity recommendations put forth by *Healthy People 2010*, the Centers for Disease Control and Prevention, the National Association of Sports and Physical Education, the National Association of State Boards of Education, and the American Academy of Pediatrics.
- Connecticut requires some physical education in schools, but neither the amount nor the consistency of the scheduling is prescribed. Even during years when physical education is included in the curriculum, students in 23 percent of the middle schools and 69 percent of the high schools included in this study can go for weeks or even months with no physical education whatsoever.
- The majority of physical education teachers interviewed did not feel that the physical education requirements at their schools were adequate. However, they did feel that when physical education classes were held, they were usually successful in getting students to engage in at least 20 minutes of aerobic activity.
- Providing recess, as well as intramural and interscholastic sports, can create opportunities for daily physical activity.
- Creating after-school programs through partnerships with local groups, such as the town parks and recreation department or the YMCA, can be an effective strategy in helping students become more physically active.

VI. Recommendations

- Daily physical activity must be made a priority in our schools. The state should require physical education for children during every year that they are in school, and should include minimum time requirements for weekly physical education in this legislation.
- Schools should schedule physical education classes at regular intervals throughout the school year. Students should not go for weeks, and sometimes even months, without any physical education. Providing physical education every other day for a full year is preferable to providing physical education every day for only one half of the year.
- Schools should ensure that physical education classes are long enough and structured such that students are engaged in at least 20 minutes of aerobic activity in every class.
- Elementary school students should be provided daily recess, and should be encouraged to be active during that recess.
- Schools districts should encourage and financially support intramural and interscholastic sports programs in their schools.
- Schools should work with local organizations to provide as many opportunities as possible for students to be physically active.



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The Study's Recommendations for the Federal and State Governments

Recommendations for the Federal Government

- The federal government should continue to work to include fresh fruits and vegetables in the National School Lunch commodities program.

Recommendations for the State Government

- The state should impose nutritional requirements on all foods and beverages sold in schools, not just those sold in and around lunchtime. The sale of “extra foods,” such as soda and candy, should not be permitted at any time during the school day, at any school level.
- The state should create policies that restrict the sale of all food and beverage items in schools to those that are healthy and nutritious.
- In elementary schools, the state should ban the sale of any food or beverage items during the school day, other than those provided as part of the National School Lunch and Breakfast Programs.
- The state should require physical education for children during every school year. These requirements should include minimum standards for weekly physical education. Providing physical education every other day for a full year is preferable to providing physical education every day for only one half of the year.

The Study's Recommendations for School Districts and Individual Schools

Recommendations for School Districts

- School districts should create nutrition committees that include parents, teachers, food service staff, administrators, and other community members. These committees should work in the following ways to promote healthy school nutrition environments:
 - (A) The committees should evaluate the nutrition content of foods and beverages sold in competition with the National School Lunch Program.
 - (B) The committees should help school districts draft policies encouraging healthy fundraising activities.
 - (C) The committees should review and/or create school food policies that reflect and reinforce the nutritional messages taught in the classroom.
- School districts should be encouraged to participate in the National School Lunch and Breakfast Programs, which are currently available to all schools across the country. Participation in these programs can encourage students to eat complete, nutritious meals instead of high-fat, high-sugar snacks.
- School districts should take advantage of state and federal programs designed to increase fresh fruits and vegetable offerings in school lunches. District participation in local “Farm-to-School” programs is one way to accomplish this.

- School districts should provide financial support for food service programs, if additional funds are necessary to achieve a healthy nutrition environment. The decision to sell competitive foods should be based on nutrition goals for students, not financial needs.
- School districts should lower the price of bottled water so that it costs less than high-sugar alternatives such as partial fruit drinks or sports drinks. Research shows that lowering prices on healthier items often encourages students to purchase them.
- School districts should ban the use of food as an incentive or a reward for good behavior or good academic achievement.
- School districts should provide nutrition education to students in all grade levels. This education should afford students the skills they need to make healthy food choices.
- School districts should require physical education for children during every school year. These requirements should include minimum standards for weekly physical education. Providing physical education every other day for a full year is preferable to providing physical education every day for only one half of the year.
- School districts should encourage and financially support intramural and inter-scholastic sports programs.

Recommendations for Individual Schools

- Schools should provide even the last student in line for lunch with enough time to buy and eat a complete meal. Administrators should work with lunch monitors and cafeteria staff to determine the length of their students' opportunity time to eat, and based on their school's unique characteristics, create a strategy that will ensure sufficient time.
- School food service directors and cafeteria managers should meet with student councils and other student groups to involve them in the school lunch program, and to learn from the students about food items that they might like to have included in the lunch program.

Recommendations for Individual Schools (Continued)

- School food service directors and cafeteria managers should limit offerings of higher fat vegetables, such as oil-fried French fries, not only because of the fat content, but also because offering these foods may decrease consumption of other, more nutritious choices.
- School food service directors and cafeteria managers should make fruit and vegetable choices as appealing as possible. Offering a variety of whole or pre-cut fresh fruits and vegetables is one way to encourage more students to eat these foods.
- Schools should integrate nutrition education throughout the curriculum, and should utilize the cafeteria environment to teach students nutrition skills.
- School policies should include nutrition standards for all foods and beverages available to students throughout the school day, including those offered as part of celebrations or school events, and those sold during fundraising activities. All foods and beverages available at school become part of the daily school nutrition environment. Therefore, all of these items should be required to meet nutrition standards.
- Schools should lower the price of bottled water so that it costs less than high-sugar alternatives such as partial fruit drinks or sports drinks. Research shows that lowering prices on healthier items often encourages students to purchase them.
- Schools should schedule physical education classes at regular intervals throughout the year. Students should not go for weeks, and sometimes even months, without any physical education. Providing physical education every other day for a full year is preferable to providing physical education every day for only one half of the year.
- Schools should ensure that physical education classes are long enough and structured in such a way that students are engaged in at least 20 minutes of aerobic activity in every class.
- Elementary schools should provide daily recess, and students should be encouraged to be active during that recess.

VI. Physical Education (PE) and Physical Activities in Schools



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Summary of Findings

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- Providing recess, as well as intramural and interscholastic sports, can create opportunities for daily physical activity.
- Creating after-school programs through partnerships with local groups, such as the town parks and recreation department or the YMCA, can be an effective strategy in helping students become more physically active.

VI. Physical Education (PE) and Physical Activities in Schools

This study not only recorded information about the school nutrition environment, but also about physical education and activity at school. Physical education requirements at each school were reported by a principal or other administrator, or by a physical education teacher. As shown in Table 1, elementary school children received an average of 59 minutes of physical

Physical education was often only required during certain years at the high school level.

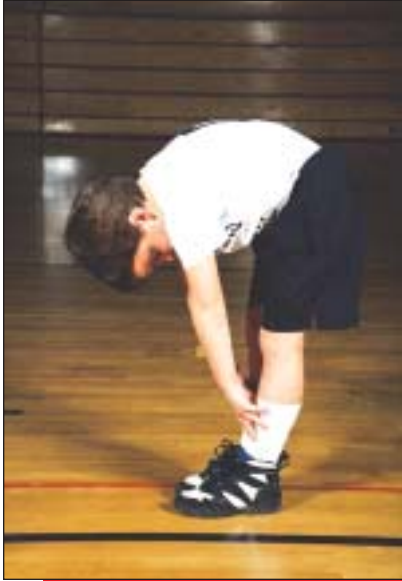
Table 1. Amount of physical education (minutes) by school level.

	Elementary ^a (n=23)	Middle ^a (n=22)	High ^b (n=16)
National Recommendations^c			
<i>Minutes per week</i>	150	225	225
Actual physical education time per week (minutes)			
<i>Average</i>	59	92	65
<i>Range</i>	40–90	55–134	45–103
Physical education time per week (minutes) recommended by teachers in this study			
<i>Average</i>	139	187	133
<i>Range</i>	80–210	75–300	94–225

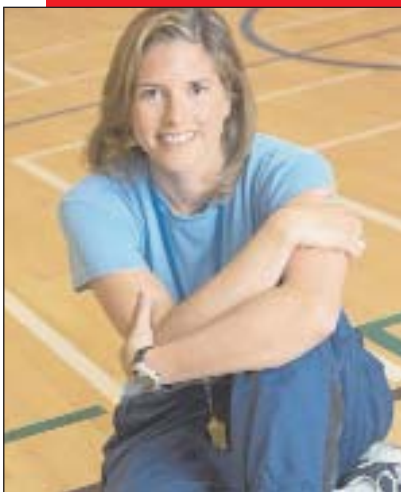
^a For the five K-8 schools included in this study, physical education requirements for elementary students were considered separately from physical education requirements for middle school students.

^b Physical education was often only required during certain years at the high school level. In this analysis, the average minutes of PE per week were calculated by averaging the requirements across all four years.

^c Based on recommendations from the National Association for Sport and Physical Education (NASPE) and the National Association of State Boards of Education (NASBE). (See text.)



State of Connecticut... legislation does not require a minimum amount of time that should be given to physical education.



education per week, while middle school students received an average of 92 minutes per week and high school students received an average of 65 minutes per week.

As Table 1 demonstrates, the average quantity of physical education in these schools was well below the amount recommended by the physical education teachers interviewed in this study as well as national organizations such as *Healthy People 2010*, the Centers for Disease Control and Prevention (CDC), the National Association of Sports and Physical Education (NASPE), the National Association of State Boards of Education (NASBE), and the American Academy of Pediatrics (AAP). All of these organizations recommend daily physical education for all students.¹ NASPE and NASBE recommend that at least 150 minutes per week be provided for elementary school students and 225 minutes per week be provided for middle and high school students.² None of the 56 schools included in this study met these recommendations.

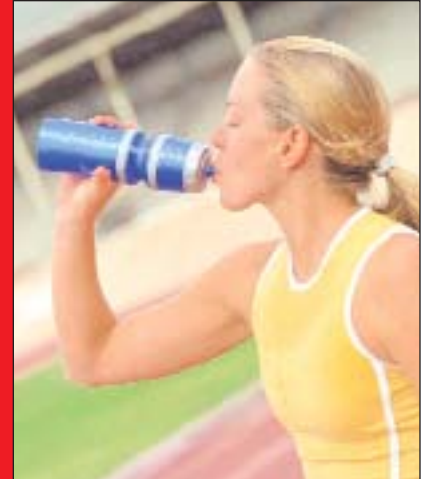
Although the State of Connecticut requires a planned and sequential program of physical education for students K–12,³ the legislation does not require a minimum amount of time that should be given to physical education nor does it stipulate any requirements for an even distribution of physical education throughout the year.

During the study, a physical education teacher at each school was asked whether or not he or she felt the physical education requirements were adequate at his or her school. Teachers were asked to rank their answers on a scale of 1–5, with 1 indicating an answer of “definitely not” and 5 indicating “definitely.” Significantly more teachers responded with a 1 or 2 than with a

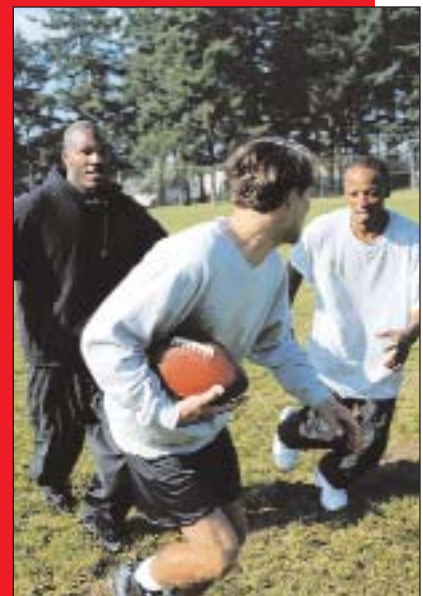
4 or 5, indicating that they did not feel that the physical education requirements were adequate.⁴ These results were found at every school level, and across all Economic Reference Groups (ERGs).

The physical education teachers were then asked how much physical education they thought would be adequate for the students in their schools (see Table 1). Nearly all teachers stated that schools ideally should meet the national recommendations of daily physical education, and often echoed the guidelines of 150 minutes for elementary school children and 225 minutes for both middle and high school students. However, the majority of teachers (63 percent) also said that this was not realistic in their school system due to current staffing or facilities limitations, and offered the following suggestions.

At the elementary level, 23 percent of the teachers interviewed said that two classes per week would be adequate. Another 46 percent reported that students needed physical education at least three to four times per week, while the remaining 31 percent said that physical education needed to be provided daily. At the middle school level, 20 percent of the teachers felt that physical education should be required either twice a week or every other day. Another 20 percent felt that it should be required three to four days per week. The remaining 60 percent felt that physical education needed to be provided daily. At the high school level, every teacher interviewed recommended that at least some physical education be required each year. Thus, as shown in Figure 1, actual physical education amounts were far below what the teachers recommended as well as the national recommendations for physical education in schools. This finding held even in the schools that provided the most physical education.



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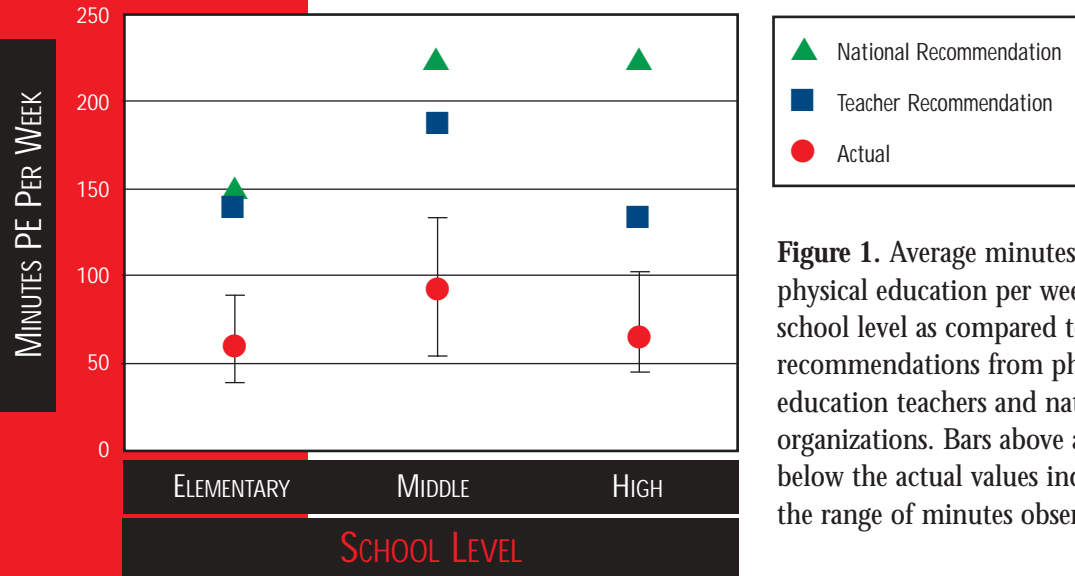


Figure 1. Average minutes of physical education per week by school level as compared to recommendations from physical education teachers and national organizations. Bars above and below the actual values indicate the range of minutes observed.

Many teachers commented that having regular physical education classes on a consistent basis throughout the year is crucial to developing a lifestyle that includes physical activity.



Distribution of physical education class time

Not only was the amount of time spent in physical education inadequate, but the structure of that time was often unevenly distributed throughout the year. Even during years when physical education was included in the curriculum, it was not uncommon for students to go for weeks or even months with no physical education whatsoever.

Many teachers commented that having regular physical education classes on a consistent basis throughout the year is crucial to developing a lifestyle that includes physical activity, and they expressed frustration with the sporadic scheduling of physical education periods in many schools. While students in elementary schools generally had physical education classes once or twice per week throughout the year, older students often had much less consistency. Sixty-nine percent of high schools offered physical

education classes on a semester basis only, such that students would only attend these classes during half of the year. Twenty-three percent of middle schools offered physical education classes on either a semester or three- to five-week rotational basis, with physical education offered just one semester, or only on alternate rotations.

In this study, 55 percent of elementary schools had one physical education class each week, another 13 percent had two physical education classes in each six-day cycle, and the remaining 32 percent of schools scheduled two physical education classes each week.

At the middle school level, nine percent of the schools had one physical education class each week; 27 percent had two classes per week; and five percent had three classes per week. Another 27 percent of the middle schools had two physical education classes every six days, and nine percent had two classes every four days. Fourteen percent of the middle schools required physical education daily or four times per week for one-half the year (one semester), and then not at all during the other semester. The remaining nine percent of schools operated on three- to five-week rotations, with physical education classes scheduled every day during alternate rotations.

At the high school level, 25 percent of the schools in this study required one semester of daily physical education for each of two years, and five percent required half that—physical education classes were scheduled every other day for one semester during each of two years. Thirteen percent required two to three classes a week for a full two years, and another 13 percent required two to three classes a week for a full three years. Daily physical



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education was required at five percent of schools for just one year, and an additional 19 percent required two to four days of physical education during each of three semesters. At just 19 percent of the high schools was some physical education required every year. These schools generally required one trimester (12 weeks) of daily physical education from 9th through 12th grades.

Aerobic activity

Another important consideration in the structure of physical education classes is the length of each class. Classes must be long enough to incorporate aerobic activity into the skills aspects of physical education. One of the objectives of *Healthy People 2010* was to increase the proportion of students nationally who are physically active in physical education class.^{5, 6} In this study, physical education teachers were asked how often most students in their classes received at least 20 minutes of aerobic activity causing them to sweat and breathe hard. Teachers were asked to rank their answers on a scale of 1 to 5, with 1 indicating “never” and 5 indicating “always.” Seventy percent of the teachers responded with either a 4 or 5, indicating that physical education classes at the schools included in this study were generally successful in getting students to engage in sufficient amounts of aerobic activity.

Other opportunities for physical activity

While physical education is a very important component of a child's overall health and fitness, there are often many opportunities to be physically active in school beyond physical education classes. The schools that participated in this study provided a wide variety of these opportunities, including recess, intramural sports, interscholastic sports, and after-school programs, among others.

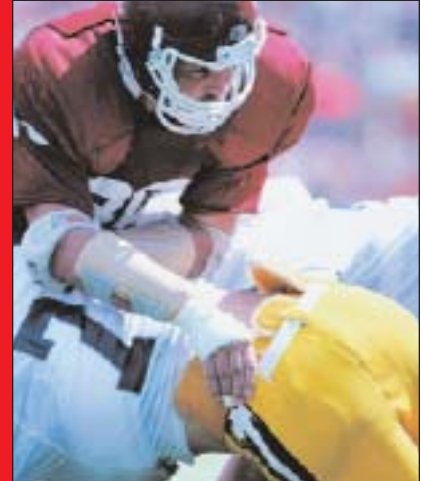
Interscholastic and intramural sports

Interscholastic sports offered by schools in this study included badminton, baseball, basketball, cheerleading, crew, cross-country running, cross-country skiing, dance team, diving, downhill skiing, field hockey, football, golf, gymnastics, ice hockey, indoor track, lacrosse, soccer, softball, tennis, outdoor track and field, volleyball, and wrestling. While no elementary schools participated in interscholastic sports, 91 percent of middle schools and 100 percent of high schools included in this study competed in at least two interscholastic sports.

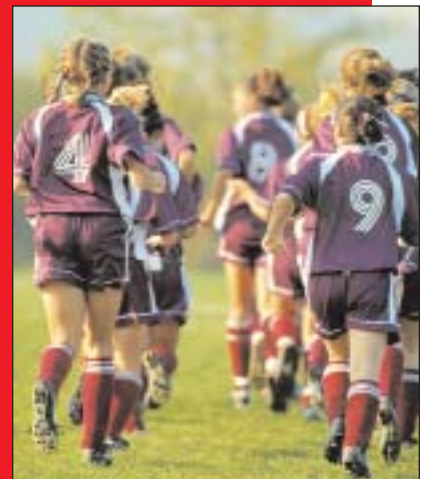
At each school, an administrator, a coach, or a physical education teacher was asked what percentage of the student body participated in at least one interscholastic sport during the school year. In middle schools providing interscholastic sports opportunities, an average of 33 percent of students played at least one sport, with a range of 10 to 60 percent. In high schools, an average of 50 percent of the student body participated in at least one sport, with a range of 25 to 70 percent. Athletes in these sports practiced or competed nearly every day during the season, which typically lasted two to three months.

Unfortunately, some schools have had to start charging students to participate in interscholastic sports. Instituting a “Pay to Play” program has allowed some schools to continue to offer sports despite tight budgets, but coaches at some of these schools reported a significant drop in the number of students trying out for sports teams.

Intramural sports, which are either noncompetitive or have teams competing with other teams from within the school, were most



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common in middle schools. Intramural sports offered by schools in this study included badminton, basketball, bowling, fencing, flag football, golf, gymnastics, hackey sack, karate, soccer, tennis, trampoline, volleyball, weight-training, and yoga.

Nine percent of elementary schools, 50 percent of middle schools, and 25 percent of high schools provided intramural sports opportunities. In middle schools with intramural programs, an average of 26 percent of the student body participated in at least one sport (the range was from 10 percent to 71 percent). These sports often ran on shorter rotations than interscholastic sports, but usually did not have tryouts and were available to everyone.

Recess

While few elementary schools included in this study had interscholastic or intramural sports programs, most provided recess. During this time students were free to play either indoors or outside, depending on the weather.

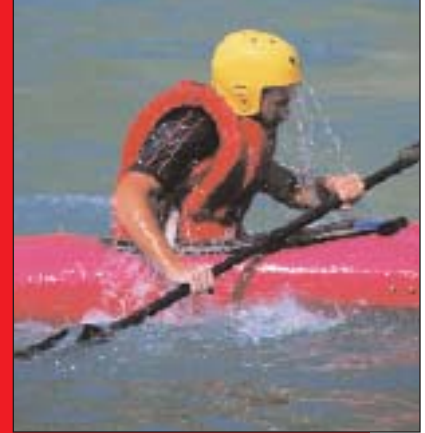
Schools included in this study provided students in grades K–5 an average of 21 minutes of recess time. However, recess lengths in some schools were as short as 10 minutes, and one school provided no recess at all. Most recess was scheduled after lunch, despite research suggesting that students who have recess before lunch may perform better in school.⁷ Providing recess prior to lunch also allows students to socialize and burn off energy so that they come to cafeteria ready to eat at lunchtime.⁸

Students in general need to be more physically active. However, schools have only a limited amount of resources at their disposal,

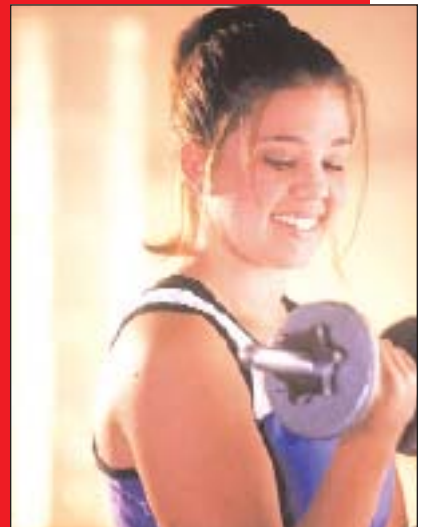
and there is often simply not enough time to include everything. Despite these limitations, several schools in this study found ways to encourage students to be more physically active both during the school day and beyond.

Effective strategies for encouraging students to be physically active

- One mid-sized high school in ERG B, with a student population of 1,050, required a trimester of physical education every year. In 12th grade, students were allowed to fill the physical education requirement with an elective activity, which they could choose to participate in outside of school. Students could sign up to go on kayaking or canoeing trips, enroll in a pilates, yoga, or karate class, work with a physical education teacher after school on weight-training, or any one of many other activities. This was part of the school’s “Fit for Life” philosophy, which held that students should try to find an activity that they might pursue well beyond high school.
- A teacher at one small elementary school in ERG D, which housed just 6th grade and had a student population of 300, began an after-school intramural basketball program eight years ago. It is coed, open to all students, and runs for three months during the winter. This program encourages students of all abilities to play together, to coach and organize themselves, and to be active. This program now boasts participation from over 60 percent of the student body.
- Several schools were very involved with their local Parks and Recreation department or their local chapters of the YMCA.



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One elementary school started an after-school “Fun Run” group for 4th and 5th graders, during which the physical education teacher took a group of students on a twice-weekly jog.



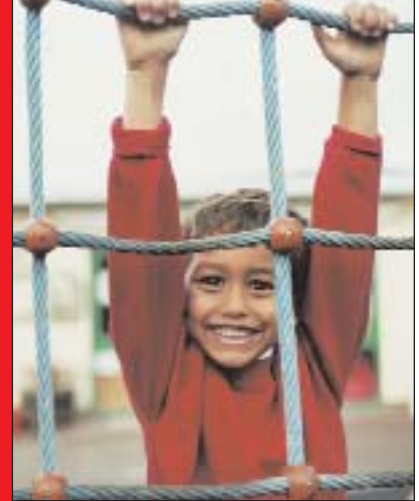
Many schools provided facilities and worked with their town Parks and Recreation departments to provide students the opportunity to play on a variety of sports teams after school.

- At one inner-city K–8 school in ERG I, the assistant principal walked a mile each morning before school with a small group of 7th and 8th grade students who may be at risk for obesity.
- Several physical education teachers required homework for days when students did not have a physical education class. They assigned certain aerobic activities, and required that a parent verify that these activities had been completed.
- One elementary school started an after-school “Fun Run” group for 4th and 5th graders, during which the physical education teacher took a group of students on a twice-weekly jog. Another elementary school started a “Fitness Club” that met three times a week. This club gave participants an opportunity to be active for an hour at the end of the school day.
- Two high schools, one in ERG B and one in ERG F, opened fitness centers with weight-lifting and cardiovascular equipment, and offered after-school weight-training and fitness programs for interested students.
- One relatively small high school in ERG E, with a student population of 325, had an extended lunch period of 40 minutes. Students had access not only to the cafeteria, but also to the gymnasium and several other areas of the school. Students who were finished eating were free to use the gymnasium, and many students chose to play basketball during this time.

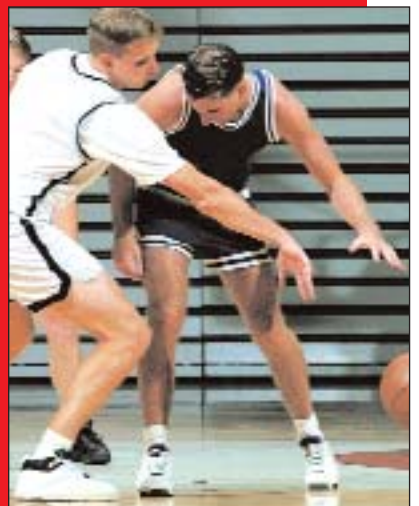
By teaching children ways to include physical activity in their daily lives, these schools made physical activity fun and helped students reduce their risk for obesity.

VI. Recommendations

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 - (B) The committees should help school districts draft policies encouraging healthy fundraising activities.
 - (C) The committees should review and/or create school food policies that reflect and reinforce the nutritional messages taught in the classroom.
- School districts should be encouraged to participate in the National School Lunch and Breakfast Programs, which are currently available to all schools across the country. Participation in these programs can encourage students to eat complete, nutritious meals instead of high-fat, high-sugar snacks.
- School districts should take advantage of state and federal programs designed to increase fresh fruits and vegetable offerings in school lunches. District participation in local “Farm-to-School” programs is one way to accomplish this.

- School districts should provide financial support for food service programs, if additional funds are necessary to achieve a healthy nutrition environment. The decision to sell competitive foods should be based on nutrition goals for students, not financial needs.
- School districts should lower the price of bottled water so that it costs less than high-sugar alternatives such as partial fruit drinks or sports drinks. Research shows that lowering prices on healthier items often encourages students to purchase them.
- School districts should ban the use of food as an incentive or a reward for good behavior or good academic achievement.
- School districts should provide nutrition education to students in all grade levels. This education should afford students the skills they need to make healthy food choices.
- School districts should require physical education for children during every school year. These requirements should include minimum standards for weekly physical education. Providing physical education every other day for a full year is preferable to providing physical education every day for only one half of the year.
- School districts should encourage and financially support intramural and inter-scholastic sports programs.

Recommendations for Individual Schools

- Schools should provide even the last student in line for lunch with enough time to buy and eat a complete meal. Administrators should work with lunch monitors and cafeteria staff to determine the length of their students' opportunity time to eat, and based on their school's unique characteristics, create a strategy that will ensure sufficient time.
- School food service directors and cafeteria managers should meet with student councils and other student groups to involve them in the school lunch program, and to learn from the students about food items that they might like to have included in the lunch program.

Recommendations for Individual Schools (Continued)

- School food service directors and cafeteria managers should limit offerings of higher fat vegetables, such as oil-fried French fries, not only because of the fat content, but also because offering these foods may decrease consumption of other, more nutritious choices.
- School food service directors and cafeteria managers should make fruit and vegetable choices as appealing as possible. Offering a variety of whole or pre-cut fresh fruits and vegetables is one way to encourage more students to eat these foods.
- Schools should integrate nutrition education throughout the curriculum, and should utilize the cafeteria environment to teach students nutrition skills.
- School policies should include nutrition standards for all foods and beverages available to students throughout the school day, including those offered as part of celebrations or school events, and those sold during fundraising activities. All foods and beverages available at school become part of the daily school nutrition environment. Therefore, all of these items should be required to meet nutrition standards.
- Schools should lower the price of bottled water so that it costs less than high-sugar alternatives such as partial fruit drinks or sports drinks. Research shows that lowering prices on healthier items often encourages students to purchase them.
- Schools should schedule physical education classes at regular intervals throughout the year. Students should not go for weeks, and sometimes even months, without any physical education. Providing physical education every other day for a full year is preferable to providing physical education every day for only one half of the year.
- Schools should ensure that physical education classes are long enough and structured in such a way that students are engaged in at least 20 minutes of aerobic activity in every class.
- Elementary schools should provide daily recess, and students should be encouraged to be active during that recess.

APPENDIX 1.

Methods

This report includes data from 56 public schools in the state of Connecticut. EHHI's researcher observed food service programs at each school during one day from the beginning of the first lunch period until the end of the last lunch period. At each school, administrators, food service personnel, physical education teachers, nutrition education teachers, lunchroom monitors, and students were interviewed regarding their school's nutrition and physical activity opportunities.

Study population

Ten local and regional health directors across the State of Connecticut worked with EHHI on this research project. These health directors contacted superintendents or other school administrators in their districts to inform them about this study. Administrators who expressed interest in participating were sent an informational letter from the study investigator (see Appendix 2). Based on the response from the administrator, the investigator presented information about the study either to: an administrative council, including superintendents and school principals; a nutrition committee, consisting of administrators, food service personnel, teachers, and parents; or an individual, such as a school nurse, food service director, or school principal. The investigator then worked with the school personnel to set up dates for study visits. Of all the school districts that were originally contacted by a health director, 73 percent participated in this study.

This resulted in a total study population of 56 schools, representing 21 public school districts in the state of Connecticut. These schools were visited during the 2003–2004 school year, between September 15, 2003, and March 25, 2004. Six additional schools were visited in the spring of 2003 as part of this study's pilot project, but are not included in any of the results presented in this report.

At least one school district in each of Connecticut's eight counties was included in this study, and the number of schools per county ranged from three to 19 (see Appendix 3

for a map of Connecticut counties). At least one school district was also visited in each Economic Reference Group (ERG), and the number of schools in each ERG ranged from three to nine (see Appendix 4 for a list of Connecticut school districts by ERG).

In 14 of the 21 school districts participating in this study, the investigator visited three individual schools, generally one elementary, one middle, and one high school. When a district included more than one school at a certain level, school selection was based on the preference of the superintendent or other administrator. Of the seven remaining school districts, five were in relatively rural areas, and consisted of only one or two schools. In these districts, all schools were visited. The final two school districts had unconventional school configurations, such as both a lower and an upper middle school, and in both of these districts, four schools were visited.

Survey

A survey instrument was developed both to systematize the information being asked in each school and to allow the researcher to uniformly record demographic data and information on physical activity and nutrition in each school (see Appendix 5). Survey questions were divided into six groups, and each group of questions was directed to one of the following: an administrator, who was generally a principal; a food service director or cafeteria manager; a lunch monitor, who was either a teacher on lunch duty or a lunchtime aide; a physical education teacher; a teacher responsible for nutrition education; and a group of students. The information obtained from each set of questions is described below:

Administrators, usually principals, were asked first about school demographics. They provided information on the grade levels at the school and the size of the student body. They were then asked about the financing of the food service program. Administrators also provided information on school scheduling and requirements, such as length and times of lunch periods and amounts of physical and nutrition education required for students. They were then asked about other opportunities for physical activity, such as

recess, interscholastic sports, and intramural sports. Finally, administrators were asked about the availability of food from sources other than the cafeteria, such as school stores, fundraisers, and non-cafeteria operated vending machines.

Food service directors or cafeteria managers were asked about their participation in the National School Lunch Program, including, if applicable, the number of students receiving free or reduced-price lunch, and student participation in the program. They were also asked about the commodities received from the federal government through that program. Food service directors or cafeteria managers were then asked whether or not they thought students at their school had enough time to buy and eat lunch. Finally, they were asked about the competitive foods program, and about other programs they might have, such as School Breakfast Programs or after-school snack programs.

Lunch monitors were asked whether they thought students had enough time to buy and eat lunch. They were then asked whether they felt an extension in the lengths of lunch periods would lead to student behavioral problems. Finally, they were asked whether they themselves ate lunch purchased in the cafeteria

Physical education teachers were asked about the physical education requirements in the school. They were also asked whether or not they felt these requirements were adequate. If they did not think they were adequate, they were then asked how much physical education they thought there should be. Physical education teachers were asked about the amount of aerobic activity that was incorporated into their classes. Finally, they were asked if there were any other programs in their schools that encouraged or created opportunities for students to be physically active.

Nutrition education teachers were identified by a school administrator, since nutrition education was housed under a variety of different departments in the various school systems. Once identified, nutrition education teachers were asked about the amount of nutrition education taught in their schools and whether or not they felt that that amount was adequate. Finally, they were asked if there were any other programs in their

schools that aimed to influence students' eating behaviors or increase their nutrition knowledge.

Students were asked whether or not they thought they had enough time to buy and eat lunch. If they answered sometimes or never, they were asked what they did when they did not have enough time. They were also asked about the frequency with which they exercised and ate breakfast. At each school, student selection was by convenience sample, and therefore may not be representative of the entire student body at that school.

Disclosure of individually identifiable student information without express consent is unethical and prohibited by state and federal law. No identifying characteristics of students were collected or recorded, and the issue of anonymity was addressed in the informational letter. In addition, anonymity for all school districts, individual schools, and individual respondents was also protected, as failure to do so would be likely to discourage participation in the study.

Observational survey

In addition to the interview, the researcher also made several standard observations during school visits. On the day of the visit to each school, the researcher made a list of the foods offered both as part of the reimbursable lunch and as competitive food items. The researcher also recorded the opportunity time to eat for the last student in line during each lunch period. Finally, the researcher noted any innovative programs or strategies being used by the school to provide a healthy nutrition environment.

Data analysis

Data were first recorded on hard copy questionnaires and subsequently coded and entered into an Excel (Microsoft) spreadsheet. Data were then imported into STATA (Stata 7, College Station, TX), and sorted by school level. Schools enrolling students in kindergarten through 6th grade were considered elementary schools. Schools including grades 7 and 8 were considered middle schools, though some middle schools also included grade 6. All high

schools were attended by students in grades 9 through 12. Kindergarten through 8th grade (K-8) schools were coded as both elementary and middle schools, but differences in school treatment of older and younger students were noted where appropriate. For example, it was not uncommon in K-8 schools for only 7th and 8th graders to play interscholastic sports.

Descriptive statistics were performed for all relevant variables, and associations were examined using Pearson correlations, multiple linear regressions, and analysis of variance (ANOVA) techniques. Where appropriate, regression models were adjusted for potential confounders, such as school level or Economic Reference Group.

Limitations of the study

School districts were not randomly selected for inclusion in this study; rather, a convenience sampling approach was employed. Therefore, while schools in all counties and ERGs are included, the results of this study still may not be representative of all public schools in Connecticut. Similarly, the selection of students surveyed was not random, and may not reflect the opinions or habits of all students at included schools. Further, the majority of information was collected at the school level, not the individual level, so no assessment of individual level risk can be made from this data. This study also did not assess obesity prevalence, and therefore cannot be used to evaluate the relationship between school environments and childhood overweight or childhood obesity.

Another limitation of this study is that not all requested information was provided at all schools. In some schools, physical education or nutrition education teachers were not available for interview during the school visit, and in other schools, the administrators requested that the investigator not speak with students. Data were analyzed without these missing data. In addition, when respondents were not sure of the answer to a particular question, they were asked to provide their “best guess.” This may have increased the potential for recall bias.

APPENDIX 2. INVESTIGATOR'S LETTER



1191 Ridge Road • North Haven, CT 06473

Tel: (203) 248-6582 • Fax: (203) 268-7571

Dear School Administrator:

Environment and Human Health, Inc. (EHHI) is conducting a survey of school nutrition and physical activity, with help from health departments and school systems across the state. EHHI is a non-profit organization committed to research, education, and public policy, and is led by a board of nine doctors, policy experts, and public health professionals. This project is designed to address the growing epidemic of childhood obesity. Our project aims to benefit school children, including those in your district, by helping to understand the components of childhood obesity, and by suggesting areas where change may occur.

Our first objective is to learn what children are eating at school and to determine how much time they spend exercising. We want to know what food choices are available to students and, within that availability, what decisions they are making. We hope to begin to answer these questions by observing school cafeterias during lunchtime, talking with teachers and cafeteria staff, and by asking students themselves about their food choices and exercise habits. We also hope to observe aspects of individual school lunch and physical activity programs that are working well, so that we can highlight these things, and pass this information on to other schools throughout the state.

School districts from all eight counties of Connecticut and in each of the nine Economic Reference Groups are participating in this study. This project is expected to last through the end of the 2003-2004 school year. When completed, we will produce a final report, which will summarize our findings regarding school nutrition, physical activity and childhood obesity. This report will not identify individual schools, but will provide recommendations based on school size, level, or ERG. All participating schools will receive copies of the report when complete.

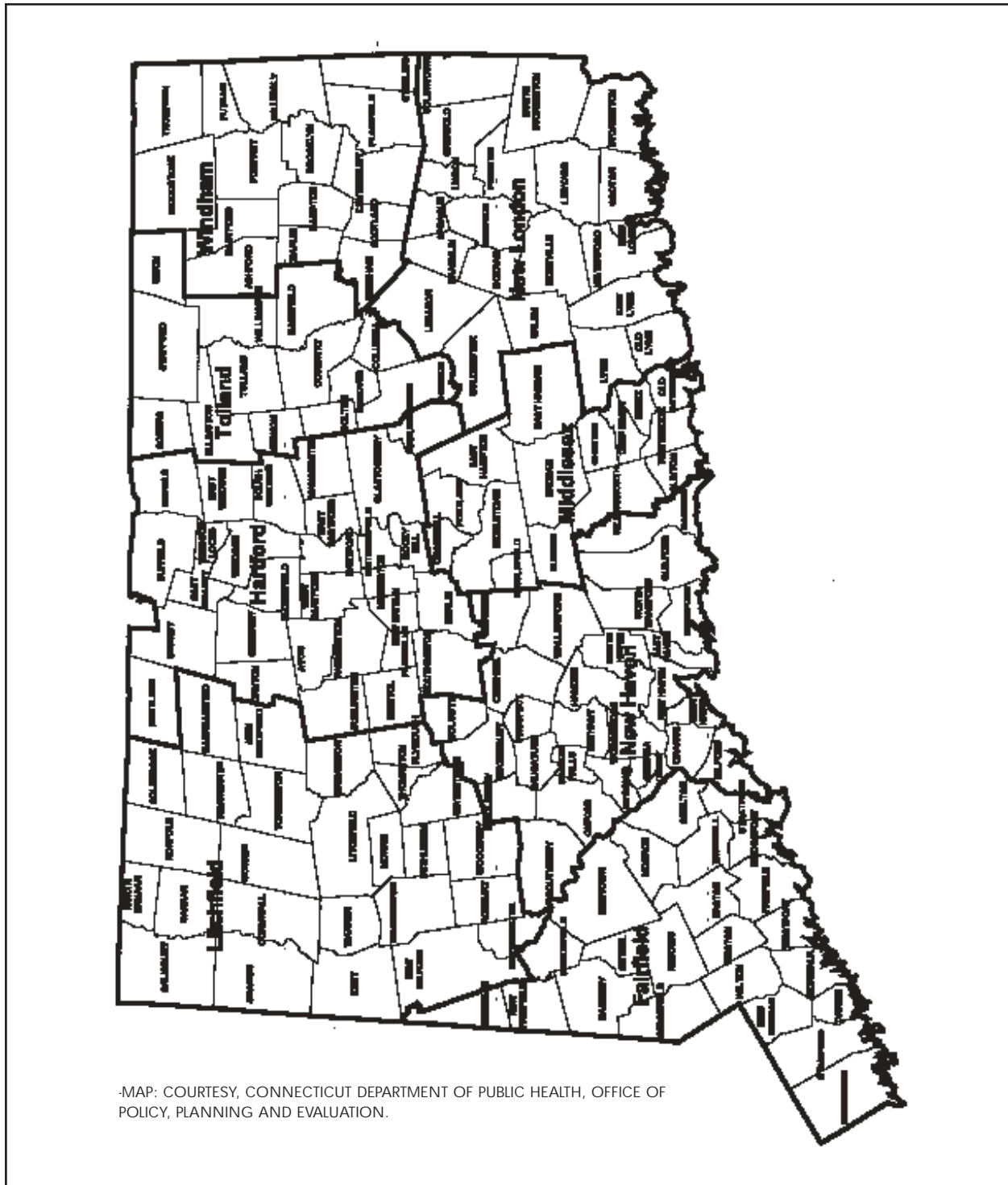
I would very much like to include schools in your district in this study. In each district, I try to visit one elementary, one middle, and one high school for one day each, during the time that lunch is served. During my visits, I interview the principal, the food service director or cafeteria manager, a PE teacher, a nutrition teacher, and a teacher on lunch duty. I also ask a few students some brief questions, such as whether or not they eat breakfast, and how often they exercise. All information is recorded anonymously, and no identifying characteristics are included.

Thank you in advance for your assistance in this important public health study. If you have any questions or would like any further information, please don't hesitate to contact me.

Sincerely,

Cynthia Curl Henderson, MS
Project Investigator, EHHI

APPENDIX 3. MAP OF CONNECTICUT



MAP: COURTESY, CONNECTICUT DEPARTMENT OF PUBLIC HEALTH, OFFICE OF POLICY, PLANNING AND EVALUATION.

APPENDIX 4. SCHOOL DISTRICTS BY ERG

EDUCATION REFERENCE GROUPS (ERGS)

ERG A	ERG C (Cont'd)	ERG E	ERG G
Avon	Ledyard	Ashford	Chaplin
Darien	Litchfield	Brooklyn	East Haven
Easton	Mansfield	Canaan	East Windsor
New Canaan	New Hartford	Canterbury	Griswold
Redding	Oxford	Chester	North Canaan
Regional #9	Pomfret	Colebrook	Plainfield
Ridgefield	Preston	Coventry	Plainville
Simsbury	Regional #10	Cromwell	Plymouth
Weston	Regional #13	East Haddam	Sprague
Westport	Regional #14	Eastford	Stafford
Wilton	Regional #15	Franklin	Sterling
Woodbridge	Regional #17	Hampton	The Gilbert School
	Regional #18	Hartland	Thomaston
	Regional #19	Kent	Thompson
	Regional #4	Lebanon	Voluntown
	Regional #6	Lisbon	Winchester
	Regional #7	Norfolk	
	Regional #8	North Stonington	ERG H
	Salem	Portland	Ansonia
	Salisbury	Regional #1	Bristol
	Sherman	Regional #11	Danbury
	Somers	Regional #16	Derby
	Suffield	Scotland	East Hartford
	Westbrook	Sharon	Killingly
	Willington	Union	Meriden
	Woodstock	Woodstock Academy	Middletown
			Norwalk
	ERG D	ERG F	Norwich
	Berlin	Bloomfield	Putnam
	Branford	Enfield	Stamford
	Clinton	Groton	West Haven
	Colchester	Manchester	
	Columbia	Milford	ERG I
	East Hampton	Montville	Bridgeport
	East Lyme	Naugatuck	Hartford
	Hamden	Seymour	New Britain
	New Milford	Stonington	New Haven
	Newington	Stratford	New London
	North Branford	Torrington	Waterbury
	North Haven	Vernon	Windham
	Old Saybrook	Wallingford	
	Regional #12	Waterford	
	Rocky Hill	Windsor Locks	
	Shelton	Wolcott	
	Southington		
	Tolland		
	Washington		
	Watertown		
	Wethersfield		
	Windsor		
ERG B			
Bethel			
Brookfield			
Cheshire			
Fairfield			
Farmington			
Glastonbury			
Granby			
Greenwich			
Guilford			
Madison			
Marlborough			
Monroe			
New Fairfield			
Newtown			
Orange			
Regional #5			
South Windsor			
Trumbull			
West Hartford			
ERG C			
Andover			
Barkhamsted			
Bethany			
Bethlehem			
Bolton			
Bozrah			
Canton			
Cornwall			
Deep River			
Durham			
East Granby			
Ellington			
Essex			
Hebron			

APPENDIX 5. THE SURVEY INSTRUMENT

IN-PERSON SURVEY

Administrator interview:

1. What grades are included in this school?
2. How many students attend this school?
3. When does the school day begin and end?
4. Does the food program pay for itself? If so, does that include salaries and equipment? If not, how is it subsidized?
5. How long are the lunch periods, and what are the times of those periods?
6. How many minutes of physical education do students at your school receive per week, and how is that time structured?
7. Is nutrition education provided at your school?
IF YES:
 - a) Who is primarily responsible for teaching nutrition?
 - b) How many hours of nutrition education do students at your school receive per year, and how is that time structured?
8. Does your school have an interscholastic sports program?
IF YES:
 - a) What sports are offered?
 - b) What percentage of your student body plays at least one sport?
9. Does your school have an intramural sports program?
IF YES:
 - a) What sports are offered?
 - b) What percentage of your student body plays at least one sport?

APPENDIX 5. THE SURVEY INSTRUMENT (Cont'd)

10. Are your students provided recess?
IF YES:
a) How long is recess?
b) When is recess scheduled?
11. Does your school have any non-cafeteria operated vending machines?
IF YES:
a) How many, and what do they contain?
b) Who determines what is sold in these machines?
c) Who collects the proceeds from these machines?
d) Who makes the decision to operate vending machines in your school?
12. Is there a school store that sells food and/or beverage items?
IF YES:
a) What food and/or beverage items are sold there?
b) When is it available to students?
c) Who collects the proceeds from the store?
13. Are food sales a part of any fundraisers at your school?
IF YES:
a) What is sold?
b) Who organizes and collects the proceeds from these fundraisers?
14. Does your school allow parents to send in food for birthdays, classroom parties, etc.?
15. Is any other food sold or provided in your school?
16. Do you have any other rules regarding food sale or consumption at your school?
17. Does your school have an organization aimed at overseeing or improving the school nutrition and/or physical activity environment, such as a nutrition committee or a health council?
IF YES:
a) Who is included in this organization?
b) What is this organization responsible for?

APPENDIX 5. THE SURVEY INSTRUMENT (Cont'd)

Food service director/cafeteria manager interview:

1. Do you participate in the National School Lunch Program (NSLP)?

IF YES:

- a) What is the average daily percentage of students purchasing a reimbursable lunch?
- b) What percentage of your students receives free or reduced price lunch?
- c) What government commodities do you receive most frequently?
- d) What proportion of the total food you buy is represented by these commodities?
- e) Do you think the commodities you are offered help you to provide healthy lunches?
5 (Definitely) → 1 (Definitely not)
- f) What items not currently offered would you most like to receive?
- g) Do you participate in any "Farm-to-school" programs?

2. Do you feel students have enough time during their lunch periods to buy and eat lunch?

5 (Definitely) → 1 (Definitely not)

3. How much does the full price lunch cost?

4. Do you sell foods à la carte?

IF YES:

- a) What is the average daily percentage of students purchasing an à la carte item?
- b) What items do you offer à la carte?
- c) Which items are most popular?

5. Do you operate any cafeteria-run vending machines?

IF YES:

- a) How many?
- b) What do they contain?
- c) Who decides how they are stocked?

6. Is your lunch program not at all, somewhat, or completely dependent on the proceeds from the competitive foods program?

7. Does any nutrition education occur in the cafeteria? If so, what does it entail?

APPENDIX 5. THE SURVEY INSTRUMENT (Cont'd)

8. Are you involved in teaching nutrition to students, either in the cafeteria or elsewhere?
9. Do you operate a breakfast program?
IF YES:
 - a) How many students participate?
 - b) What do you serve?
10. Do you operate an after-school snack program?
IF YES:
 - a) How many students participate?
 - b) What do you serve?
11. Is any other food provided to students through the cafeteria food service program?

Lunch monitor interview:

1. Do you feel students have enough time during their lunch periods to buy and eat lunch?
5 (Definitely) → 1 (Definitely not)
2. Do you think that increasing the length lunch period would lead to increased behavioral problems in the cafeteria?
5 (Definitely) → 1 (Definitely not)
3. Do you buy your lunch from the school food service program? If not, why not?

Physical education teacher interview:

1. How many minutes of physical education do students at your school receive per week?
2. How is the physical education time structured?
3. Do you think the physical education requirements at your school are adequate?
5 (Definitely) → 1 (Definitely not)
4. If not, how much do you think there should be?

APPENDIX 5. THE SURVEY INSTRUMENT (Cont'd)

5. During one of your physical education classes, how often do most students get at least 20 minutes of exercise where they sweat and breathe hard?

5 (Always) → 1 (Never)

6. Are there any other programs or events at your school that aimed at increasing students' physical activity and education?

Nutrition education teacher interview:

1. How many hours of nutrition education do students at your school receive per year?

2. How is the nutrition education time structured?

3. Do you think the nutrition education requirements at your school are adequate?

5 (Definitely) → 1 (Definitely not)

4. If not, how much do you think there should be?

5. Are there any other programs or events at your school that are aimed at influencing students' eating behaviors or increasing their nutrition knowledge?

Student interview:

1. What grade are you in?

2. Do you feel like you always, sometimes, or never have enough time to buy and eat lunch? If sometimes or never, what do you do when you do not have enough time?

3. How many days per week do you get good aerobic exercise for at least 20 minutes? If one or more days, what do you do for that exercise?

4. How often do you eat breakfast?

APPENDIX 5. THE SURVEY INSTRUMENT (Cont'd)

Observational survey:

1. If the school participates in the National School Lunch Program, what are the reimbursable meal options?
2. Does the school sell competitive foods?
IF YES:
 - a) What do they sell?
 - b) Do students appear to be in any way restricted as to what they can buy or when they can buy it?
 - c) How are competitive foods sold (in vending machines, at snack bars, in lunch lines, etc.)?
3. What time does the last student in line receive his or her meal? What is the interval between this time and the end of the lunch period?
4. Are any strategies employed to occupy or entertain students who have finished eating?
5. Are there are non-cafeteria operated vending machines available at the school, and if so, what do they offer?
6. Are there any other innovative programs or strategies being used at this school?
7. How is the overall atmosphere?

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