



The Wellness Impact:

Enhancing
Academic Success
through
Healthy School
Environments



GENYOUth
FOUNDATION



NATIONAL DAIRY
COUNCIL



AMERICAN COLLEGE
of SPORTS MEDICINE
LEADING THE WAY



American
School Health
Association

Acknowledgments

Special thanks to the following educators and other experts who provided valuable information, guidance and critical review for this report.

Lilly Bouie, Director, Child Nutrition Department, Little Rock (AR) School District

Jim Bogden, MPH, School Health Program, National School Boards Association

Stephen Conley, PhD, Executive Director, American School Health Association

Joseph Donnelly, EdD, FACSM, Professor and Director, Center for Physical Activity and Weight Management, University of Kansas Medical Center and University of Kansas-Lawrence

Jane Gleason-Senior, Assistant Executive Vice President, American College of Sports Medicine

Rose Haggerty, Manager, Secondary Health/Physical Education, Houston (TX) Independent School District

Mary Haley, Chief Operations Officer, Action for Healthy Kids

Charles H. Hillman, PhD, Professor, Departments of Kinesiology and Community Health, Psychology and Internal Medicine, University of Illinois at Urbana-Champaign

Ann Marie Krautheim, MA, RD, LD, Senior Vice President, GENYOUth Foundation

Molly Pelzer, RD, Senior Vice President, Health and Wellness, Midwest Dairy Council

Jean Ragalie, RD, President, National Dairy Council

Ricardo Casas Trujillo, Principal, Theodore Roosevelt High School, Chicago Public Schools

Francesca Zavacky, Senior Program Manager and Project Director, National Association for Sport and Physical Education



This report was produced with generous funding support from the Midwest Dairy Council.

About GENYOUth Foundation

Founded through an unprecedented public-private partnership with the National Dairy Council (NDC) and the National Football League (NFL) and committed to child health and wellness, GENYOUth brings leaders in health, education, government and business together in a movement to reverse childhood obesity rates. The Foundation officially launched on February 4, 2011, at Super Bowl XLV with the signing of a historic six-way Memorandum of Understanding with U.S. Departments of Agriculture, Education and Health & Human Services. GENYOUth empowers students to improve nutrition and physical activity by taking small steps to accelerate a lifetime of healthy changes. When youth are given a voice, change can happen. For more information, visit www.GENYOUthFoundation.org.

About National Dairy Council

Established in 1915, National Dairy Council® (NDC), the nonprofit organization funded by the national dairy checkoff program, is committed to nutrition education and research-based communications. NDC provides science-based nutrition information to, and in collaboration with, a variety of stakeholders committed to fostering a healthier nation, including health professionals, educators, school nutrition directors, academia, industry, consumers and media. For more information, visit www.NationalDairyCouncil.org.

About the American College of Sports Medicine

The American College of Sports Medicine is the largest sports medicine and exercise science organization in the world. More than 45,000 international, national and regional members and certified professionals are dedicated to advancing and integrating scientific research to provide educational and practical applications of exercise science and sports medicine (acsm.org).

About the American School Health Association

The American School Health Association (ASHA) is the leading membership organization for school health professionals. ASHA's mission is to build the capacity of its members to plan, develop, coordinate, implement, evaluate and advocate for effective school health strategies that contribute to optimal health and academic outcomes for all children and youth. We envision healthy students who learn and achieve in safe and healthy environments nurtured by caring adults functioning within coordinated school and community support systems (ashaweb.org).

Copyright © 2013

www.GENYOUthFoundation.org

Contents

Executive Summary 2

1 Prerequisites to Learning: Healthy Students and the Tools They Need 6

Despite varying levels of policy implementation, schools still hold an important key to achieving widespread student wellness. Demographic trends are making schools' role in a healthy future for children more urgent than ever, implying the need for constant reassessment of whether schools are doing all they can to further health-promoting behaviors.

2 Neuroscience: What It Reveals About Nutrition, Physical Activity and Learning 8

Current research into how students' development is affected by nutrition and physical activity is providing insights into the learning connection.

3 Where It All Begins: The Potential and the Price Tag 15

Schools have enormous influence over children's behavior, for better or worse. There are numerous benefits that come from schools' improving nutrition and physical activity opportunities, and costs if wellness is not a priority. Poor nutrition, sedentary lifestyles, unhealthy weight and associated disorders come with a steep cost to youth, schools, communities and the nation.

4 School Wellness Right Now 19

Implementation of, and adherence to, wellness policies is easier legislated than done. The quest for widespread wellness is exacerbated by the special challenges experienced by poor, minority and vulnerable populations, among whom obesity and its attendant problems, including lowered academic achievement, still coexist.

5 Time to Act: Recommendations for Next Steps 23

Schools nationwide are overcoming practical and systemic barriers every day to achieve school wellness. Right now what's important is accelerating the progress already made toward healthier schools by taking specific action. Learn what organizations and government agencies are saying about how districts can create a culture of wellness.

Endnotes 32



Executive Summary

This report addresses why schools play a more important role than ever in helping forge the nation's future. It illuminates the vital importance of improved nutrition and increased physical activity in creating an environment that enriches students' readiness to learn.

Overview

In the 12 years since U.S. Surgeon General David Satcher sounded the alarm about the nation's epidemic of childhood obesity in his Call to Action to Prevent and Decrease Overweight and Obesity, real progress has ensued. The federal school wellness mandate became law in 2006 and the Healthy, Hunger-Free Kids Act that strengthened and modified that mandate followed in 2010.

In the past decade, there's been real progress in building awareness for and driving positive changes in school wellness. Today, schools are a focal point for addressing the urgent need for improved nutrition and physical activity — and the academic success they enable. And the economic costs of creating healthier schools pale in comparison to the price tag for inaction.

Because of continual research and study, we are learning more and more about the opportunities possible to create a culture of wellness within our schools as well as the persistent hurdles and inequities that thwart it. For instance, we're learning more about the human brain and its connection to school wellness. Specifically, we're discovering the measurable neurophysiological role that nutrition and physical activity may play in improving academic achievement for all — not just some — children.

That kind of knowledge is highlighted throughout this report, which makes these key points:

Schools have an indisputable role in ensuring the healthy environment that learning requires.

A wide variety of research continues to demonstrate the positive correlation between health and learning *and* that they are mutually reinforcing. The benefits that can arise from proper nutrition and physical activity are a prerequisite to optimal learning and to avoiding and preventing chronic diseases. Since a broad range of critical societal conditions — from workforce preparedness to military readiness — depend on the effectiveness of our schools on the well-being front, neglecting wellness there runs the risk of incurring substantial real and hidden costs.

Neuroscience illuminates the effects of nutrition and physical activity on learning.

The brain is malleable when responding to biological and environmental factors, which proves an important attribute for learning. Research indicates the quality of foods children eat impacts cognition — with poor nutrition linked with absenteeism, hunger symptoms and psychosocial problems. Brain-imaging studies show that the brains of aerobically fit children may exhibit superior executive-function control. Physical activity, regardless of whether it's during recess, in the classroom or in physical education class, may improve school performance and achievement.

Breakfast, diet quality and food insecurity are key issues.

Serving school breakfast — especially through alternative options such as breakfast in the classroom and grab 'n' go — is possibly the easiest, most cost-effective and most directly helpful step schools can take to improve school and student wellness. Because of federal reimbursements, potentially high participation rates and profitability, school breakfast programs make economic sense. Breakfast can also help improve the quality of children's diets. The quality of food children eat has been shown to relate closely to overall growth and development. Positive associations between diet quality and academic performance are helping shape the view of what constitutes the "best" breakfast. Meanwhile, far too many American children remain vulnerable on the food front. In

CONVENING LEADERS, UNCOVERING CHALLENGES, ADVANCING SOLUTIONS

The call-out quotes throughout this report represent insights shared by experts at the GENYOUth Leadership Roundtable session of the **2012 GENYOUth Nutrition + Physical Activity Summit**, held in September 2012 in Washington, D.C. This Leadership Roundtable united a diverse group of CEOs and corporate executives, leaders in public health, education and fitness and students to identify barriers to the movement for healthy students and healthy schools and to brainstorm creative, cooperative solutions to school wellness challenges. GENYOUth Foundation serves as an aggregator of partnerships and shared wisdom about the ever-more complex, urgent and multilayered discussion around school wellness, with particular focus on the impact of nutrition and physical activity on learning. For more information, visit www.GENYOUthFoundation.org.



some cases, their situations link paradoxically to obesity. And that's as urgent a problem for learning as are poor nutrition and physical inactivity.

The costs mount for ignoring school wellness.

The rise in poor nutrition, inactivity and unhealthy weight among children and youth not only adversely affect academic achievement, but also come with devastating monetary, individual and societal costs. The price for children may include poor academic achievement, early onset of diseases and reduced career prospects. Schools face the effects of lower standardized test scores, reduced funding from high absenteeism and the expenses involved in student academic remediation and chronic disease management. Costs to society may include higher healthcare expenses, lower productivity and a workforce unprepared for global competition. Business and the military may face higher annual medical costs, fewer recruits, lost productivity and other problems linked with overweight and obesity.

School wellness policies stand at a critical juncture.

Today, school wellness represents a patchwork of implementation and enforcement. Some school districts align with national recommendations for nutrition and physical activity, some barely align and some don't align at all. Wellness policies often are plagued by vague language,

absence of a school point person and few, if any, consequences or accountability for being ignored. Socioeconomic level remains connected to school wellness: Implementation and enforcement of wellness policies are unequal when low- and high-socioeconomic (SES) status groups are compared. Low-SES schools are less likely than their peers in high-SES schools to have established wellness policies. Similar gaps exist regarding other issues that matter, such as the simple availability of salads at lunch, participation opportunities in sports programs and the degree to which formal nutrition education is offered. Academics may suffer since overweight or obese children and adolescents in every grade experience poorer academic outcomes than their normal-weight peers.

Despite hurdles, many schools are overcoming challenges through active buy-in from the full school community, dedicated technical assistance and training, sheer commitment to progress and the use of more serious accountability systems.

It's time to act.

School wellness — that environment in which every child can access good nutrition and regular physical activity — is achievable. Many school districts have made progress toward that goal over the past decade. Still, hurdles to school wellness exist. Too little time is devoted to wellness or it ranks low on the totem pole of school objectives. Financial resources are scarce, support from stakeholders and leadership is low, poor communications abound and tools and training are unavailable to put wellness practices into effect.

Creating a culture of wellness is realistic and doable. But it requires a support system, active communications and promotion, and a formal set of comprehensive wellness policies that are implemented. Numerous organizations and individuals that work in and with schools already are creating such a culture. The action steps they endorse and follow — summarized in the box to the right and in more detail at the conclusion of the full report — can inspire and instill the changes that lead to healthy, high-achieving students and schools. ■

How to Create a Culture of Wellness

Establish a support system.

- *Hold schools accountable for adopting and implementing wellness practices.*
- *Provide technical assistance to build capacity for staff and students (from grants, programs or partners).*
- *Establish school health advisory councils.*
- *Encourage student participation.*
- *Use Coordinated School Health as a framework for delivery of nutrition and physical activity information and services.*
- *Conduct yearly evaluations.*

Communicate and promote wellness.

- *Provide in-school promotions about physical activity and healthy eating goals.*
- *Promote resources and programs available that support wellness policies for school staff to incorporate.*
- *Conduct regular outreach to parents and community leaders about priorities and successes.*
- *Educate stakeholders regarding the role of nutrition, physical activity and healthy weight in reaching achievement goals.*

Instill comprehensive policies.

- *Enhance knowledge about, and practice of, nutrition by starting or expanding breakfast programs that use alternative approaches.*
- *Ensure that nutrition guidelines are aligned with U.S. Dietary Guidelines for Americans and applied throughout the school.*
- *Provide high-quality nutrition education for all grades, with integration throughout the curriculum.*
- *Deliver quality physical education for all students in all grades that apply standards and best practices. Ensure that quality health education is available to all students in all grades.*
- *Improve knowledge about, and practice of, physical activity by providing options each day before, during and after school for students to be physically active. Activities could include a “walking school bus” for students coming to school, recess before lunch, activity breaks during class and after-school extracurricular activities and sports.*
- *Offer school employee wellness programs; engage staff, families/parents and community members in promoting physical activity inside and outside of school.*

1

Prerequisites to Learning

Healthy Students and the Tools They Need

Schools and Health

This report presents the case as to why schools have a more important role than ever in helping build the nation's future. It stresses the vital importance of *improved nutrition and increased physical activity* in ensuring the type of environment that improves students' readiness to learn.

A wide variety of research has demonstrated the positive correlation between health and learning, and that those two things are mutually reinforcing.^{1,2} There's little disagreement that, whether we're talking about improved nutrition or increased physical activity, students with health-promoting behaviors perform better academically than those with poor health behaviors. Simply put, healthy students are better students. Though schools have always played a role in keeping students nourished and physically active — acknowledged or not — the local wellness policies that were federally mandated in 2006³ and the subsequent Healthy, Hunger-Free Kids Act of 2010⁴ served to formally establish schools' role in fostering wellness in general, and in helping to prevent childhood obesity in particular. Beginning in 2006, school districts were to implement policies that promoted physical activity and foods adhering to recommendations of the Dietary Guidelines, which the 2010 Act served to strengthen.

As outlined in these pages, there is variance among school districts,⁵ and sometimes within single districts, in the degree to which these policies have evolved, as intended, into daily practices. Nevertheless, good nutrition and adequate physical activity remain core to preventing chronic diseases.⁶ And schools hold the power to put well-intentioned wellness policies into daily practice.

The Realities We Face

Today, chronic maladies such as Type 2 diabetes, which in previous generations appeared in middle age or later, in one's 50s or 60s, are occurring in children and teens.⁷ Exacerbating such public health challenges now is an aging population. The ratio of people aged 65 and over to those aged 20 to 64 is expected to increase by 80% by 2050,⁸ and an astonishing one in seven youth aged 16 to 24 years are not in school or working.⁹

This means a lower percentage of the population will be equipped to support programs such as Social Security for a much higher percentage of the population.

Importantly, tomorrow's jobs will require today's youth to acquire skills and knowledge that were not necessary even a decade ago.⁹ The good health that results from adequate nutrition and physical activity is a prerequisite — perhaps *the* prerequisite — for optimal learning.

The news is not all alarming, and change is occurring. Stakeholders of all kinds are more involved in the school wellness debate than ever. Students are actively problem solving themselves to improve their schools and their own healthy behaviors.¹⁰ New findings about the brain and cognition can help inform new strategies for teaching and creating healthier environments.¹¹ Notably, findings in the newest studies reveal that developing the problem-solving part of the brain requires not more study time, but a more nurturing environment, including physical activity and more playtime.^{12,13}

At the same time, vital to learning and cognition are the nutrients necessary to support normal growth and development — although the reality is that the majority of American youth still have a diet that is deficient in one or more nutrients.⁶ Given breakfast's positive effect on overall nutrition, it's discouraging that a recent survey found 62% of students did not eat breakfast on all seven days before the survey and 13% of students never ate breakfast during that time.¹⁴ Equally frustrating, even now, nearly three-fourths of high school youth are not physically active for 60 minutes seven days a week.¹⁴

Time for Action

At this juncture, it is more important than ever that schools and community partners examine the wellness policies and practices that were to have been implemented beginning in 2006³ with an eye toward what can be done to further enhance the food, nutrition and physical activity environments at school. Health-promoting behaviors cultivated in students can and must be turned into lifelong positive habits, and the urgency is increasing.

Not only are health and education mutually reinforcing, but there also can be immediate benefits from improving the school's wellness environment — fewer students are tardy or absent when breakfast is eaten at school,¹⁵ and when physical activity is included in class, academic achievement improves, too.¹⁶ Indeed, by neglecting school wellness, schools and society incur enormous real and hidden costs both today and tomorrow.

We can't make kids smarter, but with improved nutrition and physical activity, we can put a better student in the chair.

— Robert Murray, MD, Department of Pediatrics, The Ohio State University

The following pages summarize current findings on the links that physical activity, nutrition and body weight have to academic achievement. They make the point that schools cannot make the necessary changes alone. The broader community, including business leaders, health professionals, community organizations, parents, educators and students all must get involved. This report aims to renew and reinvigorate interest, and motivate the giving of additional support and resources to schools for a simple and urgent reason:

Our future well-being as individuals, as communities and as a nation lies with students in elementary and secondary schools today. For all our sakes, we must provide these students with the tools they need to achieve and succeed. The good health that results from improved nutrition and increased physical activity — and the learning that is made possible as a result — is primary among those tools. ■

2

Neuroscience

What It Reveals About Nutrition, Physical Activity and Learning

The Malleable Brain

One of the things we've learned in the quest for school wellness over the past decade or more is that, despite the hurdles, change is possible. Most recently, we're learning that this is true not merely of policy, but of physical, or perhaps more accurately *physiological*, change.

The interactions among multiple disciplines, including sociocultural, neuro-scientific, biological and cognitive science, have led to new understandings of children's development and exciting possibilities for enhanced learning.¹¹ It is now known, for example, that the human brain is malleable and changes throughout one's lifespan as a function of both biological and environmental factors. How the brain self-modifies to adapt to its environment is a relatively new discovery and reflects the brain's plasticity and its ability to accommodate to its context.¹²

We also know that the environment to which children are exposed (unhealthy foods, lack of areas for physical activity, bullying or unsafe neighborhoods) influences how children think, feel and respond. The mind-body connection, therefore, becomes a genuinely important concept. *What we think affects our health and vice-versa: our health impacts how we think.*¹¹

Brain functions can be enhanced in order to improve children's ability to learn. Research on the area of the brain that controls functions relative to thinking, concentration and acting (or not) on impulse — a network involving the prefrontal cortex — indicates that the school environment is key to the development of these areas.¹³ The brain's executive functions, those critical to learning, include working memory, problem solving, reasoning and planning. It turns out that these functions are so vital to the learning process that some feel they are more predictive of school readiness than a child's IQ.¹³

What You Eat, or Don't Eat, Matters

Children's diet quality — the actual quality of foods children eat — is important to their overall growth and development.⁶ Normal brain development must have an array of macronutrients (fats, carbohydrates, protein, water) and micronutrients

(a range of vitamins, minerals and other substances found in foods that enhance absorption or fight off cell damage) each day; and at some intervals, or windows of opportunity, high-quality diets are even more vital.¹⁷

Given how the brain develops throughout childhood and dynamically adapts to the environment, poor nutrition *could have a negative effect on brain functions*, although more research is necessary to fully understand this relationship.¹⁷

The implications are worrisome considering that the majority of youth eat fewer nutrient-rich foods and over consume calories, fat and added sugar,⁶ and that almost one out of four children in the U.S. live in food-insecure households.¹⁸ Studies of school children with insufficient food revealed poorer class performance, more days of school missed and a decline in academic achievement.¹⁵

Even among adequately nourished children, diet may help or hurt cognitive abilities. Unfortunately, *more than half of all teens do not eat breakfast each day*.¹⁶ Skipping breakfast can have immediate negative effects on cognitive abilities, especially for children at nutritional risk.^{19,20} Early research on fasting and cognition found that transient hunger in well-nourished school children negatively affected their performance on given tests.²⁰

School children may or may not care about the effects of skipping meals on their ability to learn. As with many things, and depending on age, children need the adults who surround them each day to provide what's needed. School meals become very important, as there are countless reasons parents may not be able to provide breakfast, lunch or even dinner. Studies reveal that *positive outcomes associated with school breakfast include less tardiness and absenteeism, improved math scores, fewer visits to a nurse's office and fewer behavior problems*.^{19,21,22} Another benefit tied to eating breakfast is the meal's positive effect on overall nutrition. Students who eat breakfast have higher consumption of key nutrients than breakfast-skippers, and those who skip breakfast do not make up for those missed nutrients from other meals.^{19,22} This makes breakfast critical.



I visited a classroom recently in which a science teacher was not only teaching nutrition, but after the academic part she transitioned into a physical-activity unit and got the kids moving. I see this all the time — schools are finding creative ways to engage kids in physical movement. I'm encouraged by that.

— **Audrey Rowe**, Administrator for the Food and Nutrition Service, U.S. Department of Agriculture

Review articles on the role of breakfast in cognitive development have focused on the breakfast meal; however, less research has focused on the specific quality of the foods eaten at the meal. One study used an index of diet quality to correlate students' diet quality with scholarly performance.²³ Children with a lower score for diet quality performed poorly on the academic assessment when compared to students having a higher score for diet quality. The positive association between diet quality and improved

(Continued on page 12)

School Breakfast:

A FAST AND EFFECTIVE STEP TO IMPROVE SCHOOL AND STUDENT WELLNESS

The easy, obvious solution

Of all the steps schools can take toward creating healthier, higher-achieving students — and a culture of wellness in schools — implementing school breakfast is perhaps the simplest and most cost-effective, with very possibly the most direct impact. Because schools receive federal reimbursement for each meal served, more than one administrator has been known to characterize serving breakfast in school as a “no-brainer.”

The benefits of breakfast are well-known — breakfast contributes to daily nutrient intake. For example, when breakfast includes a ready-to-eat cereal, key nutrients are provided, and it also has a positive effect on cognition all morning.³⁰ Breakfast literally breaks the nightlong fast. If breakfast is skipped the fast continues, which can place unnecessary stress on a developing body. Studies on well-nourished students who skipped breakfast found adverse effects on attention and memory.²⁰

Some studies show that children, especially nutritionally at-risk children, who eat breakfast at school have higher math and verbal fluency scores and perform better on standardized tests. The breakfast-eaters pay better attention, behave better in class and are less likely to be absent, late or see the school nurse.²⁰⁻²²

In the classroom or on the run

Served after the opening bell, breakfast-in-the-classroom programs have become an effective strategy for increasing overall participation in breakfast for many school districts nationwide.³⁵ Kids eat together and enjoy nutritionally well-balanced foods like breakfast wraps,

yogurt, low-fat milk and fruit, while the teacher takes attendance or collects homework.

Grab ‘n’ go breakfasts are also easy — students pick up bagged meals with foods like yogurt-and-granola bars that are available in high student traffic areas and students can eat on the way to class, in the classroom or in designated areas.

However it’s served, the breakfast meal couldn’t be more important

Research is demonstrating why breakfast is vital to students’ success in school. A recent study assessed the neural networks in the brain that engage during learning. Two groups of students, breakfast-eaters and non-eaters, were asked to complete the same math problems. Investigators monitored the activation of those areas of the brain involved in mathematical cognition. The breakfast-eaters had significantly different activation patterns of neural networks involved in mathematical thinking and they had fewer errors on the math equations. The non-eaters had significantly more errors, and brain wave frequencies showed more mental effort was used to complete the math equations.³² If this alone is not a reason for eating breakfast consider that:

- * Some studies indicate that participation in breakfast at school, particularly for those who are nutritionally at-risk, results in students being on time, missing less school and having better attention, behavior, math grades and standardized test scores.^{15,21,22}
- * Participation in school breakfast programs has been associated with fewer psychosocial



problems such as depression, anxiety and hyperactivity,^{21,33} and adds to the time students are present at school, which is connected to educational attainment.³⁴

- * Students with low nutrient intake have been found to report more symptoms of hunger, have more psychosocial problems and higher rates of absenteeism and tardiness than students with higher nutrient intakes.²¹ Participation in school breakfast led to higher nutrient intakes than in students who skipped breakfast — and missed nutrients were not replaced by other meals during the day.^{21,22} One study found that breakfast-skippers, or those hungry, have worse attention and poorer episodic memory than breakfast-eaters.³⁰

SCHOOL BREAKFAST MAKES ECONOMIC SENSE

Student behavior problems and lack of concentration due to morning hunger, as well as absenteeism related to illness, have measurable financial consequences that are directly and positively impacted by breakfast. But that's just one reason school breakfast makes economic sense. Rates of participation in breakfast-in-the-classroom programs have been shown to increase dramatically when schools with high concentrations of free or reduced-price eligible students begin offering it³⁵ — *and, correspondingly, so would the amount of federal funding the school receives through the National School Breakfast Program.* This can result in what is essentially a significant new revenue stream for districts. A University of Wisconsin cost-benefit analysis on school breakfast programs finds that they often do more than break even — they actually turn a profit, in some cases ending up being more profitable than school lunch programs. The same study points out that school breakfast programs also create jobs and help to increase the overall financial stability of school food services. Breakfast isn't just good for learning — it can be good for the bottom line.³⁶



Food Insecurity

Far too many American children are food insecure. Paradoxically, food insecurity often is linked with obesity,³⁷ and it also increases vulnerability to short- and long-term consequences for health, well-being and achievement. Approximately 16.6 million children lived in food-insecure households in 2011. That's 22.4 percent of the nation's children.³⁸ Part of the answer to this issue is broadening participation in and quality of the federal free and reduced-price school meal programs — breakfast, lunch, after school and summer — especially school breakfast, which is severely underutilized. These programs are effective, logical means of promoting healthful diets and contributing to a reversal of the current childhood obesity epidemic, especially given their reach in schools and communities across the country and among particularly vulnerable low-income and food-insecure children.

A hungry child is as urgent a problem for learning as a poorly nourished, physically inactive one.

(Continued from page 9)

academic performance was independent of other factors,²³ and will no doubt lead to other research to further our understanding of what constitutes the “best” breakfast for school children.

Fitness and Cognition

Neuroimaging technology is making it possible to identify how physical activity helps improve school performance and achievement.

Aerobically fit children exhibit better executive control functions relative to less-fit children, and differences are related to both brain structure and brain function.²⁴ With the use of neuroimaging, investigators are discovering that the sizes of certain areas in the brain are positively associated with the fitness levels of children. These areas in the brain that are larger in higher-fit children are related to enhanced cognitive functions, such as working memory, inhibition control and ability to block out unrelated information.^{24,25}

A related randomized, controlled study (FITKids) found that when moderately to vigorously active for an average of more than 75 minutes per week-

day, kids' fitness levels improved *along with cognitive performance.*²⁶ A study reported in 2011 noted the associations of fitness and fatness with cognition, academic achievement and behavior in overweight, sedentary children. These findings reveal that a student's fitness level is positively related to cognition, achievement and better behavior. *The authors found direct benefits to fitness relative to resistance to distraction, mathematics and reading as well as to parent ratings of child behavior.*²⁷

In 2010, the Centers for Disease Control and Prevention released a report that summarized the association between school-based physical activity (including physical education) and academic performance, looking at indicators of cognitive skills and attitudes, academic behaviors and academic achievement. *Results speak strongly in favor of having time for physical education and physical activity for the purpose of cognitive functioning and academic achievement.* In assessing 14 different studies on physical activity or physical education (looking at the effects of recess, short bouts of activity in the classroom

(Continued on page 14)

Physical Activity and Performance

As pressures for measurable academic achievement in schools mount, one of the most concerning developments is the number of school districts that have simply eliminated recess and/or physical education entirely. Purely from the perspective of common sense, many have characterized that decision as misguided. But now, quantitative and rigorous scientific research is suggesting they're correct.

A recent three-year randomized, controlled study of second- and third-graders looked at the relationship of physical activity to academic performance, with a specific focus on classroom physical activity.¹⁶ Among the findings:

- * There is a positive correlation between amount of time spent being physically active and academic performance. Students who were more active during school and on weekends performed better on standardized tests for reading, math and spelling.¹⁶
- * The classroom physical activity breaks were reported to be fun and easy to do and did not interfere with learning as shown by higher test scores than were found in the control group.¹⁶
- * Physical activity was integrated into lessons and teachers participating in the activity made a positive impact, as those students were observed to be more active.¹⁶
- * Regardless of how long students were active per session, or if the activity was at home or school, the total time spent physically active per week positively impacted students' body weight and school performance.¹⁶

Encapsulating the research, the study's lead author, Dr. Joseph Donnelly, Professor of Internal Medicine at the University of Kansas and Director of that institution's Center for Physical Activity and Weight Management, summarized: "There is no evidence that removal of physical activity programs results in greater academic achievement."



When it comes to getting kids moving, I'd want to involve the community and neighbors more in what we're doing at school. Everyone should be able to use the space and equipment we have around our school, not just students!

— Alejandro, Middle School Student, Waukegan, Illinois



(Continued from page 12)

and various extracurricular activities) the study indicates that increased time in PE has positive or neutral effects on academic achievement. It concludes that increased time in PE does not have a negative relationship to academic performance. In other words, time spent in PE does not detract from academic achievement.²⁸

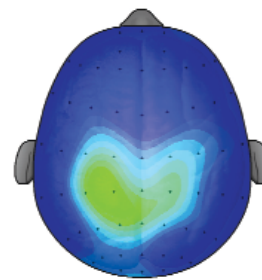
Perhaps Professor Charles E. Basch of Columbia University Teacher's College summarizes it best. "School administrators," he writes, "trying to raise standardized test scores, may mistakenly believe that physical education curricular time should be sacrificed and reallocated to reading, mathematics and science. There is currently no evidence indicating that this strategy is, in fact, effective in increasing standardized test scores; in fact, a growing body of evidence shows that increased time for physical education and other school-based physical activity programs is associated with either a neutral or positive impact on academic outcomes."²⁹ ■

THE PROOF IS IN THE BRAIN

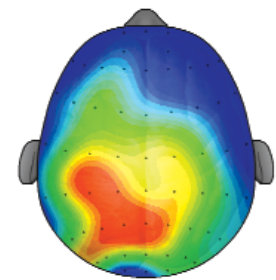
Recent controlled studies involving brain imaging are casting new light on the effects of exercise and obesity on cognition. They're providing visual evidence of the neurophysiological impact of physical activity — or the lack thereof — on children. Dr. Charles Hillman of the Department of Kinesiology and Community Health at the University of Illinois at Urbana-Champaign is teasing out the relationship between physical activity and processes involved in attention, memory and academic performance in children.

Cognitive Effects of Exercise in Preadolescent Children

Average composite of 20 students' brains taking the same test after sitting quietly or taking a 20-minute walk.



After 20 minutes of
Sitting Quietly



After 20 minutes of
Walking

Reprinted with permission of Dr. C. H. Hillman.

With the help of neuroimaging we're learning that:

- * Physical fitness may benefit cognitive and brain health, as well as academic performance.³⁹
- * Even single bouts of aerobic exercise have been shown to benefit cognitive performance.⁴⁰
- * Research indicates aerobic fitness levels of school children may be associated with cognition and its neural underpinnings.⁴¹
- * Obesity is linked to adverse cognitive performance in school-aged children and teens; and in older adults, obesity is actually found to change brain structure.⁴²
- * There exists a positive association between fitness and key aspects of learning — thus, early intervention is crucial toward lifespan health and effective function of brain and cognition.²⁶

3

Where It
All Begins

The Potential
and the
Price Tag

A Place of Change — and the Potential for Change

Apart from the home, many would say our schools are the ideal venue in which to encourage and effect change with respect to children's health-promoting behaviors. Schools wield influence over children's development along with parents, friends and the larger community.⁴³

We must remember that most American children spend approximately 2,000 hours each year at school, where not just teachers but their peers and the general environment can support positive (and negative) behaviors. This is particularly relevant with underserved populations, in which children may lack a nurturing home environment and/or the advantage of parents or caregivers who are knowledgeable about, or committed to, either the basics of nutrition or the importance of physical activity.

Schools clearly provide many opportunities to model and communicate healthful eating and physical activity — and the school environment can certainly contribute to an overall energy balance in children's lives.⁴³ Indeed, the 2012 Institute of Medicine report *Accelerating Progress in Obesity Prevention: Solving the Weight of the Nation* cited schools in its list of five primary goals aimed at preventing obesity.⁴⁴ And the U.S. Department of Health and Human Services' Healthy People 2020 agenda sets 10-year goals for the nation's health that include nutrition, physical activity and educational attainment goals for youth.⁴⁵

Moreover, because of the structured environment that schools represent, they can exert a special authority when it comes to the fostering of good habits. Significantly, as 16th Surgeon General David Satcher has noted, schools are "great equalizers" in that they provide equality of access to information in areas where families differ in their levels of knowledge and in their ability to discuss nutrition and physical-activity needs. In this light, it's not an exaggeration to say that schools can help communities fulfill perhaps the most vital of social responsibilities: ensuring that all students, no matter their backgrounds or socioeconomic status, have the same opportunities for health and education.³

Lastly, it almost goes without saying that schools have an obvious investment in students being healthy. Students who do not engage in health-risk behaviors tend to perform better academically. Given this mutually reinforcing association, schools clearly have a vested interest in the learning connection. This is more relevant than ever as the rigorous Common Core State Standards raise academic expectations of schools and students.

In the Long Run

From a societal perspective, *workplace readiness and military preparedness* are possibly the ultimate indicators of schools' effectiveness. Schools carry the primary responsibility for readying the nation's future workforce and military. The importance of this fact alone turns the spotlight squarely on schools as the logical venue for improving learning through increased nutrition and physical activity.

Future job seekers will need to possess different types of skills than 20 to 30 years ago when manual labor was in demand and there were many trades as alternatives to college degree-based positions. Today's market is requiring — and is expected to continue on this path — specific knowledge and skills for various industries that require college and graduate school degrees, and at a minimum, a two-year associate degree. Given the current economy and limited number of jobs, candidates need more sophisticated skills. Those without a high school diploma will have limited opportunities — and even with a high school diploma, chances are most jobs paying above minimum wage will require at least two years of college or the equivalent.⁹

Similarly, military preparedness is a vital national concern and fact of life for our country. There are clear signs that, because of the health and physical fitness of incoming recruits, readiness is already a problem for the U.S. military. According to The Heritage Foundation, declines in America's military readiness signal to the rest of the world that the United States is not prepared to defend its interests.⁴⁶ U.S. military leaders report that obesity has already reduced their pool of potential recruits to the armed forces.⁴⁷



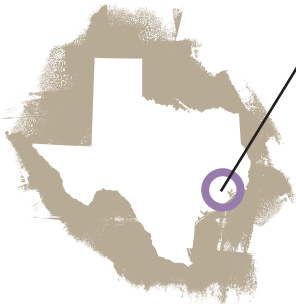
I don't like obesity being called a disease. We've got to remember that obesity is a symptom — physical inactivity and poor nutrition are the root causes. More physical activity and better nutrition are the cures.

— **Shellie Pfohl**, Executive Director, President's Council on Fitness, Sports & Nutrition

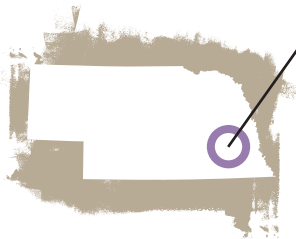
A related study by the Trust for America's Health predicts that more than half of Americans in 39 states could be obese by 2030, with a likely resulting rise in obesity-related diseases and healthcare costs.⁴⁸ As noted in *Foreign Policy* magazine, "This is disturbing enough, but it becomes even more troubling for the armed forces when individual state-recruitment trends are compared to their childhood obesity rates. All 10 states that contributed the most military inductees in 2010 have childhood obesity rates greater than 15 percent. Three of them (including Texas, which was second in total recruitment with over 15,000 new military members) exhibit rates between 20 and 25 percent."⁴⁶ ■

DOING IT RIGHT

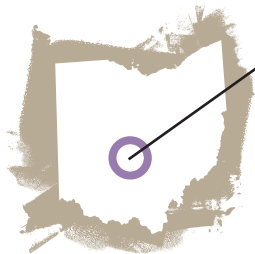
More and more school districts, like those profiled below, are making wellness a priority and moving the needle in the right direction.



The Houston (TX) Independent School District expanded its free school breakfast program in 2010 to all elementary and middle school students, and today more than 112,000 students enjoy breakfast in the classroom daily. Students help select and promote healthy, tasty new school menu options for lunch and breakfast and have launched walking clubs in many schools. The district links student wellness measures, captured with tools such as FITNESSgram, with student achievement data, and engages and supports school staff as role models for healthy behaviors.



Norris School District (Firth, NE) has embraced a state-mandated student health and wellness policy and integrated it as a vital element of their school improvement and staff development programming. Norris has served as a Coordinated School Health pilot school under the Nebraska Department of Education-sponsored “Building Healthy School Environments” grant initiative. The Norris team also has partnered with the University of Nebraska to offer brain-based physical-activity infusion strategies for the classroom, which has inspired the district to move even faster in making changes. University of Nebraska-Lincoln Agricultural Extension officials have partnered with Norris in offering a farm-to-school grant that integrated low-fat dairy products from local producers. The district has improved its lunch menus and reduced the amount of competitive foods sold, increased opportunities for physical activity, improved employee health programs and overhauled its physical education and health education offerings.



Columbus (OH) City Schools and its district leaders have embraced the wellness council process, bringing together school and community advocates to lay out a three-year plan to address high rates of obesity and diabetes among the district’s students. The nutrition committee, working with the district’s vending company, directed the replacement of sweet drinks with water-only vending, made dramatic improvements in nutritional quality of the school meals and oversaw a step-wise process for clearing away high-calorie, low-nutrient vended and à la carte food items. Within three years the school was strikingly improved without the financial catastrophe that was predicted. Physical activity and physical education standards were rewritten. Staff wellness programs were formed with the help of the school’s insurance provider. In its new three-year plan, the district laid out an array of satellite clinical spaces to improve primary and secondary prevention and screening for the students and families. The Columbus experience is an example of what a committed wellness coalition can do when it has the support of a strong leader and is armed with the tools to make it happen.

PICKING UP THE TAB

The costs of ignoring school wellness are virtually incalculable. Everybody pays the price when nutrition and physical activity are ignored, though in different ways. For some, the costs can be physical, others may pay in lack of achievement and the sheer dollar cost of poor health and its attendant effects can impact everyone. At the end of the day, someone pays. It's just a question of who and how.



How might our nation pay?

An underprepared workforce unable to compete in the global marketplace

Higher healthcare costs for federal employees

Lower national productivity due to an aging population and fewer wage-earners



How might children pay?

Poor academic achievement

Lack of concentration

Behavior problems, isolation, targets of bullying

Earlier onset of chronic disease and attendant costs

Reduced career prospects



How might schools pay?

Increased student absenteeism

Reduced state funding based on poor attendance (for some states)

Lower standardized test scores

Additional staff time spent tending to medical needs of students with obesity-related illnesses

Additional instructional costs to support underperforming students

Poor nutrition, physical inactivity and unhealthy weight



How might the military pay?

Smaller pool of recruits due to overweight and obesity

Money spent by the U.S. Defense Department annually on management of obesity and overweight among recruits



How might business and industry pay?

Higher medical costs as well as disability and unemployment benefits related to obesity

Lost productivity annually due to obesity-related worker absenteeism

And speaking of numbers...

Estimated additional instructional spending needed to offset the negative obesity effects in low-income districts (measured in West Virginia): **\$1,392 PER STUDENT**⁴⁹

Amount school districts can lose annually in attendance-based state funding because of absenteeism:

TENS OF THOUSANDS TO MILLIONS OF DOLLARS⁵⁰

Cost of healthcare for obese children as compared to the average insured child: **3 TIMES AS HIGH**³¹

Estimated cost of obesity-related illnesses in the U.S. as a percent of annual medical spending: **21%**⁴⁴

Amount that Medicare and Medicaid costs would be reduced, annually, without obesity:

8.5% and 11.8%, RESPECTIVELY⁴⁸

THE BOTTOM LINE

Many of these costs could very possibly be reduced, halted or reversed with the right attention put toward creating health-promoting school environments – and many schools are already doing just that.

4

School Wellness

Right Now

Recent History

The U.S. Child Nutrition and WIC Reauthorization Act of 2004 was a landmark in both federal legislation and school wellness. The Act was Congress's response to the alarming surge in childhood obesity by identifying a key role for schools in its prevention. A true milestone, the Act called for the implementation of a Local Wellness Policy in virtually every school district in the country. Districts were given until July 2006 to put their policies in place. Policies were to include goals to promote student wellness, nutrition education and physical activity; nutrition guidelines for school meals and other foods available at school; a plan and a person responsible for monitoring the policy; and creation of a local guidelines committee, made up of representatives of local schools, parents and other community members.³

At the time of the Act's passage, some criticized its lack of funding and requirements for accountability as well as the absence of specific standards for implementation and systems for monitoring and evaluation. Nevertheless, it was a major step.

A further legislative step toward school wellness was the more recent Healthy, Hunger-Free Kids Act of 2010, a federal statute that was a key element of the reauthorization of funding for child nutrition. The bill funded child nutrition programs, including school lunch and breakfast programs, for five years and also set new nutrition standards for schools.⁴

The Act gave the U.S. Department of Agriculture the authority to set new rules for food sold for lunches during the school day, provided resources for schools and communities to use local farms and gardens for fresh produce and, notably, set minimal standards for school wellness policies.⁴

How's It All Working Out?

Reviews are mixed.⁵¹⁻⁵³

According to Bridging the Gap, a research initiative funded by the Robert Wood Johnson Foundation, district wellness policy provisions have generally improved in the years since the federal mandate went into effect; however, many remain ineffective overall, some barely aligning or not



When people are insecure about food, there's a tendency to eat when you can get it — and the higher in calories and fats it is, the more filling it is. In disadvantaged communities where children are hungry, it's much easier to get and eat something that's not healthy for you than something that is.

— David Satcher, MD, PhD, 16th Surgeon General of the United States

aligning at all with national recommendations for either nutrition or physical activity.⁵

A substantial number of school wellness policies do not address all the required provisions and feature vague or interpretive language that, in reality, doesn't require action. In terms of addressing both nutrition and physical activity concerns as well as ensuring policy implementation overall, the majority of local wellness policies are, in the report's word, "weak."⁵

Other wellness policy assessments also found policy language to be vague and lacking a point person in the schools for evaluation.^{5,52,54,55}

A similar assessment is provided by Metos and Murtaugh, whose systematic review of publications on wellness policy status points out that, "In the complex world of schools, a written policy does not ensure that intended practices occur at the school level."⁵² Other articles on the topic stress the need for periodic assessment and accountabilities in order for wellness practices to become a priority.^{52-54,56}

Researchers at Yale examined school wellness policies and identified factors that predicted school-level implementation. The strongest predictor: a district with a strong and comprehensive written policy. The study identified lack of coordination and lack of resources as the most common challenges to policy implementation.⁵³

Socioeconomic Level and Wellness

It's an unfortunate truism that poor nutrition and a lack of physical activity exact a disproportionate cost on poor, minority and vulnerable populations. But is school wellness, and the implementation and enforcement of policies to enhance it, similarly unbalanced between low- and high-socioeconomic status (SES) groups, even today? A review of recent literature reveals that in important ways the answer is still yes.

A national review of wellness policies for secondary schools found that high school students attending low-SES schools were less likely than their peers in high-SES schools to attend a school with established wellness policies (69% vs. 84%).⁵⁷ In addition, African-American and Latino students were less likely to have salads available

INEQUITIES REMAIN

It would be absurd to try to paint a portrait of American schools as a utopia in which disparities magically disappear. The U.S. has historically had large gaps in wealth, healthcare and a score of other areas — and those gaps are certainly reflected in schools.⁶⁵ And because both health and educational disparities tend to be racially and ethnically centered, minority populations remain most challenged when it comes to both health and academic performance.^{44,65}

Consider that:

- * African-American, Hispanic and low-income populations continue to have a much higher incidence of chronic diseases such as diabetes, obesity and cancer.⁶⁶
- * Low-income children and adolescents are more likely to be obese than their higher-income counterparts although the relationship is not consistent across race and ethnic groups.⁶⁷
- * Obesity is associated with lower academic achievement,^{63,68,69} though it is not a causal relationship and it is complicated by other factors like race and socioeconomic status.^{49,61}
- * New surveys are revealing that schools in higher-SES areas have, for example, far more intramural sports opportunities and that rates of sports participation differ markedly by school SES, even after adjusting for the number of sports facilities at the school. Pay-to-play fees, equipment costs and school-supported transportation are barriers that may disproportionately affect lower-income students.⁷⁰

These inequities can all begin to be addressed, and to some extent corrected, through health-promoting school environments that prioritize proper nutrition and physical activity. What's more, a healthy school environment helps connect kids to school. When they have a greater connection to school, students are more likely to have positive health and academic outcomes.⁷¹ They are more likely to attend school regularly, stay in school longer and get higher grades. Thus, it's not simply schools that are important, but schools to which students can feel a meaningful connection.

at school compared to white students' schools. Students in low-SES schools and majority African-American or Latino schools were also less likely to participate in sports programs than their peers in predominantly white or high-SES schools, while students in low-SES schools were less likely to attend a school that offered formal nutrition education or one that shares its recreational facilities outside of school hours.⁵⁷

The same study found students from high-SES schools had significantly higher availability of vending and à la carte foods when compared with low-SES middle and high schools students. Vending machines were also more available for

white than African-American middle and high school students. Only middle schools where Latino students attended had higher availability of stores or snack bars than white or black students.⁵⁷ Another study by Bridging the Gap found differences in participation in sports based on SES. In middle school, significantly more students from high-SES schools participated in intramural sports.⁵⁸ And the availability of facilities influences participation. Schools with recreational facilities had significantly more students participating in interscholastic sports, and the relationship held constant even when looking at SES. Appropriate facilities are critical and are not

I've worked in schools with underserved populations where blanket free breakfast programs literally transformed the school. In those same areas, opportunities to be physically active in a safe environment can also be transforming. I understand the challenges of providing these things, but it can be done. When you work with kids like this and give them opportunities, the most rewarding thing is seeing their confidence in all areas go through the roof.

— **Francesca Zavacky**, Senior Project Manager,
National Association for Sport and Physical Education

equally distributed.⁵⁸ In a special edition of the *Journal of School Health*, Dr. Basch wrote, “The low level of physical activity among black and Hispanic adolescent girls is largely attributable to the nature of the schools they attend.”⁵⁹ If the school is located in a low-income community, there are fewer resources and this may affect the physical activity level of the community’s youth.

Do Academics Suffer in This Climate?

They do. Overweight or obese children and adolescents in every grade experience poorer academic outcomes than their normal-weight peers.⁶⁰ Recent studies have found that overweight children perform worse academically than normal-weight children, even when studies control for demographic factors such as socioeconomic status and parent educational level.^{61,62}

Recent research has also revealed that when compared to normal-weight students, overweight children have a lower relative degree of academic achievement, are tardy and absent more often and are more likely to receive detention.⁶² Other findings at the middle and high school levels indicate that adolescents at risk of obesity typically earn lower grades, and individuals who were obese at age 16 complete significantly fewer years of schooling than do their non-obese peers.⁶³

Bottom line? According to the growing body of evidence it is clear that poor nutrition, physical inactivity and obesity are directly associated with lower levels of student achievement.

We're Partway There

Despite the potential benefits to health, achievement and the bottom line, what we have today is a nation of partially fulfilled school wellness policy mandates.

Some schools are doing less than others because of systemic, practical or other barriers — challenges that in some cases can be overcome and in other cases seem intractable. Similarly, there's little debate that many districts with high numbers of students living in poverty continue to struggle with implementing as well as enforcing wellness policies. Absent any action, schools with high percentages of students from minority communities will likely continue to live with greater health risks.

Nevertheless, schools are overcoming these challenges through active buy-in from the full spectrum of stakeholders (students, administrators, parents, teachers, community and business), technical assistance and training,⁶⁴ a commitment to progress and accountability systems that visibly connect wellness to schools' plans for addressing student progress. ■

5

Time to Act

Recommendations for Next Steps

Of Ultimate Importance: The School Environment

If the brain is a student's internal environment, then a school is his or her external one, which can be equally impactful.

Every administrator and educator has a different notion of what the ideal school environment is, but the following ingredients are, by general consensus, among the basics: quality administration and staff, open-mindedness and an embrace of differences, a consistent discipline-and-reward system, a commitment to communication and collaboration and a dedication to parent and community involvement.

Beyond that, the vision of anyone who cares about school wellness is an atmosphere in which every child has access to good nutrition and regular physical activity. In many, if not most, school districts in our nation over the past decade, progress has been made toward this goal. Organizations and individuals that work with schools have taken on school wellness and the notion of creating a culture of wellness as a major topic of dialogue.

Surmounting the Hurdles

Schools are changing, but change takes time and varies widely because of contextual factors that include everything from school board support and state legislation to school building space and enrollment numbers. Research with key stakeholders and experience with schools and school leaders over the past decade provide insight into the challenges common to many schools that can prevent them from turning wellness policies into daily practices. These include:

- * Lack of time and prioritization of wellness
- * Scarce financial resources
- * Limited support from key stakeholders and leadership
- * Lack of communication with, and education of, stakeholders
- * Unavailability of tools and training (technical assistance) to build schools' capacity for implementing wellness practices

(Continued on page 25)

Success Profiles

These profiles are among the hundreds available through Fuel Up to Play 60, the student-centered, in-school wellness program in which nearly 73,000 schools are enrolled. Launched by the NFL and National Dairy Council, in collaboration with the U.S. Department of Agriculture, the program aims to help schools improve their food, nutrition and physical activity environments — with students leading the way. Fuel Up to Play 60 complements many other valuable local and national school wellness initiatives as some of the stories below demonstrate. Visit FuelUpToPlay60.com for more details and how-to information on these and other successes.

LOCALE	SOLUTION	FEATURES	RESULTS
Ridge Family Center for Learning, Elk Grove Village, IL	“All-School Exercise” for 20 minutes after morning arrival, and after-school fitness clubs for all grades. PE class is now no longer the sole source of movement.	School lunch program overhauled, with a 20% increase in participation; televised taste tests on school’s “Food Network” shows.	“Ridge is now a different place!”
Maiden Elementary School, Maiden, NC	Instituting grab ‘n’ go breakfasts for students that don’t have enough time to make it through the breakfast line.	Supported by the school’s closed-circuit TV station, with spots on how to utilize the breakfast cart intelligently for grab ‘n’ go offerings.	“Breakfast participation has increased 50% — and so have attention spans.”
James Bowie Elementary School, Dallas, TX	“Student Chef Recipe Contest,” managed by foodservice personnel and student leaders, to help nutritious foods make it onto the menu.	Three student finalists chosen in district-wide competition: Strawberry Smoothie, Vegetable Burrito and Caesar Salad.	“The Caesar Salad won and is now on the district menu — and James Bowie received the Bronze Recognition Award from the Alliance for a Healthier Generation!”
Chief Joseph Middle School, Richland, WA	Establishment of “Open Gymnasium” so that students can begin each day with physical activity.	Rather than being locked, school gym is open early in the morning; change of policy highlighted in local news media.	“Students can wake up their brains and bodies before school, there’s improved behavior in those students participating, and we’ve had only one before-school fight since the open gym started.”
Johnson Elementary School, Appleton, WI	Implementation of “Run/Walk Program” during recess.	“Mustang Milers” (student participants) receive punch cards to record mileage; incentives include water bottles, shoe tokens, T-shirts.	“Increased overall activity levels, decreased bullying and other behavioral issues on the playground.”

(Continued from page 23)

- * Lack of acceptance of new wellness practices by students, especially related to changes in food and beverages outside of school meals

In spite of these barriers, creative and dedicated schools can surmount these and other systemic and practical hurdles in effective, replicable ways — as the success stories profiled in the chart on page 24 make clear.

Creating a Culture of Wellness

Anybody who has worked in, studied or observed the school environment is likely to have opinions on what can be done to promote the learning connection — that is, to support better nutrition and increased physical activity for the purpose of enhancing academic achievement. And while there's no shortage of ideas, it remains the *concrete, informed action steps* from those facing the challenge that really count.

All across the country, education organizations, health advocacy organizations and government agencies are calling for school administrators to lead the way to creating healthy schools. The suggestions below build on guidance from many leading organizations and offer ideas for how school leaders, and those who influence and support them, can create a new culture of wellness in their school or district.

Take a leadership role in setting a tone and vision for healthy schools.

Promote and participate in multidisciplinary planning to develop health-related goals and objectives that are included in the district's strategic plan and school improvement plan(s). Promote a coordinated approach to enhancing academic and health outcomes among school personnel, students, families and the wider community. Become familiar with federal and/or state legislative requirements pertaining to health and well-being of students (e.g., local wellness policy) and support policy and practice adherence to fully meet these legislative requirements. Establish health and wellness in the district's mission and vision so it's always on the radar screen.

I think the more interactive the eating is, and the more choice there is, the more kids are going to want to participate. It's true of eating, and it's also true of gym class — some kids love jogging, others hate it and would rather walk, but they're still moving! Kids need options. They have to find the fun in something, and do what *they* like to do.

— Juliana, Middle School Student, Edison, New Jersey

Communicate the link between nutrition, physical activity and academic achievement.

Promote awareness of the links between health and academic success. Gather and disseminate data that demonstrate the impact of health-promoting actions on academic achievement. Ensure that leaders and staff understand the connection between health and academic achievement and agree that schools must address health issues if they are to meet their educational goals. Share what you have learned with your colleagues at state and national conferences and in publications.

Establish a district or school wellness council or school health advisory committee to develop and implement a strong school wellness policy. If your district or school already has a wellness policy, now's a good time to review and update it.

Get the buy-in of administrators, teachers and the community. Use school health or wellness advisory councils that are representative and can serve as your community voice. Identify staff members who will work on your effort. It's generally considered most effective to establish a coordinator position that oversees all facets of

the program (health and physical education, health and other student services, community partnerships, staff wellness). Provide adequate resources to support wellness policy implementation. Lack of resources, including funding, for wellness policy implementation, monitoring and evaluation has been widely cited as a barrier to wellness policy implementation.

Involve students in program planning, implementation and participation.

Involve and empower students in making changes. They will be more likely to participate in healthier options if they help to create and promote them.

Gather data about health and wellness policies and practices in your school or district — and evaluate the impact of these policies and practices.

Support and fund improved data collection and utilization to inform the development of programs and implement those that lead to increased student achievement.

Expand school breakfast, including alternative breakfast opportunities at school.

Advocate by being aware of your school's current initiatives to provide students with breakfast. Determine if an alternative breakfast delivery model is appropriate for your school and use data to drive conversations. Find out what other schools are doing and model your program based on the ideas that you like and think would work in your school.

Make sure all foods served and sold at school, including school meals and competitive foods, are appealing, nutritious and aligned with the Dietary Guidelines for Americans.

Ensure that meals offered through the school breakfast and lunch programs meet nutrition standards. Adopt policies ensuring that all foods and beverages available on school campuses and at school events contribute toward eating patterns that are consistent with the Dietary Guidelines for Americans. Provide food options that children are not getting enough of, including low-fat or fat-free dairy, fruits, vegetables and whole grains. Ensure that healthy snacks and foods are provided in vending machines,



For so many years people said worrying about school wellness is wildly impractical — you can't do salad bars, you can't do fitness clubs, you can't do walking groups, you can't do breakfast in the classroom. It was all non-sense. We can do, and are doing, all these things. We just have to do them more.

— Jean Ragalie, RD, President, National Dairy Council

school stores and other venues within the school's control. Evaluate the financial and health impact of school contracts with vendors of high-calorie foods and beverages with minimal nutritional value. *(Continued on page 28)*

CREATING A CULTURE OF WELLNESS

WHAT SCHOOLS CAN DO

CREATE A SUPPORT SYSTEM FOR WELLNESS

Hold schools accountable for adopting and implementing wellness practices.

Provide or acquire (from grants, programs or partners) technical assistance that builds capacity for staff and students.

Establish school health advisory councils, with staff-leads given time to coordinate activities and meetings.

Institute a student health advisory council that actively collects and incorporates students' opinions, ideas and participation. Involve a variety of students in planning, implementing and evaluating wellness practices.

Use a Coordinated School Health framework for delivery of nutrition and physical activity services along with other prevention activities.

Conduct yearly evaluations using the School Health Index (and other free tools from the Centers for Disease Control and Prevention) to track progress and assess students' and schools' wellness practices.

COMMUNICATE AND PROMOTE WELLNESS

Provide in-school promotions about physical activity and healthy eating goals, and what the school has in place for students.

Encourage school staff to incorporate available resources and programs that support wellness policies.

Conduct regular outreach to parents and community leaders about school wellness priorities and successes.

Educate stakeholders about the role of nutrition, physical activity and healthy weight in reaching schools' achievement goals.

INSTILL COMPREHENSIVE WELLNESS POLICIES

ENHANCE KNOWLEDGE ABOUT, AND PRACTICE OF, PROPER NUTRITION

- * Start or expand a breakfast program that uses alternative approaches to cafeteria set-up; consider breakfast in the classroom or foods students can grab as they go to class.
- * Ensure that nutrition guidelines are aligned with the U.S. Dietary Guidelines for Americans and the USDA's HealthierUS School Challenge, and are applied to any food or beverage made available to students throughout the campus.
- * Provide high-quality nutrition education for all grades, with integration throughout the curriculum.

IMPROVE KNOWLEDGE ABOUT, AND PRACTICE OF, PHYSICAL ACTIVITY

- * Deliver quality physical education for all students in all grades that apply standards and best practices.
- * Ensure that quality health education is available to all students in all grades.
- * Provide options each day before, during and after school for students to be physically active. These activities could include a "walking school bus" for students coming to school, recess before lunch, activity breaks during class and after-school extracurricular activities and sports.
- * Offer school employee wellness programs; engage staff, families/parents and community members in promoting physical activity inside and outside of school.

What **EVERYONE** Can Do...

GENYOUth Foundation has compiled action steps from and for stakeholders who can help support schools in improving student nutrition and physical activity. At GENYOUth's 2012 Nutrition + Physical Activity Learning Connection Summit, participants — including educators, school leaders, policy makers, business leaders, health professionals, parents and students — identified doable actions they could, and would, implement within 30 or 90 days that would improve schools' wellness environments. See their ideas — and join the discussion — at www.GENYOUthFoundation.org.

(Continued from page 26)

Ensure that high-quality, standards-based physical education is offered to all students in all grades.

Implement a comprehensive physical activity program with quality physical education as the cornerstone. Require students in grades K-12 to participate in daily physical education that uses a planned and sequential curriculum and instructional practices that are consistent with national or state standards for physical education. Provide a substantial percentage of each student's recommended daily amount of physical activity in physical education class. Use instructional strategies in physical education that enhance students' behavioral skills, confidence in their abilities and desire to adopt and maintain a physically active lifestyle.

Provide standards-based health education to all students in all grades.

Implement health education that provides students with the knowledge, attitudes, skills and experiences needed for healthy eating and physical activity. Implement a planned and sequential health education curriculum that is culturally and developmentally appropriate, addresses a clear set of behavioral outcomes that promote healthy

eating and physical activity and is based on national standards. Use curricula that are consistent with scientific evidence in helping students improve healthy eating and physical activity behaviors.

Provide recess for elementary school students and in-class physical activity breaks for all students.

Promote recess for elementary students and physical activity breaks for older students. Implement recess in a healthy way that promotes physical activity and social skills development.

Provide additional opportunities for students to be physically active, including extracurricular activities and active transportation to school.

Offer interscholastic sports. Implement and promote walk- and bicycle-to-school programs. Provide extracurricular physical activity programs, especially inclusive intramural programs and physical activity clubs. Encourage the use of school facilities for physical activity programs offered by the school and/or community-based organizations outside of school hours.

Reach out to families and community partners to gain their support for healthy schools.

Build a network of supporters. Partner with families and community members in the development and implementation of healthy eating and physical activity policies, practices and programs. Encourage communication among schools, families and community members to promote adoption of healthy eating and physical activity behaviors among students. Involve families and community members on the school health council. Develop and implement strategies for motivating families to participate in school-based programs and activities that promote healthy eating and physical activity. Access community resources to help provide healthy eating and physical activity opportunities for students.

Be a healthy role model - and encourage other adults to be models for healthy eating and regular physical activity as well.

Educate parents, teachers, coaches, staff and other adults in the community about the importance they hold as role models for children, and teach them how to be models for healthy eating and regular physical activity.

Resources That Can Help

You don't have to do it alone. Numerous organizations and government agencies provide resources that can help school leaders, teachers, parents, students and those who support them make healthy changes in your district or school.

Breakfast in the Classroom Toolkit (School Nutrition Foundation)

<http://docs.schoolnutrition.org/SNF/BIC/>

The Breakfast in the Classroom initiative takes the traditional school breakfast approach and improves it with one key ingredient: the classroom. The Breakfast Resource Center has a wealth of ideas to help inform and guide decision makers in making the right choices for students.

Coordinated School Health Resources (CDC)

www.cdc.gov/healthyyouth/cshp/

Coordinated School Health (CSH) is recommended by the Centers for Disease Control and Prevention (CDC) as a strategy for improving students' health and learning in our nation's schools. Included here are the rationale and goals for CSH, a model framework for planning and implementing CSH and resources to help schools, districts and states improve their school health programs.

CDC Assessment Tools for Schools

The School Health Index (www.cdc.gov/healthyyouth/shi/) is a self-assessment and planning tool to help schools improve their health and safety policies and programs.

Two curriculum analysis tools — the Health Education Curriculum Analysis Tool (HECAT) (www.cdc.gov/healthyyouth/hecat/) and Physical Education Curriculum Analysis Tool (PECAT) (www.cdc.gov/healthyyouth/pecat/) — help school districts, schools and others conduct a clear, complete and consistent analysis of health education and physical education curricula based on national standards.

I'm discouraged when I see physical education being cut. I can tell you from personal experience that being active definitely affects the brain in a positive way. I also know that if kids don't develop a passion for movement at an early age, their future just isn't going to be an active one — or a bright one.

— Joe McCarthy, Physical Education Teacher,
Meadowview Elementary School, Farmington, Minnesota

Fuel Up to Play 60

www.FuelUpToPlay60.com

This in-school program from the NFL and National Dairy Council aims to improve healthy eating and physical activity with students playing a key role. Resources include a Playbook of action strategies, a School Wellness Investigation assessment tool, rewards and recognition for students, educators and schools, and funding opportunities.

HealthierUS School Challenge (USDA)

www.fns.usda.gov/tn/healthierus/index.html

This voluntary certification initiative recognizes those schools participating in the National School Lunch Program that have created healthier school environments through promotion of nutrition and physical activity. Many schools find that applying for the Challenge is a valuable learning process that helps their school wellness team focus on areas needing improvement.

Healthy Schools Program (HSP)

(Alliance for a Healthier Generation)

www.healthiergeneration.org/schools.aspx

The HSP provides resources and technical assistance at the district and school levels, at no cost, to systemically address the health of the school environment, following a six-step continuous improvement process and best practice framework.

Designing a Great Physical Activity Program

Partnership for a Healthier America and Nike have worked with national leaders to develop seven essential program practices — or design filters — which, when applied to physical activity programs for kids, are a critical first step to getting our kids moving more. The best physical activity programs should be designed to:

- * Strive for **universal access**
- * Include a range of **age-appropriate** activities
- * Aim to reach the recommended guidelines on **dosage and duration**
- * Be engaging and **FUN for kids**
- * Be led by well-trained **coaches and mentors**
- * **Track progress**, both individually and for the group
- * Provide consistent **motivation and incentives**

For more information, see <http://ahealthieramerica.org>.

Let's Move! Active Schools www.letsmoveschools.org

Let's Move! Active Schools is a collaborative effort to empower “school champions” — teachers, administrators, staff and parents — to create active environments that engage students in movement every day. This comprehensive program guides champions along a simple six-step process and provides free resources and training to help them increase physical activity before, during and after class.

Designed to Move www.designedtomove.org

Presented by Nike, the American College of Sports Medicine, the International Council of Science & Physical Education and several other

expert organizations, this report consolidates the evidence for urgently addressing the epidemic of physical inactivity and lays out an action agenda to solve it.

Presidential Youth Fitness Program (President's Council on Fitness, Sports and Nutrition) www.presidentialyouthfitnessprogram.org/

A national program that includes fitness assessment, professional development and recognition, the Presidential Youth Fitness Program helps schools assess, track and award youth fitness and physical activity.

School Physical Education Program Checklist (NASPE) www.aahperd.org/naspe/publications/teachingTools/upload/School-PE-Program-Checklist-Web-9-14-09.pdf

This checklist from the National Association for Sport and Physical Education is a tool for assessing whether elements of quality physical education exist in a school program that will help all students attain knowledge, skills and attitudes necessary for them to lead healthy and active lives.

Team Nutrition (USDA Food and Nutrition Service) www.fns.usda.gov/tn/

This initiative provides training and technical assistance for foodservice, nutrition education for children and their caregivers, and school and community support for healthy eating and physical activity, including a “Food Buying Guide for School Meal Programs” and the “Best Practices Sharing Center.”

Tools for Observing Quality Physical Education (NASPE) www.aahperd.org/naspe/publications/teachingTools/observepe.cfm

This collection of resources from the National Association for Sport and Physical Education offers a range of tools, including job interview questions for prospective PE teachers, a physical education teacher evaluation tool, a school physical education program checklist and the National Standards for Physical Education.

As much as we try to simplify our lives and the work we do, the reality is that we live in a very complex world, and school wellness is a very complex issue — not least of which is because of the number of people involved and the amount of information that we need to coordinate. It starts with identifying and engaging the right players. And then we need to actually exchange and act on information and work in a collective way.

— Paul Ellingstad, Development Director,
Sustainability and Social Innovation, Hewlett-Packard

Active Schools Acceleration Project **www.ActiveSchoolsASAP.org**

ChildObesity180's Active Schools Acceleration Project (ASAP) is increasing quality physical activity in America's schools by identifying innovative solutions pioneered by grassroots champions, and empowering new schools with the tools and resources to replicate these proven models. ASAP is demonstrating in schools across America that fun physical activity is a critical component of what defines a great school. ASAP is an initiative of ChildObesity180 (www.ChildObesity180.org), an organization committed to cross-sector collaboration to reverse the trend of childhood obesity.

Ready, Set, FIT!

<http://www.aafp.org/online/en/home/clinical/publichealth/aim/aimschoolprgm.html>

This free school-based health education program from the American Academy of Family Physicians teaches third and fourth graders about the importance of being active, eating smart and feeling good. It includes in-class lessons and take-home activities.

Wellness Policy Tool (Action for Healthy Kids) **www.actionforhealthykids.org/for-schools/wellness-policy-tool/**

With this tool's eight steps, administrators can create a local wellness policy that meets their district's or school's goals for nutrition and physical activity and take the next steps to put the policy into action to have a positive impact on students' health and lifelong choices.

What School Administrators Can Do to Enhance Student Learning by Supporting a Coordinated Approach to Health (ASHA) **www.ashaweb.org/files/public/Miscellaneous/Administrators_Coordinated_Approach_Support.pdf**

This document from the American School Health Association outlines concrete actions that district and building administrators can take to support a coordinated approach to enhance student learning and student and staff health.

Share Our Strength's No Kid Hungry Campaign **<http://nokidhungry.org/breakfast>**

Share Our Strength's No Kid Hungry campaign connects kids with school breakfast across the country. *Ending Childhood Hunger: A Social Impact Analysis* is a recent report developed by No Kid Hungry with Deloitte, which shows dramatic potential impacts associated with the simple act of feeding kids a healthy school breakfast, including positive, large-scale outcomes in education, economics and health. ■

Endnotes

1. Centers for Disease Control and Prevention. Division of Adolescent and School Health. Coordinated School Health Program, 2008. Available at: <http://www.cdc.gov/healthyyouth/cshp/index.htm>. Accessed October 6, 2012.
2. Centers for Disease Control and Prevention. Division of Adolescent and School Health. Health and Academics and Data and Statistics, 2012. Association between health risk behaviors and academic grades. Available at: http://www.cdc.gov/healthyyouth/health_and_academics/data.htm. Accessed October 6, 2012.
3. 2004 Congress. Child Nutrition and WIC Reauthorization Act of 2004, P.L. 108-265, Section 204.
4. 2010 Congress. Healthy, Hunger-Free Kids Act of 2010, P.L. 111-296.
5. Chriqui JF SL, Chaloupka FJ, Gourdet C, Bruursema A, Ide K, Pugach O. *School District Wellness Policies: Evaluating Progress and Potential for Improving Children's Health Three Years after the Federal Mandate, School Years 2006-07, 2007-08 and 2008-09*. Vol. 2. Chicago, IL: Bridging the Gap Program, Health Policy Center, Institute for Health Research and Policy, University of Illinois at Chicago, 2010. www.bridgingthegapresearch.org.
6. U.S. Department of Agriculture and U.S. Department of Health and Human Services. *Dietary Guidelines for Americans, 2010*. 7th Edition, Washington, DC: U.S. Government Printing Office, December 2010. Available at: <http://www.cnpp.usda.gov/DGAs2010-PolicyDocument.htm>. Accessed November 28, 2012.
7. Centers for Disease Control and Prevention. National diabetes fact sheet: national estimates and general information on diabetes and prediabetes in the United States, 2011. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2011. Available at: <http://www.cdc.gov/diabetes/pubs/factsheet11.htm>. Accessed November 28, 2012.
8. National Research Council. Aging and the Macroeconomy. Long-Term Implications of an Older Population. Committee on the Long-Run Macroeconomic Effects of the Aging U.S. Population. Board on Mathematical Sciences and their Applications, Division on Engineering and Physical Sciences, and Committee on Population, Division of Behavioral and Social Sciences and Education. Washington, DC: National Academy Press, 2012.
9. Burd-Sharps S, Lewis K. One in Seven: Ranking Youth Disconnection in the 25 Largest Metro Areas. Measure of America; September 2012.
10. Yoshida SC, Craypo L, Samuels SE. Engaging youth in improving their food and physical activity environment. *Journal of Adolescent Health*. 2011;48:641-643.
11. Diamond A. Interrelated and interdependent. *Developmental Science*. 2007;10(1):152-158.
12. Diamond A. The interplay of biology and the environment broadly defined. *Developmental Psychology*. 2009;45(1):1-8.
13. Diamond A, Lee K. Interventions shown to aid executive function development in children 4 to 12 years old. *Science*. 2011;333(6045):959-964.
14. Eaton DK, Kann L, Kinchen S, Shanklin S, Flint KH, Hawkins J, Harris WA, Lowry R, McManus T, Chyen D, Whittle L, Lim C, Wechsler H. *Morbidity and Mortality Weekly Report*. 2012;61(SS-4).

15. Taras H. Nutrition and student performance at school. *Journal of School Health*. 2005;75(6):199-213.
16. Donnelly JE, Greene JL, Gibson CA, Smith BK, Washburn RA, Sullivan DK, DuBose K, Mayo MS, Schmelzle KH, Ryan JJ, Jacobsen DJ, Williams SL. Physical Activity Across the Curriculum (PAAC): a randomized controlled trial to promote physical activity and diminish overweight and obesity in elementary school children. *Preventive Medicine*. 2009;49(4):336-341.
17. Bryan J, Osendarp S, Hughes D, Calvaresi E, Baghurst K, van Klinken JW. Nutrients for cognitive development in school-aged children. *Nutrition Reviews*. 2004;62(8):295-306.
18. Food Research and Action Center. Hunger and Poverty. 2012; <http://frac.org/reports-and-resources/hunger-and-poverty/>. Accessed November 13, 2011.
19. Rampersaud GC, Pereira MA, Girard BL, Adams J, Metz J. Breakfast habits, nutritional status, body weight, and academic performance in children and adolescents. *Journal of the American Dietetic Association*. 2005;105(5):743-760.
20. Pollitt E, Cueto S, Jacoby E. Fasting and cognition in well- and undernourished schoolchildren: a review of three experimental studies. *American Journal of Clinical Nutrition*. 1998;67:779S-784S.
21. Kleinman RE, Green H, Korzec-Ramirez D, Patton K, Paganoe ME, Murphy JM. Diet, breakfast, and academic performance in children. *Annals of Nutrition and Metabolism*. 2002;46 (suppl 1):24-30.
22. Murphy JM. Breakfast and learning: an updated review. *Current Nutrition & Food Science*. 2007; 3: 3-36.
23. Florence MD, Asbridge M, Veugelers PJ. Diet quality and academic performance: research article. *Journal of School Health*. 2008;78(4):209-215.
24. Chaddock L, Kramer AF, Hillman CH, Pontifex MB. A review of the relation of aerobic fitness and physical activity to brain structure and function in children. *Journal of the International Neuropsychological Society*. 2011;17(6):975-985.
25. Chaddock L, Erickson KI, Prakash RS, VanPatter M, Voss MW, Pontifex MB, Raine LB, Hillman CJ, Kramer AF. Basal ganglia volume is associated with aerobic fitness in preadolescent children. *Developmental Neuroscience*. 2010;32:(3) 249-256.
26. Castelli DM, Hillman CH, Hirsch J, Hirsch A, Drollette E. FIT Kids: time in target heart zone and cognitive performance. *Preventive Medicine*. 2011;52:55-59.
27. Davis CL, Cooper S. Fitness, fatness, cognition, behavior, and academic achievement among overweight children: do cross-sectional associations correspond to exercise trial outcomes? *Preventive Medicine*. 2011;52(SUPPL.):S65-S69.
28. Centers for Disease Control and Prevention. Division of Adolescent and School Health. The association between school-based physical activity, including physical education, and academic performance. Atlanta, GA: U.S. Department of Health and Human Services, 2010.
29. Basch CE. Healthier students are better learners: a missing link in school reforms to close the achievement gap. *Journal of School Health*. 2011;81(10):593-598.
30. Wesnes KA, Pincock C, Richardson D, Helm G, Hails S. Breakfast reduces declines in attention and memory over the morning in school children. *Appetite*. 2003; 41:2003:329-331.
31. Marder W, Chang S. Childhood obesity: costs, treatment patterns, disparities in care, and prevalent medical conditions. Thomson Medstat Website. Available at: http://www.medstat.com/pdfs/childhood_obesity.pdf. Published December 5, 2005. Accessed October 12, 2012.

32. Pivik RT, Tennal KB, Chapman SD, Gu Y. Eating breakfast enhances the efficiency of neural networks engaged during mental arithmetic in school-aged children. *Physiology & Behavior*. 2012;106:548-555.
33. Murphy J, Pagano ME, Nachmani J, Sperling P, Kane S, Kleinman RE. The relationship of school breakfast to psychosocial and academic functioning: cross-sectional and longitudinal observations in an inner-city school sample. *Archives of Pediatric & Adolescent Medicine*. 1998;152(9):899-907.
34. Grantham-McGregor, S. Can the provision of breakfast benefit school performance? *Food and Nutrition Bulletin*. 2005; 6(2)S2:S144.
35. Food Research and Action Center. School Breakfast in America's Big Cities, January 2012. Available at: <http://frac.org/wp-content/uploads/2011/01/urbanbreakfast2009-2010.pdf>. Accessed December 17, 2012.
36. Hilleren HM. *School Breakfast Program Cost/Benefit Analysis — Achieving a profitable school breakfast program*. University of Wisconsin Extension Family Living Program: University of Wisconsin; 2007.
37. Food Research and Action Center. Food Insecurity and Obesity — Understanding the Connections. FRAC Focus Spring 2011. Available at: http://frac.org/pdf/frac_brief_understanding_the_connections.pdf. Accessed November 30, 2012.
38. Food Research and Action Center. Hunger and Poverty, 2011. Available at: <http://frac.org/reports-and-resources/hunger-and-poverty/>. Accessed November 30, 2012.
39. Hillman CH, Erickson KI, Kramer AF. Be smart, exercise your heart: exercise effects on brain and cognition. *Nature Reviews Neuroscience*. 2008;9(1):58-65.
40. Hillman CH, Pontifex MB, Raine L, Castelli DM, Hall EE, Kramer AF. The effect of acute treadmill walking on cognitive control and academic achievement in preadolescent children. *Neuroscience*. 2009;159:1044-1054.
41. Hillman CH, Buck SM, Themanson JR, Pontifex MB, Castelli DM. Aerobic fitness and cognitive development: event-related brain potential and task performance indices of executive control in preadolescent children. *Developmental Psychology*. 2009;45(1):114-129.
42. Burkhalter TM, Hillman CH. A narrative review of physical activity, nutrition, and obesity to cognition and scholastic performance across the human lifespan. *Advances in Nutrition*. 2011;2(2).
43. Institute of Medicine, Committee on Nutrition Standards for Foods in Schools. *Nutrition Standards for Foods in Schools: Leading the Way Toward Healthier Youth*. 2007.
44. Institute of Medicine, National Research Council. *Accelerating Progress in Obesity Prevention: Solving the Weight of the Nation*. 2012.
45. Department of Health and Human Services Office of Disease Prevention and Health Promotion. Healthy People 2020, Topics and Objectives, Adolescent Health. 2010. Available at: <http://www.healthypeople.gov/2020/topicsobjectives2020/overview.aspx?topicid=2>. Accessed November 13, 2012.
46. Spencer J. *The Facts About Military Readiness*. The Heritage Foundation, 2000. Available at: <http://www.heritage.org/research/reports/2000/09/bg1394-the-facts-about-military-readiness>. Accessed November 30, 2012.

47. *Too Fat to Fight*. Mission Readiness; Washington, DC, 2010. Available at: <http://www.missionreadiness.org/2012/still-too-fat-to-fight/>. Accessed November 30, 2012.
48. Trust for America's Health. *F as in Fat: How Obesity Threatens America's Future 2012*. Available at: <http://healthyamericans.org/report/100/>. Accessed November 30, 2012.
49. Gurley-Calvez T, Higginbotham A. Childhood obesity, academic achievement, and school expenditures. *Public Finance Review*. 2010;38(5):619-646.
50. Action for Healthy Kids. *The Learning Connection: The Value of Improving Nutrition and Physical Activity in Our Schools*. Chicago, IL: Action for Healthy Kids; 2004.
51. Taber DR CJ, Chaloupka FJ. Association and diffusion of nutrition and physical activity policies on the state and district level. *Journal of School Health*. 2012;82:201-209.
52. Metos J, Murtaugh M. Words or reality: are school district wellness policies implemented? A systematic review of the literature. *Childhood Obesity*. April 2011;7(2):90-100.
53. Schwartz MB, Henderson KE, Falbe J, Novak SA, Wharton CM, Long MW, O'Connell ML. Strength and comprehensiveness of district school wellness policies predict policy implementation at the school level. *Journal of School Health*. 2012;82:262-267.
54. Moag-Stahlberg A HN, Luscri L. A national snapshot of local school wellness policies. *Journal of School Health*. 2008;78,562-568.
55. Budd EL SC, Yount BW, Haire-Joshu D. Factors influencing the implementation of school wellness policies in the United States, 2009. *Preventing Chronic Disease*. 2012;9(110296).
56. Lamis H, Jomaa P, McDonnell EM, Weirich E, Hartman T, Jensen LP, Probart P. Student involvement in wellness policies: a study of Pennsylvania local education agencies. *Journal of Nutrition Education and Behavior*. 2010;42(6):372-379.
57. Johnston LD, O'Malley PM, Terry-McElrath YM, Freedman-Doan P, Brenner JS. *School policies and practices to improve health and prevent obesity: national secondary school survey results, school years 2006-07 and 2007-08, Executive Summary*. Ann Arbor, MI: Bridging the Gap Program, Survey Research Center, Institute for Social Research; 2011.
58. American Association of School Administrators. Coordinated School Health, 2012. Available at: <http://www.aasa.org/content.aspx?id=206>. Accessed November 28, 2012.
59. Basch CE. Physical activity and the achievement gap among urban minority youth. *Journal of School Health*. 2011;81(10):626-634.
60. Taras H, Potts-Datema W. Obesity and student performance at school. *Journal of School Health*. 2005;75(8):291-295.
61. Averett SLS. Race and gender differences in the cognitive effects of childhood overweight. *Applied Economics Letters*. 2010;17(17):1673-1679.
62. Shore SM, Sachs ML, Wright AR, Libonati JR, Lidicker JR, Brett SN. Decreased scholastic achievement in overweight middle school students. *Obesity*. 2008;16(7):1535-1538.
63. Daniels DY. Examining attendance, academic performance, and behavior in obese adolescents. *The Journal of School Nursing*. 2008;24(6):379-387.
64. Beam M, Donze Black J, Block A, Leviton LC. Evaluation of the Healthy Schools Program: Part II. The role of technical assistance. *Preventing Chronic Disease*. 2012;9(110105).

65. Association of Latino Administrators and Superintendents. *Confronting the Growing Epidemic of Childhood Obesity: Schools, Businesses, and Policymakers Working Together to Promote Wellness White Paper*. Association of Latino Administrators and Superintendents, 2011.
66. Centers for Disease Control and Prevention. Overweight and obesity: causes and consequences. Available at: <http://www.cdc.gov/obesity/adult/causes/index.html>. Accessed October 12, 2012.
67. Ogden C. Public health grand rounds: presentation. The childhood obesity epidemic: threats and opportunities. Atlanta, GA: Public Health Grand Rounds, 2010.
68. Datar A, Strum R, Magnabosco JL. Childhood overweight and academic performance: national study of kindergartners and first-graders. *Obesity Research*. 2004;12(1):58-68.
69. Ramaswamy R, Mirochna M, Perlmutter L. The negative association of BMI with classroom effort in elementary school children. *Journal of Child Health Care*. 2010;14(2):161-169.
70. Colabianchi N, O'Malley PM. *Sports Participation in Secondary Schools: Resources Available and Inequalities in Participation - A Bridging The Gap Research Brief*. Ann Arbor, MI: Survey Research Center, Institute for Social Research, University of Michigan, 2012.
71. Centers for Disease Control and Prevention. School Connectedness: Strategies for Increasing Protective Factors Among Youth. Atlanta, GA: U.S. Department of Health and Human Services, 2009.



GENYOUth
FOUNDATION

www.GENYOUthFoundation.org