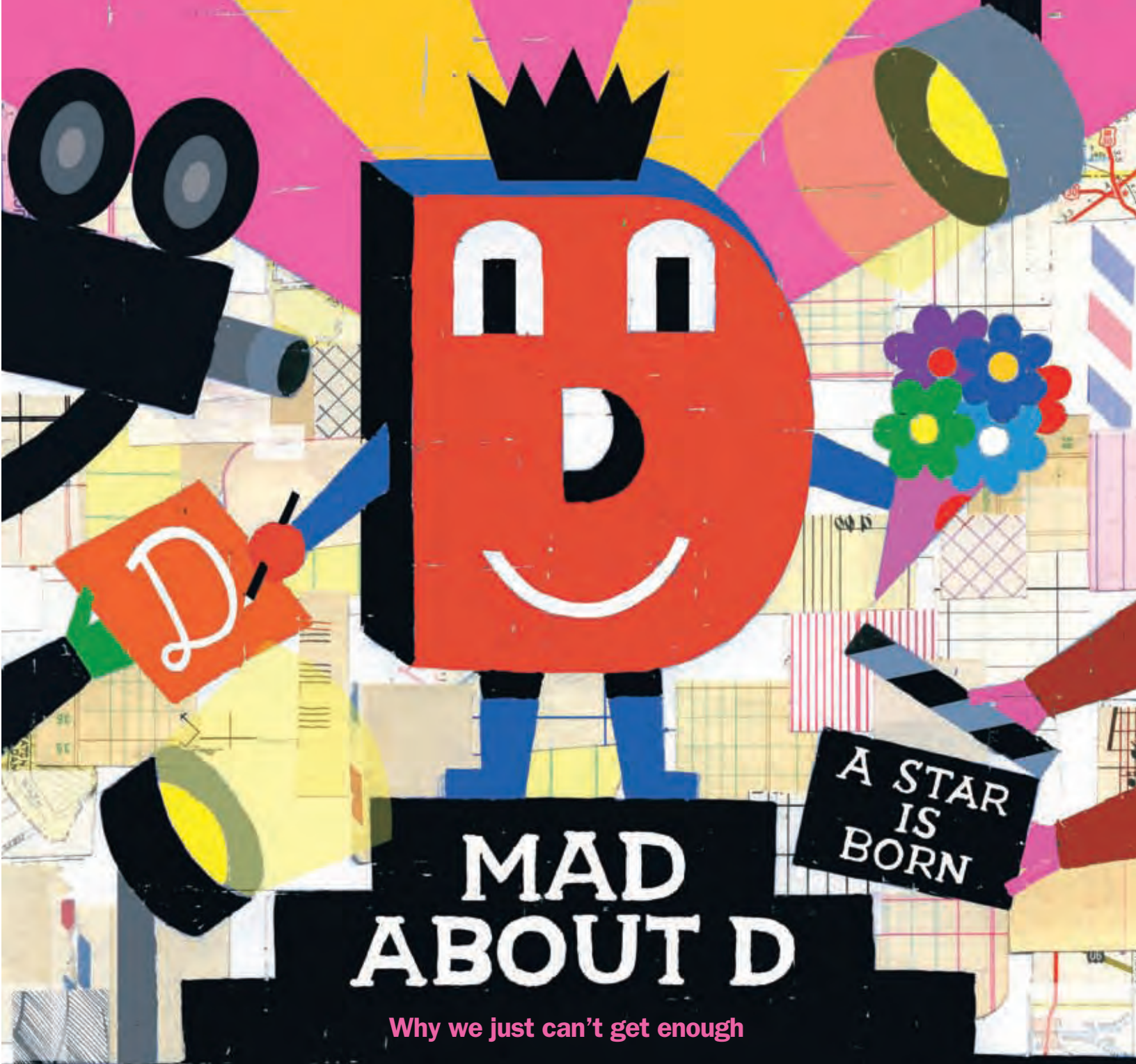


Tufts

NUTRITION



Why we just can't get enough

PLUS: IRAQI POULTRY INDUSTRY • SMOKING IN THE MOVIES • GLOBAL FOOD CRISIS



Can Cultures Survive the Chill?

For this installment of “Ask Tufts Nutrition,” Simin Nikbin Meydani, D.V.M., Ph.D., professor of nutrition at the Friedman School and associate director of the Jean Mayer USDA Human Nutrition Research Center on Aging, serves as our expert.

Q: Is frozen yogurt as nutritious as regular yogurt?
What happens to live cultures such as acidophilus when yogurt is frozen?

A: Frozen yogurt is usually lower in fat than ice cream, because yogurt is used in the place of cream. But compared to regular yogurt, frozen yogurt can be higher in sugar and calories. Frozen yogurts often contain less protein and calcium than their non-frozen counterparts. There is a wide variation between brands and flavors (50 calories in a half cup of Pinkberry’s Green Tea frozen yogurt versus 160 calories in a half cup of Ben & Jerry’s Cherry Garcia FroYo), so you’ll have to check the label.

Both yogurts and frozen yogurts can contain live active cultures. Manufacturers might add extra “healthy” bacteria (such as *L. acidophilus*, *Bifidobacterium* and others) for their health effects, but not all yogurts have these extra probiotic bacteria. Although the flash-freezing technique

used in the production of frozen yogurt, unlike slow freezing in a freezer, should not kill the live cultures, there is no guarantee that this won’t occur.

As a result, the number of bacteria in frozen yogurt is usually lower than that in the yogurt it was made from. However, different yogurts and frozen yogurts are made with different types of live cultures and probiotics, and the levels that remain in frozen yogurt depend on the numbers that were in the yogurt and on the heartiness of the specific bacteria that was used. Some frozen yogurts may be better sources of probiotics than some regular yogurts.

The National Yogurt Association sponsors a voluntary labeling program for frozen yogurt; look for the “Live and Active Cultures” seal on containers of frozen yogurt. If the yogurt doesn’t have the label, contact the manufacturer and ask what types of bacteria their product contains and at what level.

The National Yogurt Association standard for a live active culture frozen yogurt is 10 million cultures per gram at time of manufacture; for yogurt it is 100 million.

Please send your questions for future installments of “Ask Tufts Nutrition” to Julie Flaherty, Tufts University Office of Publications, 80 George Street, Medford, MA 02155. Or send an e-mail to julie.flaherty@tufts.edu.

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Tufts

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the shaping of public policy.

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At left, first year students (front row) Huang (Lena) Nguyen, Tara Fiechter-Russo, Vivian Cheng, Amy Scheuerman, (back row) Julie MacCartee, Nicole Brewer and Kathleen Stewart. Below, faculty members Beatrice Rogers, Alice Lichtenstein and Joseph Kehayias.



82 STUDENTS, 1,000 STORIES



ONE WAS A PHILOSOPHY MAJOR, AND ONE IS FINISHING HER PILOT'S license. One has a small insect collection, and another, her own sourdough starter. One was born in a barn, one lived on a houseboat in Seattle, and one lived in an RV for two years while traveling around the country. This year's incoming class had many stories to trade at the school's annual picnic in September, when new and returning students get together with faculty and staff to kick off the academic year.

This year's incoming class has 82 students—12 men and 70 women. The United States is home for 68 of them, while two each hail from Canada, China and Uganda, and one each from India, Kenya, Lebanon, the Netherlands, Poland, South Korea, Switzerland and Trinidad and Tobago.

Stars, Lights and Checks: What's Best for Consumers?



The nutrition community is never at a loss for “hot topics.” Take nutrition profiling, which has become a prominent issue in recent months.

Put simply, nutrition profiling is the rating or ranking of foods by how nutritious they are. Food companies and retailers have developed a variety of front-of-package and store-shelf icons that are intended to help guide consumers to make healthier food choices.

For example, the Traffic Light System that originated in the U.K. classifies foods with green, yellow or red lights to suggest whether you should reach for a package, proceed with caution or stop yourself from overindulging. The Pepsi Co.'s “Smart Spot” check mark and Hannaford Supermarkets’ “Guiding Stars” are two other rankings.

However, there is now concern that the proliferation of different icons and scoring systems has led to consumer confusion. Rather than helping, the information overload is viewed by some as stymieing consumers in their food selection.

In September, the Friedman School Symposium was host to a lively discussion of the effectiveness of various food-ratings systems, including two new, high-visibility systems that were presented at the symposium. The Keystone Center, a nonprofit that looks at environmental, energy and public health dilemmas, unveiled its Smart Choices program. Developed in consensus with major food companies, retailers, consumer groups and academics, its “better for you” icon is a check mark combined with a calorie listing on the front of package. Individual foods receive a check mark or not, based on agreed-upon nutrition criteria. If adopted by major food manufacturers, the system has the potential to reach millions of consumers.

Similarly, Dr. Adam Drewnowski presented research from the Nutrient Rich Foods Coalition, a consortium of public- and private-sector organizations, which has used nutrient density as a way to rate foods. The NR system uses a tiered approach to classify foods, rating them, in essence, from good to better to best.

Aside from a rich conversation on the scientific underpinnings of both systems, there was serious debate about which approach is more likely to effectively reach the consumer. Whatever the verdict, public and private sector forces will likely continue to look for a simple, consistent way to alert consumers to healthier food choices, a goal that will probably receive increased attention during the creation of the 2010 Dietary Guidelines, now under way.

Also in September, I had the privilege of speaking to the Institute of Medicine's Standing Committee on Childhood Obesity Prevention. I was asked to talk about the intersection of nutrition policy and public health interventions for obe-

sity prevention. Preparing my presentation, I was struck by how much of the cutting-edge research on childhood obesity prevention has involved our faculty. I was reminded once again of the Friedman School's strength in linking science to application and policy.

Of course, no place is more associated with our nation's policies than Washington, D.C. That is where, thanks to the efforts of Overseer Ed Cooney, Sylvia Rowe, Andrew Shao, N00, Rachel Cheatham, N05, N08, and Kate Houston, N99, the school will be sponsoring a workshop in spring 2009 that will focus on the next decade's nutrition challenges. We expect key members of the new administration and the new Congress to participate. Stay tuned for more details.

The Dean's Medal is the highest honor bestowed by the Friedman School, and we were honored to have three stellar awardees at a ceremony on September 23: Dr. Joan Bergstrom, Mr. Edward Budd and Dr. Nevin Scrimshaw. (See story, page 34.) Joan's vision of expanding the Friedman School's impact worldwide, Ed's efforts to make the school and its endowment stronger, and Nevin's advancement of nutrition globally are just a few of their many contributions for which we are grateful.

Wishing all a happy Thanksgiving.

EILEEN KENNEDY

A Boost for Bones

VITAMIN C IS NOT THE MICRONUTRIENT MOST people turn to when they think about osteoporosis. But according to a new study, a high intake of vitamin C may help reduce bone loss in elderly men.

The study, which appeared in the *Journal of Nutrition*, evaluated the vitamin C intake and bone density of 213 men and 393 women, average age 75 at the start, over a four-year period. The men who took in the most vitamin C—which was more than three times the recommended daily allowance of 90 milligrams for men—suffered fewer losses in their bone density.

“At one hip site, for example, men in the highest intake group, who took in 314 milligrams of vitamin C a day in food and supplements but had low calcium intake, did not lose bone density on average,” said Professor Katherine L. Tucker, Ph.D., a senior scientist at the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts, “whereas those in the lowest group, who took in 106 milligrams, lost 5.6 percent of their bone.”

Why look at C and bones? Vitamin C is known to enhance calcium absorption, stimulate the cells that build bone and produce collagen—the fibrous protein part of bone and cartilage. Its antioxidant properties may protect against inflammation, which can drive calcium away from bones.

Tucker, the senior author of the study, said the vitamin C only protected against bone loss in non-smoking men who had diets that were low in calcium or vitamin E.

The study did not find any significant results in the women it followed. One reason for this, Tucker said, may be that estrogen and calcium supplements, which many women take, can complicate vitamin C interactions.

The effect was strongest in those men who got most of their vitamin C from food rather than supplements, “suggesting that whatever positive effects of vitamin C we observe may not be able to be separated from those of a good quality diet,” the authors wrote. With that in mind, Tucker recommends that people get as much of their vitamin C as possible from fruits and vegetables.



ARMS, LEGS AND MEMORY LOSS

HAVING shorter-than-average arms and legs may signal an increased risk of developing memory problems late in life, according to the results of a study led by a Tufts scientist.

Researchers found that women with the shortest arm spans were 50 percent more likely to develop dementia and Alzheimer’s disease than women with longer arm spans. At the same time, the longer a woman’s leg from floor to knee, the lower her risk for dementia. In men, only a shorter arm span was linked to dementia, according to the study, which was published in *Neurology*.

“Body measures such as knee height and arm span are often used as biological indicators of early-life deficits, such as a lack of nutrients,” said Tina Huang, a scientist in the immunology lab at the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts. Other studies have found a link between limb length and dementia in populations in Asia, and Huang wanted to see if the trend would hold true in a U.S. population as well.

The researchers studied 2,798 people for an average of five years and took knee-height and arm-span measurements. Most people in the study were white, with an average age of 72. By the end of the study, 480 had developed dementia. “We found that shorter knee heights and arm spans were associated with an increase risk of dementia,” Huang and her colleagues concluded.



TAKE THE PILL? TAKE CARE

Women who take birth control pills may be at risk for vitamin B6 deficiency, according to a study published in the *American Journal of Clinical Nutrition*. Martha Savaria Morris, Ph.D., an epidemiologist at the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts, found that three-quarters of women taking oral contraceptives—but not supplements—had low blood levels of the vitamin. Even women who reported using oral contraceptives but who were no longer using them at the time of the survey came up short, with 40 percent showing inadequate levels of B6.

“This finding is troublesome because women commonly discontinue contraception so they can become pregnant,” says Morris, pointing out that

through its role in protein and fat metabolism, B6 is essential to normal fetal development. “My greatest concern would be for women entering pregnancy—when not only the woman but her fetus is depending on her vitamin B6 level.”

Although the pill takers stood out, many of the nearly 8,000 men, women and children surveyed showed inadequate B6 status, even when they reported consuming more than their recommended daily allowance of the vitamin. This could mean that for healthy immune systems and normal brain function people need to take in more B6 than once thought, although more study is needed. If you’re looking for B6, baked potatoes, bananas and chicken are all good sources.

Remember Your B’s, Lest You Forget

RESEARCHERS HAVE FOUND A LINK BETWEEN deficiency of three B vitamins and impaired memory, providing new insight into the mechanisms that may underlie age-related cognitive decline.

Researchers at the Jean Mayer USDA Human Nutrition Research Center on Aging (HNRC) at Tufts used mice to examine the effects of B vitamin deficiency on metabolic, cognitive and microvascular functions.

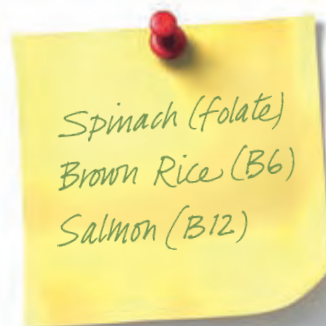
Mice that were fed a diet deficient in vitamins B6, B12 and folate (also known as B9) showed significant shortcomings in spatial learning and memory compared with normal mice, according to Aron Troen, Ph.D., an assistant professor at the Friedman School. At the same time, the B-deprived mice showed “reductions in brain capillary length and density,” says Troen, a scientist at the HNRC and the study’s lead author.

The study, published in *Proceedings of the National Academy of Sciences*, helps define more precisely the workings of cerebral microvascular disease, which can lead to vascular dementia, the second most common cause of dementia after Alzheimer’s disease.

The mice were fed special diets for 10 weeks. Researchers then tested their spatial learning and memory with a water maze, measured their blood concentrations of B vitamins and assessed their brain anatomy.

“It took longer, on average, for the B vitamin-deficient mice to maneuver the water maze, compared with the controls,” Troen says. The slower mice had shorter capillaries, particularly in the brain region called the hippocampus. They also showed higher blood levels of homocysteine, a chemical that has been implicated in cognitive decline.

The levels were “comparable to the levels that are associated in older adults with an increased risk for Alzheimer’s disease and cerebrovascular disease,” such as stroke and atherosclerosis, says Irwin H. Rosenberg, M.D., University Professor and director of the Nutrition and Neurocognition Laboratory at the HNRC.





Major Jessica McCoy
and a hatchling.

Operation Chicken Run

It takes a tender humanitarian to fix Iraq's poultry industry By Jacqueline Mitchell

FOR MAJOR JESSICA MCCOY, V98, N05, THE symbol of peace is not a dove but a chicken. Stationed in Iraq since May 2007, McCoy, an Army veterinarian, is part of a State Department–led reconstruction team whose goal is to help revive Iraq's domestic poultry industry. If successful, Operation Chicken Run (as the project is affectionately known) will not only improve the quality of the Iraqi diet but also create jobs and promote inter-tribal cooperation, says McCoy.

Poultry farming was once a major industry in Iraq, but like much of civilian life, it has been severely disrupted by the war. The roots of the current problem go back even farther: Before the war, the industry was controlled by Saddam

Hussein's government, which supplied poultry farmers with chicks, feed, medication and fuel, and then took most of the profits. "Corruption was rampant, and farmers were very dissatisfied with what they got," says McCoy. Farmers had no say in the process and little incentive to raise a quality bird. Then, in 2003, with the fall of Hussein and the ensuing chaos, many poultry growers sold their farms. Most of today's Iraqi chicken farmers have little experience running such an operation.

Major McCoy's mission is to rebuild the poultry industry from scratch, as it were. "We are teaching farmers how to raise a quality chicken—and why they should," she says.

A big reason they should is to help Iraq's economy. Today, almost half the eggs consumed in Baghdad are

imported from places like the United States and Brazil. McCoy's team believes Iraqi producers can achieve the economies of scale required to compete with these foreign imports by banding together. By forming co-ops, Iraqi farmers can bring down production costs by buying high-quality feed in bulk. Considering Iraq's unstable electricity supply, which prevents farms from operating near capacity, domestic chicken and eggs will probably still cost more than frozen imports, but McCoy and her colleagues are urging local producers to cater to Iraqi tastes. "There is a very strong market for fresh, not frozen, poultry that has been raised without hormones or other chemical additives and slaughtered according to the Muslim *halal* method," she says.

That kind of thinking is typical for McCoy, who has made a career out of finding better ways to feed people. As an undergraduate, she spent a semester on a Kenyan game ranch devoted to the principle that wild meat feeds people more efficiently than cattle. The idea stuck with her, and she's been traveling the world looking for alternatives to cattle ever since. In Iraq, where the diet tends to be low in protein, producing poultry makes a lot of sense. McCoy is working in the Land Between the Rivers, a fertile patch of territory just south of Baghdad with good irrigation. Farmers there eschew cattle production, putting the land to better use raising high-value vegetables. But poultry farms would fit right in, because they don't require much land.

McCoy says she never expected to wind up in the military. "Like most folks, I never even knew the Army hired veterinarians," she says. But three months after responding to a bulk-mail recruitment postcard, she reported for duty on September 11, 2001. "The military kind of changed on that day," she says. Since then, McCoy has worked in Egypt, Afghanistan and Iraq, spending a year in each. The military also sent her back to Tufts, where she obtained a master's in humanitarian assistance, a joint degree offered by the Friedman School and the Fletcher School (Tufts' graduate school of international affairs) and managed by the Feinstein International Center.

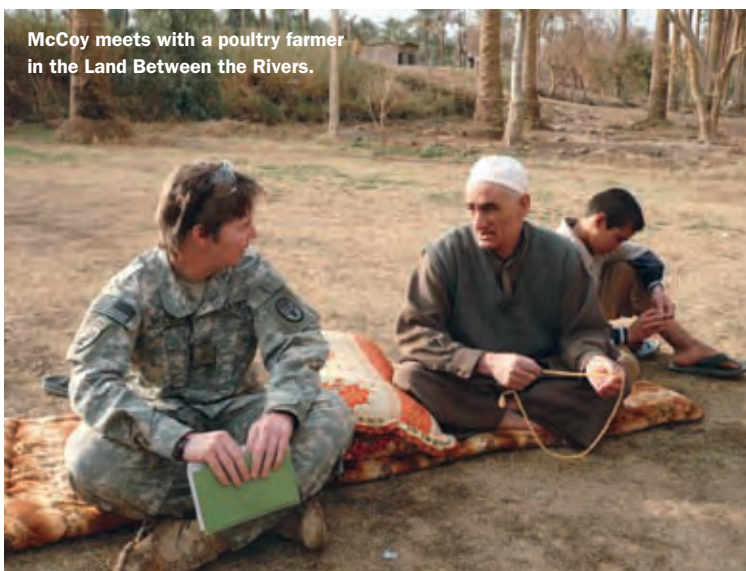
In Iraq, McCoy works with "bilingual bicultural advisers"—Iraqi-Americans, Iraqi-Canadians or Iraqi-Australians who have returned to their homeland to help rebuild it. The advisers help her reach the poultry farmers through their respective sheikhs. "Since sheikhs have a blood relationship with their people, they are often more influenced by their people's needs than an outsider would be," says McCoy.

She and her colleagues have established a co-op in Al-Mahmoudiyah, the agricultural area south of Baghdad, with nearly 300 registered poultry farms. There, a slaughter plant owner, three feed mill owners and about 100 growers have formed their own association.

Co-op members represent 14 tribes and cross religious lines, so the business model is also "a good tool for reconciliation," says McCoy, although "the first goal has to be raising chickens and selling them profitably." This, she believes, will stimulate other industries, such as trucking,

"We are teaching farmers how to raise a quality chicken—and why they should."

—JESSICA MCCOY



McCoy meets with a poultry farmer in the Land Between the Rivers.

slaughterhouses and corn or sorghum production for chicken feed. Meanwhile, poultry waste—called litter—is an excellent organic fertilizer that could encourage farming in other regions of the country.

Though she's hopeful that Operation Chicken Run will help Iraqis feed their nation, McCoy is scheduled to leave the country before the first co-op chickens are hatched. What's next? Some kind of international development work for sure—with the Army or otherwise, she says. "There are still plenty of hungry people out there."

Jacqueline Mitchell, a senior health sciences writer in Tufts' Office of Publications, can be reached at jacqueline.mitchell@tufts.edu.

SMOKE SCREENS

**In starring roles or cameos,
cigarettes make frequent appearances in movies.
What does it mean for the young people who watch?**

MADELINE DALTON, PH.D., N88, N94, DOESN'T CONSIDER MOVIES THE ROOT OF all evil. She and her twin 16-year-old sons can often be found in their Vermont home catching the latest Netflix arrival on their big-screen television. They devour everything from animated features to action thrillers. "Especially up here in the winter, we enjoy watching a lot of movies," she says. ■ So when Dalton, an epidemiologist, associate professor and director of the Hood Center for Children and Families at Dartmouth Medical School, set out some years ago to study how movies influence a child's chances of taking up smoking, she had no grudge with Hollywood. She didn't know her research eventually would make producers quake and force the movie industry to rethink its ratings system. ■ Dalton started researching movies in 1996, when she and her colleagues at Dartmouth were working on a project to help children design their own tobacco-prevention programs. Because some 90 percent of adult smokers start smoking by age 18, preventing children from trying cigarettes has long been a public health goal. ■ Talking to children at their schools, the researchers saw they were up against some powerful marketing. Back then it was still legal for cigarette companies to give out promotional items like hats and T-shirts, some of which parents passed on to their children. "You could see the Marlboro backpacks sitting in the back of a third-grade classroom," Dalton says. So she and

BY JULIE FLAHERTY

ILLUSTRATION BETSY HAYES



her colleagues started thinking about some of the other media that might influence children to start smoking. They noticed that one thing the students talked about a lot—and could recount with amazing detail—was all the movies they watched.

No one had ever studied whether watching Gwyneth Paltrow light up in the *Royal Tenenbaums* could influence a youngster to do the same. “Now I know why,” Dalton says. “It is a very hard thing to measure. You can measure how many people smoke in movies—although that’s not easy either—but to tie that to what kids are watching and how strong their exposure is, that was really challenging.” Just designing the study took almost two years, as their group, which included a pediatrician (James Sargent, M84, as primary investigator), two social psychologists and a statistician, hammered out all the factors they would have to measure. With the researchers’ varied backgrounds, “it was really difficult to come to a consensus,” Dalton says, “but it made for great discussions.”

First they had to figure out what movies the teens and tweens (ages 9 to 15) were watching. Through focus groups with children and interviews with video store owners, they narrowed their movie sample to box office hits from the previous 10 years, plus a handful of others that featured popular teen stars, for a total of roughly 600 films. (Yes, most great films of yesteryear are filled with scenes of smoking, but you won’t find many 12-year-olds standing in line at Blockbuster with a copy of *Citizen Kane*, so the classics were not included.) They then hired a pair of movie aficionados to watch each film and mark down every time tobacco made an appearance. (“The movie coders say it is a great job when it’s a good movie,” Dalton says. “But when it’s a bad movie with a lot of smoking, it’s tough.”) This way, when they asked the nearly 5,000 children they were surveying about their movie-watching histories, they could tally the total puffs and drags each had seen on the screen.

At the same time, the researchers had to control for all the known risk factors for taking up smoking. There were the obvious ones: age, gender, ethnicity and parents’ education. Do their parents smoke? Their siblings? Their friends? How do they do in school? (The better the grades, the less likely the student will become a smoker.)

They also looked at how closely the students’ parents (in this case, they focused on the mothers) supervised them and how approachable

they were when their kids had concerns. Does your mom know what you do with your friends, they asked? Does she know where you are after school, or check to see that you do your homework? Does she want to know about your problems?

To make sure they weren’t comparing Sandra Dees to James Deans, they tried to get a feel for whether the children were sensation-seeking or rebellious. They also gauged self-esteem.

When the researchers completed the study, they found a link between the movies the children watched and their smoking experience that was so clear, even they were taken aback. All other things being equal, the children who saw the most smoking in movies were two and a half times more likely to have tried smoking than those who saw the least amount of on-screen light ups. “I don’t think any of us expected to see such a strong association,” Dalton says.

“We looked at the first analysis and said, ‘Nobody is going to believe that,’” Dalton says. They crunched and re-crunched the numbers, but the finding didn’t go away. The results were published in the British medical journal *BMJ* in 2001.

They followed the children for two more years, and their next paper, published in *The Lancet* in 2003, revealed something that non-smoking parents were surprised to hear: It was their children who were most susceptible to the movie influence. In that group, children who saw the most on-screen smoking were four times more likely to light up than the ones who saw the fewest cigarette scenes.

“I’ve talked to parents who said, ‘Well, my kids watch the movies, but they are not going to be influenced by the smoking. We don’t smoke, and they hate smoking,’” Dalton says. “As a parent of teenagers, I can tell you, you never know what might influence your children.”

AN AFFAIR TO REMEMBER

Smoking and the movies have a long, tangled history. Decades after Bette Davis and Paul Henreid fell in love over plumes of smoke in *Now, Voyager*, and long after the dangers of smoking came into focus in the ’50s and ’60s, cigarettes continued to have a starring role in films. Tobacco companies often paid to have their brands promoted on screen. (See *Superman II*, where Philip Morris paid \$42,000 for prominent placements of Marlboros, the brand name Lois Lane clearly prefers.) One company, R.J. Reynolds, sent monthly supplies of free cigarettes to actors and directors. In 1983,

Sylvester Stallone agreed to use Brown & Williamson tobacco products in five of his films in exchange for \$500,000.

Tobacco companies, under pressure from the public, pledged voluntarily to end paid product placement in 1990, and it became official in 1998 as part of the companies’ master settlement agreement of lawsuits filed by state attorneys general over the health-care costs of tobacco-related illnesses.

Even so, tobacco depictions in movies, which declined through the 1970s and 1980s, actually increased after 1990, according to a 2002 report. (The authors speculated that Hollywood was still influenced by Big Tobacco, although they could not prove it.) And the smoking is not only in R-rated films. Researchers at



COMING ATTRACTIONS: RESEARCH ON OBESITY

ALTHOUGH HER RECENT RESEARCH HAS FOCUSED ON SMOKING AND THE media, Madeline Dalton, Ph.D., N88, N94, has retained her interest in nutrition. Since 2005, she has been the principal investigator on a comprehensive study examining how environments influence a child's risk for obesity.

Several studies have looked at whether children are healthier if they have playgrounds nearby or neighborhood schools they can walk to. But Dalton's study, which looks at children in a variety of New England cities and towns, attempts to cover more bases. In assessing schools, for example, her team measures the food offerings in cafeterias, snack shacks and vending machines; the recreational facilities available; the cost of playing interscholastic sports and transportation to games and practices. In the cities and towns, they study retail food outlets, convenience stores, fast-food restaurants, sidewalks and traffic patterns. In the home, they examine meal patterns, shopping habits, media use, parent physical activity and parent diet as an influence on kids.

The goal is to account for all the potential confounders. "We know that people who live in 'walkable' towns are more likely to walk and exercise, but we don't know if they moved to the town because it was walkable or if they walk just because they live in the town," Dalton says. "More importantly, are kids who walk home from school going to be at lower risk of being overweight? Or are they walking past a convenience store and going in to get something to eat?"

How environment and society influence behavior and public health are something of a theme of Dalton's career. As a doctoral student at Tufts, she went to rural Mexico to examine how mothers' behavior and home environments influenced whether children thrived. She then studied environmental risks for lead poisoning in children, both in the United States and Mexico. And of course, her research on movie exposure and adolescent smoking focuses on the media environment. "I've been able to study a range of topics," Dalton says, "because the methods for answering each of these questions are similar." —J.F.

Dartmouth found that the vast majority of on-screen smoking children see is in youth-rated movies, meaning G, PG and PG-13 films.

Armed with the research team's findings, which were reiterated in several studies, public health advocates and state attorneys general began to push the film industry to make smoking part of the criteria for an R rating, just as nudity, sex, violence, drug use and bad language are taken into account. In 2004, Dalton was called to testify before a Senate hearing on the issue.

"From a researcher's perspective, I think it's important to understand what the risk factors are," she says. "From a parenting standpoint, I just felt like parents needed to know. Many parents were unaware of the impact that movie smoking exposure could have on their children."

Jack Valenti, then president of the Motion Picture Association of America (MPAA), the movie industry's trade group, also spoke at the

Senate hearing. Earlier he had revealed to Dalton that the MPAA had paid someone to go over her paper in *The Lancet*, looking for weaknesses, but could not find any. "Although he didn't agree with our conclusions, he admitted that the study was methodologically sound," she says.

Curiously, Dalton found that most of the film directors she spoke with didn't parry her research with a freedom-of-expression argument. "Some had a more sympathetic view than many of the public," she says. "I think that's because their movies are rated based on all kinds of content that they decide to include. And they certainly are aware that movies impact kids. They are the first to tell you that it is a very powerful medium. The producers had a different take on it because they don't gross as much from an R-rated movie as from a PG-13."

The movie industry is beginning to make some changes. In May 2007, the MPAA announced it would consider tobacco use as a factor in its film ratings. In July of this year, six major movie studios said they would place anti-smoking public service announcements on DVDs of all movies with youth ratings that depict smoking. The industry could be under even more pressure with the recent release of a comprehensive report from the National Cancer Institute, a federal agency, which concluded that films have a powerful effect on adolescent tobacco use.

Still, many are reluctant to believe that letting little Jimmy kill time on a Sunday afternoon with *Iron Man* or *Daredevil* (two PG-13 films that received "black lung" designations from SceneSmoking.org) would be enough to get him to take up the habit. After all, when Elvis Presley swiveled his hips, the rock-and-roll generation didn't turn to lives of debauchery, as some predicted. "No, but a lot of people started dancing like that," Dalton says. "And that's the thing with the movies. How many people wanted to buy Mini Coopers after *The Italian Job*? Most of us are influenced in some way by what we see in movies."

She continues: "No one really has a problem talking about peer influences. If your friends smoke, you're more likely to smoke—people take that as a given. The influence of movies is not that much different. It's a social influence much the same as peers. It took us years to understand how peers influence children, and it will probably take us years to figure out how movies influence children."

There is still a lot to make sense of. In a paper for the journal *Preventive Medicine*, Dalton points out that there is a limit to how well a researcher can convert "the contextual richness and nuances of movies" into survey data. She uses the example of a scene from *Romeo & Juliet*, where a pensive Leonardo DiCaprio smokes while writing in his diary. A researcher simply ticking it off as a smoking instance on a data sheet "would not capture the fact that smoking followed a scene in which Romeo's parents described his depression and alienation from them," something many adolescents can identify with, she writes, emphasizing that adults—and scientists—can't necessarily watch a film the way a teenager does. "Nor would it capture the almost-sensual nature in which smoking was portrayed, which has to do with lighting, sound and other factors that simply cannot be coded in a large sample of movies."

Some people say it should be acceptable for villains to smoke in movies, since it only underscores their wickedness. But Dalton points out that the characters that draw children in aren't always the ones who wear white hats, and that it is too simplistic to characterize them as good versus bad. She laughs when she thinks of her own sons, who as adolescents are drawn to the tough guys. "When they are watching *The Godfather*, they want to be like members of the family, not the police who are after them," she says. **TN**

THE POSSIBLE
ADVENTURES OF

UP



Long known as calcium's sidekick, vitamin D is now gaining recognition for its powers beyond bones. If only more of us got enough of it

BY HELENE RAGOVIN

ILLUSTRATIONS BY NOAH WOODS



VER THE YEARS, VITAMIN D HAS been a loyal partner in the defense of bone health, the Robin to calcium's Batman. But recently, scientists have come to suspect that when it comes to treating and preventing other diseases, they could one day be sending up the "D" signal.

Researchers of illnesses as varied as cancer, heart disease, diabetes, rheumatoid arthritis and multiple sclerosis are investigating the potentially beneficial role of vitamin D. While it's too early to draw any definitive conclusions, the vitamin that was once best known for building strong bones appears, from several recent studies, to be associated with overall health.

"We've come to realize that there are a whole bunch of things other than bone that have to do with vitamin D, and that are clearly of great interest scientifically," says Johanna Dwyer, D.Sc., the director of the Frances Stern Nutrition Center at Tufts Medical Center and a professor at the Friedman School and the School of Medicine. "I think the argument people are having right now, in the scientific world, is how good the evidence is for these other kinds of effects, and the jury's still out on that. I would submit that it's probably going to be out for another year or two."

The research adds some urgency to a discussion that has been going on among researchers, physicians and the government—exactly how much vitamin D do people need? The current recommended daily Adequate Intake is 200 international units (IU) for children and adults up to age 50, 400 for those ages 51 to 70 and 600 for those over 70. Those numbers were set in 1997 by the Food and Nutrition Board of the Institute of Medicine—the U.S. advisory agency that recommends nutritional intakes—and were based on the amount of vitamin D then believed to be needed to maintain bone health. These are also the recommendations used by Canada's national health agency. But based on newer research, many researchers are asking for an update.

"The recommended intakes are too low.

Virtually everyone working in the field believes that," says Susan Harris, D.Sc., N87, a scientist in the Bone Metabolism Laboratory at the Jean Mayer U.S.D.A. Human Nutrition Research Center on Aging (HNRCA) at Tufts and an adjunct associate professor at the Friedman School.

And, she says, even by current standards, far too many people in North America aren't getting enough. According to the third National Health and Nutrition Examination Survey (NHANES III), at least 40 percent of men and 50 percent of women in the United States have lower-than-optimal blood levels of vitamin D for at least part of the year.

THE ABCs OF D

Vitamin D's best-understood job is regulating calcium. It functions as a hormone, triggering the intestines to absorb calcium from food and add it to the blood stream, where it can be brought to organs and muscles that require it to function, or to the bones for bone growth and repair. In addition to helping muscles, the brain, the nervous system, the pancreas and reproductive organs, vitamin D has also been shown to affect immune function and to reduce inflammation.

Back in grade school, you might have learned that vitamin D was the "sunshine vitamin." Your body makes it when ultraviolet B (UVB) radiation from sunlight hits cholesterol compounds in the skin, converting them

to vitamin D precursors. These precursors travel to the liver and kidneys, where they are converted to the active form of vitamin D.

The amount of vitamin D you synthesize depends not only on your sun exposure, but on the season (winter is less desirable than summer), your skin color (darker tones absorb less UVB) and where you live (the farther from the equator, the less UVB is available). In fact, Americans who live north of 42 degrees latitude (including residents of Boston, Milwaukee and Seattle) do not get enough D-making UVB from roughly mid-October to mid-March, regardless of how much time they spend outdoors. The sun comes in at such an angle that the necessary rays never hit the earth's surface.

Unlike most other vitamins, adequate vitamin D is tough to acquire solely through a balanced diet, although it is naturally present in some fatty fish and fish liver oils, and in small quantities in beef, liver, cheese and egg yolks. In the U.S., most of the vitamin D we consume is in the form of fortified milk, cereal or juice.

Historically, the result of severe D deficiency was rickets, a childhood disease that softens the bones—its most obvious symptom is a tell-tale bowlegged stance. Once prevalent, rickets mostly disappeared in the U.S. in the 1930s, with the advent of D-fortified milk.

Occasionally, Dwyer says, health professionals would see rickets surface in populations that didn't consume milk, fish or other animal products, including the children of macrobiotic vegans in the 1970s. Today, vegans can obtain adequate vitamin D through fortified soy products and supplements.

THE 'HOT VITAMIN'

In adults, a severe lack of vitamin D can lead to osteomalacia, a painful condition of weakened bone and muscle. But even people who are not D-deficient, but simply have lower-than-ideal levels, may experience health consequences.

"We're no longer talking only about avoiding frank deficiencies," Harris says. "We're talking about maintaining optimum health, and reducing our risks in more subtle ways."

For the past several decades, Bess Dawson-Hughes, M.D., M75, the director of the

Bone Metabolism Laboratory at the HNRCA and a professor of medicine at Tufts, has been a leading figure in the study of osteoporosis, a condition in which bones become fragile and easily fracture. Her research has shown that vitamin D insufficiency can contribute to development of the disease.

Today, work to investigate the possible connections between low levels of vitamin D and other conditions, such as heart disease, stroke, hypertension, cancer (of the colon, breast or prostate), Type 1 and Type 2 diabetes, autoimmune diseases—even gum disease—have made vitamin D research “a fast-moving field and one of extreme interest,” Dawson-Hughes says, although “just what is involved with each of these, it’s too early to tell.”

The intense research attention to vitamin D dates back about 30 years, when a pair of epidemiologists hypothesized that lack of exposure to sunlight might explain why colon cancer rates were higher in northern states than in the South.

“We now know that there are receptors for vitamin D in almost all body tissues,” Harris says. “Those receptors would not be there if they didn’t serve some purpose.”

Researchers are still not clear about the exact mechanisms that might make vitamin D an effective cancer-fighter, or why it seems to be associated with lower incidence of other diseases, but the quest to answer those questions has made it “the hot vitamin nowadays,” as cardiologist Thomas Wang, M.D., puts it. Wang and his colleagues—including Friedman School professors and HNRCA scientists Sarah Booth, Ph.D., and Paul Jacques, D.Sc.—analyzed work from the famous Framingham Heart Study, and concluded that people with low levels of vitamin D were at increased risk of developing heart disease. These results held even for those who had few other cardiovascular risk factors, such as obesity or high blood pressure.

“That’s obviously one of the intriguing questions,” said Wang, an assistant professor of medicine at Massachusetts General Hospital. “Why do some people who develop cardio-

vascular disease do so inexplicably, in the absence of any obvious risk factors? Could vitamin D deficiency be a novel risk factor?”

Wang stresses that the connection between vitamin D and heart disease is far from certain, and much more work is needed. “It’s easy to understand why there is this interest in vitamin D,” he says. “There is a longstanding interest in vitamins and any kind of disease; vitamins are very easy to take ... in cardiology, there have been other reported links between vitamin deficiencies and heart disease, but they have been hard to prove.”

CALL FOR MORE

When it comes to heart health or cancer prevention, “we don’t have enough information yet to know what D level in the blood you need to achieve the maximum benefit,” Dawson-Hughes says. But her research and that of others has given plenty of direction on D levels and bone health. “We now have a reasonable estimate of the minimal amount needed for bones; less is known about the amount needed for the other areas,” she says.

And the ideal for bones, by most accounts, is a higher one than what is currently recom-

cluded. With that in mind, in an editorial in the *American Journal of Clinical Nutrition* in March 2007, 15 vitamin D experts from around the world, including Dawson-Hughes, criticized the “perpetuation of outdated intake recommendations.”

Healthcare Research and Quality completed an ODS-funded, evidence-based review of the literature on vitamin D and bone health. This year, it began a second review, examining broader research on D. “Those reviews generally take about a year,” Dwyer said. “I don’t know where it will go, but I know

conclusion that the public health is best served by a recommendation of higher daily intakes of vitamin D,” the editorial said. “Relatively simple and low-cost changes, such as increased food fortification or increasing the amount of vitamin D in vitamin supplement products, may very well bring about rapid and important reductions in the morbidity associated with low vitamin D status.”

The government is not unaware of the situation. But for the sake of safety, before the federal government can recommend a change in any of the Daily Required Intakes (DRI), there is a years-long review process. “The government is very much interested in the whole issue of vitamin D,” says Dwyer, who, in addition to her work at Tufts, is also a senior scientist in the federal Office of Dietary Supplements (ODS), part of the National Institutes of Health.

In August 2007, the federal Agency for



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CHILDREN AND D

AT THE TURN OF THE LAST CENTURY, MANY OF THE CHILDREN WHO arrived at Boston's Floating Hospital for treatment of various ailments were also suffering from rickets, the bone-softening disease that results from a severe lack of vitamin D.

Doctors in 1899 recorded these findings in the *Boston Medical Journal*, the forerunner of *The New England Journal of Medicine*. As Johanna Dwyer, D.Sc., the director of the Frances Stern Nutrition Center at Tufts Medical Center, tells it, even though the children likely spent time outdoors, the coal-smoke haze that then covered the city prevented enough sunlight from getting through, and they were not able to synthesize a healthy dose of vitamin D. Boston was not unique. It was not until several decades later, with the advent of vitamin D-fortified milk and other advances in nutrition, that rickets became rare in the United States.

But vitamin D deficiency in children has not disappeared entirely. Studies, including a recent one done by researchers at Children's Hospital Boston, have found that significant numbers of children—infants through teens—have extremely low levels of vitamin D.

The Children's study, which appeared in the June 2008 issue of the *Archives of Pediatrics & Adolescent Medicine*, found that out of a group of 365 infants and toddlers brought to the hospital for well-child exams, 40 percent had vitamin D levels below the optimum considered necessary for bone health, and 12 percent were frankly deficient; of those who were deficient, 32 percent had evidence of bone loss.

Those showing the low vitamin D levels were likely to be exclusively breastfed infants who were not given vitamin D supplements and toddlers who were not drinking enough milk.

"As a trained pediatrician and a pediatric endocrinologist, I'm a strong advocate of breastfeeding, and we're in no way trying to deemphasize the importance of breastfeeding," says Catherine Gordon, M.D., lead author of the study. But exclusive breastfeeding without vitamin D supplementation

is a major risk factor for vitamin D deficiency, she says.

With this in mind, in October the American Academy of Pediatrics doubled its recommended intake of D for infants, children and adolescents, from 200 IU per day to 400, beginning in the first few days of life.

"Breastfeeding is a healthy trend, but it's missing one factor—vitamin D," Gordon says. For infants who are not exclusively breastfed, formulas are fortified with vitamin D;

for older children, chewable multivitamins usually contain 400 IU. For breastfed infants, vitamin D is available in supplement drops, either alone or in combination with other vitamins.

For toddlers and older children, another way to get vitamin D is through fortified milk, which contains about 100 IU per cup, or fortified juices. "The only caveat about getting vitamin D exclusively through diet is that the labeling is not always accurate," Gordon says.

"Even if the label says it has a certain concentration, it may actually have only 50 percent of that when analyzed."

While the previous recommendation of 200 IU was enough to prevent rickets, Gordon says, it was not enough to get vitamin D levels to the optimal range. The new recommendation may still fall short. "Many, myself included, think the recommended intake should be higher, perhaps 800 to 1,000 IU a day," she says. "We critically need health-outcomes research in that area."

Bess Dawson-Hughes, M.D., M75, agrees. "We don't know what the functional outcomes of vitamin D insufficiency in children are," says Dawson-Hughes, the director of the Bone Metabolism Laboratory at the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts. Waiting to see how childhood vitamin D insufficiency affects bone mass in adulthood is not the best way to answer the question, she says. "We need shorter-term endpoints to find out what dose might be best."

—Helene Ragovin



there is great interest in seeing a good, solid review done.”

In the meantime, Dawson-Hughes says an increased daily intake is especially vital for maintaining bone and muscle strength in the elderly. The current recommendation for those over age 70 “is simply not enough,” she says. “To get to what appears to be a reasonable threshold, the average older person needs 800 to 1,000 IU”—at least 200 IU more than the current recommended intake. Those ages 51 to 70 would also benefit from consuming 800 to 1000 IU, she says, which is more than twice the current recommendation.

Even those age 50 and under would benefit from consuming more than the recommended 200 IU, Dawson-Hughes says. “There is no real documented danger in modest increases in vitamin D,” she says. “So if some want to hedge their bets, they might choose to step it up a little.”

However, Dawson-Hughes does not recommend mega-supplements. “I don’t support what some colleagues are recommending, which is extremely high doses for big segments of the population, in the absence of more safety data,” she says.

THOSE AT RISK

Based on the results from NHANES, low vitamin D levels are more prevalent among women, Hispanics, African Americans and people age 65 and older. People with a high Body Mass Index (BMI) also tend to have lower levels, as body fat can “trap” vitamin D. Homebound or institutionalized people, and others who spend great amounts of time indoors, also tend to have vitamin D deficiency.

It’s not surprising that African Americans and dark-skinned Hispanics would have lower vitamin D levels, since skin with more pigmentation is less able to synthesize vitamin D. But studies have also shown that African Americans are less likely to eat foods fortified with vitamin D. One reason may be a higher level of lactose intolerance among African Americans, which in turn leads to lower consumption of milk and dairy products.

“African Americans have a lower blood level on average—we saw that very clearly in NHANES,” Harris says. Even most young, healthy African Americans don’t show optimal

levels of vitamin D, regardless of where in the country they live, or the time of year.

But what hasn’t been shown as clearly, Harris adds, is how this affects health outcomes, because even though African Americans have lower vitamin D levels than Caucasians, they also have lower rates of osteoporosis. The underlying physiological reasons for this are not well understood, and are most likely connected to factors other than vitamin D status.

“There was less interest in vitamin D nutrition in African Americans than there could have been,” Harris says, because for a long time, it wasn’t seen as having a strong negative impact. “Now that we’re seeing the connections to diabetes, heart disease and cancer, are the low D levels increasing their risk for other conditions? We really don’t know yet.”

With that in mind, Harris has begun work on a three-year study of vitamin D, glucose control and insulin sensitivity in African Americans; the research is funded by a \$455,000 grant from the American Diabetes Association. The study will look at whether giving African Americans vitamin D supplements for three months will improve their markers for diabetes risk. The African-American population has a higher incidence of diabetes than Caucasians; among people over age 65, the death rate from diabetes is nearly twice as high.

LET THE SUN SHINE?

In general, researchers recommend meeting increased needs for vitamin D through supplements—unfamiliar words in the nutrition community, where experts usually prefer nutrient-rich foods to pills. But, quite simply, it’s almost impossible for most people to eat the volume of vitamin D-rich foods—whether natural or fortified—to meet their needs.

“It’s not really feasible right now,” Dawson-Hughes says. “Foods are fortified at fairly low levels, and there is not a lot of vitamin D, as far as we know, in the natural food supply.”

Vitamin D is included in most multivitamins, and also in combination with calcium supplements; in fact, one of the major vitamin manufacturers recently doubled the amount of vitamin

D it puts in its “women’s formula” multivitamin, from 400 to 800 IUs.

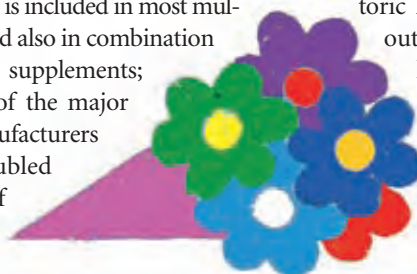
Which raises a thorny question: What about sunlight? Some researchers say 10 minutes of sun exposure to the face and arms at midday, depending on season and location, could be enough to guarantee the body will make enough D.

At the same time, people are cautioned to mind the risks of skin cancer. There’s no sure formula for figuring out how much sun exposure might be adequate, but not dangerous, on an individual basis. The 2007 Agency for Healthcare Research and Quality review of vitamin D and bone health states: “We did not find any systematic reviews that addressed the question on the level of sunlight exposure that is sufficient to maintain [vitamin D] concentrations but minimizes risk of melanoma and non-melanoma skin cancer.”

The American Academy of Dermatology is emphatic in its advice that people avoid unprotected sun exposure and get their vitamin D from food and supplements, noting that ultraviolet radiation is responsible for more than 1 million skin cancers each year in the United States. Perhaps fearing that people will shun their sunscreen or take to a tanning bed in an effort to get their D, the academy notes that sunscreens are not perfect, and that even those who wear sunscreen will likely absorb some UV rays and produce some vitamin D. On a sunny June day, it could take a fair-skinned individual wearing a typical coating of SPF 15 as little as 20 minutes to get her fill of vitamin D.

That said, in northern-most and southern-most latitudes, “you’re still left with almost half the year” when sunlight won’t do the job, says Dawson-Hughes. While the body can store vitamin D made during the summer for several months, it’s unlikely to be enough to see most people through the winter, Harris says. That process worked much better for prehistoric humans, who spent much more time outside—and usually died of other causes long before skin cancer could claim them, she says. **TN**

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Latrice Goosby Landry

on the heart

**The mystery began with her family.
Why were so many people sick all the time?
A Tufts student heads to Mississippi to investigate
nutrition and health in an African-American community**

BY CLAIRE VAIL PHOTOS BY MELODY KO

IN ELEMENTARY SCHOOL, LATRICE GOOSBY LANDRY, A02, N04, N09, M12, THOUGHT PILLS WERE A normal part of any adult's dinner, like mashed potatoes or buttered cornbread. ■ "Everyone in my family had some sort of low-level chronic illness—mainly high blood pressure—that they were treating with medication," she recalls. "They accepted it as inevitable. So I did, too. I just figured that one day I'd probably have the same thing." ■ As she grew older and started thinking about medicine as a possible career, Landry noticed her family seemed to have more than its fair share of poor health. Her grandmother had died of a brain aneurysm at age 43. Her mother, aunts and sister had all had at least one miscarriage. Births were always premature, often dangerously so. No one asked why, Landry noticed. That's just how it was. ■ In fact, her family's experience isn't unusual. Forty percent of black Americans suffer from hypertension, a condition that can lead to more severe health problems, especially if untreated. Consequently, African Americans suffer heart attacks, strokes, kidney failure, vision problems, poor birth outcomes and premature death in far higher numbers than any other racial or ethnic group. According to the Centers for Disease Control and Prevention, an American has a 30 percent greater chance of dying from heart disease—already the nation's leading cause of death—if he or she is black.

While researchers have been aware of the race-related disparity in heart disease figures for decades, isolating the cause is a politically sensitive and scientifically complex task. Investigators must round up all the usual suspects—genetics, diet, economics, culture, plus social factors such as racism—and take a hard look at how they interact and influence one another. It is precise and painstaking work, but Landry welcomes the challenge. At age 27, with a nearly completed Ph.D. in nutritional epidemiology from the Friedman School and the first year of Tufts Medical School under her belt, she is involved in new research that may reveal why African Americans are more prone to heart disease than other Americans.

For the last four years, her thesis has required her to shuttle back and forth from the laboratory in Boston's bustling Chinatown neighborhood to a converted strip-mall in Jackson, Miss., where she has joined the staff of the Jackson Heart Study, the largest-ever single-site investigation of cardiovascular disease in African Americans.

Since 2000, the Jackson Heart Study has established a cohort of 5,302 black residents from three nearby counties where rates of heart disease are among the highest in the country. A staff of prominent doctors, nurses and students, including Landry, have spent several years gathering and analyzing genetic, nutritional and general lifestyle data from these study participants in an attempt to identify the many risk factors for this particular population.

Landry's specific research examines the interactions between genes and nutrients and a variety of fatty acids, from "good" mono-

unsaturated fats like the kind found in olive oil to "bad" trans-fats once common in margarine and vegetable shortening and now banned from many restaurant menus.

"We've found that depending on what genetic inheritance you have, fatty acids have a different impact on your health," Landry explains. "So, you might be more likely to get cardiovascular disease if you have some genetic traits rather than others. Some drugs might work on you, and some may not."

Once the study is further along, there is a possibility that her results may be used to build a nutritional intervention, a strategic plan aimed at a particular group to reduce that group's harmful eating habits. While such a plan might begin in Jackson, Miss., where heart disease is rampant, Landry hopes the study eventually will demonstrate how any African American might be able to prevent the onset of heart disease by following a particular diet.

FOOD, FAITH AND FAMILY

Landry, a bubbly, resourceful woman with an easy laugh, has been welcomed by her fellow researchers in Jackson as one of their own. Though she was born and raised in suburban Maryland, visits to her grandmother in Alabama steeped her in the culture of the deep South, especially the strong ties to food, faith and family. She feels at home here, and it shows.

"I was always attracted to the idea of following rules," she says with a smile. "Even as a very young child, I took rules very seriously." She made sure, for example, that her family went to church on a regular basis. She also decided that her family should observe the nutritional guidelines laid out in the USDA's

food pyramid. She used it to supervise family mealtimes, banishing cake and cookies. Her parents coined a half-joking nickname for her: the Food Police.

As a pre-med major at Tufts, Landry enrolled in a graduate class in primary care at the Friedman School. The class taught nutrition students the basic clinical knowledge needed to deal with famine and HIV in refugee camps and international crisis situations. Landry was fascinated by how many health problems could be prevented with proper nutrition. In 2002, she was accepted to the Friedman School's Food Policy and Applied Nutrition master's program, specializing in nutritional intervention.

Landry had always assumed a genetic risk factor predisposed people in her family to develop high blood pressure. Her sister, Cherita, had been diagnosed with hypertension in her 20s, an unusually young age. Once they had the condition, they were advised by doctors to cut out salt and fat. But Landry, who maintained a fairly strict diet, had not yet had any health issues. Was it possible some combination of bad genes and the wrong food was the smoking gun? Could the right food prevent the onset of the disease altogether?

"I knew I had to become a doctor to understand the medicine, but I also wanted to continue with research in the nutritional field," says Landry, who sought academic counsel from University Professor Irwin Rosenberg, M.D., who was then dean of the Friedman School. Though Tufts offered no formal program that coupled a Ph.D. at the Friedman School with an M.D. at Tufts Medical School, he encouraged her to see if it could be done. Landry convinced deans at both schools that if anyone could meet such an ambitious goal, she could.

"That's one of the remarkable things about Tufts. If you have a good idea, they'll help you make it happen," says Landry.

Professor Katherine Tucker, Ph.D., Landry's thesis advisor and a senior scientist at the Jean Mayer USDA Human Nutrition Research Center on Aging, saw that Landry's talents extended beyond laboratory research and introduced her to the Jackson Heart Study.

A week before her med school board exams, she got an urgent call from her mother. Cherita, then 25 weeks pregnant, was being prepped for an emergency C-section after tests revealed her fetus had stopped growing.





Landry is investigating how food and genetics influence the health of southern blacks. Clockwise from top left: fast food chains line Jackson's downtown area; homemade pies from a farmer's market; Landry and her husband's extended family indulge in southern cuisine at a reunion, where some said they have adapted their family recipes to be more heart-friendly. Opposite: a typical buffet at a southern family-style restaurant.



Landry knew her sister's hypertension was to blame. Only weeks before her sister's blood pressure had spiked at a stroke-level high of 220 over 100—most probably the point at which the placenta began to decline.

At birth, her niece weighed just 13 ounces, less than three sticks of butter. After months of intensive care, the baby began to thrive, but Landry was shaken. Her family had been through tremendous strain. Medical research had to offer something better.

HEART OF THE PROBLEM

Nearly everything that is known about heart disease and what causes it—high blood pressure, high blood cholesterol, smoking, obesity, diabetes and physical inactivity—comes from a landmark experiment begun in Framingham, Mass., in 1948. The Framingham Heart Study, which surveyed three generations of Yankee stock, is considered one of the most successful clinical inquiries of all time.



Fewer than 10 blacks took part, but researchers claimed that the study's results applied to everyone, regardless of race. While the known risk factors may apply across the board, curiously higher levels of heart disease for blacks, especially Southerners, suggest the portrait is more complex.

"The question that arose in any academic conference, in any cardiologists meeting, was always, do the results in Framingham apply to non-Caucasian Americans? Are there unique aspects for African Americans, particularly in the South?" says Herman A. Taylor, M.D., head of the Jackson Heart Study.

He and his fellow researchers are the first to focus on the complex interplay of nutritional, genetic and socio-economic factors in a sizeable African-American population. Structurally, the Jackson Heart Study is similar to the Framingham one. But the Jackson study also monitors social stresses that may be unique in their degree and effect on the black, southern population, including perceived discrimination, cultural differences such as religious faith or regional factors like high unemployment rates.

The Jackson data has revealed some interesting differences from the Framingham study,

Taylor says. For example, a person who is likely to develop heart disease is also likely to have multiple risk factors—he might not only suffer from high blood pressure, but be overweight, a smoker or diabetic. In African Americans, however, the prevalence of multiple risk factors is extraordinarily high, and the factors themselves are slightly different from those seen in the white population. While whites at risk for cardiovascular disease typically have high triglyceride levels, African Americans tend to have a combination of truncal obesity, hypertension and low HDL, the “good” cholesterol.

“That’s surprising in some ways,” Taylor says. “Historically, it’s been thought that if there’s anything good about the risk profile for African Americans, it’s that they have high

with the disease to believe they were being treated, when in fact they were not.

Whether Tuskegee’s legacy has permanently affected African-American trust of the medical community is a matter of debate. A 2008 study by Johns Hopkins suggested that blacks are willing to participate in trials, but are more fearful than whites that they’ll be treated as guinea pigs.

Donna Antoine-Lavigne, Ph.D., coordinator for the Jackson study’s community outreach and partnership office, agrees there is some distrust, and emphasizes the importance of a tight bond between the public and the study’s administration.

“It’s not that black people don’t want to be involved in clinical trials,” she says, “but certain conditions have to be in place.”

“When I became a graduate student I realized there wasn’t enough data on African Americans and health disparities. I thought if the data isn’t there, someone needs to start collecting it. Why not me?”

HDL levels, and that protects them from having even more cardiovascular disease than they might otherwise have had. And there’s old data to suggest that’s true—that high levels of HDL were common in African Americans and therefore they were protected against heart disease. In the Jackson Heart Study, we have found that’s not the case.”

A MATTER OF TRUST

In 2007, Landry called several of the study participants for a follow-up visit. One of the men declined to return. He claimed that taking part was too expensive.

But it’s free, she told him.

“He said, ‘No, you all referred me to a doctor, and now I’ve got to take medicine,’” says Landry. “That was his perception—that there was an associated cost with the study. But of course, it’s our responsibility as medical people to refer someone if we find they have a condition that requires treatment.”

Clinical trials that focus on African-American populations, particularly in the South, have a burden of responsibility to bear ever since Alabama’s infamous Tuskegee Syphilis Study, which, between 1932 and 1972, led almost 400 poor, black sharecroppers infected

The Jackson Heart Study has been careful to meet those conditions, drawing in community support and participation from the very beginning. Each of the study’s committees includes two local residents, who help guide how the data will be used to benefit the study participants and the wider public. Volunteers suggest and carry out public programs such as weight loss initiatives and cooking demonstrations.

“Trust, truth and honesty,” were the study’s watchwords, according to Francis Henderson, the study’s deputy director. Most participants wanted to be informed immediately if they had a medical condition.

“They wanted black doctors and researchers. It was important that the people on the staff look like them. Most importantly, though, they wanted to know they would be listened to.”

WITH GRACE AND GUSTO

The Kentucky-born mystery writer Sue Grafton once said that as a Southern woman, she was taught two things: “Never call attention to yourself, and never make anybody uncomfortable.”

It’s excellent advice for an aspiring physi-

cian who wants to get the most out of the patient-doctor experience, and Landry follows it to the letter. Her voice is one of her greatest assets. Experience and travel abroad and in the U.S. has helped her cultivate an accent that she alters to suit the company and situation—anything from a brisk Boston clip to a leisurely Alabama stroll.

In an interview with one of the Jackson Heart Study participants, Landry senses the woman’s slight reluctance to open up about her eating habits. With a bit of conversation about the weather and local restaurants, and a polite sprinkling of “yes, ma’ams” and “no, ma’ams,” Landry easily establishes a common language of graciousness. In short order, her subject is smiling and talking about buffet dinners, barbecued chicken and her ongoing struggle with weight loss, which she knows is important if she wants to stay healthy.

Her clinical experiences in Jackson and abroad have taught her, Landry explains, that you have to listen to people if you’re going to discover how to treat them. Doctors need to understand that circumstances might be different for some patients, and maybe if they asked a few more questions, they would get at something essential.

“An African American from the South might use different words than a Northerner to describe an illness,” she says. “In some parts of the South, people still refer to diabetes as ‘the sugar.’ As in ‘I’ve got a touch of the sugar.’ You have to be sensitive to these things.”

Taylor and the others on staff at the Jackson Heart study value her delicate touch as much as her research. “Latrice is such a sweet, gracious individual that you are sometimes taken aback by how brilliant she is,” he says. “Her work is outstanding, and really poises her for a position of leadership in the field. If I had 10 more like her, I could retire.”

But Landry says it is simple stubbornness.

“You remember Ashley’s wife, Melanie, in *Gone with the Wind*?” she says, laughing. “When I was young, I wanted to be just like her, because she was so sweet and unselfish and gracious with everyone. But I realized I had a lot more in common with Scarlett. When someone tells me I can’t do something, I become twice as determined to do it.” **TN**

Claire Vail is a senior web content specialist at Tufts Medical School.

Stocking the World's Cupboard

The global food crisis reminded us that although we're growing more food, it is not yet enough.

Are we prepared for 2030? BY PATRICK WEBB



PHOTOS BY VITO ALUIA



FOR THE BILLIONS OF PEOPLE AROUND THE WORLD WHO EARN LESS THAN \$2 A DAY AND spend more than half of it on food, it has been an especially rough year. In a single day in early March, the price of wheat on the global market leapt a staggering 25 percent. In April, the price of rice soared 50 percent in just two weeks. This was on top of global food prices that had already doubled or tripled over the past couple of years. In dozens of countries from Bangladesh to Haiti, people rioted over the soaring costs of basic foods as many were threatened by the specter of hunger.

Several factors conspired to push up prices, including rising fuel and fertilizer costs, back-to-back droughts for food exporters like Australia and farms that devoted their acreage to growing currently lucrative biofuel crops rather than food.

But ironically, a key reason for the price hikes was not a generalized global shortage of food; it was the relative success of historically famine-prone countries in growing more food and reducing poverty. Places like India, China, Bangladesh, Vietnam, Brazil and Nigeria all saw their agricultural sectors improve between 1970 and 2000, thanks to a string of technological advances and agricultural reforms collectively known as the Green Revolution. Improved seeds, fertilizers and pesticides; better irrigation technologies; access to credit; investment in farmer education and local markets; and an opening up to the global economy all played a role in their agricultural success. This contributed to an economic prosperity that lifted many millions of people out of poverty. A new middle class began to buy more meat, fats, sugar and higher-quality cereal grains, much of which needed to be imported. And when demand goes up, so do prices.

This should not take away from the success of the Green Revolution, which was nothing short of a remarkable moment in human history. The share of undernourished people in the world fell by about half between the early 1970s and the mid- to late-1990s, not coincidentally because more cereals were produced each year in the last quarter of the 20th century than at any other recorded time in history. But the current crisis serves as a warning and a reminder that our war with hunger is not over. To avert greater food pressures down the road, we will have to learn some lessons from the previous 50 years of agriculture.

KEEPING UP WITH THE NEED

As prosperity and population growth converge to increase our demand for food, we will need to grow a lot more of it—an additional billion tons of cereals by 2030, according to some United Nations estimates. Developing countries in particular will need to step up their output. By 2030, developing countries are expected to produce only 86 percent of their own cereal consumption, with net imports rising from 103 million tons in 2000 to some 265 million tons. Given the damage already done by global price shocks, and the potential impact of higher fuel and

transportation costs, a dependence on imported food could carry a high price tag. To keep their imports to manageable levels, developing countries will have to invest much more in their own agriculture. Given constraints to expansion and concerns for protection of fragile natural resources, almost 70 percent of the increase in crop production in developing countries will need to come from higher yields, as opposed to farming more land.

Unfortunately, it is unclear if the world has yet made the appropriate investments to meet future demands. For years, too many international donors and developing country governments have largely ignored agriculture. The share of overseas development assistance (ODA) that went to agriculture fell from around 15 percent in 1980 to less than 4 percent in 2005. The allocation to Asia fell from more than \$4 billion in 1980 to \$1.5 billion in 2004, roughly the same level obtained by Africa, which received more than \$3 billion in the late 1980s. This lack of external funding was influenced by the long-term downward trend in prices and by signals from some donors (not all) that African governments should not waste too much time trying to generate national income growth from agriculture.

Last year, the World Bank wrote that the importance of agriculture to most growing economies “will shrink to boutique niches,” such that just a few resource-rich regions and countries will, in the future, supply more than 50 percent of the world’s grain. Needless to say, most donors still do not believe that Africa will be one of those regions. As a result, the capacity of Zambia’s Ministry of Agriculture, for example, to provide help to small farmers has seriously eroded. Zambia has devoted roughly 6 percent of its annual budget to the agricultural sector in recent years, but of this, less than 4 percent was allocated to agricultural researchers and extension agents, while 75 percent went to salaries for Ministry of Agriculture administrators.

True, it has proven to be a major challenge to introduce into Africa the package of products and practices that worked well elsewhere. The continent generally has a low population density, a lack of irrigation, poorly connected markets, under-funded local agricultural research and farmer education systems, and a tradition of growing crops other than cereals (such as cassava and beans) that have not lent themselves to major yield gains. As a result, while East Asia, South

Asia, Latin America and the Caribbean all saw their crop yields grow in recent years, yields in the North Africa/Near East region remained largely unchanged, and sub-Saharan Africa trailed far behind. Per-capita production of all staple foods (grains combined with soy and vegetables) was still lower in Africa in the late 1980s than it had been in the 1960s. In the early 2000s, less than 4 percent of sub-Saharan Africa's arable land was irrigated, compared with an average of 26 percent for all developing countries and more than 40 percent for South Asia. At the same time, Africa is the only continent that has seen child malnutrition rise in the past decade. This does not mean that gains cannot be made in Africa. Rather, we may need different approaches to achieve the productivity enhancements that were seen in the rest of the world.

QUANTITY VS. QUALITY

Even if the world increases its yields of the most commonly consumed grains (like wheat and rice), a focus on growth in cereal yields has implications for the net nutritional quality of diets. At the dawn of the Green Revolution in 1966, the scientist Roger Revelle pointed out that “cereal production tends to be emphasized at the expense of other crops in the underdeveloped countries, because it is a relatively efficient

way of producing food energy for human consumption.” He warned that large-scale increases in cereal yields were coming “at the expense of animal and vegetable protein and ‘protective’ foods, such as fruits and vegetables.” Some say that the new focus on wheat in countries like Pakistan and India has led to a long-term decline in the cultivation of higher-protein crops like peas, beans and lentils. That trend has been blamed for contributing to the high price of legumes in the 2000s and a decline in their consumption. Others argue that because the agricultural sector is boosting the economy, people are earning more, which should enable villagers to buy better-quality foods. But protein consumption has been declining in rural India, and many people seem to be eating fewer calories, dropping from a daily intake of just under 2,300 calories per person in the early 1970s to under 2,100 in 2004–05.

Productivity has also taken a toll on natural resources. Many problems have been pointed to over the years, including loss of biodiversity due to heavy pesticide and herbicide use; water pollution from fertilizer residue in irrigation drainage; exposure to pests or diseases due to increased mono-cropping; and more recently, output decline as soils taxed by intensive cropping over several decades are becoming depleted of nutrients and organic matter. For example, some argue that intensive irrigation of rice in India and Pakistan led to zinc and iron deficiency in the soil, which could have played a part in a recent slowdown in yields.

All these lessons emphasize the need for more investment in the agriculture sector—but in many places in ways different from the past. We need to continue agronomic research that raises productivity, but also focus on plants that can fix nitrogen in the soil (particularly legumes, but perhaps also cereals) to bypass some of the rising costs and potentially deleterious effects of excessive fertilizer applications. We have to

invest in nutrient-density traits and drought resistance, not only yield maximization. We should also give renewed attention to minimizing losses (both before and after harvesting), such that the burden of feeding more people does not rest solely on the plants themselves. We need to invest in education, clean water supplies and access to health care that together with food can support not just higher consumption but better nutrition and health.

The caveats that apply to the agronomic revolution of the 1960s take away none of its achievements. Our challenge today is to recreate those achievements in sustainable ways, with fewer environmental—and socially painful—side effects. **TN**

Patrick Webb, Ph.D., is a professor and dean for academic affairs at the Friedman School. He is the former chief of nutrition for the United Nations World Food Program.

Unfortunately, it is unclear if the world has yet made the appropriate investments to meet future demands. For years, too many international donors and developing country governments have largely ignored agriculture.





Packard Hall on the Academic Quad is being completely renovated. Construction is well under way to add five floors and 95,000 square feet to the 10-story dental school at One Kneeland Street on the Boston campus.



The Big Build

Game-changing facilities construction and renovation projects are taking place on all three Tufts campuses

C

ONSTRUCTION CREWS ARE NOT AN UNUSUAL SIGHT AT TUFTS these days, with new buildings, additions and renovations under way on all three campuses. Following is a list of current construction projects, and their estimated completion dates:

MEDFORD/SOMERVILLE CAMPUS

Packard Hall. The interior and exterior of this building, constructed in 1856 as a dormitory for 26 students, are being completely restored; plans also call for an elevator to provide improved accessibility. “The slate roof is about 50 percent in place now, and work has begun on a very small addition that will accommodate the elevator and a set of stairs,” says John Roberto, vice president for facilities. Completion is set for mid-March.

Tisch Library Roof Garden. This project will provide a new roof, an accessible entrance plaza, and the creation of an artistic garden/meditation space with seating areas, landscaping and mosaic tile. The installation of granite and masonry on the roof that will create those seating areas is under way. The project is scheduled to be completed in December.

51 Winthrop. The interior renovation of the former Sacred Heart Church, which Tufts purchased after the Archdiocese of Boston closed it, will create a large, mul-

tipurpose function space, including seating for 175 to 200 for dining and other events. “Work is under way on the exterior for the new front entrance with a handicapped-accessible ramp,” says Roberto. Demolition on the inside is substantially complete, and crews are beginning interior finish work. It is scheduled for completion in January.

BOSTON CAMPUS

Dental School Vertical Expansion. This project, which will add five floors and 95,000 square feet to the 10-story building at One Kneeland Street, is well under way. “Work is now beginning on the exterior skin of the building—the curtain wall—which should be complete in the December/January time-frame, at which time the building would be enclosed, and we would begin the interior fit-out,” Roberto says. The expansion of One Kneeland Street, which opened in 1972, will create more teaching and research space, a

continuing education suite, and offices and meeting rooms. The project is scheduled to be completed in November 2009.

Sackler Campus Center. The project involves the complete interior renovation of the basement and six of the Sackler Center's eight floors. It is planned as a three-phase project. The project is currently in phase two, which is scheduled to be finished in December. A new café, Food 4 Thought, which occupies most of the fourth floor of the Hirsh Health Sciences Library, opened in October. Renovations are ongoing for the eighth-floor administrative offices, classrooms and study rooms. Phase I saw the construction of space for new "learning communities" at the medical school—seven students and their advisor in each group—a configuration that will ensure personal attention for students and build a sense of community. The Class of 2012 is the first to begin their studies in the learning communities, which are housed on the second and third floors of the Sackler Center. Painted with vibrant colors and equipped with comfy chairs, TVs and kitchenettes, the communities provide space for classes, group study, mentoring and socializing. The final phase of the project, which will entail a major renovation of the first floor and the basement, is set to be completed by August 2009.

Clinical Skills and Simulation Center. This brand-new 9,000-square-foot facility, which opened this fall on the third floor of 35 Kneeland Street, adds yet another high-tech dimension to the clinical educational program at Tufts School of Medicine. Using computerized mannequins, students are able to refine their clinical and physical diagnosis skills, practice commonly performed procedures, and learn how to care for acutely ill patients as part of a team. The 12 patient exam rooms and three simulation rooms are outfitted with video and audio equipment so faculty can observe students interacting with standardized patients from observation rooms equipped with computer monitors.

Green Space. A former parking lot adjacent to the Jaharis Center on Harrison Avenue is being converted into open green space for the Boston campus community. "It's going to have some seating areas, some grass, some landscaping, a place for folks to come and relax, sit and enjoy lunch, or congregate in an

informal manner," says Roberto. "It is getting ready for planting and fencing now, and should be completed by late November."

GRAFTON CAMPUS

Agnes Varis Campus Center Auditorium. The addition to the new campus center at the Cummings School will include a 173-seat auditorium, equipped with state-of-the-art acoustics, lighting and audio-visual electronics, and a continuing education facility. "The ability to hold campus-wide meetings, national and international meetings, and community hearings on our campus will broaden our impact on society and academic life, while bringing faculty, students, staff and the local community closer together," says Andrew Hoffman, associate professor of clinical sciences and director of the Lung Function Testing Laboratory. "The exterior of the building and the masonry are substantially complete," Roberto says, and

work is starting on step risers to accommodate auditorium-style seating. Completion is scheduled for early February 2009.

New England Regional Biosafety Laboratory. The exterior and site work for this facility, which will allow researchers to focus their work on emerging infectious diseases and food- and waterborne illnesses, are substantially complete, and the mechanical systems have been installed. The project is on schedule for a December completion of construction activity. "Then there will be a period when the systems will be commissioned, meaning they will be operated to ensure all the mechanical, electrical and plumbing systems are operating as designed," Roberto says. The construction is being funded with some \$20 million from the National Institutes of Health and another \$9.4 million from Massachusetts' new Life Sciences Initiative, which will offset some capital investment in the building.

TIME TO SERVE



In the cover story of the September 22 issue of *Time* magazine, "21 Ways to Serve America," Tufts President Lawrence S. Bacow joined the likes of Colin Powell and Arnold Schwarzenegger in penning suggestions for improving the country.

In his article, "Get Your College Involved,"

Bacow wrote that colleges and universities "have a special responsibility to educate the next generation of active, engaged citizens" and encourage them to get involved in public service.

He argued that to "address this nation's major challenges, we need people across the political spectrum to serve in government, to run for office and to work to build stronger, more vibrant communities."

Bacow outlined the efforts Tufts has made to encourage its graduates to pursue careers in the nonprofit or public sectors, focusing on the Loan Repayment Assistance Program, believed to be the first university-wide program of its kind in the country. The program, called LRAP, received more than 400 applications for assistance this year.

"Helping young people pursue their passion for service is one of the best investments our society can make," Bacow wrote.

Scoping Out Supplements

Applying science to alternative therapies is nothing to sneeze at

T

HE QUESTION HAS PLAGUED SNIFFLY CONSUMERS IN DRUG STORE aisles across the nation. So once and for all: Is echinacea an effective vanquisher of the common cold, or just the mother of all supplement scams?

Getting to the answer reveals some of the complexities, even frustrations, inherent in alternative nutrition research. Wendy Weber, a naturopathic doctor and a research associate professor of natural health sciences at Bastyr University in Kenmore, Wash., has run into many challenges while studying this well-publicized plant. One confounder is that there are three different echinacea species that are used medicinally, with each featuring a number of chemicals that could have beneficial properties. And which part of the plant works the most alleged magic? Is it the dried roots or fresh stems? Leaves or flowers? Some people drink it as tea; some swallow pills. "With echinacea we don't know exactly what to focus on" in clinical research, Weber said.

Weber was one of four experts who spoke at the 2008 Gershoff Symposium, which this year highlighted complementary and alternative nutrition. Nutrition researchers, they said, should be aware of the field's potential and its drawbacks, especially in light of 1994's Dietary Supplement Health and Education Act (DSHEA).

"DSHEA casts this huge umbrella over what is defined as a dietary supplement," said Paula Gardiner, M.D., an assistant professor in the family medicine department at Boston Medical Center. Teas, tinctures, capsules, shakes, drinks, concentrates, metabolites and extracts are just some of the many forms of supplements. It's a huge industry. In 1990, only 2 percent of people reported using herbal medicines. In 2002, 19 percent did.

According to DSHEA, such remedies are characterized not by their contents, but by their intentions. While supplements cannot claim to treat or prevent diseases, they can make general wellness statements that imply health benefits.

"You use calcium to improve bone health, it's a dietary supplement. You use calcium to treat osteoporosis, it's a drug for that patient," said Jonathan Berman, M.D., Ph.D., director of clinical and regulatory affairs for the National Center for Complementary & Alternative Medicine at the National Institutes of Health.

Joseph Pizzorno, N.D., founding president of Bastyr University, is a longtime supporter of the strategic use of foods, herbs and vitamins to influence health. He acknowledged that botanical remedies are not studied as thoroughly as pharmaceutical drugs. This "lower standard of evidence" is appropriate, he said, when nutrients have low toxicity and are used in areas where safer alternatives are not available.

"We don't have to spend \$300 million proving that when a person needs more vitamin C that you give them more vitamin C," he said.

At the biochemical level, roots, herbs and some common foods have some of the same properties as familiar pharmaceuti-



Josiemer Mattei, N04, M04, Stanley N. Gershoff Scholar; Grace Bennett, Gershoff Scholar; Alison Tovar, N06, M06, recipient of the 2008 Stanley N. Gershoff, Simon J. Simonian, Arpi A. Simonian Prize for Research Excellence in Nutrition Science and Policy; Alice Lichtenstein, Stanley N. Gershoff Chair; Stanley Gershoff, dean *emeritus*; Dean Eileen Kennedy; Julie Evans, N08, Gershoff Scholar; Latrice Goosby Landry, A02, N04, N09, M12, Gershoff Scholar; and Simon Simonian.

cals, he said. He used the examples of green tea, licorice root, ginger, onion and willow bark, which are all used by naturopathic physicians to reduce inflammation.

Like drugs, these foods can chemically interfere with the enzymes involved in inflammation, such as Cox-2. “Most drugs are enzyme poisons,” Pizzorno said. “What are Cox-2 inhibitors? They are Cox-2 poisons.” Botanicals, on the other hand, he said, are able to more gently “tune down the enzyme” without eliminating it altogether.

One drawback of DSHEA is that supplements are largely unregulated by federal agencies. As a result, “what’s on the label’s not always what’s in the bottle,” said Gardiner. Products often contain less of a key ingredient—such as ginseng—than their labels claim. For example, Wisdom, a soft drink made by the SoBe beverage company, promoted its nutraceutical ingredients, including St. John’s wort, a mood enhancer. But an analysis found that a person would have to drink 15 to 45 bottles of Wisdom daily to get what naturopathic doctors consider a therapeutic dose, Gardiner said.

Even more alarming was a study that showed 20 percent of Ayurvedic products, traditionally used in Eastern medicine, are contaminated with heavy metals.

Still, sales of supplements like chamomile, St. John’s wort, garlic and ginseng are strong. At the top of the list is echinacea. In 2006 echinacea sales topped \$129 million in the United States alone.

The National Center for Complementary & Alternative Medicine (NCAMM), a government agency that funds research, finds that echinacea has gotten mixed results in clinical trials, with most studies to date indicating that echinacea does not appear to prevent colds. NCCAM is continuing to support the study of echinacea for the treatment of colds and other upper-respiratory infections. With echinacea and some other supplements, Berman said, it is possible that researchers have not been using large enough doses in their experiments. “Placebo-controlled dose ranging trials are the way to go,” he said.



Tim Griffin

CO₂: A HOT POTATO ISSUE

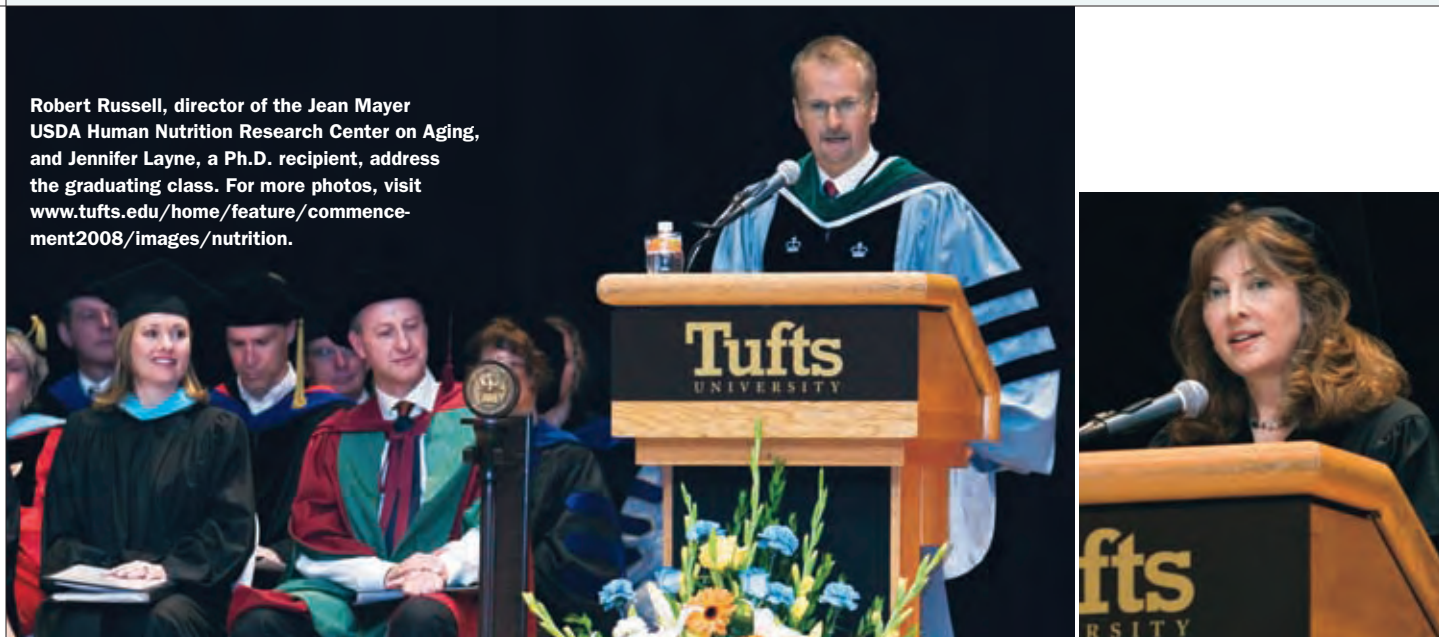
Tim Griffin has spent a good portion of his career helping farmers learn to keep fertilizer nutrients where they belong: in the soil. He has looked for ways to keep phosphorus from washing into rivers and streams; nitrogen from dissipating into the air as ammonia; and most recently, carbon from wafting skyward as CO₂, one of the greenhouse gases that is causing global warming.

Although other scientists have studied the CO₂ production of commodity crops like corn and wheat, Griffin, who joined the Friedman School this summer as an associate professor in the Agriculture, Food and Environment Program, has measured how much greenhouse gas is released by high-value crops, like potatoes. Because potatoes grow underground, harvesting them means disturbing the soil a lot. “When you do that, every time you do that, there is a flux of carbon dioxide,” he says. “And those kinds of intensive farming operations do that a lot, more than if you were a wheat farmer in eastern Washington, where you might not stir the soil at all.”

Measuring the gas released is only the first move. “The difficult step is can you make the leap and talk about how that might influence an entire set of farms,” Griffin says. The goal is to turn the science into effective policies that make sense for both potato growers and the planet.

Griffin is a former research agronomist with the USDA Agricultural Research Service at the University of Maine. From 1992 to 1998, he held positions with the Extension Service, where he was appointed the first sustainable agriculture extension specialist in the United States. Griffin has a Ph.D. in crop and soil science from Michigan State University, an M.S. in agronomy and a B.S. in forage and range management, both from the University of Nebraska.

Robert Russell, director of the Jean Mayer USDA Human Nutrition Research Center on Aging, and Jennifer Layne, a Ph.D. recipient, address the graduating class. For more photos, visit www.tufts.edu/home/feature/commencement2008/images/nutrition.



COMMENCEMENT 2008

Graduates bring needed skills to a nutrition-challenged world

WITH FOOD AND NUTRITION ISSUES—from the high cost of food to lifestyle diseases—affecting both underdeveloped and industrialized nations, Dean Eileen Kennedy, D.Sc., told the audience at the school's 27th commencement ceremony on May 18 that the world seems ready to put the skills of this year's 69 graduates to work.

"It is unambiguous to me, with your talent you will be in high demand," Kennedy said at the start of the ceremony, held at Cohen Auditorium on Tufts' Medford/Somerville campus.

Robert Russell, M.D., director of the Jean Mayer USDA Human Nutrition Research Center on Aging, agreed, but added that few graduates will end up doing what they expected to do. In his commencement address, Russell related his own experience, saying that after finishing medical school he was certain he would be a psychiatrist. Instead, he was drafted during the Vietnam War. Seeing the diseases suffered by malnourished war orphans inspired him to embark on a career in nutrition and public health, including more than a quarter century at the Friedman School.

Russell, who was named a professor *emeritus* earlier in the day at the university-wide commencement ceremony, also spoke of his setbacks. He spent several years researching beta-carotene, which had shown some strong promise as a cancer-fighting nutrient. But his hopes

were dashed when it was discovered that high doses of the compound can actually stimulate lung cancer in smokers.

"Since a lot of my career up to that point had been invested in beta-carotene, I thought this was devastating, and I was going to have to find another career," he said. But he decided to look at the reasons behind these effects and found four new genomic and cell-signaling mechanisms that could explain the paradox, opening up a whole new research area.

The upside of failure was also a theme for Jennifer Layne, a Ph.D. recipient, who revealed in her class address that she did not pass her doctoral qualifying exams the first time she took them. She learned that it's important to be able to articulate what you know, and to admit what you don't know. "If we can be humble enough to view each mistake as an opportunity to learn, then we will be successful, both personally and professionally," she said.

During Tufts' all-university commencement earlier in the day, Tufts President Lawrence S. Bacow presented honorary degrees to Meredith Vieira, J75, co-host of NBC's "Today" show; Pulitzer Prize-winning poet Mary Oliver; Steven S. Manos, retired executive vice president of Tufts; Robert S. Schwartz, deputy editor of The New England Journal of Medicine and former professor at Tufts School of Medicine; Susan Rodgers, founder of Artists for Humanity; and Donald E. Wilson, M62, senior vice president of health sciences at Howard University.

Scenes from Reunion 2008

1. Assistant Professor Sai Krupa Das, N02, seen here, served as reunion co-chair with Sarah Ash, N82, N86.

2. Gregory Auclair, N88, and Julie Auclair at the cocktail reception at Ivy Restaurant and Wine bar

3. Melinda Downie Maryniuk, AG79, recipient of the Alumni Association's Service to the Profession Award, and her husband, George Maryniuk, D80

4. Ph.D. candidates Chloe Puett and Lucy Bassett, both Gerald J. Friedman Fellows in Nutrition and Citizenship

5. The Alumni Association's Faculty Award was presented to Professor Willie Lockeretz, seen here with Marla Rhodes, N96, Claire Kozower, N99, and Julie Petot, N99.

6. Dean Eileen Kennedy presented the Alumni Association's Frontline Award to Professor Xiang-Dong Wang, N92, A12P.

7. Hugh Joseph, N84, N94, Bill Reid, N90, and Tessa Wymer Cooper, N83



N88 Haddy (Gabbidon) Jallow is the network project director/research scientist for the Thalassemia Clinical Research Network at the New England Research Institutes. She is responsible for the management and oversight of the day-to-day operations of clinical trials implemented within the network.

N90 Bill Reid, see N02.

N98 Jen Otten and Greg Dean tied the knot on August 18, 2007, on the top of Aspen Mountain in Colorado. The groom and friends hiked to the top of the mountain for the ceremony, while the bride rode up in the gondola.

N00 Suzanne Dorfman, J98, N05, married Marc Busche on June 7 in Truro, Mass. She now lives with her husband in Germany.

N02 Kristen Cashin, J97, is a maternal and child health and nutrition specialist with the Food and Nutrition Technical Assistance (FANTA) Project of the Academy for Educational Development (AED) in Washington, D.C. She received a 2008 Technical Leadership Award from AED with her FANTA colleague Hedwig Deconnick Sr., an emergency nutrition specialist, for the development of training modules for community-based management of acute malnutrition.

Sai Krupa Das, president of the Friedman School Alumni Association, was one of 15 recipients of Microsoft's HealthVault Be Well award, which funds the creation of computer applications that allow individuals to monitor

and track their health online and share information with their health-care providers. Her proposal, titled "The Remote Monitoring of Body Weight and Food Intake in Free-Living Individuals," was chosen from nearly 200 submissions. She learned of Microsoft's request for proposals from **Bill Reid**, N90, director of the HealthVault Platform Strategy, when he spoke at a career panel during an All-Alumni Reunion at the Friedman School.

Cheryl Gilhooly gave birth to her first child, Sadie Lynn, on March 21.

Casey Lewis has accepted a position as the health and nutrition marketing manager for Welch's Inc.

ARE YOU ON FACEBOOK?

If you are an alum, faculty member or student of the school, join the Friedman School Alumni Association group page on www.facebook.com, where you can share news and photos and get updates from the Alumni Association.



TRAVEL TO EXTRAORDINARY PLACES WITH EXCEPTIONAL PEOPLE

TRAVEL-LEARN

Available ONLINE: our exciting new line-up of 2009 destinations!

From the Baltic to Bora Bora, from Greece to Peru, our journeys feature intellectual inquiry with lectures and exploration. There's a perfect trip for every taste! Call Usha Sellers, Program Director, at 800-843-2586 for our brochure or visit our website for itineraries. www.tufts.edu/alumni/ed-travel-learn.html



N03 Sarah (Buckner) Barber was married in May and is currently working for Abbot Nutrition.

Vanessa Cavallaro has accepted a consulting position with the national nonprofit Action for Healthy Kids and continues working part-time at Tufts Medical Center.

Congratulations to **Ning Wan** on the birth of her daughter, Karen, in July. Karen joins her two-year-old brother Philip.

N04 Reena Kanbar, M08, is pursuing a residency in obstetrics and gynecology at St. Luke's Hospital in Bethlehem, Pa.

N05 Xiang Gao writes: "Recently, I was selected to the Parkinson Study Group (PSG) Mentoring Committee for a three-year term (2008 to 2011). PSG is a non-profit group of physicians and other health-care providers from medical centers in the United States and Canada, experienced in the care of Parkinson's patients and

dedicated to clinical research of Parkinson's disease, including more than 350 active investigators, coordinators and scientists." He is currently a research associate at the Harvard School of Public Health.

Fan Fan Han was the main contact in China working with the World Health Organization Food Safety Department during the Beijing Olympics. She also helped create the 3 Fives health-promotion materials with the Beijing Food Safety Administration and the Chinese Ministry of Health. The 3 Fives

materials helped launch a campaign to raise awareness of food safety, nutrition and the benefits of physical activity among everyone involved in or observing the 2008 Summer Games.

Karrie Kalich's "Early Sprouts Program" earned the "Healthy Youth for a Healthy Future" Community Champion Award. The program, a 24-week nutrition and gardening curriculum for preschoolers, originated at Keene State College in New Hampshire in 2006. Kalich worked with Keene State students and faculty from the nutrition and education departments to implement a program to address childhood obesity.

Tatyana El Kour is the new president of the Overseas American Dietetic Association.

Deepa (Bhat) Lakshmi Shanadi welcomed her daughter, Divya, into the world on June 21.

N08 Rachel Cheatham has accepted the position of director of nutrition communications at Weber Shandwick in Chicago.

Allison Parker has been hired as corporate nutritionist for the Buffalo division of Wegmans Food Market Inc.

SAVE THE DATE

All-Alumni Reunion April 4-6, 2009

Joins us for the All-Alumni Reunion on April 4-6, 2009. Enjoy reconnecting with friends and faculty, as well as attending the Gershoff Symposium and the presentation of the Alumni Association Awards.

Graduates of the last five years, 2004 through 2008 can catch up with classmates at a private one-hour reception.

For more information about the reunion, visit nutrition.tufts.edu/reunion. Interested in volunteering? Contact Sean Devendorf at sean.devendorf@tufts.edu.

COMING RIGHT UP

December: "A Toast to Finals" student/alumni networking night at Jacob Wirth Restaurant in Boston

March 2009: Alumni/Student Networking Trip to Washington, D.C., during spring break

April 2009: Alumni Association reception at the Experimental Biology Conference in New Orleans

May 2009: Friedman School Alumni Association Champagne Toast for new graduates

WE WANT TO HEAR FROM YOU!

Have a new job? Published a book or paper? Is your family growing? Are you getting together with classmates? Keep fellow graduates up to date by sharing your news.

Send to:

Sean Devendorf,
Director of Annual Giving and Alumni Relations
136 Harrison Avenue, Boston, MA 02111
Or e-mail sean.devendorf@tufts.edu or go online to <http://alumni.nutrition.tufts.edu>

CLASS NOTES DEADLINE FOR NEXT ISSUE IS MARCH 1, 2009



Overseer Ellen Block, J66; Provost Jamshed Bharucha; Overseer and Trustee Emeritus Edward Budd, A55, J80P, J86P; Overseer and Trustee Emerita Joan Bergstrom, J62; Nevin Scrimshaw; Dean Eileen Kennedy; Overseer Edward Cooney; Overseer Barry Rosenbaum, A60, and President Lawrence Bacow. Below: Eileen Kennedy and Trustee Emeritus Nelson Gifford, A52, H96, present a Dean's Medal to Edward Budd.

Lasting Legacies

Medal ceremony honors dear friends of the school

THE FRIEDMAN SCHOOL'S HIGHEST PRIZE, THE DEAN'S MEDAL, HAS BEEN awarded to Tufts Trustees *Emeriti* Joan M. Bergstrom, J62, and Edward H. Budd, A55, both members and former chairs of the Friedman School's Board of Overseers, and to Visiting Professor Nevin Scrimshaw, a pioneering researcher in the field of nutrition.

"It's an honor to be able to acknowledge the extraordinary contributions of these three individuals to the Friedman School," said Dean Eileen Kennedy, who presented the medals at a ceremony on September 23. "With their energy, generosity and dedication, they have helped shape the institution, and they continually create new possibilities for exciting developments here."

Bergstrom, a professor of education at Wheelock College, has long been associated with children's issues as an educator, author, consultant and entrepreneur. As a volunteer leader at Tufts, she has sought to expand the university's ability to positively impact children around the world. Her generosity has enabled the Friedman School to hire a new junior professor, who will address such vital global issues as malnutrition, hunger, food insecurity and famine. The newly created Bergstrom Foundation Professorship in Global Nutrition will focus on nutrition for mothers and children. Bergstrom is a past recipient of the Tufts University Alumni Association's Distinguished Service Award. Previously she, her husband, Gary, and son Craig established the Bergstrom Family Chair in

Applied Developmental Science, the first endowed chair in Tufts' Eliot-Pearson Department of Child Development.

Budd has championed ways to provide the school with long-term strength and ongoing growth. In 2003, he issued a challenge to potential donors, pledging to donate \$1.5 million to the school's endowment if others would give \$10 million over a five-year period. When his challenge—the "Budd





Assistant Professor Jennifer Coates, J94, N00, N06; Dean Eileen Kennedy; Office Manager Marlene Smith, and Kyung Jae Kang, N03. Below: Joan Bergstrom and University Professor Irwin Rosenberg.



Challenge,” as it is known—draws to a close, the Friedman School will have raised \$11.5 million toward its endowment. Budd is a retired chairman of the board and chief executive officer of The Travelers Corp. He and his wife, Mary, regularly give to the Friedman School’s Annual Fund and have endowed funds for undergraduate scholarships and nutrition education and research.

Scrimshaw, founding president of the International Nutrition Foundation at the Friedman School, is a giant in the field. In the 1950s, he pioneered a method for fortifying salt to save poverty-stricken children in Central America from iodine deficiency disorder. He also created a protein-rich weaning food adopted by mothers throughout the world and helped form the United Nations University’s World Hunger Program. In 1991, he received the top accolade in the food and nutrition sector, the World Food Prize. Scrimshaw continues to advocate for universal food fortification in developing countries to combat micronutrient deficiencies.

—Amy Rosenberg

FOUNDATION GIFT ACCENTUATES THE POSITIVE

“POSITIVE DEVIANCE” HAS AN UNUSUAL-SOUNDING NAME, BUT AS AN APPROACH TO SOLVING community problems in the developing world, it rests on common sense.

The practice pioneered by the Friedman School’s Positive Deviance Initiative enables poor and vulnerable communities around the world, as well as organizations such as schools and hospitals, to harness local wisdom to address problems requiring social and behavioral change. The positive-deviance (PD) approach is being used to address challenges as diverse as childhood malnutrition, maternal and newborn care, environmental conservation and school performance.

The Positive Deviance Initiative has received a \$3 million pledge from the Rockefeller Foundation, including a \$1 million matching gift from the foundation if the Friedman School raises \$1 million for the initiative by 2012. The pledge was made in recognition of “the importance of PD as a ‘big idea’ and the importance of diffusing the approach throughout the world.”

Positive deviance argues that every community has certain individuals or groups whose special practices or behaviors enable them to find a better solution to a problem than their neighbors or colleagues in the exact same circumstances. These individuals or groups “deviate positively,” and the approach enables the community to discover and adapt their uncommon—but demonstrably successful—practices.

Jerry Sternin, director of the Positive Deviance Initiative, and his wife and colleague Monique Sternin pioneered the positive deviance approach in Vietnam in the 1990s, inspired by the seminal research work on positive deviance in nutrition by Marian Zeitlin, a former Tufts professor and now a visiting professor at the Friedman School.

“Positive deviance is grounded in the wisdom of the people and the potential transformation from unleashing that wisdom,” said Bonnie Newman, interim executive director of the Positive Deviance Initiative.

Take the example of an African village in which many children are malnourished and underweight, but a few are thriving. The mothers of the healthier children have habits different from the mothers of the less-healthy ones: Perhaps they wash their hands before preparing food, or make an extra effort to find green vegetables growing near their homes. Whatever the case, they follow beneficial practices that others in their community also could be following, but are not. Such mothers are “positive deviants.” PD facilitators might help arrange daily meetings during which the “positive deviant” mothers explain how they obtain and prepare food, and then lead the group in making a meal together.

The Positive Deviance Initiative’s current projects include addressing childhood malnutrition in about 40 countries across three continents, lowering high school drop-out rates in California, preventing goiter in Indonesia and hospital-acquired infections in the United States, and improving maternal-child health and nutrition in Guatemala.

With the Rockefeller grant, the Positive Deviance Initiative will train more professionals in the methodology, support research to evaluate its effectiveness, expand the number of PD projects worldwide and create a community of practice via its new website. “We are moving from a small venture to a multifaceted outreach and education center,” Newman said.

—Amy Rosenberg

“It’s exciting to see how well kids can do when they are getting the best nutrition they can get.”

Abigail Usen, N03,

a dietitian at Floating Hospital for Children at Tufts Medical Center, helps kids like Madison Worden, who has a metabolic disorder, get the nutrients and energy they need to go to school, socialize with friends—and look forward to a promising future.

A graduate of the master’s degree in nutrition and dietetic internship program at the Frances Stern Nutrition Center, which is part of the Gerald J. and Dorothy R. Friedman School of Nutrition Science and Policy at Tufts as well as Tufts Medical Center, Usen creates comprehensive—and effective—diet regimens for her patients, drawing on the best research and latest technological advances.

Your gift to the Friedman School annual fund supports programs like the Frances Stern Nutrition Center and gives children, like Madison, the chance to live a healthy life. Please give today.

Make your gift today in support of the Friedman School. Mail your gift using the envelope in this issue or online at tufts.edu/givenow.

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PHOTO: MELODY KO

MUST IT RUN IN THE FAMILY?

Growing up, Latrice Goosby Landry wondered why so many of her relatives suffered from persistent health problems. Might it somehow be related to what they ate? Landry has headed south to find out. For more on the story, turn to page 18.



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