

# Tufts

## Nutrition



# WHY SO GOOD?

The science behind yogurt's  
aura of health

# MOM, THERE'S SOMETHING GREEN ON MY PLATE!

Years ago, the parenting party line was that kids had to clean their plates before leaving the table, even if meatloaf made them gag. Then parents were advised to present healthy options to their kids, but let the kids decide whether and how much of each choice to eat.

The result, says Deborah Kennedy, Ph.D., N93, N03, is that we are raising a nation of picky eaters, and what they pick is usually not good for them.

"We cannot put our children in control at a time when they have access to junk food wherever they turn," she writes in her book *The Picky Eating Solution* (Fair Winds Press, 2013).

Kennedy advocates for a parenting style somewhere between old-school strict and current-day lenient. Making kids try a bite of a new food and then requiring more bites at future meals? Good. Not letting them have dessert unless they eat their veggies? Sound advice. She advocates serving a fruit or veggie with every meal or snack and serving only one dinner (as opposed to being a short-order cook).

Despite the book's title, she doesn't pretend that there is one magical solution for getting junior to open his mouth. Picky eaters come in all styles, from the kid who fears anything unfamiliar to the kid who won't sit still at the table long enough to cajole a carrot into him. Parents need to use a food strategy crafted just for their little one's needs, and Kennedy provides several. For the truly neophobic child, for example, you might have to let the child touch the food, smell it and lick it before you make him take that first bite.





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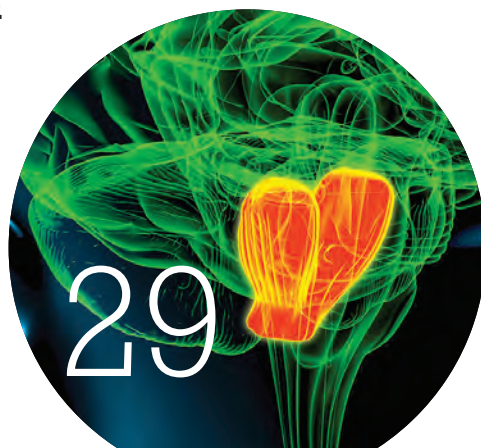
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# THIS IS NUTRITION'S TIME



**AS THE NEW DEAN** of the Friedman School, I am tremendously enthusiastic about joining the Tufts family and its terrific students, staff, faculty and network of alumni and friends. Together, we provide unique opportunities for cutting-edge research, education and multidisciplinary innovation in nutrition science, agriculture, economics, sustainability and policy.

I am deeply passionate about food and how it influences our communities, our environment, our families and ourselves. The Friedman School, the most renowned graduate school of nutrition in the world, focuses on increasing the understanding and translation to policy of some of the most fascinating, important and complex issues of our time.

One of the Friedman School's most unusual qualities is the drive of our students, faculty and alumni to not only deepen our understanding of important scientific questions, but also study and influence policies to achieve lasting change. This combination is crucial: Policy without science is dangerous, and science without policy is merely stale knowledge.

I arrive at Tufts after a decade at Harvard, where as a faculty member, cardiologist and public health advocate, I focused on elucidating the key dietary priorities for cardiometabolic diseases, the impact of suboptimal diet on chronic diseases worldwide and the most cost-effective policies to improve diet quality in the United States and around the world. My core research team and projects have come with me, and we are excited to integrate our work into the complementary portfolios for innovation that already exist at the Friedman School, the Human Nutrition Research Center on Aging and across Tufts.

In recent years, remarkable scientific advances have made clear that how we eat is the leading cause of poor health and how we produce our food is the leading cause of environmental injury. Creating enough healthy, sustainable and equitably distributed food has truly become a top global priority. Together with the strong support of Tufts President Anthony Monaco, our alumni and our friends, the Friedman School is poised to leverage and multiply its breadth and depth of education, scholarship, advocacy and policy impact to make a tremendous difference in the lives of Americans and hundreds of millions more around the world.

This is nutrition's time. It is a privilege to serve the school and travel forward together on this next phase of the Friedman School's incredible journey.

**DARIUSH MOZAFFARIAN, M.D., Dr.P.H.**

Dean, Gerald J. and Dorothy R. Friedman School of Nutrition Science and Policy

## Tufts Nutrition

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# FIGHT EPIDEMICS WITH FOOD



**THE DEADLY OUTBREAK** of Ebola in West Africa continues to spread, despite the heroic efforts of health-care workers. Those patients who contract the disease and survive appear to have something in common: Their bodies are able to stand up to the virus's first attack with a robust immune response, followed by a measured inflammatory response. This keeps the virus from rapidly reproducing and causing lethal damage to key organs.

As I read news stories about the outbreak, I can't help but ask what role nutrition could play in helping stem the spread and mortality of the disease—and perhaps deterring future outbreaks. We have known for many years that a healthy immune system goes hand in hand with good nutrition. Adequate nutrition plays a key role in ensuring a robust and early immune response as well as a disciplined inflammatory response.

Nutrients are needed for the normal function of the immune response, whether it is to increase the number of cells capable of fighting the virus, produce antibodies and other key mediators, such as cytokines, or kill the invading pathogens. Proper nutrition is also important in keeping inflammation under control. Producing inflammatory molecules is part of the normal process of defending the body against viral infections, yet heightened and continued inflammation, as is seen with Ebola, can result in extensive cellular damage with dire consequences.

It seems telling that many emerging infectious diseases have originated in regions of the world where malnutrition is prevalent. Malnutrition is the primary cause of immunodeficiency worldwide, and West Africa is no exception. The area has long struggled with a food crisis brought on by seasonal food shortages and high prices. (See “Finding the Next Famine,” page 18.) A 2012 report about Liberia found that 36 percent of the population was malnourished.

I wonder how continued food scarcity will affect future outbreaks. If a vaccine were to be developed for Ebola, how effective would it be in a malnourished person with an impaired ability to produce antibodies and appropriate cell-mediated responses?

At first glance, the Ebola outbreak is a medical crisis, but at its core, it is also a nutritional one. While the barriers to better nourishing the global population have never been more complex, we have even more reason to strive to do so.

A handwritten signature in black ink that reads "Simin Meydani".

SIMIN NIKBIN MEYDANI, D.V.M., Ph.D.

Director, Jean Mayer USDA Human Nutrition Research Center On Aging

## LAURELS

Professor **JEFFREY BLUMBERG**, director of the HNRCA Antioxidants Laboratory; **BETH DAWSON-HUGHES**, M75, director of the HNRCA Bone Metabolism Laboratory; and **DARIUSH MOZAFFARIAN**, dean of the Friedman School, were included on the Thompson Reuters list of the World's Most Influential Scientific Minds for 2014. The list cites the top thinkers in 21 fields and is based on how frequently their publications were cited by other scientists between 2002 and 2013.

Professor **JOHANNA DWYER**, director of the Frances Stern Nutrition Center, received the inaugural Trailblazer Award and Lectureship from the Academy of Nutrition and Dietetics and the Institute of Food Technologists.

Professor **WILLIAM MASTERS** and Margaret McMillan, an associate professor of economics in Tufts' School of Arts and Sciences, won the Publication of Enduring Quality Award from the Agricultural and Applied Economics Association. The award recognizes their 2001 study, “Climate and Scale in Economic Growth,” published in the *Journal of Economic Growth*.

## OUR NEW LOOK

With this issue, you'll notice an updated look to *Tufts Nutrition*. The magazine will continue to bring you a wide range of stories to keep you connected with the Friedman School and the HNRCA. You'll notice a new section called “From All Corners,” where you'll find news about the school, the research center and the rest of Tufts University. It is also the place to learn about events for alumni and friends and to share your news with your Friedman School classmates. Let us know what you think.



# A La Carte



## For a Longer Life, Add Less Salt

Study finds too much sodium a worldwide killer

**A** **AMERICANS ARE NOT** alone in their taste for salty foods. Whether the salt comes from french fries or miso soup, people all over the world are getting more than the current recommendations. And according to an analysis of global sodium intake published in *The New England Journal of Medicine*, that overabundance of salt accounts for more than 1.6 million cardiovascular-related deaths each year.

The researchers looked at existing data on sodium intake in 187 countries representing nearly three-quarters of the world's adult population. Separately, they determined the effects of sodium on blood pressure and of blood pressure on cardiovascular diseases—including heart disease and stroke—by analyzing more than 100 previous clinical trials. These findings were combined with current

rates of cardiovascular disease around the world to estimate the number of cardiovascular deaths attributable to taking in more than 2,000 mg of sodium per day, the World Health Organization's recommended amount.

In 2010, the average global sodium consumption was nearly double that recommendation—3,950 mg—the researchers found. In fact, all regions of the world were above recommended levels, with averages ranging from 2,180 mg per day in sub-Saharan Africa to 5,510 mg per day in Central Asia.

"These 1.65 million deaths represent nearly one in 10 of all deaths from cardiovascular causes worldwide. No world region and few countries were spared," said first and corresponding author Dariush Mozaffarian, M.D., Dr.P.H., dean of the Friedman School, who led the research while at the Harvard School of Public Health. Some of the highest rates were in East Asia and Southeast Asia, where excess salt consumption accounted for more than 20 percent of cardiovascular deaths in people under age 70, the study found.

In the United States, the researchers found that nearly 58,000 cardiovascular deaths each year could be attributed to daily sodium consumption greater than 2,000 mg. Average U.S. sodium intake was 3,600 mg per day, 80 percent higher than the WHO's recommendation and 57 percent higher than the 2,300 mg recommended by the *Dietary Guidelines for Americans*.

"These new findings inform the need for strong policies to reduce dietary sodium in the United States and across the world," said Mozaffarian, who chairs the Global Burden of Diseases, Nutrition and Chronic Disease Expert Group, an international team of more than 100 scientists studying the effects of nutrition on health that contributed to the research.

## LUTEIN? SMART MOVE

Researchers have known for a while that getting enough lutein in your diet seems to be a good thing for eye health. People who consume more of this deep yellow pigment found in green, leafy vegetables and brightly colored fruits are less likely to develop age-related macular degeneration, for example. But lutein may have a special role in brain health as well.

In an article she wrote for the journal *Nutrition Reviews*, Assistant Professor Elizabeth Johnson, Ph.D., a scientist in the Antioxidants Research Laboratory at the Jean Mayer USDA Human Nutrition Research Center on Aging (HNRCA), makes a case for studying lutein's cognitive benefits. She points out that the brain absorbs more lutein than it does other carotenoids, including beta-carotene and lycopene. One study found that having a lutein-rich brain was associated with better marks on a wide range of cognitive tests, including executive function, language, learning and memory.

The need for lutein may start early. Johnston writes that because children have twice the percentage of lutein in their brains as adults, there is a good chance that lutein is important for neural development during the first years of life.

Unfortunately, most Americans don't get enough. While there is no recommended dietary intake for lutein, it takes 6 mg per day to lower the risk of age-related macular degeneration. The average adult gets less than 2 mg per day. Kale, collards and spinach are the lutein powerhouses, but you can also find it in broccoli, eggs and avocados, among other foods.

## BROCCOLI ON THE BRAIN

You can learn to crave healthy foods

**PEOPLE TEND TO** assume that they were born with a yen for high-calorie junk food, because it's so much easier to turn down a serving of broccoli than a batch of french fries. But a small study done at Tufts last fall showed that our appetites are formed in response to learned behavior.

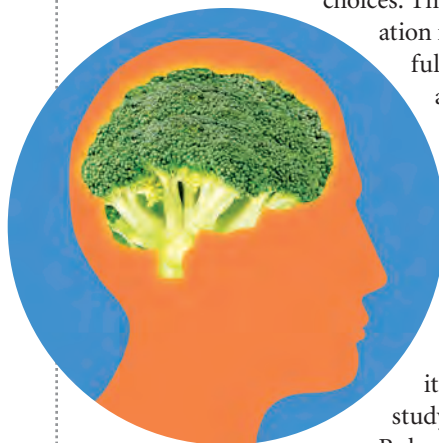
"We don't start out in life loving french fries and hating, for example, whole-wheat pasta," says Professor Susan Roberts, Ph.D., director of the Energy Metabolism Laboratory at the HNRCA. "This conditioning happens over time in response to eating—repeatedly!—what is out there in the toxic food environment."

Once established, these patterns can last a lifetime. To determine if the same process of conditioning can train our brains to select healthy food, Roberts' team studied 13 overweight and obese men and women, eight of whom were already enrolled in a weight-loss program at Tufts and five of whom were in a control group.

Participants in the weight-loss program were put on healthier diets while also being educated about better food choices. The idea was to build up an association in their minds between healthful foods like broccoli and living a better life. Results after six months were impressive. MRI brain scans of the test subjects revealed changes in the area of the brain reward center associated with learning and addiction, showing an increased sensitivity to healthy choices and decreased sensitivity to the high-calorie options the study subjects formerly craved.

Roberts is cautious about the findings: "There is much more research to be done here involving many more participants, long-term follow-up and investigating more areas of the brain."

The study was published in the September 1 online issue of *Nutrition and Diabetes*.



# A REASON TO BE CHOOSY ABOUT FAT

**LIMITING SATURATED FAT** could help people whose genetic makeup increases their chance of being obese. Researchers from the HNRCA identified 63 gene variants related to obesity and used them to calculate an obesity risk score for more than 2,800 white American men and women enrolled in two large studies on preventing heart disease.

Those with a higher genetic risk score who consumed more of their calories as saturated fat were more likely to have a higher Body Mass Index (BMI), the ratio of body weight to height.

"We already know there are certain genes that interact with dietary fat and affect BMI," says senior author José M. Ordovás, Ph.D., director of the Nutrition and Genomics Laboratory

at the HNRCA and a professor at the Friedman School. "In the current study, we analyzed dozens of variants of those genes and other genes frequently associated with obesity risk and saw that while total fat intake was related to higher BMI, people who were genetically predisposed to obesity and ate the most saturated fat had the highest BMIs."

As for why this would be the case, Ordovás says some research suggests that saturated fat might interfere with activity in the part of the brain that lets us know we're full. He said more research is needed to know whether those findings would apply to gene function. The study appeared in the *Journal of the Academy of Nutrition and Dietetics*.

## LIT REVIEW

### Statin Status

People with high cholesterol are usually told to change their diet and sometimes given a prescription for a statin. But does what you eat affect how well that statin does its job?

Researchers at the HNRCA conducted an extensive review of studies on the interaction of statins with dietary components such as fat, alcohol, vitamin D, niacin and fiber. "In some cases it is likely there is more synergism than recognized," they write in *Molecular Aspects of Medicine*. The area, they say, is ripe for research, as harnessing any good interactions could mean lower doses of statins.







Carrying water is no longer considered women's work in Dembele Keta.

## SHARING A BURDEN IN ETHIOPIA

Change came swiftly to the village of Dembele Keta in Ethiopia one day last June. A four-person survey team led by James Levinson, Ph. D., a research professor at the Friedman School, was asking the village women about their daily workload.

The thing that made their already exhausting chores almost impossible, the women said, was having to haul water for more than an hour each day. Couldn't the men of the village help? One older man, watching on the periphery, said, "Yes, we understand, but we men also have lots of work to do, and men carrying water is against our cultural tradition."

Another man, Zerihun Neguse, the village chairman, stood up. "OK," he said, "we'll do it." Thirty minutes later, Neguse had gathered 200 men in the center of the village, telling them that the new water-carrying program would begin the next day. It did, making Dembele Keta the scene of a gender-equalizing scheme virtually unknown in sub-Saharan Africa.

The team's research is part of a USAID-funded project run by Tufts' Feinstein International Center to advance rural development in Ethiopia. Among other goals, it will help evaluate how gender issues relate to calorie expenditure.

## Thwarted Strength

**IN TRYING TO** understand why older people have a harder time building new muscle, Tufts researchers may have found a molecular culprit.

For a study published in *The FASEB Journal*, researchers at the HNRCA recruited 16 healthy but sedentary men—half in their 20s and half in their 70s—to perform a single bout of resistance exercise that would trigger muscle growth. When the scientists examined tissue samples taken before and six hours after the exercise, they found that the older men had lower levels of microRNAs, small molecules that have a prominent role in regulating the genes that program muscle protein production.

"One of the steps in building muscle seems to be missing in the older men, preventing them from responding to the exercise as strongly as the younger men did," said lead author Donato Rivas, Ph.D., a scientist in the Nutrition, Exercise Physiology and Sarcopenia Laboratory at the HNRCA.

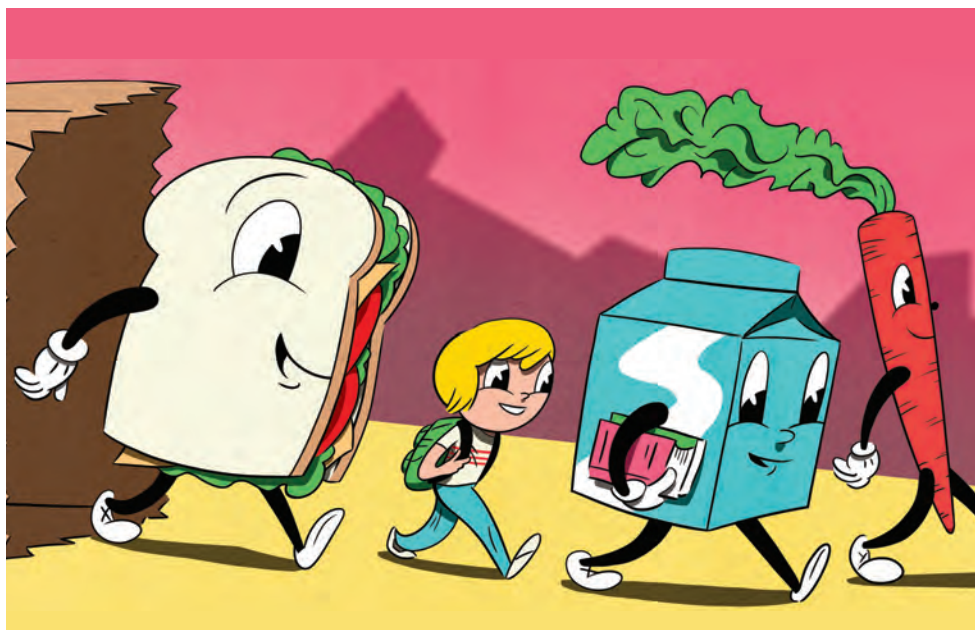
The authors, including senior author and laboratory director Professor Roger A. Fielding, Ph.D., note the small size of the study necessitates conducting more research, particularly in men and women who have sarcopenia, the age-related loss of muscle mass, strength and function.



"Chia seeds are fine—but they are just another food choice. You don't see apples being advertised as superfoods although they are as nutrient dense."

Prof. Jeffrey Blumberg, Ph.D., director of the HNRCA's Antioxidants Research Laboratory, explaining in *The Guardian* how the marketing of "superfoods" can cause consumer confusion about what to eat

# Dig In



## HOME-PACKED LUNCHES FALL SHORT

New study finds those brown bags are usually strong on snacks and weak on nutrition

BY JACQUELINE MITCHELL

**PARENTS, ADMINISTRATORS** and policymakers are squaring off on federal guidelines requiring schools to serve healthier, more affordable and ecologically sustainable meals. No matter how they pan out, these guidelines won't apply to a sizable portion of the classroom. More than 40 percent of kids bring their lunch on any given day, according to data from the USDA's Food and Nutrition Service.

So what's in those brown paper bags? Is the food brought from home

better than what the lunch lady serves?

That's what Jeanne Goldberg, Ph.D., G59, N86, a professor at the Friedman School, and her colleagues wanted to find out. In their recent study, published in the *Journal of the Academy of Nutrition and Dietetics*, the researchers peered inside the lunchboxes of third- and fourth-graders in 12 Massachusetts schools and assessed how the contents stacked up against the National School Lunch Program (NSLP) and Child and Adult Food

Care Program (CAFCP) standards. These federal guidelines promote diets that include foods from five basic categories: vegetables, fruits, whole grains, lean proteins and dairy.

By those standards, most food brought from home failed to meet the mark. The majority of kids had a sandwich, a bottle of water and some packaged snack food in their bags—not too bad, right? But just 11 percent of lunches contained vegetables, and only 17 percent contained a dairy item. A mere 3

percent of kids brought milk along as a beverage (another 11 percent planned to buy their milk at school). Nearly a quarter of the lunches included a sugar-sweetened drink.

All in all, just over a quarter of the home-packed lunches met three of five NSLP standards, and only 4 percent met two of four CAFCP guidelines. "Parents serve a lot of packaged foods," says Goldberg, director of the Friedman School's Nutrition Communication Program. "At the extreme, there were kids whose lunches contained four or five packages of snack foods with nothing at the core."

Goldberg points out that the study was not done to make parents feel bad. Rather, the idea is seen as a first step toward improving the quality of home-packed lunches. In that spirit, she has a few suggestions. It's best to provide kids with an insulated container and ice pack, she says, to enhance the food's appeal as well as its safety. Also, exposing kids to new foods at home and then recruiting kids to help prepare their own lunches can be fun.

Finally, take the long view when it comes to selecting healthy foods for lunch. "Not everything will work the first time," says Goldberg. "But change over time is quite possible."

# AFTER PEDIATRIC CANCER

Survivors face yet another battle: obesity

BY JULIE FLAHERTY

**THEIR 4-YEAR-OLD SON** has leukemia and has completed an intensive course of chemotherapy. Finally they get the good news: The cancer is in remission. When is the right time for the doctor to mention that their child is at risk for obesity?

A little weight gain may seem like a small problem after such a crisis, but Assistant Professor Fang Zhang, M.D., Ph.D., an epidemiologist at the Friedman School who specializes in the relationship between nutrition and cancer, says that the risk is real and can have harmful consequences.

On top of the many reasons obesity is not good for anyone, pediatric cancer survivors who become obese are more likely to see their cancer return. They are also more prone to chronic health problems than their peers who did not have cancer: They are seven times more likely to die of cardiovascular disease, for example. Obesity adds even more risk, Zhang says.

Unfortunately, survivors

of the most common form of childhood cancer, acute lymphoblastic leukemia (ALL), are at a higher risk of developing obesity than other children. In a statistical analysis Zhang and colleagues published in the journal *Pediatrics*, they found that on average, ALL survivors who had completed treatment within the last 10 years had a substantially higher Body Mass Index than their peers.

The reasons may be many. During treatment, patients are usually given steroids, which increase their appetite. The treatment can also have neurological effects on their motor function, leaving them with less flexibility and less ability to engage in physical activity.

Zhang, an adjunct scientist at the HNRCA, hypothesizes that parents also become very permissive during treatment, allowing

children to eat whatever they crave and spend time in front of the TV. “And this pattern has been kept after the treatment completion,” she says. Parents in one focus group admitted that once they let their child have free reign of sugary treats and salty snacks, “they find it very difficult to change it back.”

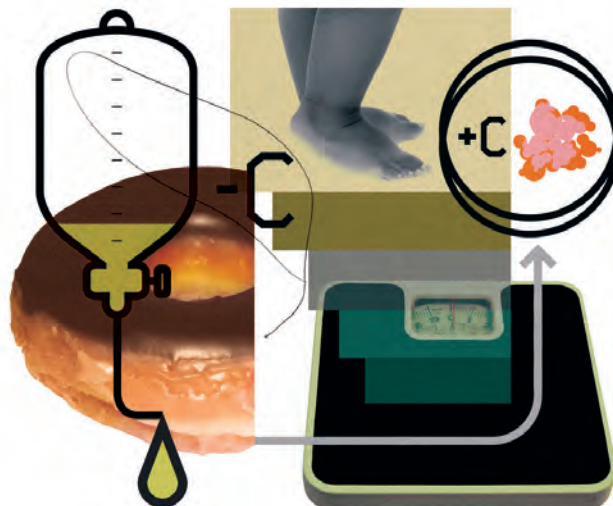
Zhang conducted a literature review, published in the *International Journal of Child Health and Nutrition*, which concluded that the diets of cancer survivors generally do not meet recommended dietary guidelines. She is currently working with St. Jude Children’s Research Hospital in Memphis to analyze dietary data collected from more than 2,500 survivors of childhood cancer to see exactly what they are eating. One thing she does know is that the children aren’t getting much physical activity. A recent

study she conducted with Professor Susan Roberts, Ph.D., director of the Energy Metabolism Laboratory at the HNRCA, found that childhood cancer survivors burn 500 fewer calories per day than their peers—a “huge gap,” she says.

Now, the question is whether health-care providers should intervene and let parents know about the obesity risks and what they can do about them. Zhang and colleagues from the Friedman School, the HNRCA, Tufts School of Medicine and Tufts School of Engineering received university funding to design a weight-management program for families with children who have survived cancer. The online program is aimed at educating parents as soon as their child completes cancer treatment, as studies by Zhang and others show a rapid weight gain during—not after—treatment.

The researchers will be assessing whether educating parents contributes to a healthy body weight or other markers of health in the children—children who now, thankfully, have so much life left to live.

“Childhood cancer is the only cancer where we have achieved so much in terms of improving survival,” Zhang says. “Fifty years ago, a diagnosis was almost a death sentence. Now more than 80 percent survive





five years or longer. So I think anything we can do to improve their quality of life would have a big impact. And nutrition plays an important role.”

## THE PRICE SHOULD BE RIGHT

On taxing the rich (foods, that is) to subsidize the healthful  
BY MICHAEL BLANDING

**WHAT DOES** a 20-ounce bottle of soda cost? If you said 99 cents, you are only partly right. While that may be the price on the sticker at the store, it doesn’t take into account the cost to public health. One study, for example, found for every extra can of soda a person drinks per day, he or she is 30 percent more likely to become obese—increasing the risk of heart disease, diabetes and other diseases.

“Diet is now the leading cause of poor health in the country,” says Dariush Mozaffarian, M.D., Dr.P.H., dean of the Friedman School, who notes health-care costs account for nearly one out of every five dollars in our national economy. Yet when cities and states have tried to enact so-called “snack taxes” on soda, candy and other junk food,

they’ve met resistance. Conservatives greet such attempts as evidence of the “nanny state” limiting personal choice, while hunger groups view such taxes as discriminatory against the poor, who consume more high-calorie foods.

That doesn’t mean the policy of taxing foods should be abandoned, says Mozaffarian. In fact, as he argues in a recent editorial in the *Journal of the American Medical Association*, it doesn’t go far enough. Along with Boston Children’s Hospital obesity researcher David Ludwig, M.D., Ph.D., and Harvard economist Kenneth Rogoff, Ph.D., Mozaffarian expands on the “snack tax” by proposing across-the-board food taxes combined with key food subsidies.

“We propose taxing pretty much everything with a food label or sold in chain restaurants,” explains Mozaffarian, recommending a flat tax of anywhere between 10 to 30 percent. At the same time, he and his co-authors propose dramatically lowering the prices on unimpeachably healthy foods. “The modest tax would be used to subsidize minimally processed, mostly whole foods that the scientific evidence demonstrates are clearly healthy, such as fruits, vegetables, nuts, fish, vegetable oils and yogurt.” The taxes would also support school lunch programs.

The radical step comes out of research Mozaffarian



did on different strategies for improving diet, published by the American Heart Association last year. “It showed us that education and knowledge alone have a pretty minimal effect,” he says. On the other hand, “there is strong evidence that taxes reduce consumption, while subsidies increase consumption.”

He compares changing food choices to efforts to reduce fatalities from car accidents over recent decades. “Did we simply say, ‘Car accidents happen; let’s just educate people about the risks’? No. We instituted driver’s licensing, car crash standards, antilock brakes, airbags, guard rails, speed limits, rumble strips and seat belt, child seat and motorcycle helmet laws,” he says. “The food system is just as complex—we need to use all the tools at our disposal to address the consumer, industry, food

environment and food culture to be successful.”

By providing subsidies for healthy foods, the proposal would avoid challenges that food taxes are punitive or regressive. “The subsidy in the beginning would be very large,” he says. “Imagine: An apple might cost 5 cents; a filet of salmon, 25 cents. It would radically alter incentives for producers, retailers, restaurants and the public.” While those bargains would be offset by modestly higher prices on processed foods, Mozaffarian believes that with healthier choices, the average grocery bill for families could stay the same or even decrease—while at the same time reducing family medical costs.

Originally, Mozaffarian and Ludwig considered taxing foods at different amounts depending on their healthfulness. However, economist Rogoff

counseled them that such a scheme would be too open to lobbying by food companies for exemptions, undermining the system. Instead, the idea is to start with a simple flat tax, and later introduce scaled taxes to further increase incentives for food companies and restaurants to create healthier offerings.

"If Pepsi can sell an apple with 'Pepsi' on it and make the same amount of money as soda, they would be delighted to do that," says Mozaffarian. "I believe that over five to 10 years, it would transform the food system."

## FIRST, DO NO HARM

Linda Cole's rules for international development

BY JULIE FLAHERTY

### SOON AFTER GRADUATING

from the Master of Arts in Humanitarian Assistance program at the Friedman School in 2006, Linda Cole set out to start her own relief agency in Uganda. She knew that she wanted it to be an organization to help women in Africa affected, or more typically, devastated, by war. She also knew what she didn't want it to be.

"We had to make sure we wouldn't make their situation worse," she says.

There would seem to be

little danger of that, what with many of the women she was targeting uprooted by conflict and struggling to survive. And yet, during her many years working for development organizations throughout Africa, she had seen one program start a clinic just for rape victims and one that gave out yellow water basins to HIV-positive women. Going to the clinic or carrying a basin was as good as guaranteeing the women would be shunned by their communities. Or there was the program that taught 500 women how to sew, but once the training ended, the women didn't have enough skill to be very good tailors or access to sewing machines.

"So many programs have a grant that lasts for six months or a year, and then they are out," Cole says. "It doesn't necessarily build the capacity of the community."

So as she was creating what would become the Community Action Fund for Women in Africa ([cafwafrica.org](http://cafwafrica.org)), Cole traveled all over northern Uganda to see what the women in that war-torn region were already trying to do for themselves and then figured out how she could assist them. The obvious route was agriculture. Farming is the main livelihood in northern Uganda, but many women run out of food months before their crops of cassava, corn, millet or rice are ready to be harvested. During those times, "they eat maybe once

a day, sometimes every other day," Cole says.

CAFWA introduced them to the concept of permagardening—keeping a kitchen garden in addition to their field crops. That way, they can harvest vegetables throughout the year. "Some of them have one garden they eat from and another for vegetables they sell at the market," Cole says. Young girls have even started gardens to pay for their school fees.

CAFWA has also helped the women with microfinancing based on a savings-and-loan model. A group of women contribute small sums so that at the end of the month one woman gets the money that has been pooled to buy livestock or farming supplies.

The women also asked for education, as most cannot read, write or do the simple calculations needed for farming or small business. So CAFWA set up adult learning centers, where the women can come for lessons twice a week, on the days they choose.


The programs took a while to get off the ground, and even longer to see the effects. Martha is a case in point. She and her husband had once owned a store in Uganda, but during the conflict, her store was burned down, and her husband and two of her sons were killed. When she and her youngest son fled through the bush, his eyes were cut by the long elephant grass and

the resulting infection left him blind.

Martha participated in several CAFWA programs, but none seemed to make a dent in her poverty. Then, on Cole's most recent visit (she lives in California but travels to Uganda at least four times a year), Martha offered to show her the goats she had bought with her savings. Cole expected to see one or two, but Martha trotted out more than a dozen. "She now has all these goats that are giving her financial security," Cole says, adding that Martha plans to send her son to a secondary school for the blind. "It took six years, but we didn't give up on Martha."

With many other development programs, that wouldn't happen, Cole says. Large humanitarian organizations have to follow the available grants. "Money moves around, and that is just the reality of development," she says. "The emergency here is over, and everyone goes to Darfur."

CAFWA is planning to stick around. "Aid is not reaching these women, because they are not seen as viable investments; they are basically too poor to help," she says. "We disagree. There is a cycle of poverty, and if we don't invest in these women, we are never going to break it."

 Web extra: To watch a video narrated by CAFWA supporter Oprah Winfrey, go to [cafwafrica.org/videos](http://cafwafrica.org/videos).



## Toxic Crops

In developing countries, a food contaminant may be stunting children's growth **BY DAVID LEVIN**

**N**EARLY 162 MILLION children under the age of 5 suffer from stunted growth, a condition that leads to smaller stature later in life, according to a 2014 United Nations study. Shorter height may not sound like such a big deal, but Patrick Webb, Ph.D., the McFarlane Professor at the Friedman School, says even minor stunting can lead to serious health problems.

"It's not just a matter of height. It's a marker of

long-term nutrient deprivation," says Webb. "Stunting slows the development of internal organs. It can impair cognitive function and cause a greater risk of dying from diseases like malaria or chronic diarrhea."

Poor sanitation, access to clean drinking water and lack of diverse



nutrition might contribute to the problem, he notes, but only about 20 million cases of stunting can be attributed directly to those issues. The cause of the remaining cases is somewhat of a mystery—but Webb thinks the culprit could be a substance in the food supply itself, a naturally occurring poison called “aflatoxin” that is produced by common types of mold.

These molds, called *Aspergillus*, are found worldwide. They grow readily on corn, grains, ground nuts and other staple crops and can easily infest large stores of harvested foods. If ingested regularly, Webb says, the toxins they contain can wreak havoc on the body.

“Some would argue that these are the most dangerous naturally occurring toxins in our environment,” he says. “They are incredibly carcinogenic. They can impair your immune system and systems that promote the body’s growth. They can also impair gut function, which means you could be absorbing fewer nutrients.”

In the United States and Europe, foods are tested regularly for aflatoxins, and government agencies set strict limits on acceptable levels of exposure. In developing countries, that sort of oversight is often not feasible. Many families, Webb notes, are too poor to throw out foods contaminated with *Aspergillus*. “They might pick out the worst kernels of infested corn, but some of the mold is invisible to the eye, so they’re still exposed,” he says.

Although Webb says there’s a growing body of research that points to a connection between aflatoxins and childhood stunting, the full extent of the toxins’ impact is still unclear. To learn more, he and his colleagues at the Friedman School are leading a new multiyear study in Nepal and Uganda that aims to track aflatoxins in the food supply and examine their effects on the health of pregnant mothers and newborns.

The researchers will follow a group of pregnant women in those nations

over several years, conducting surveys on their diet and sanitation and assessing the health of both mother and child until each baby is 18 months old. Throughout pregnancy and early childhood, the researchers will also take samples of blood, breast milk and other food sources to test for levels of aflatoxins.

“We want to know how aflatoxin first gets into a child’s blood,” says Webb. “Is it transmitted from mother to child in the womb? Through breast milk? Through food eaten during weaning? It’s likely a combination of all three.”

In the past, he notes, researchers have focused on recording levels of aflatoxin

research in Nepal and Uganda. Similar funding from USAID in 2010 allowed the Friedman School to create its Feed the Future Nutrition Innovation Lab, a collaborative research group based at Tufts that is spearheading the study.

The group, which partners with universities and research institutions in the United States and abroad, seeks to improve nutrition in developing nations by focusing on agricultural programs and policies. Webb says that means not only finding better ways of growing crops, but ways of expanding the diversity of those crops, the diversity of foods available to consumers and the quality

**Aflatoxins “are incredibly carcinogenic. They can impair your immune system and systems that promote the body’s growth.”** —Patrick Webb

at a single point in time. But in the upcoming study, he and his colleagues will be able to see how levels of the toxin vary from season to season and trace how exposure over the early years of childhood affects growth over time.

### RESEARCH FOR POLICY

Conducting such a long-term study is expensive. According to Webb, few labs in the world are equipped to measure aflatoxins in blood, and the tests can cost hundreds of dollars per sample.

“In Nepal alone, we’re looking at 600 mothers-to-be, and their 600 children. We’re planning to take four blood samples each, plus all the breast milk and food samples, so that really adds up,” he says.

For this study, the costs will be covered by major grants from the U.S. Agency for International Development (USAID), which is providing funding for

of those products on the whole—including a focus on such food-safety issues as aflatoxin contamination.

The idea of looking at nutrition through the lens of food safety is a relatively new concept, Webb notes. “Improving the productivity and diversity of crops and of diet is essential for improving nutrition, but it’s only going to get us part of the way there if there’s widespread contamination in the food supply,” he says. With that in mind, he hopes the study will act as a gateway—a sort of entry point for discussing larger agricultural and nutritional issues in developing nations.

“Ultimately, we’re looking at places where biology interfaces with human choices and policy,” he says. “Those are the sorts of situations where the Nutrition Innovation Lab really shines.”

DAVID LEVIN is a science journalist in Boston.

AMERICANS OF A CERTAIN AGE MIGHT REMEMBER A SERIES of yogurt commercials that aired in the mid-'70s. "In Soviet Georgia, where they eat a lot of yogurt, a lot of people live past 100," a deep voice intoned over images of elderly peasants enjoying yogurt. The campaign, which became legendary in the advertising world, helped turn around the fortunes of Dannon in the United States and establish yogurt as a "health food" in the national consciousness.

Forty years later, yogurt is a \$7 billion industry in the United States. In 2010 to 2011 alone, more than 600 new yogurt products came on the market. "When you walk into the yogurt section of the grocery store, it's like going to a museum," says Tufts biologist Benjamin Wolfe, Ph.D.,

The science behind yogurt's aura of health

# WHY SO GOOD?

BY HELENE RAGOVIN PHOTOGRAPH BY BRUCE PETERSON

who studies the microbial activity of fermented foods. And in survey after survey, consumers say the healthfulness of yogurt is top among the reasons they eat it.

Research confirms yogurt consumption correlates with a host of health benefits. Yogurt-eaters are more likely to have lower blood pressure and lower levels of circulating triglycerides (considered an indicator of heart health) and blood glucose. Those who consume more than three servings of yogurt per week appear to be better able to manage their weight.

But scientists caution that it's still far from certain that yogurt produces these desirable outcomes. "There's some







interesting evidence that suggests yogurt might be related to certain health benefits. But we still have a long way to go to determine that these associations we're seeing are, in fact, causal," says Professor Paul Jacques, D.Sc., a senior scientist at the Jean Mayer USDA Human Nutrition Research Center on Aging (HNRCA) at Tufts.

He adds: "One thing we do know is that yogurt is a good source of nutrients." Yogurt is indeed a vitamin-and-mineral-dense source of high-quality protein, which may be why yogurt-eaters are less likely to be deficient in vitamins B2 and B12, calcium, magnesium and zinc.

Beyond the Nutrition Facts label, though, there is still a lot to understand about yogurt. Researchers are looking at the connections between yogurt and conditions as varied as immune response, infectious disease, susceptibility to cancer, inflammatory markers, cardiovascular and metabolic risk factors, energy metabolism and cognitive function. The yogurt industry, for its part, is helping that research along. Both Jacques and Professor Simin Nikbin

Meydani, D.V.M., Ph.D., director of the HNRCA, sit on a scientific advisory board for Dannon, which has helped fund some of Jacques' yogurt studies.

Much of the work at the HNRCA and elsewhere has been observational, examining yogurt consumption within populations and how it correlates to various health markers. Several Tufts studies, for instance, have been based on data amassed in the landmark Framingham Heart Study.

Meydani says it is time for the next step. "We need more interventional studies," she says. "There is a lot of benefit to be gained through observational and epidemiological studies, but there comes a point where we need to determine the efficacy of foods through clinical trials, and I think that's what's been lacking. What we hope to see is a lot more research that would actually show these health benefits that have been attributed to yogurt."

### DIETARY POWERHOUSE

Basically, yogurt is milk that has been fermented using bacterial cultures. For a refrigerated product to be

labeled as yogurt under U.S. Food and Drug Administration regulations, it must be cultured using *Lactobacillus bulgaricus* and *Streptococcus thermophilus*, although other bacteria may be included. (This criterion does not apply to frozen yogurt or "yogurt products," such as candies or dips.) A trade group, the National Yogurt Association, has created a "Live and Active Cultures" logo to identify products that meet a certain threshold of those two bacteria, but regardless of the marketing, all yogurt needs to start with live and active cultures for the yogurt-making to occur. (Some manufacturers heat-treat their yogurt after fermentation to prolong shelf life or decrease the tart taste, which deactivates the cultures.)

Yogurt has a much higher concentration of protein, vitamins and minerals than milk—anywhere from 20 percent to 100 percent more—part of the reason it's regarded as a dietary powerhouse. The acidity of yogurt also makes it easier for the body to absorb such nutrients as calcium, zinc and magnesium. Another bonus is that the bacteria break down the sugars in the milk, making yogurt a food

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## SMOOTH OPERATOR

# SHOPPING SMARTER IN THE YOGURT AISLE

The yogurt aisle presents a dizzying array of choices. Nonfat to low-fat to cream-top. Greek-style, Icelandic or Australian. Cow's milk, goat's milk or no dairy milk at all.

How to pick? "Your best bet is to choose yogurt in its most simple, plain form," advises Alicia Romano, N10, a clinical dietitian at the Frances Stern Nutrition Center at Tufts Medical Center. "Start with plain yogurt and then control what you add."

While fat content has traditionally been the focus of yogurt labeling and advertising, Romano says what consumers should really be paying attention to is added sugar.

Yogurt naturally contains between six and 12 grams of sugar in a six-ounce serving (the size of most yogurt containers these days). So anything too far above that is something to be cautious about. "Some yogurts have up to 33 grams of

sugar. That's just crazy," she says.

But what about the fat? "In general, low-fat would be a fine choice for most consumers. A lot of fat-free products tend to add more sugar to get some flavor," Romano says.

Yogurts marketed specifically to children or toddlers can also be high in added sugar, she notes, so read labels carefully. The same goes for nondairy yogurts, often made from soy, coconut or almond milks. They are likely to be highly processed and may have more added sweeteners and stabilizers to mimic the taste and consistency of dairy yogurt.

And watch for marketing that distracts from nutritional content, she says. For example, organic yogurts are just as likely as conventional ones to be high in added sugar, so while they may be good for the planet, they may not be great for you. —H.R.

that can be more easily digested by those with lactose intolerance.

If more Americans would eat yogurt, says Meydani, it would go a long way toward filling the nutritional gaps in our diets. For instance, two-thirds of Americans do not meet the recommended dietary guideline of three daily servings of low-fat or nonfat dairy products, according to the National Health and Nutrition Examination Survey. “The general population is missing the boat on many markers of nutrition,” Meydani says. According to the Dietary Guidelines for Americans, calcium, potassium and vitamin D are considered “nutrients of concern” for Americans at large, and all are amply supplied in yogurt, assuming it is made from vitamin D–fortified milk.

In particular, yogurt is a good candidate for addressing nutritional deficits in the elderly, Meydani says. Maintaining bone health is a top concern for older people, and yogurt’s rich amounts of calcium and vitamin D (if fortified milk is used) address that. Data from the Framingham Heart Study Offspring Cohort indicates that eating more than four servings of yogurt a week is associated with greater bone-mineral density and protection against hip fracture; the same was not found with similar consumption of milk or cheese.

“It’s a very convenient food, and it can be eaten easily, even if you have problems chewing,” which also makes it ideal for older people, Meydani says.

Jacques and Huifen Wang, formerly of the HNRCA’s epidemiology department, examined data from the Framingham studies to see if there was a connection between yogurt consumption and weight. Their findings suggest yogurt could be helpful, if not for weight loss, then at least for weight maintenance.

The data, published in the *International Journal of Obesity* in 2014, showed people who ate more than three servings of yogurt a week gained less

weight over the course of a year than those who ate less than one serving. And a meta-analysis by Jacques and Wang of existing research on yogurt and weight, published last year in the *American Journal of Clinical Nutrition*, also found that yogurt-rich diets were associated with less weight gain over time. The same association was not true for consumption of low-fat or nonfat milk. And comparable consumption of whole milk and cheese was associated with weight gain.

## BEYOND DAIRY

“Some people have speculated the relationship between dairy and weight maintenance is due to calcium or other factors in the dairy itself,” says Jacques. “But based on the fact we see a difference [in the data] between yogurt and other forms of dairy, we could speculate it might be unique to the fermentation, or to the live bacteria themselves, or to various products of the fermentation that aren’t in other forms of dairy.”

The live bacteria in yogurt may affect the vast array of microbes that inhabit our intestines. The question of whether these bacteria can establish colonies and thrive on their own in the gut or enhance the growth of pre-existing beneficial bacteria, and if so, how this relates to body functioning, is what scientists are now grappling with.

“The idea that cultured products have good bacteria in them that can somehow impact bacteria that live inside our digestive tract, that is a big question mark,” says Wolfe, an assistant professor of biology in Tufts’ School of Arts and Sciences. “There are still a lot of missing pieces to link together about the role of microbes in cultured food and its impact on human health. What’s exciting is there is so much potential.”

Curiosity over the connections among cultured foods, gut bacteria and overall wellness is not new. As far back as the late 19th century, the Nobel prize-winning scientist Elie Metchnikoff speculated about the causes of senility

and other effects of old age, and promoted daily doses of “soured milk”—i.e., yogurt—as a way to stay mentally fit. In fact, his interest was spurred by the longevity of Eastern Europeans who ate a lot of yogurt. (Their descendants, presumably, appeared decades later in those Dannon ads.)

Today, the intestinal microbiome—the ecosystem of bacteria and other microorganisms in the digestive tract—is a significant focus of biological exploration. “The number of gut bacteria is so large that we can’t just think of ourselves as human,” Meydani says. “It’s almost like we’re a hybrid of human and bacteria.” And evidence is accumulating that these bacteria have an effect beyond the intestines. For example, Meydani points to immune response.

“In a way, it’s hard to believe: Why would changes in gut microbiota influence the systemic immune response?” she asks. Yet the gut bacteria communicate with immune cells in the intestinal lining, which in turn send signals to cells in the bloodstream, she says, meaning that all the distant parts of the body are affected by what’s happening in the digestive tract. “That’s where yogurt comes into play,” she says. If the bacteria from the yogurt are, indeed, able to influence the overall composition of the intestinal landscape, the result could be far-reaching, involving immune response, or susceptibility to certain cancers or infectious disease, or even cognitive functioning.

“The gut-brain connection appears to be a real thing,” says Meydani. “We’re not there yet, to [be able to] say yogurt consumption improves cognitive function, but there is ongoing research looking at that, and hopefully we will hear about that in the next few years.”

In the meantime, says Meydani, the nutritional benefits of yogurt should be enough to earn it a place at the table.

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Christopher Hillbruner, NO7,  
and his team monitor the globe  
to predict the world's coming food crises

# FINDING THE NEXT FAMINE

BY JULIE FLAHERTY  
ILLUSTRATION BY HARRY CAMPBELL

CHRISTOPHER HILLBRUNER, NO7, HAS 10 COUNTRIES ON THE FRONT BURNER, ALL IN danger of boiling over. In Central America, drought and an epidemic of coffee rust have reduced crop yields and driven down wages, making it harder for people to feed their families. South Sudan's outlook remains dire, with 2.5 million people expected to be in food crisis in early 2015, thanks to the protracted conflict. And then there is the Ebola outbreak in West Africa, which, in addition to the thousands who will die from the virus, could leave an estimated 1.3 million people without enough to eat.

"It's going to be a busy year," he says.

Hillbruner is the decisions support adviser for the Famine Early Warning Systems Network (FEWS NET), an organization tasked with monitoring the most precarious food situations in the world. Its mandate is to predict which populations are most in danger—of crop failure, of food crisis, of starving to death—in the next six to 12 months. The forecasts help governments and humanitarian organizations decide







where they will focus their efforts and resources.

FEWS NET, a project of the U.S. Agency for International Development (USAID), was created in the wake of the mid-1980s famines in West Africa, Sudan and Ethiopia that killed as many as 1 million people. Aid poured into the region, but not before a world of shocked onlookers asked, “Why didn’t we see this coming?”

So Hillbruner and his colleagues watch and warn. Predicting hunger is not as simple as forecasting the weather, although that is a big part of the calculation. Rainfall, snowfall and sea and surface temperatures affect farmers’ ability to grow crops, raise livestock, fish or forage for food. FEWS NET partners with other agencies to gather the facts. The National Oceanic and Atmospheric Administration contributes remote sensing data from aircraft and satellites to track hurricanes, earthquakes, erosion and flooding, as well how farmland is being used. NASA and the U.S., Geological Survey provide similar bird’s-eye information, including land and sea temperatures.

In addition, FEWS NET employs 85 technical professionals in offices in most-likely-to-need-help locations around the globe. Mostly nationals of the countries they cover, these analysts report on such matters as the price of sweet potatoes at a local market in Burundi, the average daily wage for a worker in urban Niger or how often households in Malawi are relying on charcoal production to make ends meet.

FEWS NET puts it all together to make a prediction, showing where the greatest need will be in the next six months. It takes special knowledge about each location to know how much weight to give each variable. In Central Asia, FEWS NET spends a lot of time looking at snowfall in winter, as it will provide the irrigation for crops when it melts. In northern Uganda, the health

of livestock markets is a bellwether of hunger levels. In some places, household crop production is a strong indicator of food security, but not always.

“What is often more important to poor households is wage labor, whether on other people’s farms or from mining or other sources,” Hillbruner says. Then, even if their crops fail, people might still be able to purchase food.

### WORDS MATTER

The result is like an oracle’s prediction, but much less cryptic. In fact, one of Hillbruner’s biggest contributions in his five years at FEWS NET has been his work with the global food-security community to make the vocabulary for talking about severe hunger crystal clear.

“In the past, you would have one agency calling it famine, one calling it an emergency and one calling it a crisis,” Hillbruner says. “And it wasn’t always apparent—particularly to decision makers and donors—are people really saying different things, or are they saying the same thing and just using different words?”

FEWS NET, along with other leading humanitarian agencies, now uses and promotes a scale with very specific definitions. A “crisis,” phase 3, means that 20 percent of households can meet their minimal food needs only by selling off livestock or other assets. (FEWS NET predicts 15 places in the world could reach that level by March.) When even selling off belongings isn’t enough, that region is considered in phase 4, “emergency.”

For “famine,” the worst level on the scale at phase 5, “we deliberately set the bar higher,” Hillbruner says. The word “famine” is always cause for alarm, and in the past, aid agencies have branched it when they needed to draw attention to a particular situation—perhaps even when they shouldn’t.

“People who are advocating for a given crisis are going to make that

crisis sound as bad as they can,”

Hillbruner says, hinting at the damage that can be done when NGOs cry wolf too often. FEWS NET, on the other hand, can be impartial and makes all its reports publicly available on its website, because, Hillbruner says, “We have no other stake in the game.”

The last time FEWS NET declared a famine was in 2011, in Somalia. Many people thought that a similar declaration would be made about South Sudan in 2014, but FEWS NET disagreed, even as it called for immediate response to avoid “dramatic deterioration.”

Hillbruner says there is often too much weight put on famine declaration as the trigger for action. It is much less expensive—and much less deadly—to intervene before things get that bad.

“There should be urgent response starting at phase 3,” he says. “If you are waiting for phase 5 to respond, you are always going to be too late.”

For the most part, FEWS NET’s predictions have been correct, but numbers and places are still only a rough estimate. In 2012, FEWS NET was concerned about price increases in Malawi, as it anticipated the government was going to devalue its own currency. “We made a prediction that prices were going to double,” Hillbruner says. “Prices quadrupled.”

There is always uncertainty in dealing with the future. And that can be a problem, Hillbruner says, because the international system of humanitarian assistance isn’t that adept at dealing with uncertainty.

“If a massive earthquake happens and there is clear need right now, the international community is able to mobilize quickly,” Hillbruner says. “But if you say there is a 50 percent chance that there is going to be famine in South Sudan in nine months, we are not as good at knowing what to do.”

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## Move it or Lose it

For adults over 70, simple exercises are good for health, mobility and mood **BY JACQUELINE MITCHELL**

**B**ECAUSE PEOPLE OVER age 65 will make up 40 percent of the U.S. population in 30 years, according to the Census Bureau, quality of life looms as an important public health issue as baby boomers head into retirement. Figuring out how seniors can best maintain it was a major goal of the recently completed Lifestyle Interventions and Independence for Elders (LIFE) Study, conducted at eight sites across the United States, including Tufts, the University of Florida and Northwestern and Stanford universities.

Scientists already knew that the ability to walk without assistance is hugely important in keeping elders independent; that is, able to care for themselves and live on their own. Rates of disease, disability and death are much higher among people with reduced mobility. That's why the study investigators—including Professor Roger Fielding, Ph.D., director of the Nutrition, Exercise Physiology and Sarcopenia Laboratory at the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts—believe that keeping older Americans moving will also ease the burden on the health-care system.

For the LIFE study, the scientists recruited sedentary men and women between ages 70 and 89 who were already having some difficulty getting around. The seniors were randomly sorted into one of two groups; half participated in structured aerobic, flexibility and strength training two times a week at their local research centers. They were also supplied with at-home workouts to complete three to four times a week. The goal of the exercise program was to get them walking up to 30 minutes at a time and doing 10-minute sessions each of strength and balance exercises three to four times a week.

The other half of the study participants attended sessions at the centers



# Healthy Aging

that included workshops on healthy aging and stretching-exercise classes that were limited to the upper body.

Over the course of the three-year study, the researchers witnessed remarkable results. Compared with those in the health-education group, the exercising seniors significantly lowered their risk of developing mobility problems. What's more, the active group fared better than their counterparts by other measures, too. They experienced fewer cardiovascular- and diabetes-related health problems during the trial. The study appeared in the *Journal of the American Medical Association* in May. *Tufts Nutrition* asked Fielding about the findings.

## **TN: Is it ever too late to start exercising?**

**ROGER FIELDING:** I don't think there is an age limit on when you can start. It's hard for me to conceive of people being too old to begin an activity program, especially given that we saw such positive effects in this relatively older group. The average age of the study participants when they started was almost 79, and they were followed for an average of three years.

Even though these folks had a lot of chronic diseases and had some mobility limitations at the start, they were still able to benefit from this program of physical activity in terms of reducing the onset of major mobility disability, which we define as not being able to walk 400 meters, or about a quarter of a mile, without stopping or using aids like walkers or canes. We were able to preserve their independence longer with this exercise program. That's an important public health finding.

## **What kind of exercise did the study participants do?**

The primary mode was walking. They also did very modest resistance training and low-intensity knee-extension and knee-flexion exercises with ankle weights. That's based on a

lot of evidence that cardio, strength and flexibility training are all really important components of physical fitness and have clear health benefits.

We tried to design a program that older people could do that didn't require any specialized equipment and could be done in a number of different settings. We also tailored the intervention to match people's level of fitness and physical health. Some people could really only walk three or four minutes before they had to stop and rest. We gradually built them up, and by the end of the study, people were walking an average of 25 to 30 minutes per session.

## **How can someone get started on his or her own?**

Cardiovascular exercise or aerobic exercise, like walking, benefits so many of the body's systems. Good cardiovascular fitness reduces the risk of heart attack and stroke. We know that for sure.

I think most people, with a little bit of guidance, can walk on their own. People don't need a lot of supervision, unless someone is really limited or has a balance problem. Go for a 10- to 15-minute walk at first; then gradually increase the time. People can do this inside; they can do it outside when the weather's good. People have lots of options, such as shopping malls or the grocery store. Walking is the most important thing we need to encourage all older adults to do. Everybody should think about getting out of that chair and walking more.

Then you'll want to introduce some strength training two to three days a week. That's particularly true for older people, because we know we lose muscle as we age.

## **Why is it important to maintain muscle tissue?**

Muscle is one of the biggest consumers of sugar. If you're physically active and physically fit and you have a lot of lean muscle mass, your risk of developing type 2 diabetes is reduced.

Certainly, if you have more muscle and are stronger, you'll find it easier to walk, stand up and get out of your chair.

Flexibility training, such as stretching or yoga, is good for reducing musculoskeletal injuries and joint pain, so that needs to be part of the picture, too. Additionally, older adults may be starting to have problems with stability and balance. Doing some simple balance-training exercises may be advisable for them as well. One example of that is holding on to a counter and standing on one leg, with one hand or two hands holding if you can, and then attempting it with your eyes closed, if you can.

## **What if someone is very overweight? Is it safe to start exercising?**

Even if you are overweight or obese, starting a physical activity program can have beneficial effects above and beyond weight loss. Don't ignore one at the expense of the other. Physical activity by itself doesn't seem to have a real strong effect on weight loss, but I think lack of fitness is an independent risk factor for a lot of bad events in people lives.

## **What are some of the other benefits of exercise?**

There's clear evidence that exercise helps with mood. Some small studies and some observational studies indicate that cognition and brain function and even brain anatomical structures may be influenced by exercise, but we need to know more about that. There's definitely some evidence that sleep quality is improved with physical activity.

## **Where can I find out more about these exercises?**

The National Institute on Aging, part of the National Institutes of Health, has an online guide that is perfectly appropriate. You can find more information at [bit.ly/nihexercise](http://bit.ly/nihexercise).

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# Dr. Zhang, Nutrition, and You: Partners in the fight against cancer

If breast cancer is in your family history, reducing your total calorie consumption would be wise.

That's the conclusion of a study of more than 4,000 women with breast cancer and their unaffected sisters that researcher Fang Fang Zhang helped conduct.

Fang Fang, a nutritional epidemiologist, is passionate about the impact of nutrition on cancer risk and progression because it's a factor that people can control.

Your generous gift provides vital support to our mission of advancing nutritional well-being. And, thanks to friends like you, scientists like Fang Fang are making discoveries every day that help improve lives.

To make your contribution to the Friedman School Annual Fund, visit [nutrition.tufts.edu/givenow2](https://nutrition.tufts.edu/givenow2)

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*Nourishing Minds.  
Nourishing Humanity.*

Fang Fang is an assistant professor at the Friedman School and a scientist at the Jean Mayer Human Nutrition Research Center on Aging (HNRC).





FIELD REPORT

# A Farmer's Double Life

Raising crops isn't always lucrative, but maybe that's OK

BY JENNIFER HASHLEY, G05, AND SAMUEL ANDERSON, G09

**A** NEW YORK TIMES opinion piece caused quite a stir in the farming community last year. You'd expect as much from an article titled "Don't Let Your Children Grow Up to Be Farmers," especially when the author is a farmer himself (Bren Smith, who farms seaweed on Long Island).

The article touched a nerve with its central premise: "The dirty secret of the food movement is that the much-celebrated small-scale farmer isn't making a living." Despite all the buzz about local foods, Smith says, most small farmers can't survive on farming alone. "After the tools are put away, we head out to second and third jobs to keep our farms afloat."

Although many in the farming community bristled at this, most people who have been small-scale farmers or worked closely with them will tell you that Smith's claim is absolutely true. Without some form of off-farm income, the majority of small-scale farmers in the U.S. wouldn't be able to pay the bills.

Many will probably tell you that they aren't counting on their farm enterprise to make ends meet. At the New Entry Sustainable Farming Project, where working adults learn the

business of farming, many trainees fall into this category: While they'd love to scale up to be full-time farmers someday, they know that it will take years to reach that point. In the meantime, they need to keep an off-farm job in order to maintain a livelihood, like the two New Entry graduates who farm their leased land but also work 30 or more hours a week as certified nursing assistants. Many may not have full-time farming income as a goal in the first place, instead seeking to farm parttime for supplementary income and to contribute to their local food system. Perhaps the American small-scale farmer is most often a part-time farmer—but is that necessarily a problem?

As for those who do endeavor to make it pay off—either as a full- or part-time career—it certainly is not what anyone would call "easy." At New Entry, we strive to improve the livelihoods of beginning farmers and to prepare them with the strategies and skills to succeed. We provide farm business-planning courses, practical skills trainings in crops and livestock, farmland access and market connections for people interested in starting commercial farms. But we also want to make sure new farmers go into the field with their eyes wide open,

fully aware that it is very challenging in today's economy to make a full-time living as a small-scale farmer, and especially as a new farmer. We aren't in the business of luring people into becoming farmers. If anything, prospective farmers who come to our Explore Farming workshop might say we try to talk them out of it.

Of course we believe—we *know*, in fact—that if you have the right combination of skills, drive, resources and circumstances, starting a farm business may be the best thing that's ever happened to you. But we also know that no matter how much buzz you may hear about local foods, no matter how "hip" it may be to be a small farmer, it's also very hard work, and it doesn't always work out. New Entry's trainees can walk away better appreciating the hard work it takes to grow food—or they can continue farming and scale up over time. Both are successful outcomes.

Donald Sutherland, who runs Long Life Farm with his wife, Laura Davis, a graduate of New Entry's Farm Business Planning Course, had a particularly poignant response to Smith's article. He points out that the economics of small-scale farming fit into the broader context of challenges facing all small and start-up businesses. "That said," he continues. "I don't think there is any career that offers as broad an array of skills, both managerial and business, as running a farm... farming gives a work ethic and business experience that few other jobs in America can offer... Farming is a brave risk-taking venture and not for the weak. I have never been so proud of a job and lifestyle which keeps on giving."

Neither have we.

**JENNIFER HASHLEY and SAMUEL ANDERSON are, respectively, director and livestock program and outreach coordinator for the New Entry Sustainable Farming Project at Tufts.**



# From All Corners

UNIVERSITY, SCHOOL & ALUMNI NEWS

**Tufts**  
Health Sciences Campus

## SIGNS OF THE TIMES

The Tufts health sciences campus in downtown Boston, housed in more than a dozen buildings of different sizes, styles and vintages sprawled across several city blocks, has been the sort of place that's hiding in plain sight. That vagueness is gone now. A smartly conceived system of signs, including 13 perforated blue-and-silver metal fins attached to the sides and corners of the main buildings, now defines the campus. Five free-standing kiosks also supply helpful map panels.





# Enlightened Palate

Eat the whole farm, advises one of America's top chefs **BY HELENE RAGOVIN**

**T**O ILLUSTRATE THE past, present, and future of American cooking, Dan Barber, A92, would have you visualize three different plates of food. The first plate, representing the mainstream of 20th-century American cooking, holds a seven-ounce steak with a small side of carrots. The second exemplifies the farm-to-table style popularized by food writers and chefs like Barber—dishes that are seasonal, artisanal, and local, but often modeled on their conventional predecessors. This plate holds a seven-ounce, grass-fed steak with organic heirloom baby carrots.

On the third plate—the one Barber is experimenting with at the two restaurants he co-owns, Blue Hill in Manhattan and Blue Hill at Stone Barns, in Westchester County, New York—is a “carrot steak” embellished with a sauce containing braised bits of beef. This seemingly topsy-turvy meal could hold the key to restoring balance to a food-production system that has become unsustainable.

The third plate emerged from Barber's efforts to perfect the second

plate. His innovative and artful fare had made him a leader in the farm-to-table movement—a winner of several James Beard awards, the foodie Oscars—and helped shepherd a change in the way Americans cook and eat. People were learning to appreciate the creamy richness of a golden-yolked egg laid yesterday by a free-range chicken, and to rediscover apples of various shapes, sizes and hues that once filled nearby orchards before mass-market Red Delicious took over.

Like an alchemist in search of the philosopher's stone, Barber quested after the secret to cultivating great-tasting

## Barber aims to persuade cooks to quit building menus around celebrated ingredients and choose foods with an eye toward the viability of the land.

ingredients. He kept meticulous records of the produce and livestock grown and raised at the Stone Barns Center, a nonprofit agricultural complex that surrounds the Westchester County restaurant. For every piece of lamb he served, he could tell you when the animal had been born, who its mother was, what grass it had eaten, and so on.

But as he sought to uncover the key to deliciousness in his data, he realized he'd been going about it the wrong way. "I was asking only about the lamb," he said recently. The recipe for delicious lamb, he learned, starts long before the lamb is even born. "I wasn't asking about the crop rotation that supported the lamb's diet. I wasn't asking about the other animals on the farm. I wasn't asking about any of the in-between crops that also supported the farmer."

He has written a book, *The Third Plate: Field Notes on the Future of Food* (Penguin), to consider just such questions. In it, he tells of farmers and scientists who are pushing the frontiers of sustainable agriculture. He aims to persuade cooks and consumers to quit building menus around a handful of celebrated ingredients and instead choose foods with an eye toward the viability of the land.

So, Barber says, if you want those peak-of-summer Brandywine tomatoes—a water-hogging crop that depletes the soil—you also need to cook with kidney beans, millet and mustard greens. Those less glamorous crops build soil structure, replenish nitrogen and keep plant diseases at bay. But because not enough people

buy them, farmers either sell such crops for animal feed, at a loss, or don't even grow them. "That's very dangerous from an ecological point of view, and economically from the farmer's point of view," Barber says.

Barber didn't set out to turn the culinary world on its head. He began his career as an apprentice at La Brea Bakery in Los Angeles, after Sol Gittleman—former Tufts provost, current University Professor—egged him on. In the spring of his senior year, Barber had mentioned a vague notion that he wanted to bake bread. The next day, in a German literature class, Gittleman beseeched an auditorium full of students to follow their passion in life. "I have a guy here who wants to be a baker!" he declared.

"And all of a sudden, I became a baker," says Barber, who insists that his liberal arts education has not gone to waste. Cooking "is a liberal arts craft in many ways," he says. "To understand it, you need to expand your mind beyond cooking."

That is what the "third plate" concept asks people to do, as they consider the whole ecosystem of food, from sustainable farming to sustainable dining. "You've heard the phrase 'nose-to-tail eating'?" Barber asks, referring to the practice of creating dishes from all parts of an animal. "This is nose-to-tail eating of the farm. We need to be more attuned to the nuts and bolts of farming, because it's the nuts and bolts that provide true sustainability."

**HELENE RAGOVIN** is a senior writer at Tufts.

## MOVERS AND DOERS



**EDWARD SALTZMAN, M.D.**, became the academic dean for education at the Friedman School. An associate

professor at Friedman and Tufts School of Medicine, he is the chief of the Division of Clinical Nutrition at Tufts Medical Center and is also a longstanding member of the Energy Metabolism Laboratory at the HNRCA. He will oversee programs related to teaching, students and student life.



**ELENA NAUMOVA, PH.D.**, was appointed academic dean for faculty. For the past three years,

she has served as the associate dean for research at Tufts School of Engineering, where she is a professor. She will coordinate the Friedman School's efforts to mentor and develop outstanding faculty.



**DENNIS STEINDLER, PH.D.**, has joined the HNRCA as director of the Neuroscience and Aging Laboratory.

He has been studying the growth and transplantation of normal brain and cancerous stem cells for more than 25 years. Most recently, he was a professor of medical research in the Department of Neurological Surgery at the University of Florida College of Medicine.



# Science That Takes the Long View

Carlota Dao, N10, N13, is on the trail of obesity and its costs to good health

## WHO AM I HELPING?

Sitting at a lab table, her face pressed against a microscope, Carlota Dao, N10, N13, asks herself this question quite often. “As a scientist, it’s easy to stay focused on the immediate world,” Dao says, “but I kept asking myself why this research mattered. Who’s in the bigger picture?”

Dao’s focus is the medical effects of obesity. Her desire to couple her interest in biochemistry with a study of its broader implications brought her to the Friedman School. As the recipient of the Stanley N. Gershoff Scholarship, Dao has had her tuition and fees covered, and she received a stipend. She also

received a seat on the student-led planning committee of the annual Gershoff Symposium, which brings together experts in the biological and social sciences to debate nutrition policy issues. Dao was humbled to receive such an honor. “I had this awesome privilege of planning the symposium along with the other committee members,” she says. “It was invaluable exposure to the field of nutrition.”

While at Friedman, Dao also won the Stanley N. Gershoff, Simon J. Simonian and Arpi A. Simonian Prize for Research Excellence in Nutrition Science and Policy for her work on her thesis about iron deficiency as

a consequence of obesity. In the lab of Professor Simin Nikbin Meydani, D.V.M., Ph.D., director of the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts, Dao worked on a clinical study comparing the iron levels of two groups of pregnant women, one obese and one lean, and their infants. The study found that regardless of the mother’s iron level, the babies of the obese mothers had lower iron levels than the infants of the lean mothers.

Having completed her Ph.D., Dao is now dividing her time between the Institute of Cardiometabolism and Nutrition (ICAN), a research institute in Paris that focuses on nutrition and health, and Danone, best known in the U.S. for Dannon yogurt products. “ICAN and Danone share the goal of enhancing nutrition in the populations that they target and are at the forefront of an important push to train people to serve as ambassadors between academia and industry,” she says. Dao’s research focuses on gut microbiota and its association with obesity and obesity-related diseases. “I really can’t quantify everything I learned from the [Friedman School] faculty and my classmates. I think about them daily and silently thank them for teaching me so much.”

—KATHY HUBBARD



Dao’s research focuses on gut microbiota and obesity.

 **Double Your Impact.** As part of a university-wide drive to increase financial aid, Tufts will match qualifying gifts of \$100,000 or more to endowed scholarships, doubling the impact of these gifts. For more information, please contact Cindy Briggs Tobin, senior director of development and alumni relations, at 617.636.0962 or [cindy.briggs@tufts.edu](mailto:cindy.briggs@tufts.edu).

The midbrain (orange) is a major site of dopamine activity.



# The Dope on Dopamine

And why it makes it hard to diet

## WHY IS IT SO difficult to eat less?

That's what Emmanuel N. Pothos, Ph.D., an associate professor of pharmacology and experimental therapeutics and of neuroscience in Tufts School of Medicine's Department of Integrative Physiology and Pathobiology, and his colleagues are trying to understand. Pothos' research focuses on the reward system in the brain that makes us want food. As it turns out, this system depends heavily on the chemical dopamine, normally released when an animal eats a meal. Dopamine produces a pleasurable sensation that lets the animal know it has satisfied a primal need.

Starvation, however, alters this otherwise tidy feedback loop. When an animal is having a hard time finding enough food, the brain doesn't want it to feel satisfied after just one meal, so it releases less dopamine. Pothos and other researchers have seen corroborating evidence in the lab: The brains of underweight animals release

less dopamine than those of normal-weight animals.

Oddly, the brains of overweight animals release less dopamine as well. And human brain imaging by other researchers indicates that something similar is likely going on in people. "Even though they are mirror opposites, the undernourished and the obese share two things—an increased motivation to eat and a deficient brain dopamine system," Pothos says.

A number of factors can knock the reward system off kilter: genetic predisposition, the environment a baby encounters in the womb, gaining or losing weight and certain diseases, including addiction. Yet the situation, while difficult to correct, is not hopeless. Exercise may offer a solution—and not just because it can burn off calories. Pothos says there's early evidence that regular exercise, in addition to all its other benefits, can help reset the dopamine reward system.

—JACQUELINE MITCHELL

## Run, Micah, Run

Marathoner and nutrition entrepreneur Micah Risk, N13, graced the cover of *Runner's World* magazine in October. The magazine praised her 3:18 marathon best, her passion for staying healthy, and her distinctive sense of running style, which she showed off on the streets of Somerville, Mass. Risk is a cofounder of Lighter, a food service that delivers recipes and plant-based ingredients to subscribers.



## JERRY DEPARTS; DATA SETS WEEP



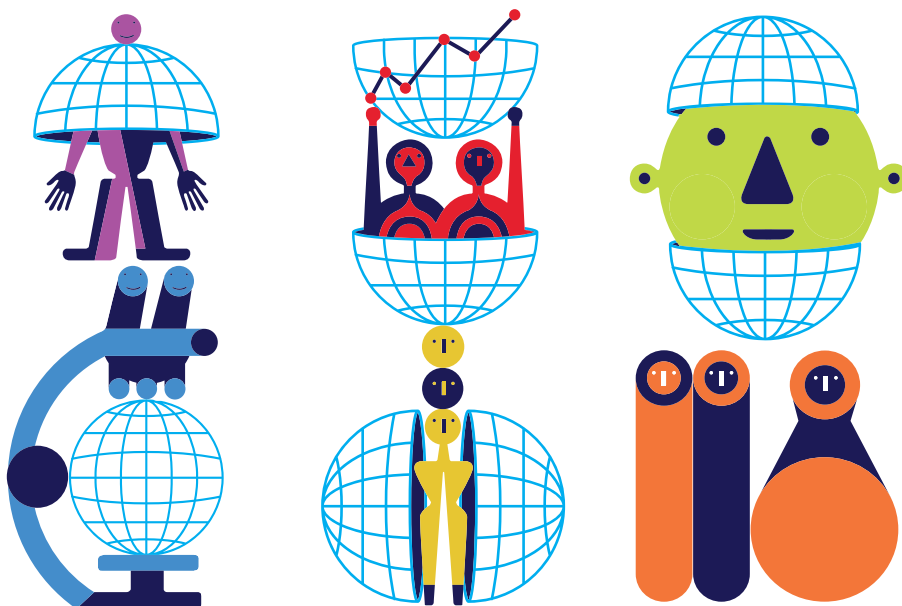
The Friedman School and the HNRCA recently bid farewell to Professor Emeritus GERARD

“JERRY” DALLAL, PH.D., who retired on Oct. 1, 2014, after 32 years at Tufts. He was an integral part of countless research projects as chief of the HNRCA’s Biostatistics Unit and trained generations of students in the fine art of number crunching.

At his retirement party, Lorien Urban, N09, N11, was one of many former students who praised his teaching skills. She testified that she came into the Ph.D. program terrified of data analysis, but was soon a convert. “You taught me to love statistics,” said Urban, who now works on obesity prevention at the biotech company Gelesis.

To see this magical pedagogy firsthand, Dallal’s colleague, Joseph Kehayias, who has known him 27 years, sat in on one of Dallal’s courses for a semester last year. The secret was a simple one: “He enjoys every second of it,” Kehayias said, “and the students know it.”

What’s next for the King of Data? “I like Walt Disney’s quote,” Dallal said. “When you’re curious, you find lots of interesting things to do.”



## Real-World Science

The Tufts Institute for Innovation crosses disciplines to take on global problems

**FOUR RESEARCH TEAMS** at Tufts have set out to solve some daunting public health problems under the auspices of a new university-wide venture, the Tufts Institute for Innovation (TII). The institute, which launched on August 28 in new laboratories on the Boston campus, is a major initiative of the university’s strategic plan, Tufts: The Next 10 Years (T10).

What distinguishes TII from similar research centers, says Tufts President Anthony P. Monaco, is that “from the outset, findings in the laboratory will be tightly and deliberately coupled with strategies for implementing them around the world. TII is a university-wide commitment to science for social good.” To support the institute’s startup, Monaco has allocated funds that were bequeathed to the university; he intends to make

the institute a priority in Tufts’ next capital campaign.

Four projects addressing TII’s inaugural research theme, “Microbes: Improving the Environment and the Human Condition,” were chosen to receive seed funding:

**WATERBORNE DISEASES.** A team led by Elena Naumova (Friedman School, Department of Civil and Environmental Engineering and Department of Public Health and Community Medicine) and Kurt Pennell (Civil and Environmental Engineering) seeks to reduce the public health burden of waterborne infectious diseases in Ghana and India. They are collaborating with colleagues from Christian Medical College in Vellore, India, and the Noguchi Memorial Institute for Medical Research at the University of Ghana.



**LYME DISEASE.** Sam Telford (Infectious Disease and Global Health) and his group are developing an oral vaccine to reduce the prevalence of the microbe in mice that causes Lyme disease. Their goal is to reduce transmission of the Lyme-causing bacterium to humans.

**HOSPITAL INFECTION.** Xingmin Sun (Infectious Disease and Global Health) and his team are working on a vaccine against a stubborn hospital-acquired infection, *Clostridium difficile*, which kills nearly 30,000 people in the United States alone each year. They're targeting those at highest risk for infection, including the elderly and patients with weakened immune systems.

**TB TEST.** Gillian Beamer (Infectious Disease and Global Health) and her research team are developing a nearly instantaneous diagnostic test for tuberculosis. The project is addressing the limitations of existing tests, including heat stability, portability and rapid results.

To ensure that discoveries get to those who need them most, each research team will recruit other Tufts faculty who can help surmount the political, cultural, regulatory, infrastructural and economic barriers that can hinder scientific breakthroughs from having significance beyond the laboratory. "When you have an outcome that really addresses a problem, you realize it's not just about the science or the technology," says David R. Walt, a University Professor and TII's founding director. "It's about actually understanding the problem and getting the right people in the room who have experience in those areas."

While TII work will be conducted on all three campuses, the institute's base is in 5,000 square feet of newly renovated laboratory, office and meeting space in the Biomedical Research & Public Health Building. The TII research teams—which will

include undergraduates and graduate students—will also tap the resources of the Department of Molecular Biology and Microbiology next door in the Jaharis Center, the new Arnold 8 Biosafety Laboratory that was built to advance research in infectious diseases, and Boston's world-class hospitals.

### INTO THE FIELD

With first-year seed funding and incubator lab space assured, the research teams will seek funding from external sources to complete their work. In an era of tight federal resources, funding agencies typically want a grant application to contain preliminary results produced by highly cross-disciplinary teams, Walt says. The TII model is designed to make Tufts more competitive in seeking such funding.

Many of the TII projects will have both social and commercial value, says Lauren Linton, TII's deputy director. "TII is designed to foster continuous waves of discovery and entrepreneurship," she says.

Future projects might engineer microbes for cleaning up oil spills or harvesting carbon out of the air, says John Leong, professor and chair of molecular biology and microbiology. TII will be able to solve problems in fields such as medicine, engineering, the environment and public health because it fuses strengths across disciplines, he says.

Additional thematic areas of research will be developed and other Tufts faculty will be invited to submit proposals that support those areas. Says Monaco: "With our expertise in human and animal models of disease, international business and policy, engineering, the environment, humanitarian issues and geopolitical contexts and challenges, Tufts is uniquely positioned to produce discoveries that improve the human condition." —JACQUELINE MITCHELL

## Gimme an R! Gimme a D!

Three cheers for **MADELYN WILSON**, an aspiring R.D. in the Master of Science/Dietetic Internship Program at the Frances Stern Nutrition Center, who was chosen to be a cheerleader for the 2014–15 New England Patriots. She was one of 320 women who vied for a spot, but the former captain of Texas Christian University's cheer squad was ready for the grueling audition.

"I go hard or go home," said Wilson, whose cheer career began in eighth grade. "I don't like doing anything halfway."

As for how she balances cheer practice, games and appearances with classwork and rotations at Tufts Medical Center, she says it's just a matter of being organized. "I have a planner that I would die without," she says.



# Urban Bounty

It's amazing how much nutrition can be had from a small bit of soil, even in the heart of the city. In 2013, the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts teamed up with the Massachusetts Horticultural Society to create an indoor vegetable garden in the lobby of the research center building on Washington Street in Boston's Chinatown neighborhood.

Three wooden carts, easily seen from the street, house the soil-filled bins and high-output fluorescent grow lights. Volunteers who maintain the garden have planted nine crops so far, including radishes, beets, turnips, Vietnamese mint, tatsoi and kale. The vegetables, harvested every few weeks, are donated to St. Francis House, a day shelter in the city. Here's how this garden grows:



**15**  
**HOURS**

Amount of daily light  
required to keep  
things growing.



**10**  
**GALLONS**

Amount of water the garden  
drinks each week.

**10**  
**MILLION**

Added nematodes,  
pest-killing microorganisms.

**134%**

The daily value of vitamin C  
in one cup of kale.

**\$8.95**

**COST FOR ONE  
18-GALLON  
PLASTIC  
STORAGE TOTE.**

**5**  
**MINUTES**

Time spent on daily  
maintenance.

## YOUR ALUMNI ASSOCIATION

# BE PART OF A TRADITION



**TWELVE YEARS AGO,** the Friedman School launched its first All-Alumni Reunion to reconnect graduates from all programs and class years.

Reunion remains one of the most popular Alumni Association traditions among the more than 1,500 alumni in our network today. This year we invite you to catch up with past and present friends and colleagues at our informative All-Alumni Reunion events on March 27–30, 2015.

This year's program is shaping up to be outstanding. Attend the Gershoff Symposium to hear four experts discuss this year's topic, "Nutrition Messages in

the Media: Making Sense of the Chaos"; celebrate your peers at Saturday's dinner and awards ceremony, and support students' professional development at the Young Alumni Networking Event on Sunday. Don't forget to RSVP early to secure your tickets at [www.nutrition.tufts.edu/joinus](http://www.nutrition.tufts.edu/joinus).

In addition to the annual reunion, the Alumni Association offers a host of opportunities for students, alums and faculty to stay involved throughout the year. We hold receptions at major conferences across the country, invite you to share your expertise on career panels and encourage your involvement in our annual Washington, D.C., networking trip for students and alumni.

We are exploring new programming

to elevate the Alumni Association's role in achieving Dean Mozaffarian's vision for the Friedman School. Some of these programs aim to enhance the student experience; others focus on making a greater impact on nutrition policy, and some are geared toward expanding our network. It is exciting to consider all that we can accomplish with an Alumni Association that comprises such talented and dedicated individuals.

If you would like to become more involved or have suggestions regarding alumni programming, please feel free to contact me at [ashao@herbalife.com](mailto:ashao@herbalife.com). I hope to see you at our reunion.

**ANDREW SHAO, N00**

**President, Friedman School Alumni Association**

## UNIVERSITY CREATES SUSTAINABLE INVESTMENT FUND

To advance its environmental agenda, Tufts will create a sustainability investment fund and begin planning for a new energy plant on its Medford/Somerville campus that is expected to reduce greenhouse gas emissions by 20 percent.

The new Tufts University Sustainability Fund (TUSF) will give donors the option of designating that their endowment gifts be invested in a way that acknowledges the importance of environmental, social and governance (ESG) factors. Tufts will launch the TUSF with seed funding from the university.

The \$36 million energy plant will replace a 60-year-old central heating plant and will pay for itself in approximately a dozen years through anticipated energy savings. It will take advantage of the latest high-efficiency cogeneration technologies, which use a single fuel source to generate heat and electricity on site. Thermal energy for heating that otherwise would be wasted is captured to produce electricity.

"Sustainability is deeply ingrained in our campus culture," Tufts President Anthony P. Monaco said.

Exploring a sustainability fund was a recommendation of

a working group of students, faculty, administrators and trustees that Monaco appointed in April 2013 to examine the university's role in mitigating climate change.

ESG investing is relatively new. "The sustainability fund gives us an opportunity to learn more about the feasibility and effectiveness of these kinds of investments," Monaco said. Ideally, income generated by the fund will support sustainability programming in both academics and operations, he said.

The TUSF will be part of the university endowment, which stood at \$1.6 billion as of June 30, and thus will be guided by the Tufts investment policy.

The first step will be to appoint a small advisory committee that will help define what constitutes an environmentally supportable or socially responsible investment.

The university does not invest in individual companies. Instead, it uses commingled or pooled funds—mutual funds are one example—in which multiple investors hold a piece of an investment portfolio in proportion to the value of their individual investments.



# Class Notes

## N90

**WILLIAM REID** has formed WJR Consulting to focus on earlier-stage health-care technology companies. Many of his current projects involve building health analytic products to apply machine learning and prediction models to health-care data. Clients include start-ups that are building new approaches to medical transport, facilitating the patient hand-off process and providing improved behavioral health care.

## N05

After nine years at Harvard University, **XIANG GAO** moved to Penn State in September to become an associate professor and director of its nutritional epidemiology

laboratory. Also in September, the National Institute of Neurological Disorders and Stroke funded his project "Statins, Statin-related Gene and Parkinson's Disease Risk." He was invited to give a talk titled "International Collaboration of Sleep Research" at SLEEP 2015, the 29th annual meeting of the Associated Professional Sleep Societies.

## N06

**STEPHANIE CLARKE LALIBERTE** and her husband, Jason, announced the arrival of their daughter, Juliette Paige Laliberte, on July 2, 2014. Jay and Stephanie report that they are so grateful to have such a happy and healthy addition to their

family and are looking forward to exciting adventures together.

## N07

**KUMAR CHANDRAN, MPH07**, and **ELANOR STARMER, F07**, welcomed a healthy baby boy, Kailas Leelakrishnan Chandran, on June 22, 2014. Elanor continues her job as policy adviser to USDA Secretary Tom Vilsack, while Kumar joined the USDA ranks in mid-September as the chief of staff for Food, Nutrition and Consumer Services. Baby Kailas is excited to spread the gospel of healthy eating to his day-care classmates once he learns to talk.

**CHRISTOPHER HILLBRUNER** was featured on NPR's "All Things Considered" in a story titled "When Do

Food Shortages Become a Famine? There's a Formula for That."

## N08

**COREY O'HARA, F08**, returned to Friedman as a Ph.D. student in food policy and applied nutrition in 2013. He has been working with iDE, an international NGO, on a research program in Nepal that examines the connections between vegetable cultivation, child malnutrition and women's empowerment through a series of interventions to support small-scale farmers. In September, he helped iDE win an \$8.2 million grant, with which he will investigate the effects of such interventions on strengthening farmers'

## Keep in Touch With Us

### THE FRIEDMAN SCHOOL

Stop by our Web pages for information on upcoming events, ways to get involved and profiles of Friedman School alumni.

Like us on Facebook, and if you are an alum, faculty member or student, join the Friedman School Alumni Association Group Pages on [WWW.FACEBOOK.COM](http://WWW.FACEBOOK.COM) and [WWW.LINKEDIN.COM](http://WWW.LINKEDIN.COM).

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[HNRCA-COMMUNICATIONS@TUFTS.EDU](mailto:HNRCA-COMMUNICATIONS@TUFTS.EDU).

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resilience to climate change.

**TAWANDA MUZHINGI, N14**, is working as a food scientist with the International Potato Center based in Nairobi, Kenya.

## N09

**MEGAN MIRAGLIA** received a Recognized Young Dietitian of the Year award from the Massachusetts chapter of the Academy of Nutrition and Dietetics. She recently landed a new role as a health improvement strategist at Cigna, where she designs and strategizes wellness plans for corporate clients.

**LARA PARK, N12**, has joined the Department of Biological Sciences at Dartmouth College as a special instructor teaching the biology labs for undergraduate students.

## N10

**CAITLIN WESTFALL HOWE, MPH10**, has moved from Boston to Dallas, Texas. She is enjoying her new surroundings and is excited to connect with Friedman School alumni in the Texas area.

**BETSY RAKOLA** is now the USDA organic policy adviser and the new chair of the USDA's Organic Working Group. She will coordinate work on organic agriculture across the agency.

## N12

**ASHLEY DUNHAM** married **JOHN SMALLEY, E14**, on Aug. 9, 2014. Friedman School alumni in attendance included **KATY HARTMAN, N12**; **CAITLIN WESTFALL HOWE, N10, MPH10**; **MEGAN MIRAGLIA, N09**; **ABBY CALCUTT, N10, MPH10**; **MOLLY UEBELE, N12**; **JENNY HALL, N12**; and **MELISSA PAGE, N12**.

**ALLISON KNOTT** is now the wellness manager and resident

registered dietitian for FLIK International at BlueCross BlueShield of Tennessee.

## N13

**MEGHAN JOHNSON, MPH13**, started a new position as the marketing and communications manager for the Health Schools Program of the Alliance for a Healthier Generation.

**SHELLY ROLLET, MPH13**, and **ELAINE SIEW, MPH13**, had a paper from their Applied Learning Experience project accepted for publication. "Prevalence of Malnutrition in Children under 5 and School-age Children in Milot Valley, Haiti" will be published in the journal *Public Health*.

## N14

**VICTORIA DIAZ-BONILLA CALLAWAY** and her husband, Jordan, welcomed their daughter, Therese Rose (named in honor of St. Therese of Lisieux), on June 13, 2014. The

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couple sends their thanks to the Friedman community for the support and well wishes.

**ZOE SCHWEITZER** has joined the Children's Clinic in Long Beach, California, as coordinator of the Choose Health L.A. Kids Initiative, a large, early-childhood obesity-prevention grant program being implemented across Los Angeles County.

**CALLIE HERRON** has joined Wis-

consin's Discovery Farms program as an outreach specialist.

**BARBARA PATTERSON** is a government relations representative at the National Farmers Union.

**LIANA PRZYGOCKI** is working for Future Harvest Chesapeake Alliance for Sustainable Agriculture. She manages Future Harvest's Foodshed Field School, providing educational programming for farmers and others across the food system.

## In Memoriam

**CLARE E. FORBES**, the former director of what is now the Frances Stern Nutrition Center, died on Oct. 16, 2014. Born in Medway, Massachusetts, she graduated from Framingham State University, where she majored in food and nutrition sciences and education. She completed a one-year internship at the Frances Stern Food Clinic of the Boston Dispensary (now Tufts Medical Center), where she later became a staff member, acting director and finally director in 1952. That same year, she obtained a master's degree from the University of Michigan's School of Public Health. In 1967, she was appointed director of nutrition for the Maryland Department of Health and Mental Hygiene, a post she held until her retirement in 1985. She was appointed a panel member of the White House Conference on Food, Nutrition and Health that was held in Washington, D.C., in December 1969. She served as first chair of the American Academy of Dietetics and Nutrition committee that explored the academy's role in legislation and public policy. Forbes requested that in lieu of flowers, friends extend random signs of kindness and generosity to others in her memory.

# Milk in the Raw

**ALICIA ROMANO, N10**, a registered dietitian at the Frances Stern Nutrition Center at Tufts Medical Center, serves as our expert.

**Q** *Do the benefits of drinking raw milk outweigh the risks?*

**A** Raw milk is milk that has not undergone pasteurization, the bacteria-killing heat treatment designed to reduce human pathogens and increase shelf life. Unpasteurized milk can contain potentially harmful and deadly pathogens, including listeria, salmonella, e. coli 0157:H7 and campylobacter. Children, the elderly, pregnant women and people with weakened immune systems have the highest risk of contracting illness from these pathogens. According to the Centers for Disease Control, outbreaks associated with these pathogens are 2.2 times higher in states where raw milk sales are legal.

So why do people go so crazy for raw milk? Because of the supposed health benefits, which include improved immunity, allergy relief and gastrointestinal health.

One claim is that raw milk can improve digestive health and does not cause lactose intolerance. Yet research has failed to support the notion that there are levels of probiotics in raw milk to produce digestive benefits. Additionally, milk, whether raw or pasteurized, does not contain lactase, the enzyme needed to digest lactose, or levels of lactobacilli bacteria (like those in yogurt) that are able to produce these effects.

There is also no evidence to support the claim that raw milk can cure or treat allergies and asthma. The study that is often used to support this claim (the PARSIFAL study) focused on milk obtained directly from farms, but some of that milk was boiled. Additionally, pasteurization has little impact on the milk's protein structure, so people with milk allergies are unlikely to tolerate milk, whether it's raw or pasteurized.

As for whether raw is more nutritious, pasteurization does affect the vitamin content of milk, but not appreciably. Vitamin E in milk is naturally low anyway. Although B12 decreases somewhat, one 8-ounce glass of low-fat milk still provides half the recommended daily intake. Vitamin C decreases, but milk is not considered a primary source of C. Milk is, however, an important source of vitamin B2 (riboflavin), providing 45 percent of the recommended daily intake. Pasteurized stacks up evenly with raw here because vitamin B2 is not affected by heat treatment, but is by exposure to light.

So what's the verdict? Drink raw milk at your own risk. Although the perceived health benefits sound tempting, there is little evidence to back up the claims. You can get the

same nutritional value by consuming pasteurized milk along with a variety of whole foods, but with a substantially reduced risk of a potentially serious infection.



Send your questions for future installments of "Ask Tufts Nutrition" to Julie Flaherty, Tufts University Office of Publications, 80 George St., Medford, MA 02155 or email [julie.flaherty@tufts.edu](mailto:julie.flaherty@tufts.edu).





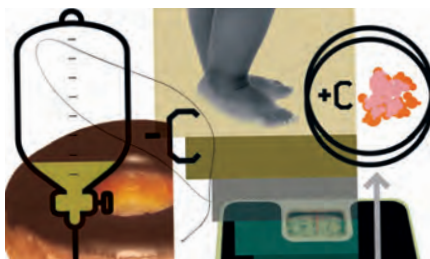
# Simple steps can make a big impact

Through simple planning now, you can create a gift that will make a difference for generations to come. If you're thinking about creating or updating your will or trust, contact the Gift Planning Office to learn how to include a gift for the Friedman School.

➔ Change of address? Questions? Email [julie.flaherty@tufts.edu](mailto:julie.flaherty@tufts.edu).



## 6 Fats and Genes



## 9 After Cancer



## 32 Urban Bounty



## ENLIGHTENED PALATE

**DAN BARBER**, one of America's top chefs, wants you to eat as if the future of farming depended on it. He envisions a diet based not just on health and taste, but on sustainability. Are you ready to plan your meals around the food ecosystem?

FOR MORE ON THE STORY, TURN TO PAGE 26.