

Tufts

Nutrition



**How Tufts researchers help keep
the U.S. military in fighting shape**



PRESSURE COOKER

As owner of What We Eat, a nutrition coaching and personal chef business in New York City, Laura Geraty, N11, is no stranger to the heat of the kitchen. And her knack for staying cool under pressure served her well during 16 intense hours taping Food Network's *Cooks vs. Cons*, a reality show pitting amateur chefs against pros like Geraty. Her episode aired in February and though she didn't win—she burned her pine nuts (twice)—she doesn't regret a thing. "If this is what losing feels like," she said, "bring it on."

Contents

SUMMER 2017
VOLUME 18, NO. 2

Features

12 TUFTS NUTRITION TOP 10
How the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts leads the way.

14 TAKING ROOT
Growing foods to feed family, culture and a diverse community, with a little help from the New Entry Sustainable Farming Project.
BY ALONSO NICHOLS AND JULIE FLAHERTY

18 NEXT-GEN FOOD AID
Engineering emergency meals to save lives around the world. **BY JULIE FLAHERTY**

24 FIGHTING SHAPE
COVER STORY Cutting-edge nutrition science keeps the nation's military ready to serve—and could help weekend warriors, too.
BY JULIE FLAHERTY



In Every Issue

- 2 **FOOD FOR THOUGHT**
- 4 **A LA CARTE**
Research in Brief
- 8 **DIG IN**
The Wide World of Nutrition
- 27 **FROM ALL CORNERS**
University, School & Alumni News
- 36 **ASK TUFTS NUTRITION**
Demystifying cow's milk alternatives

GOOD FOOD FOR A SECURE NATION



BASED ON SCHOLARSHIP from Tufts and beyond, we know our country faces a nutrition crisis. Our food system is the leading cause of poor health among Americans, causing an estimated 700,000 deaths and \$350 billion in preventable health-care spending and lost productivity each year. Imagine the response if any other aspect of our nation was causing nearly 2,000 deaths and a \$1 billion economic loss each day.

Obesity, diabetes and related conditions are at epidemic levels.

Health care costs and premiums are skyrocketing, while productivity, profits and competitiveness of American businesses are being crippled. Federal and state budgets are similarly being decimated. Since the No. 1 cause of poor health—poor nutrition—is not addressed by the health system, is it any surprise that health-care costs continue to rise? The clear solution is prevention through a healthier food system.

Poor nutrition also threatens national security. Military readiness motivated the first nutrient guidelines (RDAs) in 1941, when President Roosevelt convened the National Nutrition Conference on Defense to ensure a battle-ready population. After many young recruits were found to be undernourished, Roosevelt launched the National School Lunch Program in 1945. Our military now faces a new challenge: rampant chronic diseases from low-quality food. According to the Department of Defense, obesity is the leading medical reason that talented recruits cannot enroll, while two-thirds of active-duty forces are overweight or obese. “Mission: Readiness,” a group of more than 700 retired admirals and generals, identified improving nutrition as a national-security priority.

Fixing our country’s nutrition crisis is crucial for health, the economy, global competitiveness of American business, and national security, as well as for reducing disparities and invigorating rural communities and agriculture.

As we have done for nearly 40 years, the Friedman School is committed to addressing these issues by producing trusted science, future leaders and evidence-based public impact. I invite you to review our new strategic plan (nutrition.tufts.edu/strategicplan). In addition to leading the way in cutting-edge research and education, we will further establish our position as a trusted voice in nutrition and launch a schoolwide strategy for advocacy, policy change and public impact. Our strategic planning process identified our strong school community as one of our unique hallmarks and strengths. You are part of that community, and I look forward to working together to address the complex nutrition crisis facing our country and the world.

DARIUSH MOZAFFARIAN, M.D., Dr.P.H.
Dean, Gerald J. and Dorothy R. Friedman School of Nutrition Science and Policy

Tufts Nutrition

VOLUME 18, NO. 2
SUMMER 2017

Editor

JULIE FLAHERTY
julie.flaherty@tufts.edu

Editorial Director
JOHN WOLFSON
john.wolfson@tufts.edu

Editor-in-Chief
FRANCIS STORRS
francis.storrs@tufts.edu

Design Director
MARGOT GRISAR
margot.grisar@tufts.edu

Designer
BETSY HAYES

Deputy Editors
COURTNEY HOLLANDS
TAYLOR MCNEIL

Senior Editors
LAURA FERGUSON
MONICA JIMENEZ
HELENE RAGOVIN
GENEVIEVE RAJEWSKI
HEATHER STEPHENSON

Staff Photographers
ALONSO NICHOLS
ANNA MILLER

Multimedia
STEFFAN HACKER

Contributing Editor
BOB SPRAGUE

Editorial Advisers
Gerald J. and Dorothy R. Friedman
School of Nutrition Science and Policy

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

ELENA NAUMOVA, Ph.D., Academic Dean
for Faculty

EDWARD SALTZMAN, M.D., Academic Dean
for Education

CINDY BRIGGS TOBIN, Senior Director of
Development and Alumni Relations

ANNIE DEVANE, Director of Communications
and Web Strategies

Jean Mayer USDA Human Nutrition
Research Center on Aging

SARAH BOOTH, Ph.D., Interim Director

DEB DUTCHER, Communications Specialist

Tufts Nutrition is a publication of the Gerald J. and Dorothy R. Friedman School of Nutrition Science and Policy and the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts. It is distributed to alumni, students, faculty, staff and friends.

We welcome your letters.
Send correspondence to:
Julie Flaherty, Tufts Nutrition,
Tufts University Office of Publications,
80 George St., Medford, MA 02155
Tel: 617.627.4273; Fax: 617.627.3549
E-mail: julie.flaherty@tufts.edu

Read us online at go.tufts.edu/nutrition

© 2017 TRUSTEES OF TUFTS UNIVERSITY

Printed on 25% postconsumer waste recycled paper. Please recycle.

OUR WORK IS IN JEOPARDY



FIFTY YEARS AGO, the United States committed to improving the nutrition status of vulnerable populations and investing in aging research because of the determination and vision of Dr. Jean Mayer, noted nutritionist, former president of Tufts University and the man for whom our center was named. Since that time, research from the HNRCA has improved the well-being of millions of Americans who now lead healthier and more independent lives.

Now, the work of the HNRCA is in jeopardy. President Trump has proposed a 22-percent reduction in the budget for the U.S. Department of Agriculture's Agricultural Research Service and a 50-percent reduction in its human nutrition program. This would eliminate 17 national programs, including the nutrition centers at Tufts University, the University of Arkansas and Baylor University. He has also proposed major funding cuts to other research agencies, including the National Institutes of Health.

Tufts President Anthony P. Monaco has been in close communication with our Massachusetts Congressional Delegation in Washington, D.C., to request that these devastating cuts not be implemented. In late June, he met with members of the delegation to discuss the impact the cuts would have on the university and the important innovative research that is underway here. "At a time when health care is at the top of the American agenda, it makes no sense to eliminate a center that makes a major contribution to the health of our society," Monaco said. "The science at the HNRCA is translated into policy and action and is crucial to uncovering the keys to healthy aging and to reducing the impacts of chronic disease." We have received the strong support of our entire delegation in both the House and Senate.

As this magazine went to press, the budget debate was in its early stages, but we are pleased to report that the Senate and House Agriculture Committees voiced strong opposition to closing any research facilities this year. It's difficult to predict the level of funding they will approve or when this will be resolved. If you are interested in receiving timely information about our funding situation, please email us at HNRCA-Communications@tufts.edu.

Let's honor Jean Mayer and promote the role of food, nutrition and physical activity in healthy aging for our elders now.

SARAH BOOTH, Ph.D.

Interim Director, Jean Mayer USDA Human Nutrition Research Center on Aging

LAURELS

In May, **ALICE LICHTENSTEIN**, Stanley N. Gershoff Professor of Nutrition Science and Policy at the Friedman School and director of the Cardiovascular Nutrition Lab at the HNRCA, received the Ralph Holman Career Achievement Award from the American Oil Chemist Society for significant achievements in areas of interest to the society's Health and Nutrition Division.

Newly appointed director of the Feinstein International Center and Friedman School professor of the practice, **GREGORY GOTTLIEB**, in July received the USAID Distinguished Career Award, the agency's highest honor. It recognizes his dedication, distinction and outstanding leadership at USAID.

The International Osteoporosis Foundation's Medal of Achievement was awarded in March to **BESS DAWSON-HUGHES**, director of the HNRCA Bone Metabolism Lab, in recognition of her outstanding scientific contributions and service to the foundation as its general secretary.

NORBERT WILSON, Friedman professor of food policy, was recently elected to the board of directors for the Agricultural and Applied Economics Association (AAEA). He has chaired the group's Committee on the Status of Blacks in Agricultural Economics and its Mentorship Committee. At the AAEA's summer meeting, Wilson presented research on food waste, U.S. food security and the international water trade.

STEPHANIE HARSHMAN, a biochemical and molecular nutrition Ph.D. candidate, is the 2017 recipient of the Stanley N. Gershoff, Simon J. Simonian and Arpi A. Simonian Prize for Research Excellence in Nutrition Science and Policy at the Friedman School. Her doctoral thesis focuses on the characterization of vitamin K and its national intake.

A La Carte



In Uganda, livestock herding can be a hedge against economic hardship.

When the Old Way is Best

Insights into the wisdom of traditional herding in Uganda. **BY JULIE FLAHERTY**

FOR MORE THAN a decade, the Ugandan government has tried to steer people in the impoverished northeast away from traditional livestock herding and toward farming. Yet researchers at Tufts' Feinstein International Center have found that seminomadic herding—known as pastoralism, or agro-pastoralism when it's combined with farming—may actually be a better fit for the Karamoja region, which has been repeatedly buffeted by drought and armed conflict.

Many households in Karamoja, the researchers found, make a living by doing a little of everything, including livestock herding, growing crops, collecting firewood and making bricks. If any of those strategies fails in a given year—the crops die from poor weather, for example—livestock is food to fall back on. Keeping the family fed

during the “hunger gap” before harvest is much easier, the authors write in a report, when households have “the ability to sell a few chickens or a goat to manage hardship.” And properly moving cattle, goats or sheep to new pastures can also prevent overgrazing and erosion.

Elizabeth Stites, the primary investigator, said she hopes the research will encourage Ugandan lawmakers to recognize the value in the old ways, and promote policies to support them.

10 Foods with Life-or-Death Consequences

A study by Renata Micha and colleagues put a shocking number on the cost of a bad diet: Eating too much (or too little) of just 10 foods accounts for about 320,000 deaths each year in the U.S. from heart disease, stroke and diabetes. Here are the foods the researchers identified and some expert advice about consuming them.

EAT LESS OF THESE

SODIUM Accounting for more than 66,500 deaths per year, mostly from heart disease, excess sodium is the worst offender on the list. Intake should be limited to 2,000 mg per day, but the average adult consumes more than 3,400 mg.

PROCESSED MEATS Foods like bacon and salami were associated with nearly 58,000 deaths—and that's not counting their links to cancer.

SUGAR-SWEETENED BEVERAGES Tied to nearly 52,000 deaths per year overall, the numbers get even worse when you drill down: The proportion of deaths is twice as high in blacks as in whites, and sweet drinks are linked to more than a quarter of the deaths among ages 25 to 45.

RED MEAT You may have expected it to top the list, but it was associated with a relatively small percent of deaths, 0.4.

EAT MORE OF THESE

NUTS AND SEEDS Don't skip these nutritional powerhouses—snacking on just a handful a day could save 59,500 lives per year.

SEAFOOD Two weekly servings of fatty fish like salmon will give you the heart protective Omega-3s you need. Too little consumption is linked to nearly 55,000 deaths.

VEGETABLES No surprise here—Americans need to eat more of them.

FRUITS Just as important as veggies: Low consumption of both accounted for nearly 106,000 deaths.

WHOLE GRAINS Aim for two and a half servings per day (and ditch the white bread).

POLYUNSATURATED FATS Choosing good fats (like vegetable oil) rather than saturated ones (like palm oil) could save 16,000 lives a year.



47%

Increase in the risk of developing prediabetes among people who consume an average of six sugary drinks per week, according to a study by Nicola McKeown and colleagues at the Human Nutrition Research Center on Aging at Tufts.



Feeding Threat

Infant cereals sold in developing countries are sadly inconsistent in their quality, which could be damaging child growth, according to a study led by Friedman School Professor William Masters, who called for certification systems.

Only 15 percent of the 108 products he tested met international benchmarks for fat content, and less than 25 percent met standards for iron and zinc. With levels like that, the average child would develop a nutritional deficiency before age 1.

SOY AND SURVIVAL

Unpacking the science related to diet and breast cancer.

IT CAN BE confusing to know how soy foods, such as tofu and soybeans, affect the risk of developing breast cancer—should women eat more or less of them? The question is even trickier for women who already have breast cancer.

Soy foods are high in compounds called isoflavones, which are shown to slow the growth of breast cancer cells in lab studies. Meanwhile, studies of women with breast cancer in Asian countries show a connection between high intakes of isoflavones and increased survival. But other research suggests the estrogen-like effects of isoflavones may make some cancer therapies less effective.

A recent study by cancer epidemiologist Fang Fang Zhang and her fellow Friedman School researchers provides new evidence that eating isoflavones may be beneficial for some women with breast cancer. The study, published

in *Cancer*, followed more than 6,000 North American women with breast cancer and looked at their intake of isoflavones. Eating more isoflavones—the equivalent of one serving of soybeans per week—was linked to a 21-percent decrease in death among two groups: women with tumors without hormone receptors (about one-third of breast cancer cases) and women who were not receiving hormone therapy for their cancer.

Although isoflavones didn't have the same protective effects in women who received hormone therapy, they were not linked to increased death, implying that soy at least may not interfere with such drug treatments. If soy does have benefits for breast cancer patients, Zhang expects it does not work in isolation. "Soy foods can potentially have an impact," she said, "but only as a component of an overall healthy and balanced diet." —ERIN LEWIS





THE FOOD-PRICE EFFECT

If there's a sale on tomatoes, you're more likely to buy them, right? But just how much does price actually move the needle on your eating habits? A study by co-first author Ashkan Afshin, a former postdoctoral fellow at the Friedman School now at the University of Washington, shows that even modest price shifts can have a big effect on what we eat.

The meta-analysis of 30 international studies found that as the prices of healthy foods go down, people eat them more. Each 10-percent decrease in the price of fruits and vegetables increased their consumption by 14 percent, and each 10-percent price cut for other healthy foods (such as low-fat milk) increased consumption by 16 percent. Conversely, people eat fewer unhealthy foods when their prices rise. Each 10-percent increase in the cost of sugar-sweetened beverages and unhealthy fast foods decreased their consumption by 7 percent and 3 percent, respectively.

The results imply that while diets can be nudged in the right direction by raising the price of bad foods—as some municipalities have done with soda taxes—subsidizing the cost of good foods could be even more beneficial to public health. “Our findings suggest that subsidies and taxes are a highly effective tool for normalizing the price of foods toward their true societal costs,” said senior author Dariush Mozaffarian, dean of the Friedman School. “This will not only prevent disease but also reduce spiraling health-care costs, which are causing tremendous strain on both private businesses and government budgets.”

CANCER-FIGHTING COLORS

ALTHOUGH NICOTINE, THE addictive ingredient in cigarettes, does not cause cancer—you can blame that on tar and other chemicals—it does have the ability to accelerate the growth and spread of lung tumors. Nicotine binds to a specific receptor on the surface of lung cells, causing the growth of new cells and blood vessels—two hallmarks of cancer—and boosting production of the receptor. With more receptors available for nicotine to bind to, lung cancer cells in smokers get an even stronger signal to keep growing and spreading. But now Friedman professor Xiang-Dong Wang, N92, has found that the red pigment beta-cryptoxanthin (BCX) appears to counteract this effect.

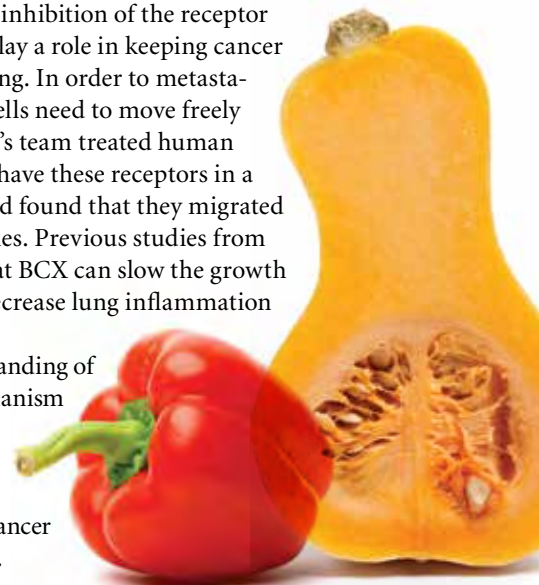
Researchers knew eating such BCX-rich foods as sweet red peppers, oranges and butternut squash is associated with a lower risk of lung cancer in smokers. So Wang, director of the Nutrition and Cancer Biology Laboratory at the Human Nutrition Research Center on Aging, and his colleagues wanted to study how that might work at the molecular level. Looking at mice and cell models of human lung cancer for a study published in *Cancer Prevention Research*, they demonstrated that BCX causes cells to decrease the number of nicotine receptors, which may dampen cancer cell growth.

A pigment in red peppers, butternut squash and other foods might inhibit the growth of cancer cells.

When the researchers administered daily doses of BCX to mice before and after they injected the rodents with a nicotine-derived carcinogen, they found that the mice had fewer lung tumors than a control group that didn't get BCX.

BCX's inhibition of the receptor may also play a role in keeping cancer from spreading. In order to metastasize, malignant cells need to move freely about the body. Wang's team treated human lung cancer cells that have these receptors in a lab dish with BCX, and found that they migrated less than untreated ones. Previous studies from Wang's lab suggest that BCX can slow the growth of lung tumors and decrease lung inflammation in animal models.

This better understanding of BCX's molecular mechanism could lead to dietary recommendations for smokers, patients with lung cancer and lung cancer survivors, Wang said.



Dig In



EATING FOR HEALTHY EYES

Why complex carbs are the clear choice for preserving vision. **BY DAVID LEVIN**

AGE-RELATED MACULAR degeneration (AMD)—the leading cause of vision loss after age 50—can leave a person feeling powerless. Over months or years, AMD patients slowly lose their sight, moving ever closer to blindness. In most cases, there's no cure, but a team at Tufts has found signs that arresting the disease may not require creating new drugs, but simply tweaking patients' diets.

Sheldon Rowan, a scientist in the Laboratory for Nutrition and Vision Research at the Human Nutrition Research Center on Aging at Tufts, said there are plenty of indications that the types of carbohydrates we eat play a role in the development of AMD. People who eat lots of simple carbohydrates, like those in white bread and sweetened beverages, are more likely to get the disease. This could be because simple

carbs break down rapidly during digestion, creating a spike in blood sugar that can lead to widespread inflammation, a condition linked to AMD. Complex carbohydrates found in whole grains, however, break down more slowly, resulting in lower blood glucose. If that blood glucose stays low over a long period of time, Rowan said, it can lower incidence of AMD.

To understand why, Rowan tested the two

diets on laboratory mice. Over the course of a year, he fed one group of mice “high-glycemic” foods—ones with lots of simple starches. A second group got a “low-glycemic” diet, rich in complex carbs, but otherwise identical in calories and nutrients. In a third group, Rowan switched the mice's diet from high- to low-glycemic foods halfway through the study.

Sure enough, mice with the low-glycemic diet did not develop AMD, while mice fed the high-glycemic diet almost all came down with the disease, a result in keeping with previous research. In the mice that switched diets, though, Rowan saw something completely unexpected: Not only did they avoid AMD, but the existing damage to their retinas was *reversed*. “No one had ever seen that before,” Rowan said of the findings, which were reported in *Proceedings of the National Academy of Sciences*. “The most common form of AMD doesn't really have a treatment right now—but this suggests that just changing to a healthier eating pattern could have a huge impact.”

Exploring the reason behind the change, Rowan tested blood and urine samples from each group

of mice. He found that those with high-glycemic diets also had high levels of molecules called “advanced glycation end products” (AGEs) in their bodies. “AGEs are toxic end products of sugars,” Rowan said. “They can damage the proteins and lipids that a cell needs to function.” In the retina, these damaged proteins slowly accumulate in a sort of cellular garbage pile, forming yellow deposits called drusen that destroy retinal cells.

Rowan also identified certain chemicals, including serotonin, in the mice’s blood and urine that acted as markers for AMD. Because these chemicals have been linked to bacteria in the gut, Rowan wondered how microbes might be involved in AMD development. He reasoned that because simple carbohydrates are easy to digest, they are fully metabolized before entering the intestines and effectively “starve” microbes living deeper in the digestive tract. This could discourage the growth of protective bacteria, while allowing species that create inflammation and other stresses to thrive. After testing the levels of various bacteria living in each mouse’s gut, Rowan

found some early evidence that may confirm this idea.

“There could be ‘good’ bacteria in the gut that are neuro-protective, and there could also be ‘bad’ bacteria, that are pro-inflammatory,” he said. “From this study, we can’t parse out good versus bad, but it does show us that molecules associated with gut bacteria are playing a role in AMD.”

Identifying those molecules could one day lead to new drug treatments. But until then, AMD patients may be able to improve their vision just by switching up their diet. “This gives us a tremendous opportunity,” said Tufts biochemist Allen Taylor, director of the Laboratory for Nutrition and Vision Research. “In humans, this is the equivalent of switching out four or five slices of white bread each day for whole grains. It’s a minor alteration that will pay great benefits.”

Rowan added: “The epidemiology is clear about these healthy-eating and dietary patterns protecting against AMD. As a side effect, it’s also going to improve your cardiovascular health, diminish risk for diabetes and maybe even help you lose weight. There’s really no downside.”

GO WITH THE GRAIN

How fiber-rich carbs could help you lose weight.

HAVING TROUBLE LOSING those last five pounds? Consider the power of whole grains. According to a Tufts study, substituting whole grains for refined grains in your diet makes you burn more calories—as well as skip the digestion of other calories—for a total loss of about 100 calories per day.

First author J. Philip Karl, NG14, and senior author Susan Roberts, director of the Energy Metabolism Laboratory at the Human Nutrition Research Center on Aging at Tufts, randomly assigned 81 men and women between the ages of 40 and 65 to eat a diet that included either whole

grains or refined grains, but were otherwise basically identical.

After six weeks of eating the food, which was provided to them, the whole-grain eaters had a resting metabolic rate about 43 calories per day higher than the refined-grain eaters. They also lost an extra 57 calories per day in their stool. Over the course of a year, that would add up to a weight loss of more than 5 pounds. (A related study also showed a modestly better immune response in the whole-grain group; both studies appeared in the *American Journal of Clinical Nutrition*.)

The findings, Karl said, “lend credibility to previously reported associations between increased whole grains and fiber consumption, lower body weight and better health.”



WHAT'S A DIETITIAN TO DO?

Challenges lead to hope in Malawi's first R.D. training program.

BY JULIE FLAHERTY

THE FIRST THING that struck Molly Uebele, N12, about the hospitals in Malawi was the crowding. During the height of malaria season in February and March, she would see three of four children in one bed, parents and extended family on the floors and in the hallways, and still more patients in beds outside. But the thing that really shocked her was how little food the hospitals had for their many malnourished patients. Some could provide beans, cabbage or a little beef; others relied on the patients' families to supply food, which many could not. And the available food was rarely what a dietitian would prescribe—no formula for infants, no renal diet for patients with kidney failure. Patients die because the hospitals can't feed them.

That was the reality Uebele faced when she moved to Malawi in April 2015 to start the country's first dietetics program, a project of the Friedman School's Nutrition Innovation Lab. As with most African countries,

dietitians are practically unknown in Malawi, save for a few NGO workers who trained in other countries. Uebele's mission, which was funded by USAID, was to create from scratch an accredited nutrition program to train Malawians who could work alongside doctors and nurses.

Uebele, a former clinical dietitian at Tufts Medical Center, knew the science and skills she wanted to teach, and worked with two local universities to create the curriculum, consulting with Tufts faculty through weekly Skype calls. And the need was clear: Hunger, malaria and HIV are constant in Malawi, while hypertension is rapidly increasing—nearly one in three Malawians have high blood pressure. But at first, Uebele didn't see how the program could succeed without enough food to go around. "You can't have dietitians without food," she said. "It's like a doctor without medicine."

She found hope in the six health-care workers who signed on for her first class, future dietitians who could advocate for the right food in the country. "The Malawians believe that if we have people there asking for it, then it will come," Uebele said. "They are the ones who know their country and how it is going to evolve."

In the meantime, Uebele and her students

worked together with what they had. "I would say, 'This is how we do it in the U.S. How do you think we could do it here?'" Uebele recalled. In class, they brainstormed alternatives for, say, the nutritional shake she would feed to a patient with throat cancer if she were working in a U.S. hospital. The idea of the exercise was to use "whatever foods were available that season they could pound up really well and make into a slurry: pumpkin, peanut flour, soya flour, banana, sometimes a little fish," she said. "That's how we had to think."

And the first time Uebele saw her students do a nutrition consultation with patients, she knew the program could work, too. Her heart lifted when she heard several patients say how well the students listened to their concerns and how

valuable their nutrition recommendations were.

One of Uebele's students, Doris Cement Nanga, said the coursework, especially the biochemistry, was harder than she expected. But she said Uebele inspired her to keep at it, because she was experienced, motivated and clearly proud to be a dietitian. "She groomed us to feel the same," she said.

When Uebele learned that she was this year's recipient of the Friedman School Alumni Association's Leah Horowitz Humanitarian Award, she demurred—she wasn't on the front lines saving lives. Then again, she thought, that was what she and the Nutrition Innovation Lab had set in motion, a slow process that she believes "will allow Malawi to eventually take care of its own."



A children's ward at a hospital in Lilongwe, Malawi.

BIG GOALS FOR LOCAL FOOD

A visionary report points New England toward a truly sustainable future.

BY BETH CAMERON

AMANDA BEAL, N12, the president and chief executive of the Maine Farmland Trust, sees a food dilemma brewing in New England. She says the region imports 90 percent of its food, tethering it to a global food system that prioritizes cheap production over environmental stewardship, encourages unhealthy eating habits and destabilizes rural economies.

But Beal is optimistic that it's not too late to tweak the recipe and secure a healthier future for the region. To that end, she and eight other food system experts (including three other Tufts alumni) created "A New England Food Vision," a set of goals that point the way to a future in which at least half the foods New Englanders eat are locally produced.

To get to "50 by 60" (producing 50 percent of foods locally by 2060), New England could grow most of its vegetables, half of its fruit, some of its grain and dry beans, and all of its dairy, beef and other animal products. The new approach could revitalize the region's once-booming



farming and fishing industries and safeguard its natural resources, while also helping combat the epidemics of obesity, heart disease and diabetes.

Achieving those ambitious goals would require fundamental shifts in the New England diet, landscape and economy. For example people could consume a more diverse diet with less meat and refined grains and more fruits, vegetables and whole grains. That would mean tripling the amount of land used for food production from to 6 million acres—about 15 percent of New England's total land area. The region would also have to focus on training the next generation of farmers and helping them make farming financially sustainable. "I grew up in a farming family, and it's clear to me that most farmers are not paid a fair wage for the work they do," said Beal. "That's a signal

of dysfunction."

The report, released in June 2014, is already influencing policy and project development across the region. At the University of New Hampshire, graduate students are investigating land-use changes, while undergrads are developing recipes to support the vision's dietary guidelines. At the state level, the new Massachusetts Food Systems Plan and Farm Fresh Rhode Island's Strategic Plan draw heavily on the food vision. It also inspired Maine Farmland Trust's "Farming for Wholesale" initiative, a business-planning program that teaches farmers how to scale up production to reach more consumers and provides seed money to put their plans into practice. "The vast majority of consumers shop in supermarkets and other retail stores," Beal said, "so to markedly increase access to locally and

regionally produced food, we need to be working on getting this food onto our store shelves."

Beal and her coauthors, including Linda Berlin, NG06, director of the Center for Sustainable Agriculture at the University of Vermont; Joanne Burke, AG77, NG77, a clinical associate professor in the Department of Agriculture, Nutrition and Food Systems at the University of New Hampshire; and Tom Kelly, F88, FG94, director of the University of New Hampshire Sustainability Institute, are building on that momentum. Creating the report took three years of brainstorming, research and gathering public feedback; making it a reality promises to be a decades-long journey. "I probably won't see the end result," Beal said, "but if I can do my part to move us in the right direction, I'm happy."



Tufts Nutrition

TOP 10

HNRCA science that soars to new heights

Based on the abundance of articles its researchers have published in top-tier journals, Tufts University was recently named No. 4 for nutrition and dietetics out of more than 26,000 institutions around the globe by the Center for World University Rankings. To celebrate, we present some of the most powerful contributions to nutrition science by the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts (HNRCA).



SENIORS HAVE SPECIAL NEEDS

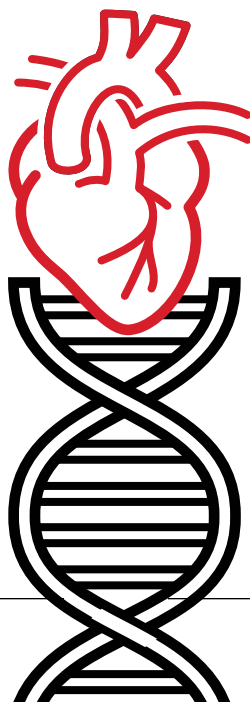
Recognizing that seniors have distinct nutritional needs and challenges, HNRCA researchers adapted the U.S. Dietary Guidelines to create MyPlate for Older Adults, a widely used at-a-glance reference for making healthy choices. The latest iteration was released in conjunction with AARP in 2016.

WHAT YOU EAT CAN SAVE YOUR EYESIGHT

HNRCA researchers have shown that swapping processed grains, such as white bread, for complex carbs will reduce the risk of developing age-related macular degeneration, the most common cause of blindness in people over 50. (To read more on this research, see page 8.)

A DIET SHOULD BE COLORFUL

The neurological benefits associated with eating dark berries, such as blueberries, strawberries and blackberries, were first discovered at the HNRCA in 1999. HNRCA scientists continue to investigate ways berry antioxidants can help slow memory loss and improve coordination.



YOU CAN HAVE TOO MUCH OF A GOOD THING

Consuming enough dietary folate protects against colorectal cancer. But too much supplemental folic acid, HNRCA scientists found, may actually increase the risk of developing it.

BONES NEED CALCIUM AND VITAMIN D IN THE RIGHT AMOUNTS

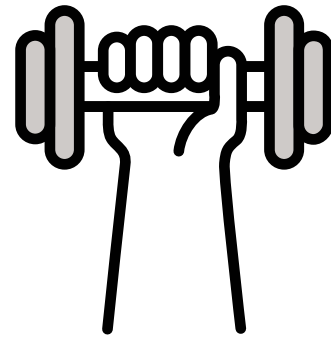
The center helped set the national adequate intakes for these micronutrients, thanks to its trials on calcium and bone density in older adults, and how well supplements increase vitamin D in the blood—taking it with some fat in your meal is best—and help prevent fractures.

WE ARE EXPERTS AT MEASURING NUTRIENTS

HNRCA labs regularly analyze food samples for the USDA Food Composition Database, the go-to source to find out what nutrients are in our food. The center has the only U.S. lab that measures the vitamin K in what we eat.

GENES AND DIET WORK TOGETHER

HNRCA scientists were among the first to demonstrate the ways that different genotypes react to the same diets, particularly when it comes to heart disease. For example, people who carry a particular variant of the gene APOA5 may have elevated risk for heart disease, but only if they eat high amounts of omega-6 fatty acids. Eventually, researchers hope to provide individuals with dietary guidance tailored to their genotype.



STRENGTH TRAINING IS IMPORTANT AT ANY AGE

In 1989, the HNRCA coined the term sarcopenia to describe the natural muscle loss that happens as we get older. Since then, the center's research has proven that the right workouts can help people at any age and health level maintain muscle and reduce the risk of falls.

NUTRITION STRENGTHENS YOUR IMMUNE SYSTEM

The HNRCA led the way in demonstrating how important nutrition is to a well-functioning immune system. Research



showed that losing excess weight can boost immune response and vitamin E supplements can improve older people's ability to fight off infection.

BODY FAT IS NOT JUST EXCESS BAGGAGE

Once considered inert, fat cells actually generate hormones that send signals throughout the body, causing inflammation and wreaking other havoc. The HNRCA's groundbreaking work on the biologically active lipid droplets in cells—and the proteins associated with them—has jump-started the understanding of storage and breakdown of intracellular fat, with big implications for weight-loss and diabetes treatment.



Top: With the help of the New Entry program, Phalla Nol was able to take out a microloan, find farmland to lease, and set up a greenhouse affordably. “They were there for me, no matter what,” she said. Her farm has been one of the most prolific suppliers for New Entry’s World PEAS Food Hub, which provides produce to senior centers, community programs, day cares and a CSA. **Above and right:** Nol harvests vegetables before heading to a farmers’ market.




Taking Root

With a little help from Tufts, an immigrant farmer sustains her family and a diverse community.

BY ALONSO NICHOLS AND JULIE FLAHERTY

PHOTOS BY ALONSO NICHOLS



PHALLA NOL, 51, IS A CAMBODIAN IMMIGRANT, A TIRELESS BUSINESSWOMAN AND THE flywheel of a family farm that employs her mother, younger brother, son and other family and friends. On two acres in North Andover, Mass., they organically grow regional standbys—corn, tomatoes, bell peppers, eggplant—as well as produce less familiar to New England, including luffa, bitter melon and Asian cucumber. Whatever country Nol’s farmers’ market customers hail from, they’re likely to find the food of their homeland under Nol’s tent.

Her thriving business has its roots in the Friedman School’s New Entry Sustainable Farming Project, launched in 1998 to help refugees and other immigrants make a start in New England agriculture. (Sixty refugee farming projects have since sprung up across the country.) From the beginning, New Entry’s mission was twofold: provide economic opportunities for immigrants, and ensure a sustainable food system. Over the years, New Entry expanded its scope to train recent college grads and people starting a second career, but refugees and recent immigrants still make up 30 percent of its long-term farmers.

Nol’s late father was one of New Entry’s first grower-trainees back in 2004—he’d bring his daughter to workshops as his translator. Once a mayor in Cambodia, he took to farming with passion, regularly working far past sundown.

Now Nol is the one putting in the long hours, sometimes harvesting water spinach or melon by flashlight until 11 p.m., preparing for the next day’s market. “I love to see my things grow,” she said. “And then my customers, they love me, they love what I grow. I love the people that love my vegetables.”



Above: Nol sets up her tables before the opening of the farmers' market in Lynn, Mass. She goes to great lengths to grow what her customers want. At the market in Lowell, where Nol also works, they love bitter melon; here in Lynn, she can easily sell 200 bunches of green amaranth. **Right:** With the market in full swing, Nol has her hands full selling (and dispensing free recipe advice), while relatives heft boxes of produce from the truck and restock tables.





Left: After the Lynn market closes, it's back to the farm for Nol and her family. Here, Nol's mother washes and bunches produce.
Below: Nol is still hard at work after sunset, harvesting eggplant to prepare for the next trip to market.

The New Entry Sustainable Farming Project will hold its Community Food Systems Conference December 5-7 in Boston. For more information, visit nesfp.org.



NEXT-GEN FOOD

These emergency meals are new, improved and engineered to save lives.

BY JULIE FLAHERTY

PHOTOGRAPHY BY VITO ALUIA

EVERY YEAR, THE U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT SENDS MORE THAN a million tons of food to malnourished people around the world, most of them children. When USAID wanted to update its food-aid products to reflect the latest nutrition research, it turned to the experts at the Friedman School. Since 2009, the Food Aid Quality Review team, led by Patrick Webb, the Alexander McFarlane Professor of Nutrition, and Professor Beatrice Rogers, has been analyzing everything from micronutrient levels to supply-chain efficiencies to whether the food is ending up in the right bellies. While the work continues, these are a few of the team's initial recommendations already put into action. "All these small, smart changes add up to better outcomes for the world's most vulnerable populations," Webb said.

DESIGNED FOR GROWTH

Corn-soy blend, a dry mix that cooks up into a nutritious porridge, has been a go-to food-aid product for more than 40 years. The Tufts team recommended adding whey protein from milk, which contains growth factors, a small change that can make a big difference for the more than 150 million children now at risk of poor growth.

LOCALLY SOURCED

The researchers are looking into new porridge mixes, including a sorghum-cowpea blend, which could better suit local tastes and even be grown in the area. One benefit is that sorghum and cowpeas come in non-GMO varieties, which could be useful in such countries as Zambia where there are rules against growing or importing genetically modified foods.

PACKED WITH HEALTHY FATS

The researchers wanted to give people more fat to boost calories and help them absorb the fat-soluble vitamins in the porridges. The ideal way, they reasoned, would be to hand out vitamin A and D fortified oil to mix in. Some humanitarian groups have favored mixes with fat included, because they worried caregivers might sell oil or use it for other cooking, but the Tufts team didn't see that in field tests. A bonus: The fresh oil makes the porridge taste better.

READY TO EAT

Researchers added two new peanut-based products to the USAID lineup. These pastes can be consumed right out of the package without mixing or cooking.



AID

EASY TO UNDERSTAND

While testing the new products in Sierra Leone, the researchers discovered that even wordless instructions can be confusing. Among the changes on the improved label: arrows to show the order of the steps, a darkened color for oil that resembles the local variety, and a more common water icon.



TOPPED OFF WITH VITAMINS

Among many micronutrient changes, the researchers added potassium and more zinc, which help children grow and recover from malnutrition. They also switched to a more easily absorbed form of iron—they could include less, which saved money, too—and added vitamin K to prevent deficiencies caused by intestinal illness common to refugee camps, natural disaster zones and other areas with poor sanitation.

OPTIMIZED FOR DISTRIBUTION

For many years, the standard package for the porridge mixes was a 55-pound bag (seen in the background here) that would get divided in the field. The new packages (at left) are about 3 pounds—roughly the right size for one child for two weeks. They're more expensive to pack, but quicker and more sanitary to distribute. In tests, the beneficiaries also found it more dignified than having to scoop from tubs.



Cutting-edge nutrition science keeps the U.S. military at peak fitness and prepared to serve. And the discoveries Tufts researchers are making in the lab and in the field could help weekend warriors, too.

BY JULIE FLAHERTY PHOTO-ILLUSTRATIONS BY OLIVER BURSTON

FIGHTING SHAPE

THE QUEST TO KEEP TROOPS WELL FED HAS LED TO ALL SORTS OF INNOVATIONS. WE HAVE military scientists to thank for the enzymes that keep supermarket bread from going stale, the energy bars that stay soft for months, and even TV dinners, which started as in-flight meals for World War II bombers. But in more recent years, the U.S. military has moved away from simply feeding its troops to nourishing them for peak performance—and it has turned to Tufts for expertise.

Researchers at the Friedman School and the Jean Mayer USDA Human Nutrition Research Center on Aging (HNRCA) at Tufts have a particularly long relationship with the Military Nutrition Division of the U.S. Army Research Institute of Environmental Medicine (USARIEM) in Natick, Mass. Since the 1990s, Tufts scientists have collaborated with the Natick team on dozens of nutrition studies—in areas such as maintaining strength, preventing injury and improving endurance—that influence policy in all branches of the military.

Often, the answers benefit the broader public. Research on fluid requirements, for example, has produced widely used hydration guidelines, and extensive studies on the safety of caffeine—a staple of late-night guard (or desk) duty—have informed coffee drinkers everywhere.

Here are some of the nutrition research projects that are helping the nation's warfighters—and how they could help civilians and athletes on the home front.







GASTROINTESTINAL DISTRESS

Guts and Glory

Service people face many threats when they are deployed overseas and one of the most common is an enemy from within: traveler's diarrhea. Joke all you like about Montezuma's Revenge, but about one in three personnel deployed to less-developed countries will have it in a given month. And getting it once makes you five times more likely to develop a chronic gastrointestinal disorder.

USARIEM researcher J. Philip Karl, NG14, is investigating prebiotics, including special dietary fibers, consumed by beneficial gut bacteria—perhaps a system full of good microbes will make it harder for invading pathogens to stake a claim. He is also experimenting with polyphenols, plant chemicals consumed by microbes that, in turn, create possibly beneficial byproducts. “We’re interested in looking at combinations of different polyphenols with different prebiotics to see if they could have potentially synergistic effects,” Karl said. This research might one day change the makeup of Meals-Ready-to-Eat (MREs).

ON THE HOME FRONT Gastrointestinal distress is common in people taking up endurance sports, such as marathons, and this work could help athletes with nutrition-based strategies for avoiding the upset. Karl hopes the research will also contribute to our understanding of how the microbiome interacts with nutrients to improve long-term health.

PSYCHOLOGICAL HEALTH

Sound Mind, Sound Body

Engineering professor Sameer Sonkusale and HNRCA scientist Jimmy Crott, an associate professor, are working to unravel the connection between our gut bacteria and our psychological health. They are collaborating with the Department of Defense's Office of Naval Research to develop an ingestible “lab on a pill” to study the microbiome. It could lead to nutritional interventions that help service members weather stress and sleep deprivation.

ON THE HOME FRONT Research into the microbiome, sometimes called the body's second brain, benefits G.I. Joes and Average Joes alike.



BLOOD SUGAR CONTROL

Calling in Reinforcements

“For people to fight, they need energy,” said Oliver Chen, interim director of the HNRCA's Antioxidants Research Lab. Digestion of simple carbs like white bread can happen too quickly, leading to blood sugar crashes. Although eating fiber can slow the process down, it has its own problems: It's bulky to carry, and high-fiber foods might make soldiers feel full and stop eating before they take in all the energy and nutrients they need.

So Chen, like Karl, is investigating polyphenols. Particularly abundant in berries, polyphenols inhibit an enzyme that breaks down carbohydrates and helps slow glucose absorption and prevent blood sugar spikes. In addition, polyphenols are free-radical scavengers, and can boost the body's immune system. Chen is currently testing a meal enriched with polyphenol-rich whole cranberry powder to see its effects on gut bacteria in volunteers.

ON THE HOME FRONT A food product that offers a source of sustained energy would benefit endurance athletes. Chen said it could also be the ideal snack food for children at sports practice, who need energy but not a sugar rush, and for diabetics in need of a steady source of glucose.



MUSCLE MAINTENANCE

A Position of Strength

A service member can burn as many as 7,000 calories a day, said Andrew Young, a research physiologist and former chief of military nutrition research at USARIEM. “When on a mission in the real world, they simply can’t carry enough food to sustain themselves in energy balance.” And when they burn more calories than they take in, they start losing weight—about 50 percent of it from muscles, which leads to declining physical performance and increased risk of injury.

One solution may start with protein. Tufts nutrition researchers working with the USARIEM helped demonstrate that when calories are insufficient, consuming more protein—more than the recommendation daily allowance—helps preserve muscle. That insight led to changes in the Military Dietary Reference Intakes, which dictate the nutrition requirements in rations.

This research could also give insight into sarcopenia, the decline in muscle mass as we age. Researchers at Tufts’ Nutrition, Exercise Physiology and Sarcopenia Lab, including director Roger Fielding and scientist Donato Rivas, have written several papers on this subject with Lee Margolis, NG16, and other USARIEM colleagues. The researchers are looking at different populations, but the work shares a focus on maintaining muscle under stress. “Tufts looks at it under the stress associated with aging; we’re looking at it under the stress associated with inadequate energy and nutrient intake,” Young said. “They probably share very fundamental physiological mechanisms.”

ON THE HOME FRONT This research could help determine how much and what kind of protein is best for dieters, who don’t want to lose muscle. The consensus, Karl said, is that the average dieter should consume 50- to 100-percent more protein than the recommended daily allowance when physically active. The work could also deepen our understanding of sarcopenia: Starting as young as age 30, the average person starts to drop muscle at the rate of about 1 percent per year, adding up to a loss of one-third of the body’s muscle mass by age 70.



WEIGHT MANAGEMENT

Winning a Losing Battle

Helping troops safely lose weight is an ongoing challenge. Col. Gaston Bathalon, N90, NG98, who established the Military Weight Management Program while at USARIEM, found that more than 71 percent of troops referred for weight loss at one Army medical center reported skipping meals and 31 percent reported fasting.

Weight control is also a problem for military families. Professor Susan Roberts, director of the HNRCA's Energy Metabolism Lab, and scientist Sai Das, NG02, are in the midst of a five-year Healthy Families, Healthy Forces study with USARIEM to test different approaches to weight control. The study is introducing adult dependents of military personnel to two programs: one that includes standard dietary advice, and one created at Tufts that focuses particularly on hunger management. The Tufts program, known as the Healthy Weight for Living plan, also provides strategies for eating in times of stress. They will report on which diet is more effective. "An eventual outcome of that is it would reduce military health-care burden as well as cost," Das said.

ON THE HOME FRONT While spouses and other adult dependents are the main focus of the study, the researchers expect military personnel will lose weight, too. In a test of the diet at workplaces, employees benefited from what their colleagues in the program were learning and lost weight. Since the researchers will gather a national sample, Das said, "we'll be able to apply many of the lessons that are learned to civilian populations in addition to military families across the U.S."

CARDIOMETABOLIC DISORDERS

Too-Heavy Infantry

The nation's struggles with obesity—and the cardiometabolic problems that stem from it—have added to the challenge of keeping the nation's military in top shape. Epidemiologist Adela Hruby, N10, M10, NG13, a scientist at the HNRCA and research fellow with the USARIEM, looked at data on nearly 1.5 million incoming recruits between 1989 and 2012, and found that the percentage who were overweight increased from 26 percent to 37 percent, mimicking the trend in the overall U.S. population. "When you have an increasingly obese population," she said, "this has ramifications for the fitness of your defense."

In a separate study, Hruby found that a soldier with a high Body Mass Index was more likely to develop a lower-body injury. A third study found a link between being overweight and the risk of developing high blood pressure, dyslipidemia and high blood sugar. Hruby said this research helps show how excess weight affects even a young, physically active population. "You don't expect them to develop cardiometabolic conditions before they are 30," she said. "Yet some people do develop them—and it's more likely to be those who are heavy."

ON THE HOME FRONT According to the 2015 Youth Risk Behavior Surveillance System, nearly 30 percent of high school students are overweight or obese, and the *New England Journal of Medicine* recently reported that new cases of Type 2 diabetes in people under age 20 increased nearly 5 percent per year from 2002 to 2012. Knowing that even service members are at risk of diabetes could serve as a wake-up call to teenagers who don't want to give up their chips and soda.



ENVIRONMENTAL STRESS

Peak Nutrition

The USARIEM facilities have specialized laboratories for testing the extreme conditions that soldiers face: heat of the desert, the cold of the tundra and the altitude of high mountain regions. One insight they've made is that people suddenly exposed to high altitudes tend to eat far less.

"It's very common that over the first several days or weeks, people stop eating without thinking," Karl said. Nausea from Acute Mountain Sickness probably contributes to the problem, but changes in brain chemistry and hormones also seem to temporarily suppress appetite. Meanwhile, the stress of the low-oxygen atmosphere can create a sort of insulin resistance, making it harder for cells to take in energy.

Last year, Karl and his colleagues went to Pike's Peak in Colorado to study nutrition needs at 14,115 feet. They fed volunteers diets with different amounts of protein to see how well they maintained muscle while losing weight, and whether the protein helped or hurt appetite. They also fed volunteers a mult carbohydrate blended drink to see how efficiently they burned carbs during exercise. While the results are still being compiled, they suggested that the body handles carbohydrates very differently at high altitudes, an effect that can influence appetite for at least three weeks.

ON THE HOME FRONT Research on appetite changes could benefit cancer patients who have reduced appetite and weight loss, known as cachexia. And work on carbohydrate metabolism could also inform research on diabetes, which affects more than 25 million Americans. Karl said that several groups are interested in exploring oxygen deprivation (which simulates the effects of high altitudes) as a treatment for obesity: "Very preliminary work, but the idea is out there."



INJURY PREVENTION

Don't Break Formation

For new recruits, repetitive, jarring activities, such as marching with body armor, can put strain on bones, leading to tiny cracks. During basic combat training, up to 20 percent of women and 5 percent of men develop stress fractures, and up to 60 percent of those have to drop out of service. Not only do they lose out on a military career, said USARIEM scientist James McClung, but “they may now be a part of the military health-care system for the rest of their lives”—at significant taxpayer expense.

Part of the problem, McClung found, is that recruits often arrive with poor levels of vitamin D. That led to the development of a before-bed snack bar, pumped with calcium, vitamin D and protein. In several tests, recruits who ate the bars showed increased bone density, which reduces the risk of injury. The Performance Readiness Bar will be available to recruits at all four U.S. Army basic-training locations in 2018.

ON THE HOME FRONT Although there aren't yet plans to make the Performance Readiness Bar available to the general public, this research may help marathoners and other athletes at risk of stress fractures. It also adds to the research on bone health, which is especially important as we age.

INFLAMMATION REDUCTION

Hostile Flare-ups

Basic training is legendary for the strain it puts on the muscles and the psyche. But all those push-ups and full-gear sprints also kick the immune system into high gear, sending out cellular emergency signals that can cause damage. “There is an inflammatory response to exercise, particularly unaccustomed activities,” McClung said. That inflammation, it turns out, can interfere with the body's ability to absorb certain nutrients.

In a series of experiments, McClung and his colleagues, including J. Philip Karl, discovered that women in basic training often deplete their iron stores. The inflammation appears to degrade a particular protein that helps transport iron into the body for incorporation into red blood cells. Without enough iron, fatigue may set in.

As a result of the work, in 2015 the army began offering its female recruits multivitamins with extra iron—along with a bit of nutrition education—during their basic training and are monitoring the results.

ON THE HOME FRONT “We get a lot of queries from the athletic community regarding this research and options for female athletes,” McClung said. He emphasizes the importance of an iron-rich diet, and, if necessary, consulting a health-care provider to determine the right supplement.



From All Corners

UNIVERSITY, SCHOOL & ALUMNI NEWS



SWEET SUCCESS

Nine years ago, Andi Wolfgang, N16, and her sister decided to make chocolate a little less sinful, but no less delicious, by cofounding Nama Kiss (namakiss.com) to make treats with organic, antioxidant-rich cacao and raw local honey. Now, she shares lessons learned as a teaching assistant for a new entrepreneurship course (learn more on page 28).



Marketing executive Jessica Deckinger's goal for her new entrepreneurship course is to leave students with "a really powerful skill set with real-world applicable tools."

A Boost for Food Businesses

A new entrepreneurship program aims to give students the theory and practical skills they'll need. **BY JULIE FLAHERTY**

A NEW TWIST ON kombucha tea drinks. A social network for vegetarians. A personalized nutrition service based on your genome. Whatever the business idea, each budding entrepreneur had just 90 seconds to persuade a room of investors to hand over some \$100,000 to fund it. "It works for a health-food market as well as a fast-food market," said Ryan Egger, pitching his idea for healthy vegetable snacks. "I'm excited for AirChips to pop, and I hope you are, too."

Even though Egger and the other aspiring moguls were students in the Friedman School's Nutrition and Entrepreneurship course—the "investors" were their classmates, and the stakes were just a good grade on their final presentation—these elevator pitches were still stressful. It was the students' chance to boil down what they had learned about starting a business, including the need for a clear and concise message.

Jessica Deckinger, the marketing executive who teaches the course, designed it to be a mini-incubator where students could grow their ideas, learning the philosophy of entrepreneurship and the practical steps to start a venture. Her goal is for students to leave the class with "a really powerful skill set with real-world applicable tools," she said.

The course, a collaboration with the Gordon Institute of engineering management at Tufts, is the cornerstone of a dynamic new entrepreneurship program being developed by the Friedman School. It will match students with mentors at businesses, help them secure internships and introduce them to actual investors, said Dennis Steindler, co-director of the program with Edward Saltzman, the academic dean for education. Eventually, students will be able to enter their business plans in an annual competition offering start-up funding.

"Many students are aiming to have private nutrition businesses or have ideas for healthy food products," said

Andi Wolfgang, N16, cofounder of the company Nama Kiss and the teaching assistant for the course. “This class will help make those ideas a reality.”

Fostering entrepreneurship is a school priority. Even as students pursue their studies, “they can make discoveries that have value within the marketplace,” said Steindler, director of the Neuroscience Lab at the Human Nutrition Research Center on Aging at Tufts, who has founded two companies based on his stem cell research. He said the Boston area, with its rich base of tech companies and rising crop of food companies, provides wonderful opportunities for students with innovative ideas for food, nutrition, diet and lifestyle products.

Some students in Deckinger’s class were already trying to turn their ideas into business ventures. Dorien Venhoeven, N17, a student in the Food Policy and Applied Nutrition program, wanted to create a healthy food-truck business in Ghana, where she worked on rural development. She was recently accepted into an incubator program to further develop the idea.

Other students saw themselves as the product they want to market. Angela Goscilo planned to start her own outpatient practice once she completed her dietetic internship. “You can be the greatest dietitian, but without some of those business skills in running your own practice, it won’t be as successful,” she said. Goscilo saw the elevator-pitch exercise helping her when, for example, she has only a short time to explain to a client the reasons to stop drinking soda. “If you can captivate them for one or two minutes, and use some of these pitching skills to convey your point, you are already making an impact,” she said.

Entrepreneurial thinking will be an asset even for students heading into academia or large corporations. “That creative, out-of-the-box thinking and problem-solving mentality,” Deckinger said, “is important in every aspect of what people do.”

POLICY EXPERT JOINS THE FRIEDMAN SCHOOL

JEROLD MANDE, a former Obama administration official with a long record of shaping public policy, joined the Friedman School as professor of the practice in May. In addition to teaching, he will help launch the Public Impact Initiative, which will create a school-wide structure and strategies for changing food policy and improving public health. “We are thrilled to have Jerry Mande join the faculty and lead our impact initiative,” said Friedman School Dean Dariush Mozaffarian. “Jerry is a proven leader with extensive experience translating food policy to health impact.”



As senior adviser to the undersecretary for food, nutrition and consumer services, Mande oversaw the Food and Nutrition Service, which helps feed one in four Americans through the Supplemental Nutrition Assistance Program (SNAP), the National School Lunch Program and 13 other federal programs. He also worked to promote healthful eating through nutrition education. But, Mande said, merely supplying people with the right nutrition information is not enough to ensure a healthy public. Real change in public health requires changing our food environment.

“Most Americans don’t understand how someone who is food insecure ends up obese,” he said. “Many people falsely believe it’s the obese person’s fault that they are overweight. The truth is that while personal responsibility plays a role, the data show clearly that we live in a toxic food environment.” If we can convince policymakers that the environment is at the root of the obesity epidemic, Mande continued, “then we can begin to reverse the trend.”

Mande argues that using sound nutrition science to create policy is vital, because meaningful systemwide change needs to start at the highest levels. “Once I started to understand nutrition and health, I realized I didn’t have the patience to change how people ate, one person at a time,” he said. “Government seemed like a more powerful lever for change. I still believe that. It is the place where the public interest comes first.”

Mande, who will also be a senior fellow at the Tisch College of Civic Life, said that in addition to the Friedman School’s outstanding nutrition science and policy scholarship, it has “a unique commitment to faculty of the practice and to civic life. That makes Friedman the best place to establish the advocacy, food-policy change and public health impact initiative that I am seeking to build.”

The Public Impact Initiative, which grew out of the school’s strategic plan, will create a broad network of public, private and nonprofit partner organizations to advocate for legislation, policies and programs that can make the biggest difference. First on Mande’s list? Organizing a task force that will look at ways to protect and strengthen SNAP by making SNAP diets healthier.

HIGHLIGHTING THE HEROES

Unearthing ideas to fix the bad stuff, Food Tank starts with the good. **BY JULIE FLAHERTY**

DANIELLE NIERENBERG, NO1, could see smart ways that we could feed the hungry, fight obesity and still preserve the environment. She just needed a lot more people to know about them. So in 2013 she quit her job, took \$6,000 of her savings and set out to see if a global network of concerned citizens—from academics and farmers to activists and moms and dads—could help build a more sustainable, nutritious food system.

The New Orleans-based nonprofit she founded, Food Tank: The Think Tank for Food, which sponsored a two-day summit at Tufts on April 1, has already built an online following of more than 500,000 people from 190 countries. As president, Nierenberg uses Food Tank to promote fixes that are as diverse as those who devise them—homeowners in Florida and California who donate their lawns as organic garden space, for example, and an Australian group that rescues surplus airline food to feed the hungry. The stories she shares on the Food Tank website and on social media are light on jargon and heavy on the “food heroes” behind the innovations.

We spoke to Nierenberg about her hopes for the future of food.

TUFTS NUTRITION: You studied environmental policy in college and then spent two years with the Peace Corps, working with farmers in the Dominican Republic. How did that influence you?

DANIELLE NIERENBERG: I thought that all farmers were the same, part of one big industry. I blamed them for destroying the environment. That all changed for me in the Peace Corps. Being on the ground, I saw there are farms of all sizes doing things in different ways, both bad and good. I realized those farmers had a lot more to teach me than I could ever teach them. The more farmers have resources and ideas and connections with other farmers, the better they can do their jobs.

TN: During your 11 years at the Worldwatch Institute, you spent months traveling through sub-Saharan Africa, Latin America and Asia talking to farmers, scientists and others about food. What were some of your takeaways?

DN: A lot of what we did at Worldwatch was very gloom and doom. But the work I was seeing on the ground was very hopeful and coming from unexpected places. Despite everything we’ve been hearing, sub-Saharan Africa has a lot of potential to be the leader in sustainable agriculture and preserving biodiversity and creating better equality for youth and women.

I was seeing really innovative things that weren’t getting a lot of attention. I wanted to put a human face on these issues, share them with other farmers, scientists and researchers, and focus on what’s working rather than what’s not. It’s what inspired me to create Food Tank.

TN: Food Tank does seem to have a very positive outlook. You’ve posted stories like “Nine Women of Color Who Are Changing the Food Industry.”

DN: We do have to talk about the problems, but I think at this point, we all know what they are. We really need to highlight the solutions. If you spend time in sub-Saharan Africa, or even in rural America, you can look around and feel very despondent. If you don’t look for the good and realize there is potential there to be scaled up, then we could all just give up. The urgency of these issues is too great to give up.

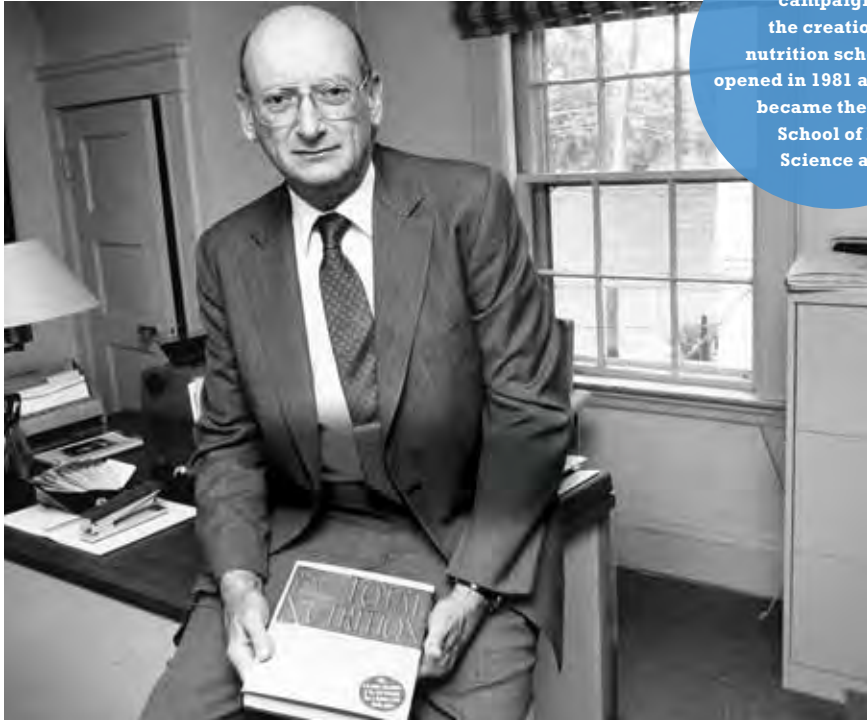


“I wanted to put a human face on these issues,” said Danielle Nierenberg, “and focus on what’s working rather than what’s not.”



Livestream the September 13 Food Tank summit on food waste at foodtank.com.

Stanley N. Gershoff campaigned for the creation of the nutrition school, which opened in 1981 and eventually became the Friedman School of Nutrition Science and Policy.



Gershoff came to Tufts from the Harvard School of Public Health, where his lab adjoined that of Jean Mayer, who had run that White House conference.

When Mayer became president of Tufts in 1976, he tapped Gershoff to create the Tufts Nutrition Institute in 1977. Four years later, Gershoff presided over its transition into a school. He also worked with Mayer on funding for the USDA Human Nutrition Research Center on Aging, which was constructed in 1982 on Tufts' Boston campus.

Elizabeth Cochary Gross, N82, N88, a student in the school's first class, stayed on for her doctorate and asked Gershoff to be her adviser. "I had such respect for his knowledge of the topic I was to pursue, vitamin B6 and aging," she said. "He was always ready to help and advise, but I had to leave plenty of extra time for our meetings since he always had a story for every question or problem."

Now a Tufts trustee, Cochary Gross went on to create a scholarship program in Gershoff's honor. "He was so proud to have the Gershoff Scholars named after him," she said, "and I am glad he met so many of them. I am proud to have initiated the program and even prouder to maintain them in his memory."

After Gershoff retired from Tufts in 1996, the school instituted the annual Gershoff Symposium, which focuses on current issues in nutrition science and policy. "The overlap of these two areas was so important to Dr. Gershoff," said Cochary Gross, who recently made another gift to endow the symposium in honor of her mentor.

Gershoff himself was always eager to attend the event. "I am so glad that he was around to experience that," Cochary Gross said. "He loved discussing nutrition issues and giving the closing comments—there were always plenty of stories."

The Matchmaker

The school's first dean was an early supporter of the union of science and policy. **BY JULIE FLAHERTY**

ESTABLISHING AN INDEPENDENT graduate school of nutrition was a radical idea in the early 1980s, when most nutrition programs were housed in schools of agriculture, home economics or public health. But Stanley N. Gershoff realized early on that good science could drive policy decisions to promote human health and well-being.

Gershoff, who died on March 22 at age 92, campaigned for the creation of the school, which opened in 1981 and eventually became the Friedman School of Nutrition Science and Policy.

As the school's first dean, Gershoff hired faculty with backgrounds in not only biochemistry and metabolism, but economics, psychology and international relations, hoping to tackle the real-life obstacles that stand between people and a healthy diet. He'd seen the cost of those barriers during his own research, studying vitamin A fortification in Indonesia and amino acid fortification of rice in Thailand.

And, while chairing a panel at the White House Conference on Food, Nutrition and Health in 1969, Gershoff saw how research could be translated into policies that would help people. "This became big to me," he said later.



Graduates
of the Class of
2017 at their
commencement
ceremony, held on the
Medford/Somerville
campus on May 21.

Persistence and Grit

A former FDA leader encouraged the Class of 2017 to take on the hard problems.

WHILE SERVING AS the commissioner of the Food and Drug Administration from 1990 to 1997, David Kessler heard his FDA colleagues warn him that taking on the tobacco industry would be “political suicide.” Still, he launched a campaign to have tobacco treated as a drug, a fight that would define his career. “It took 15 years, but eventually the president and Congress gave the FDA the authority to regulate cigarettes,” Kessler said at the 36th graduation ceremony of the Friedman School, held May 21 on Tufts’ Medford/Somerville campus. Kessler told graduates that they can make a difference, if they persevere. “There are a few of you sitting out there who will take the big, hard, challenging problems and touch what other see as untouchable,” he said to the 117 degree recipients. To have an impact, he said, will take “persistence and grit.”

Kessler served as dean of the medical schools at Yale University and the University of California at San Francisco, where he is currently a professor of pediatrics and epidemiology and biostatistics. He is also known for his best-selling books.

In his address, he told graduates that nutrition has the public’s attention, and they must make it count. “You have earned the highest privilege in life, to touch the lives of others,” he said. “Your work can improve the health of all of us.”



SCENES FROM REUNION

The Friedman School Alumni Reunion and awards event on April 1 was a cause for celebration. **1.** Sai Krupa Das, NG02; Sara Folta, NG05; and Vincent Maganzini smile for the camera. **2.** Alexandra Earle, A14; Rebecca Mozaffarian, N06, MG06; Friedman Dean Dariush Mozaffarian; and Miriam E. Nelson, N85, NG87, deep in discussion. **3.** U.S. Representative Jim McGovern was guest speaker at the event.



A HEALTHY DOSE OF FACTS

The cover of a *Time* magazine issue this year posed the question “Is Truth Dead?” Tufts economist Michael Klein has responded with an emphatic no. He and Edward Schumacher-Matos, F73, director of the Fletcher School’s Murrow Center for a Digital World, launched the online publication *EconoFact* (econofact.org) as a nonpartisan antidote to fake news and political wrangling. In it, Klein and more than 40 other academic economists—including Friedman School professor William Masters—are waging their own campaign for veracity by posting short, easily understandable analyses of pressing economic- and social-policy issues, such as education funding and trade deficits. Masters has contributed two posts on the Supplemental Nutrition Assistance Program (SNAP), which some congressional leaders have called to restrict. Regarding concerns that assistance could encourage fraud and create dependency, Masters wrote, the data on SNAP show it to be “the temporary, low-fraud, family-friendly safety net that conservatives would like to see.”

—TAYLOR MCNEIL

ALUMNI ASSOCIATION PRESIDENT

MAKE A CONNECTION



ON BEHALF OF the Friedman School Alumni Association, I would like to welcome our newest members, the graduates of the Class of 2017. Though most of you were students for only a few years, you are members of the alumni association for life.

I am passionate about the Friedman School, just like my predecessor,

Andrew Shao, N96, N00. I look back on Andrew's time as president of our alumni association with tremendous pride. This year, 22 alumni participated in our annual D.C. Alumni/Student Networking Trip, a program that Andrew developed. We also have Andrew to thank for leading the Executive Council in the revision of its mission and committee structure, including the formation of a new standing committee dedicated to

council communications.

Our semester kickoff event held in January brought together more than 70 alumni and students for an evening of networking in the Back Bay. The volunteer-led Mentoring Program matched 13 students with alumni mentors, exemplifying the collaborative relationship among Friedman alumni, students and faculty. During the student trip in March, more than 50 alumni and students gathered for our Washington, D.C., Chapter Networking Reception. The Friedman School All-Alumni Reunion and Awards Ceremony held in April

celebrated the careers of three notable alumni: Danielle Nierenberg, N01; Miriam Nelson PhD, N85, N87; and Molly Uebele, N12. All of the recipients highlighted how the Friedman School was integral to their success.

I am excited to begin my term as president of the Executive Council, the alumni association's leadership team. As alumni, we have a responsibility to build, maintain and promote the school's reputation. If you would like to become more involved as a mentor or Executive Council member, or have suggestions regarding alumni programming, please contact me at gphelan@tuftsmedicalcenter.com. I look forward to seeing you at alumni association events and programs.

GRACE PHELAN, N05,
President, Friedman School Alumni Association

Class Notes



N85

LYNN (HEWES) VINCENT, MARY (ROBINSON) SCHIPPER and LISA BOOKSTEIN, pictured at left, attended the Friedman School Alumni and Friends reception at the Food and Nutrition Conference and Expo in Boston this past fall. Schipper shared a photo of herself from back when the School of Nutrition was merely a house on the Medford campus. "Classes were held in the living room— at least those taught by Marion Zeitlin and Bea Rogers," she writes.

N99

KATYA TSAIOUN, a senior research associate at Johns Hopkins Bloomberg School of Public Health, is conducting research on how effective animal testing is at predicting drug toxicity in humans. She and her team will look at data on 10 approved drugs, including some that were later found to have toxic effects on the human liver. They will compare animal tests on those drugs with other methods that use human cells or

computer models to see which more accurately predicted the potential toxicity of the drugs.

N05

SIMÓN BARQUERA, N96, N05, was honored at the 11th annual Michael and Susan Dell Lectureship in Child Health on April 6. Hosted by the Michael & Susan Dell Center for Healthy Living at the University of Texas School of Public Health in Austin, the lectureship recognizes distinguished researchers who have made outstanding contributions to child health.

N06

JODY BIERGIEL COLCLOUGH and her husband, Renny, welcomed a daughter, Iris, on January 26, 2016.

N07

After finishing his service at the USDA with the Obama administration in January 2017, **KUMAR CHANDRAN N07, MPH07**, started a new job as policy director at FoodCorps, a public service organization that connects kids to healthy food in schools.

N08

After the 2014 birth of her son, **BECCA (KLEIN) BARTHOLOMEW** left the Johns Hopkins Center for a Livable Future, where she had spent more than five years working on federal food and agriculture policy, often with other Friedman School alumni and former faculty. Since then, she has been consulting in food systems and organization



development, having been trained in OD after leaving Tufts. “My favorite work is that which allows me to support the human system that is working to reshape the food system,” writes Bartholomew (pictured with her son above). “Need a facilitator, help with strategic planning, leadership development, or team building? Get in touch.”

ELIZABETH BONTRAGER is now a nutrition adviser with USAID’s Office of Food for Peace.

BRIERLEY HORTON has joined *Cooking Light* magazine as its food and nutrition director. She relocated to the publication’s headquarters in Birmingham, Alabama, from Shelburne, Vermont, where she had served as nutrition editor for *EatingWell* magazine.

SHIVANI SAHNI N04, N08, was recently promoted to assistant professor of medicine at Harvard Medical School.

N11

ERIC ANDERSON, N11, MPH11, is now a nutrition adviser with USAID’s Office of Food for Peace.

N13

LAUREN KASKEY, N13, MPH13, started working for Health Care Without Harm in May 2016. She joins Friedman alumni **JENNIFER OBADIA, N11**, and **JOHN STODDARD, N09**, on the New England Healthy Food in Health Care team as a regional coordinator. Kaskey works with hospitals in New Hampshire, Maine and her new home state of Vermont. She is also getting married in August. “It will be a Friedman-fest of the highest order with alum from ’12, ’13 and ’14 in attendance,” she writes.

N14

SETH COBURN is a health coach for Evolent Health, a care management company in Arlington, Virginia. He is also enrolled at the University of Maryland to complete the academic requirements to become a registered dietitian and hopes to apply for a dietetic internship in 2018.

TINA (CHANG) SUN was married in August 2016. She met her husband during her time in Boston. “We’re now in Ann Arbor, Michigan,” she writes, “but Boston will always hold a special place in our hearts.”

LINDSEY WEBB is coming up on her one-year anniversary as community liaison for U.S. Rep. Rick Larsen in his Everett, Washington, district office.

N16

DEEANA (IJAZ) AHMED, N16, MPH16 writes: “I am happy to announce that I married my best friend, Muzzamil Ahmed, in November 2016. We have spent the last five months backpacking across Africa.”

**JOIN THE TUFTS
ONLINE COMMUNITY,
WHERE YOU CAN:**

Search for friends,
network with fellow alumni,
hear about upcoming events,
access library databases,
and much more!

SIGN UP NOW:
TUFTSALUMNI.ORG/OLC

TuftsAlumni

Milks Made Easy

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

Q *If you can't drink cow's milk, what is the best alternative? Almond, soy, coconut—is one healthiest?*

A Cow's milk is naturally rich in protein, calcium, phosphorus, potassium, riboflavin and vitamin B-12. It is also a valuable source of vitamins D and A, thanks to fortification. But sometimes cow's milk is not an option due to allergy, intolerance or pure preference.

With the plethora of “milks” made from nuts, seeds, soy, coconut and grains, milk-free consumers have no lack of options; however, their protein and vitamin/mineral content can vary significantly. To start, choose a variety

fortified with calcium, vitamin D and, when possible, vitamin A and B vitamins. Unsweetened versions will avoid added sugars and calories.

Fortified soy milk's nutritional profile nearly mimics that of low-fat milk and is the only nondairy alternative with the same 8 grams of complete protein per cup. That makes it a great alternative for children ages 2 and up, who need enough protein and fat in their diets for growth and development. Consult a pediatrician or registered dietitian if soy is a problem for your child.

If you have an allergy or intolerance to soy or want something with fewer calories, the other fortified varieties may have something to offer. Almond milk is the lowest-calorie option, at 35 calories per cup. Coconut milk is also low in calories, but high in saturated fat, which may raise bad cholesterol. Hemp milk is high in good, unsaturated fat. Rice milk is hypoallergenic. Just keep in mind that all of these have less than 2 grams of protein per cup, so be sure to make up that protein elsewhere in your diet.



Send your questions for “Ask Tufts Nutrition” to Julie Flaherty, Tufts University Office of Publications, 80 George Street, Medford, MA 02155 or email julie.flaherty@tufts.edu.



A close-up, high-angle photograph of a baby's face, looking directly at the camera with a neutral expression. The baby's hands are visible near their chin. The background is dark and out of focus.

HER GROWTH

COULD BE STUNTED BUT OUR

KNOWLEDGE ABOUT WHY IS

GROWING

EVERY DAY.

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

Nutrition Innovation Lab

Tufts
UNIVERSITY

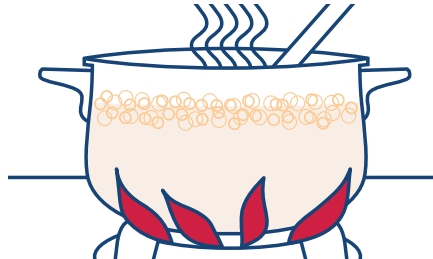
The Nutrition Innovation Lab is investigating how toxins created by molds and fungus can lead to stunting in newborns. It's this kind of work in developing countries that reflects the Friedman School's international leadership in nutrition research. It also reflects our commitment to help infants grow into healthy children and adults without any impediments along the way.

If you would like to make a donation in support of the Friedman School, visit nutrition.tufts.edu/givenow2.

➔ Change of address? Questions? Email julie.flaherty@tufts.edu.



8 Eat for Your Eyes



18 Next-Gen Food Aid



30 Nutrition Heroes



CULTURAL BOUNTY

Cambodia-born Phalla Nol grows specialty crops from around the world on her farm in North Andover, Mass. Her business has flourished with help from the New Entry Sustainable Farming Project at Tufts. For more on her story, turn to page 14.