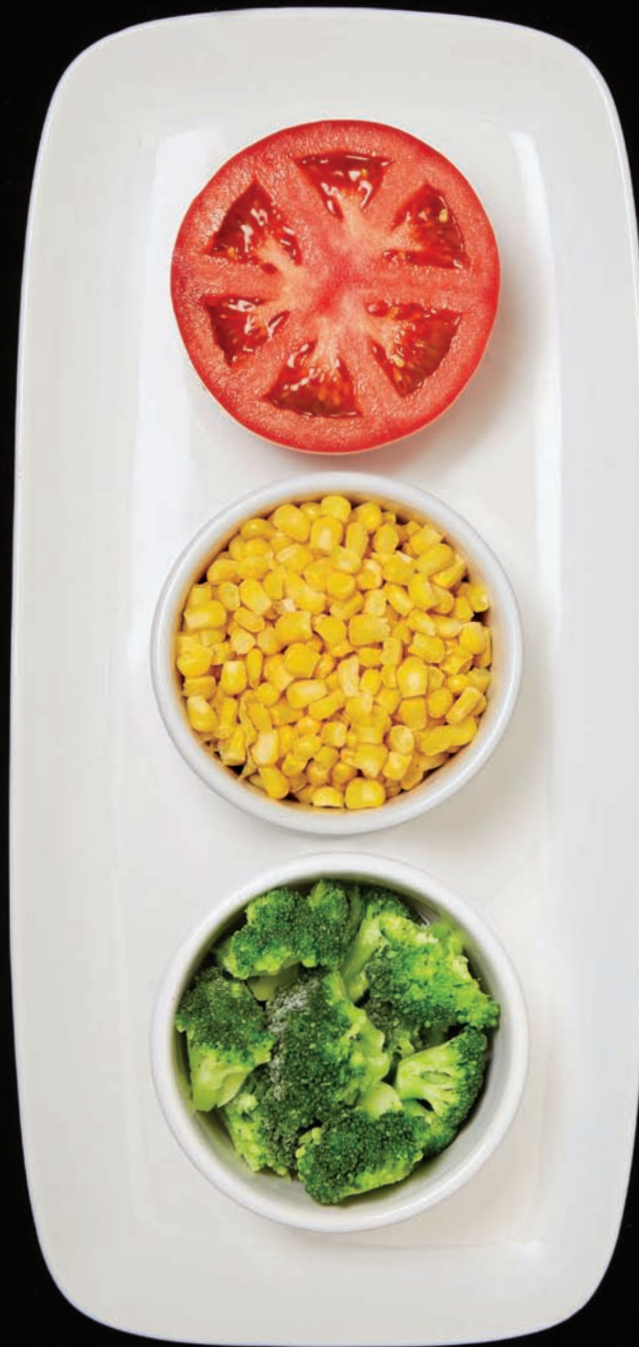


Tufts

Nutrition



READY, SET, GO!

Preparing baby boomers to eat well after 65



BATTLE-READY BELLIES

Traveler's diarrhea is an intestinal illness usually caused by a bacterial infection. It's a drag for vacationers, but far worse for deployed soldiers.

"They are not going to be out in the field fighting; they are going to be compromised," says J. Philip Karl, N14, a research dietitian at the U.S. Army Research Institute of Environmental Medicine in Natick, Massachusetts. "It's a huge problem."

A means of keeping the digestive peace may lie in the portable Meals Ready to Eat (MREs) that soldiers rely on in the field. Karl is conducting a study of how these packaged rations affect the digestive system to figure out whether tweaking the ingredients could boost the gut health of military personnel.

"We know that bacteria that live in our intestinal tract have a big influence on human health," he says. By changing the prebiotic content of the meals, likely by adding combinations of

dietary fibers that beneficial gut bacteria consume, he hopes to encourage healthful microbes to thrive in the intestine. "We think we can create an environment that really deters the growth and invasion of pathogenic bacteria or viruses."

Karl, who has worked at the Army lab since 2004, has always been interested in eating behaviors. But he became fascinated by microbiology and bacteriology while finishing his doctorate at Tufts, where he contributed to a whole-grains study at the Jean Mayer USDA Human Nutrition Research Center on Aging.

Adding beneficial bacteria directly into the meals is unlikely for now, as the MREs have to be shelf-stable for three years at 80 degrees. Karl says the military's high-tech food science might get there one day. But a brownie with extra fiber? It could be a first line of peptic defense. —JULIE FLAHERTY

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Cover photograph by Vito Aluia



MAKE FOOD AN ELECTION ISSUE



AMID THE HOOPLA of the 2016 elections, many important topics have been discussed: jobs, Syria, taxes, immigration, health care, education, the courts, banking, our relations with other nations, to name a few. While the candidates' responses may not always have been satisfying, the issues have at least been raised and considered. Yet, astonishingly, the 2016 elections so far have ignored the one topic that is among the biggest challenges and opportunities of our time: our food.

Poor nutrition is the leading cause of poor health in this country and around the world, causing more deaths and disability than any other factor. Our food system is also the leading cause of environmental impact: 70 percent of water use, 90 percent of tropical deforestation, immense challenges to the oceans and as many greenhouse gas emissions as all the world's transportation combined.

How we eat is also a leading economic issue. The U.S. spends \$3 trillion a year on health care—nearly one of every five dollars in the entire economy. From small businesses to multinational companies, crushing health-care costs are a major obstacle to growth and success. Remember Congress' great budget sequestration battle of 2013? That dispute was over \$85 billion a year. Alone, diabetes and prediabetes—mostly preventable through better lifestyle—cost \$322 billion a year. Add other diet-related illness, such as heart disease, cancers, cognitive decline and obesity, and we easily reach \$1 trillion annually. Imagine how much less wrangling and partisanship there would be, and how much more achievement, by returning all these dollars to the national coffers. Improving our food system, and how we eat, should be a bipartisan priority.

This is nutrition's time. The public is deeply interested in healthy and sustainable eating. Many across industry recognize that their success depends on being part of the solution. Advances in nutrition science and policy have positioned us to deliver major breakthroughs toward a healthier and more prosperous America.

During these elections, our food system should be front and center, receiving abundant attention from candidates, the media, debate moderators and the public. When we elect leaders who are nutrition-aware, we can bring together modern science and diverse stakeholders to achieve real change. Learning from past successes, we could accomplish in 10 years what required 50 years for tobacco reduction, 70 years for car safety, and 100-plus years for water and sanitation. As we enter the last lap of the 2016 elections, it's time for food to be a major issue on the table.

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

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WASHINGTON TAKES NOTE



THE CONNECTION BETWEEN nutrition and good health has been known since ancient Greek times, when Hippocrates declared, “Let food be thy medicine and thy medicine be thy food.” Still, even after more than two millennia, we’re continuing to promote nutrition as the path to preventing many health risks that threaten vitality as we age.

The movement to recognize nutritional well-being as a public health issue has been making progress with policymakers at the national level. In March, a multiagency committee, led by the U.S. departments of Agriculture and Health and Human Services, released the National Nutrition Research Roadmap, a blueprint that will guide federal spending on human nutrition research for the next five years. The roadmap specifically cites the need to consider certain at-risk groups, including older adults. The scientists at the Jean Mayer USDA Human Nutrition Research Center on Aging (HNRCA) at Tufts read the report with great enthusiasm, as our research agenda is well represented in the 166-page document.

More recently, U.S. Sen. Ed Markey, D-Mass., reinforced the mission of the HNRCA by adding this language to the fiscal year 2017 Agriculture Appropriations Bill: “Food and nutrition play a central role in U.S. health, environment and economic development. In fact, diet-related disease has become America’s largest single cause of premature death and disability. More research is needed to address the needs of all Americans, with a particular focus on the elderly, the fastest growing segment of the population. Therefore, the Agricultural Research Service is encouraged to prioritize human nutrition research to explore the relationship between nutrition, physical activity and healthy and active aging.”

Similar language is being promoted in the House by U.S. Rep. Jim McGovern, D-Mass., who sponsored an educational event on Capitol Hill this spring for the HNRCA to present the redesigned MyPlate for Older Adults to policymakers (see page 21). Following the event, Rep. McGovern gave a speech in Congress that focused on the problem of “hidden malnutrition” among older adults.

While I’m pleased that policymakers are recognizing the importance of nutrition, what matters most is what happens at the household level. Translating our research for individual use is important to all of us at the Friedman School and the HNRCA, and I’m hopeful that the information we share helps elevate the importance of nutrition to the vitality of older adults.

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

Four Friedman School professors and researchers at the Jean Mayer USDA Human Nutrition Research Center on Aging (HNRCA) at Tufts were recognized by the American Society for Nutrition at its Experimental Biology meeting this year. **ALICE H. LICHTENSTEIN**, the Gershoff Professor and director of the Cardiovascular Nutrition Laboratory, was given the David Kritchevsky Career Achievement Award in Nutrition. **JEFFREY BLUMBERG**, a scientist in the Antioxidants Research Laboratory, took home the Mary Swartz Rose Senior Award, given to an investigator for outstanding research on the safety and efficacy of bioactive compounds for human health. **SARAH BOOTH**, director of the Vitamin K Laboratory, received the Pfizer Consumer Healthcare Nutritional Sciences Award, given in recognition of recent investigative contributions of significance to the basic understanding of human nutrition. **SUSAN ROBERTS**, director of the Energy Metabolism Laboratory, was selected as the W.O. Atwater Lecturer by the USDA’s Agricultural Research Service. The Atwater Lecture, cosponsored by the American Society for Nutrition, recognizes scientists who have made unique contributions toward improving the diet and nutrition of people around the world.

DARIUSH MOZAFFARIAN, dean of the Friedman School, and **JEFFREY BLUMBERG**, a scientist in the HNRCA Antioxidants Research Laboratory, were named to Thomson Reuters’ 2015 list of the World’s Most Influential Scientific Minds. The list recognizes the top thinkers in 21 fields who between 2003 and 2014 published the most papers cited highly by other scientists.

A La Carte



Restaurant Pitfall

Today's Special: A whopping number of calories

IT'S NOT JUST greasy fast-food meals from the big chains that are caloric culprits. In a new study, almost all of the 364 restaurant meals researchers analyzed from across the country contained more calories than one person needs in a single meal. And some of the meals even overshot the calories a person needs in a whole day.

The study examined meals served at 123 restaurants in Boston, San Francisco and Little Rock, Arkansas, between 2011 and 2014. Even without extras like drinks, appetizers and desserts, the meals exceeded a typical woman's energy needs (570 calories for lunch or dinner was the benchmark) 92 percent of the time.

The worst offenders by cuisine were American, Chinese and Italian restaurants, which had mean counts of 1,495 calories per meal.

But wait, you say. Can't people just stop eating when they are full? It's not so simple, says the study's first author, Susan B. Roberts, director of the Energy Metabolism Lab at the Jean Mayer USDA

Human Nutrition Research Center on Aging at Tufts. She says the urge to keep eating what's in front of you is part of a natural Pavlovian response.

"All we have to do is see and smell food, and our sympathetic nervous system revs up, insulin secretion drops blood glucose and our stomach relaxes—the goal of these physiological changes being to prepare us to eat all the food within reach," said Roberts, who is also a professor at the Friedman School of Nutrition Science and Policy at Tufts.

Study author William Masters, a professor at the Friedman School, points out that standard meals are sized for the hungriest customers, so people who need fewer calories are faced with a dilemma. The average adult woman doesn't need more than 2,000 calories a day, while men average 2,500.

"There is a gender dimension here that is really important," Masters said. "Women, when dining out, typically have to be more vigilant."

Public health officials have pinned their hopes on new legislation that requires restaurants with 20 or more locations to disclose nutrition information so their customers can make healthy choices. The authors of the study write that menu labeling may help, but aside from the fact that the new law doesn't apply to about half the restaurants out there, it won't address "the basic problem that human neurobiology, rather than lack of willpower, is a primary drive of overeating" when it comes to restaurant meals.

Masters said a good option would be if customers could order partial portions at partial prices, saying they would "be able to eat out more often without weight gain."

The study appeared in the *Journal of the American Academy of Nutrition and Dietetics*.

Zinc and Infections

As the body ages, it becomes more susceptible to infections, thanks to the natural weakening of the immune system. Having too little zinc in your system can add to the problem. But a recent study of 25 nursing home residents found that supplements can help older adults bring their zinc levels up and increase the number and function of their T-cells—white blood cells that are integral to the immune response. The researchers, part of the Nutritional Immunology Laboratory at the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts, say the findings suggest that getting enough zinc could help reduce the incidence and severity of infections in seniors, wherever they may reside.

KIDS ARE SITTING IT OUT

GUIDELINES RECOMMEND THAT children get an hour of exercise every day, including a half hour during school. Unfortunately, a new study finds that few kids are meeting that goal, with girls particularly likely to fall short during school time.

A team led by Tufts researchers tracked the physical activity of 453 third, fourth and fifth graders at schools throughout Massachusetts for a week. They found that only 15 percent of children were getting the 60 minutes of daily moderate-to-vigorous physical activity (such as bike riding, playing tag or jumping rope) that the Physical Activity Guidelines for Americans recommend. Just 8 percent were getting 30 minutes during the school day, as recommended by the Institute of Medicine.

The researchers expected the school day to be an equalizer, giving boys, girls and children of different weights similar exposure to physical activity. “Instead, we found that girls and overweight children were less active for all measured segments, including during the school day,” said first author Kristie Hubbard, an adjunct instructor in the department of public health and community medicine at Tufts University School of Medicine.

Girls were far less likely than boys to meet the guidelines, as only 8 percent met the daily total and 2 percent met school-time recommendations. Overweight and obese children were also less active, both in and out of school.

The researchers also measured the students’ light physical activity, such as walking around. Girls and boys did similar amounts of light activity outside of school, but girls clocked significantly fewer minutes than boys during the school day. And all the children did less light physical activity as they got older.

Jennifer Sacheck, N01, the study’s senior author and an associate professor at Tufts’ Friedman School, said schools need to give kids more opportunities for physical activity—from light to vigorous—and pay special attention to girls. “Clearly, schools need to be aware of this disparity and should focus on increasing all intensities of physical activity equally for all children across the school day,” she said.



FOLIC ACID CAVEAT

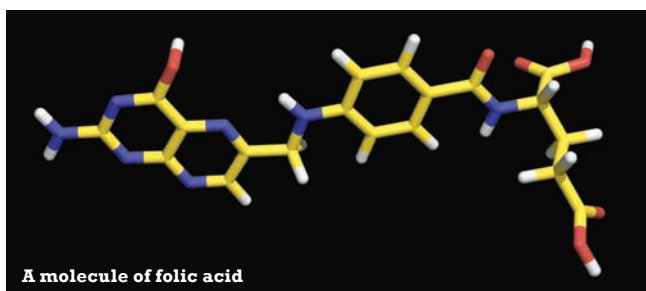
Here's another case of too much of a good thing: Researchers have found that excess folic acid can dampen the immune system, at least in mice.

In the study, scientists in the Vitamin Metabolism Laboratory at the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts gave a group of older mice the

equivalent of the Recommended Daily Allowance of folic acid, while another group got 20 times the RDA (very high even for a supplement, but it accounts for the mice's ability to quickly metabolize the vitamin). The mice who took the high dose of folic acid later showed less effective natural killer cells, types of immune cells that are important for defending against viral infections and cancer.

The findings build on previous research by the same lab: In 2005, it found that 78 percent of healthy postmenopausal women had unmetabolized folic acid in their blood (a sign of excess intake) and that those women had significantly lower natural killer cell activity.

Additional research could determine whether excess folic acid actually increases susceptibility to infections and provide guidance on the use of supplements among older adults. The study appeared in the *Journal of Nutritional Biochemistry*.



There's Something About Dairy

Whole-fat choices may have a health benefit

CREAMY, RICH, DECADENT ... and protective? A recent study by Friedman School researchers found that the dairy fat in milk, yogurt and cheese has a link to preventing diabetes.

The research, published in the journal *Circulation*, followed 3,333 adults over two decades, not only noting what they reported eating, but measuring biomarkers of dairy fat in their blood. In the end, the people who had the most dairy fat in their diet had a 46-percent lower risk of diabetes, compared with people who ate the least.

Satiety may explain why. While the study does not prove cause and effect, author Dariush Mozaffarian, dean of the Friedman School, says other studies have shown that when people consume more low-fat dairy, they eat more carbohydrates to compensate. Eating lots of refined, low-fiber carbohydrates that cause spikes in blood sugar has also been linked to a higher risk of diabetes.

It may be too early to call whole-fat dairy the healthiest choice, but Mozaffarian says there is enough research to reconsider policies that emphasize only low-fat options. The U.S. Dietary Guidelines, for example, recommend fat-free and low-fat dairy, reasoning that saturated fat—which is found in dairy, meat and other animal foods—has been shown in several studies to increase LDL cholesterol, a risk factor for heart disease.

Mozaffarian would like to see a nice glass of 2 percent back on the table for some people. "Our research indicates that the national policy should be neutral about dairy fat until we learn more," he told NPR.



STAY ACTIVE FOR A HEALTHY HEART

PEOPLE IN THEIR 70s can likely lower their risk of stroke and heart attack with regular moderate exercise, such as walking, according to a Tufts study, which provides some of the first evidence that continuing to exercise as we age really does make a difference.

“If you’re more active, you’re going to do better—especially with respect to heart and brain health,” says Dariush Mozaffarian, dean of the Friedman School, who led the study, which was published in the journal *Circulation*. “It reassures people that even after age 75, being active can make a big difference.”

What’s more, the types of exercise the researchers studied were activities many senior citizens enjoy: walking, hiking, biking, swimming and mowing or raking the lawn. “You don’t need to be an ironman,” says Mozaffarian. “You can walk or garden and not only have fun, but know you’re protecting your heart and brain.”

Researchers have known for some time that for most adults, regular

exercise reduces the risk of heart attack and stroke. But few studies focused on whether those benefits held true for older people, too. Mozaffarian and his research colleagues at the University of Porto in Portugal, the New York Academy of Medicine and the University of Washington believe theirs is the first large, community-based study to include enough participants over age 70 to provide statistically strong evidence of the rewards of exercise in older populations.

Mozaffarian and his colleagues used data collected on more than 4,200 men and women enrolled in the Cardiovascular Health Study from 1989 to 1999. The researchers looked at people with an average age of 73 who had no cardiovascular disease at the beginning of the study. By the end of the 10-year study, the group had experienced more than 1,100 cardiovascular events.

After controlling for participants who reported known diseases or ill health, the researchers saw a clear



link between more physical activity and lower instances of heart disease, stroke and coronary heart disease, even among the oldest people in the study. The scientists paid particular attention to walking, noting that while any walking at all appeared to lower risk, intensity and duration of physical activity still counted.

Study participants who were able to walk faster than three miles per hour experienced about half as many cardiovascular events as those who could manage just two miles per hour or less. Walkers who covered greater distances or spent more time at it appeared to lower their risk of heart attack and stroke even more.

“Natural isn’t always better. It’s often better, but you still have to be smart about a knee-jerk reaction that everything natural is good and artificial is bad. That can get you to an unhealthy diet... I would much rather have people have a little aspartame than a large amount of sugar.”

—Professor Susan B. Roberts, director of the HNRCA's Energy Metabolism Laboratory, in a *Fortune.com* article

Dig In

Brittany Peats, N15, is director of operations at Food Link, a food rescue organization.



WASTE NOT

There's a future for food beyond the 'sell by' date **BY JULIE FLAHERTY**

DECIDING HOW TO divvy up the 1,000 pounds of extra edibles that the food-rescue organization Food Link collects each day is a bit of an art. Surveying a day's haul, Brittany Peats, N15, the director of operations, reasoned that the local boys and girls club would be happy to get the milk, because the kids love to eat cereal for snack time. And while the apples and oranges were also perfect for the after-school programs, she knew not

to send them any bruised fruit, which doesn't fly with picky young eaters.

The folks at the senior center, on the other hand, take the occasional blemished peel in stride. "They'll just make apple sauce," Peats says.

Food Link, based in Arlington, Massachusetts, collects surpluses from restaurants and supermarkets—including Panera, Whole Foods and Trader Joe's—and distributes it to 30 nearby senior centers,

after-school programs, veterans groups, low-income housing facilities, food pantries and others. It's Peats' job to orchestrate the complicated logistics of getting food from where it's no longer wanted to where it's needed.

Since she joined the 4-year-old nonprofit as its first full-time employee last year, Peats has been concentrating on streamlining operations. She's gotten tips on logistics, food storage and organizing volunteers

from other food-rescue groups in Boston, including Food for Free, which has been operating for 35 years. The Greater Boston Food Bank provides guidelines on how long certain foods can be considered fresh, which is often well past the "sell by" date.

The goal, of course, is to cut down on waste. Up to 40 percent of food in the United States—20 pounds of food per person per month—is never eaten, according to the Natural Resources Defense Council. But Food Link is not about saddling the poor with old, damaged goods.

"For a lot of people who haven't been part of the organization, that is their first response: Why are we giving people seconds or expired food? But then they see it's all really good," Peats says. "We tell our volunteers, Don't pass on any food that you wouldn't eat yourself."

And there is a lot of it. A pickup from the nearby Whole Foods nets shopping carts full of eggs, yogurt, avocados, pickles, plantains, oranges and tomatoes, as well as soups, sandwiches and pizzas.

Back at the Arlington Food Pantry, which serves as Food Link's base of operations, some of the organization's 80 volunteers sort through the reclaimed bounty. Meat goes into the food pantry

freezer. Peak-ripe strawberries go to the kids programs. Unfamiliar exotic fruit is puzzled over. (“Are they supposed to be this squishy?”) Severely dented produce gets marked for the chicken farm down the street for feed and compost.

Boxes of seemingly pristine cookies are well within their “best by” date. They are a discontinued item, one of the volunteers explains, pulled from the shelves to make room for new products. These and other sweet treats are put aside for community meetings and conferences.

“Our emphasis is on distributing healthy foods,” Peats said. “We make sure we’re not overloading kids’ programs and senior citizens with a bunch of sugar that they don’t really need.”

The laws on what foods can be donated vary by state. Food-rescue groups got a boost in 1996, when an amendment to the national Good Samaritan Law said that people or businesses that donate food to nonprofits with best intentions are protected from liability.

Closer to Tufts, an even bigger incentive came from the Massachusetts Department of Environmental Protection, which, in October 2014, banned commercial food businesses from throwing away more than a ton of food per month. That

left businesses with four options: Create less food waste, give the extra to farm animals, compost it or donate it.

Donating it is becoming popular. It’s just the obvious thing to do, Peats said. “When you unload a van full of food and it’s just stacked up, you think, of course we’ll try to give this to someone who needs it.”

GRACEFUL EXITS

How do humanitarian projects succeed after the organizers go home?

BY HELENE RAGOVIN

IT’S A USEFUL cliché: Give a man a fish and he eats for a day; teach a man to fish and he eats for a lifetime. Veterans of international food-aid initiatives know that there is much truth there—a successful nonemergency program should benefit the population even after aid workers have left the scene.

In the most comprehensive study of its kind, two researchers from the Friedman School recently took a close look at whether food-assisted development programs kept going well after the initial investment ended, and what elements contributed to their long-term success. They

found the projects that continued to function had three things in common: an ongoing source of resources, trained people within the community to run the activities, and a way to keep the participants motivated.

“One of the things we were struck by was how consistent that was,” says Beatrice Rogers, a professor of economics and food policy at Friedman. Rogers and Jennifer Coates, J94, N00, N06, an associate professor of food policy and applied nutrition, conducted the study for the Food and Nutrition Technical Assistance Project, funded through the U.S. Agency for International Development (USAID). They examined the exit strategies of 12 USAID projects in four countries—Kenya, Bolivia, Honduras and India—and the legacy of those projects

up to three years after the projects had concluded.

Often, aid programs bank on the notion that local people will continue to devote time and energy to a project once the resources they provide are over—but that may be unrealistic. In many of the programs studied, mothers received food to improve their children’s diets, which served as an incentive to participate; when the free food ended, however, the women needed to spend their time getting food in other ways, and so they stopped participating.

“Projects need to make sure that the people they serve have very clear expectations and that the projects are transparent about what the plan is from the beginning,” says Coates. Rogers points to projects in Bolivia and Honduras, in which household members receiving new residential

A successful irrigation project in Honduras





water systems knew from the start that they would be paying user fees to a community water-management committee. The committees were trained to manage maintenance funds and perform repairs. As a result, most systems were still functioning two years later.

“The development community has traditionally thought of sustainability as a kind of luxury,” Coates says. Aid organizations focus on immediate impact, “and if there is sustainability, that’s icing on the cake. But we can envision situations when shooting for large short-term impacts can erode sustainability goals, and even sometimes bring harm.” She mentioned a project in which farmers were encouraged to switch from subsistence farming to commercial crops. When the project’s timeline expired, the farmers did not yet have solid links to markets—leaving them with no place to sell their crops and no subsistence crops to fall back on.

Food for Peace has already incorporated many of the recommendations from the Tufts study in its guidance to aid organizations. “With the U.S. government spending approximately \$2.5 billion annually on food-aid programming,” Coates says, “the issue of preserving development gains from these investments is paramount.”

DANGLING AN ACTUAL CARROT

Financial incentive to promote healthy eating appears to benefit those on public assistance program

BY CLARE LESCHIN-HOAR

VERY FEW OF us eat enough fruits and vegetables, and for the more than 47 million Americans who participate in the Supplemental Nutrition Assistance Program (SNAP), formerly known as food stamps, that number is a bit smaller still.

But what if healthy fruits and vegetables, like leafy greens or crisp apples, came with a financial incentive for SNAP participants? Would a tiny bit of extra spending power, just a little over \$6 a month, be enough to compel shoppers to move from the snack aisle to the produce bin?

The answer turns out to be a modest yes, says Parke Wilde, an associate professor at the Friedman School. He spoke about recent research on this and other proposed changes to the SNAP program that aim to promote healthy diets while still helping people get enough to eat, at the White House Conversation on Child Hunger in America in January.

“The goal of SNAP, above all, is to protect food security and to prevent

hunger,” Wilde said at the event. “It also is to promote dietary quality. And these goals are not at all necessarily in competition with each other.”

In late 2011, the USDA Food and Nutrition Service launched the Healthy Incentives Pilot Program in Hampden County, Massachusetts, where more than 5,000 low-income households were given an extra 30 cents for every dollar of SNAP benefits that they spent on a targeted list of fruits and vegetables offered by participating retailers.

When the 12-month program ended, Wilde and researchers at Abt Associates found the incentive had worked. It bumped consumption of healthy fruits and vegetables by almost a quarter cup a day, a 26-percent increase over purchases by SNAP participants not enrolled in the pilot. A quarter cup of extra veggies may not sound like much, but the researchers say it’s “large enough to be nutritionally relevant.”

The study also found that the overall calorie intake of participants who ate more fruits and vegetables did not rise—good news for those concerned with obesity rates.

But there was an underlying mystery associated with the pilot program. The quarter-cup increase in fruits and vegetables that participants reported eating was more than one

would expect, based on spending data captured at the checkout counter.

Wilde says the difference could be chalked up to confusion over exactly which fruits and vegetables qualified for the financial incentive. White potatoes, fruit juice and any fruits or vegetables with added salt or sugar were excluded.

For example, a participant may have purchased canned peas, but if those peas contained added salt, they wouldn’t qualify for the incentive. Researchers also did not have data on fruits and vegetables that participants bought at nonparticipating retailers, which may account for some of the disparity.

Wilde, whose most recent paper on the pilot program was published in December 2015 in the journal *Applied Economics Perspectives and Policy*, says the program may have persuaded SNAP participants to eat more of all types of fruits and vegetables, including those that didn’t qualify for the incentive. And, he adds, the pilot may have played a positive role in influencing awareness among participants.

“It could be the whole

pilot program had a marketing effect in addition to the explicit price incentive,” he says. “Promotion of healthy diets, backed up by a real financial incentive, increases fruit and vegetable intake. It’s a sign that marketing plus price incentive is more effective than either alone.”

CLARE LESCHIN-HOAR is a freelance writer in San Diego.

FAST MUSCLES, HAPPY KNEES

It’s power, not strength that fights arthritis pain
BY JACQUELINE MITCHELL

SCIENTISTS AT TUFTS have determined that a lack of leg muscle power—the capability of the leg muscles to rapidly exert force—is a more accurate predictor of knee osteoarthritis pain than simple leg strength, a finding that could lead to better diagnosis and treatment of the often debilitating disease.

Led by Kieran F. Reid, an exercise physiologist at the Jean Mayer USDA Human Nutrition Research Center on Aging (HNRCA) at Tufts, the study, which appeared in the journal *Arthritis and Rheumatology*, examined the relationships among leg

muscle strength, leg muscle power and perceived knee pain in people with osteoarthritis of the knee.

Reid’s team gathered their data by measuring the leg muscle strength and power of 190 men and women, ages 41 to 90, with knee osteoarthritis. They assessed the strength and power mainly of participants’ quadriceps—the big muscles on the front of the thigh—but also that of other leg muscle groups, including those in the buttocks, hamstring and calf. Participants were asked to perform a set of leg exercises known as a double leg press extension on an exercise machine. Seated, the subject brings the knees to the chest and presses a weighted plate away from the body. The faster they can do the press, the better their muscle power.

The researchers found that people with greater leg muscle power reported less knee pain and better quality of life. Muscle strength, however, was linked to lower quality of life in some circumstances. However, Reid doesn’t believe those data are contradictory.

“We think power is a better way to evaluate the overall performance of skeletal muscle compared to strength,” he says.

Their findings bring some clarity to the scientific literature about the role of musculature in knee osteoarthritis. While some studies have found

an association between more muscle strength and reduced pain—that is, stronger people felt better—others saw just the opposite. Measuring muscle power could eliminate the noise in the data.

“The key difference between training for building strength versus power is the speed at which the training is performed,” says Reid. “You can train on the same machines to develop strength and power, and with the same exercises—leg curl, leg extension, bicep curl, etc.—but to develop muscle power you have to perform the exercise very fast or as fast as you possibly can.”

Improving muscle power instead of just focusing on strength training might prove to be a more useful clinical goal, says Reid, who works in the Nutrition, Exercise Physiology and Sarcopenia Lab at the HNRCA.

“In previous studies, we’ve found that compared to muscle strength, muscle power is a stronger predictor of performance in tasks that are really important to older people and their physical independence, such as being able to get up out of a chair or climb a flight of stairs,” he says.

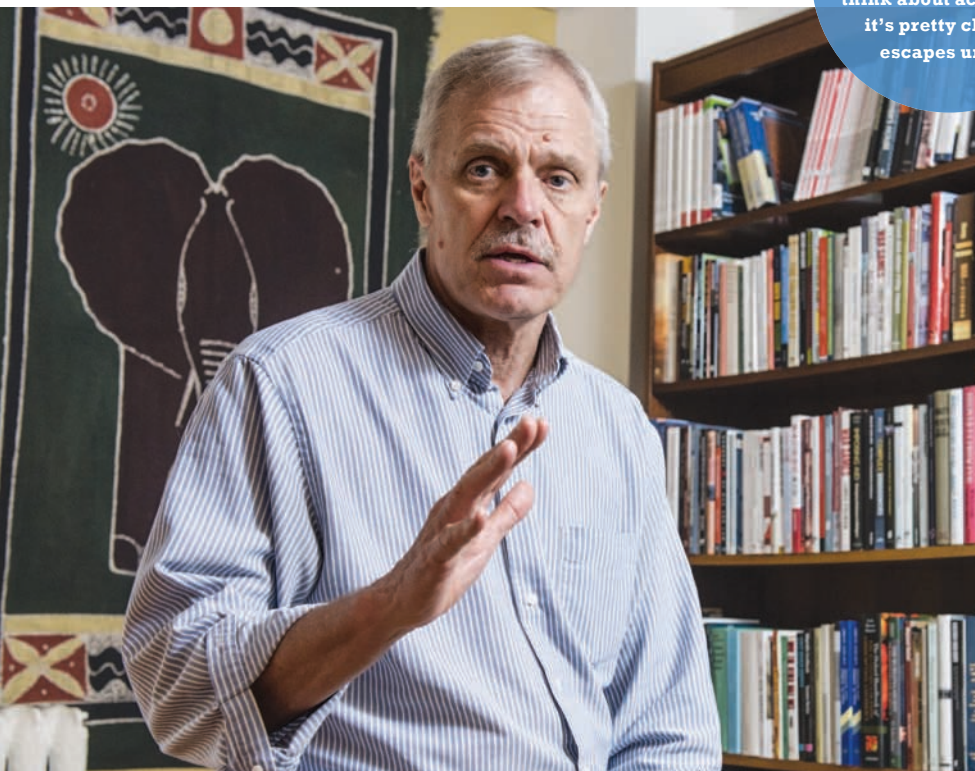
Focusing on building muscle power could prove critical to staving off both osteoarthritis and mobility problems in an aging population. While Reid’s team found that people with greater muscle

power reported less pain and better quality of life, overall, the participants in the study were pretty frail. With an average age of around 60, this group’s muscle power was more in line with “mobility-limited older adults with a mean age of about 80 years,” the researchers wrote. Whether that’s a cause or an effect of their knee pain, Reid can’t say without further research.

But he says he wouldn’t hesitate to prescribe them exercise, especially based on his previous experience as a scientist on the Lifestyle Interventions and Independence for Elders study, led by Roger Fielding, a senior scientist and director of the HNRCA Nutrition, Exercise Physiology and Sarcopenia Laboratory. That study, which focused on sedentary men and women ages 70 to 89, “really showed for the first time that we can prevent or delay mobility loss in at-risk older persons using a structured exercise intervention,” says Reid.

“We’re big advocates of having older people exercise,” he notes, adding that more research is needed to determine the safest and most effective way to build muscle power in older people with knee osteoarthritis. “We know from the data that the older population tends to be the most sedentary, but they are also the most likely to benefit from exercise interventions,” he says.

Dan Maxwell says the drought was just one factor in the famine. "When you start to think about accountability, it's pretty clear nobody escapes unscathed."



250,000 people could have been avoided, says Dan Maxwell, a professor of nutrition and humanitarian studies at the Feinstein International Center and the Friedman School of Nutrition Science and Policy at Tufts.

In their new book, *Famine in Somalia: Competing Imperatives, Collective Failures, 2011-12*, Maxwell and coauthor Nisar Majid examine what went wrong with the response to the crisis. They say it was human decision-making that stymied efforts to prevent or mitigate the worst impacts of the drought, the food-price crisis and ongoing conflict in the region.

Maxwell and Majid call for accountability from the people who made certain decisions along the line, including leaders in governments, armed groups, donor organizations, humanitarian agencies and academia—and they make no bones that analysts and academics like themselves could and should have done more to sound the alarm. Only by talking about mistakes openly, they say, will the humanitarian system keep such tragedies from repeating. Maxwell talked with *Tufts Nutrition* about the fallout.

TUFTS NUTRITION: You say that despite the drought, this famine didn't have to happen—that it was human factors that led to so many deaths.

DAN MAXWELL: First of all, the governing authority in south central Somalia, Al-Shabaab, was opposed to humanitarian assistance, and food aid in particular. It expelled agencies or threatened them to the point that they left. So several of the major agencies that could have responded to a crisis of this magnitude, such as CARE International and the [U.N.] World Food Program, were not there.

Second, Al-Shabaab had been labeled as an international terrorist organization several years earlier, so

Unnatural Disaster

A quarter-million people died in the Somalia famine of 2011. It didn't have to happen. **BY JULIE FLAHERTY**

THE SOMALIA FAMINE of 2011 was sparked by a confluence of disasters. A major drought ruined crops, killed livestock and took away wage labor opportunities for people who relied on them. At the same time, global food prices happened to rise sharply, a devastating blow for Somalia, which relies on food imports even in the best of times.

Yet even with those factors, the famine that killed

there were increasingly dire warnings that humanitarian agencies should not allow any assistance from Western donors to end up in Al-Shabaab hands. Agencies were so worried about the legal and reputational risks of being seen to be “assisting” terrorists that they were actually self-censoring, pulling themselves out even when they had some degree of access. Up until the famine was declared, there was a clear prioritization of a counterterrorism imperative over a humanitarian imperative. Given that the epicenter of the affected area was well inside Al Shabaab-controlled territory, the cumulative effect was that only limited efforts at prevention, mitigation or response were mounted until after the famine was declared.

What else contributed to it?

The international response to the crisis was far too little and far too late. By the time the famine was declared, mortality had already peaked. Even with the drought and the food-price crisis, had there been a widespread consensus that prevention and mitigation was a priority, I doubt that it would have tipped over into an actual famine.

The purpose of having an early warning is that we get a good idea of what will happen, and we intervene early. And there is a lot of evidence that shows it is much more cost effective to do so. But if you insist on seeing figures for severe malnutrition and mortality before you respond to something, then by definition you are already too late. We shouldn't have to learn this again.

If Al-Shabaab was keeping food aid out, and Western humanitarian agencies were not able to engage, what did people do?

What really determined whether people survived was the social network that people could call on to help. Much of this falls along clan or lineage lines. Some clans had more educated people,

people in business, people in urban areas such as Nairobi and Mogadishu, people in the diaspora around the world. If you had a brother in the U.K. or a son in the Middle East who was sending you a regular remittance, you survived. There was also a second sort of network. Instead of one person sending money to a family member, it

“Up until the famine was declared, there was a clear prioritization of a counterterrorism imperative over a humanitarian imperative.”

would be groups in the diaspora raising money to send back to their community in Somalia—to support people even beyond their immediate family.

So how did aid agencies eventually respond?

A number of agencies wanted to provide cash transfers and let people buy what they needed. The long history of people migrating away from Somalia and remitting money back to their families meant there was already an informal money-transfer system in place. The local agents of these transfer companies, known as hawala, more or less knew everyone in the community. There was practically universal cell phone coverage, so you had a mechanism for informing people. And then you had this network of food traders who were much better than humanitarians at negotiating access, getting across battle lines and getting into places.

There was a big argument at the time that people would use the money to buy other things. We looked at that very carefully. It turned out that the money from these cash transfers was

used overwhelming to buy food or pay down debt—debt mostly incurred buying food before there was a response. The other argument was about whether injecting cash into the economy would simply drive high food prices even higher. That also turned out not to be the case.

Unfortunately, there has been a

big effort to isolate these hawala from Western banks because of fears that they might be channels for getting money to terrorist groups. What that does is strangle the means by which millions of people survived in the hope that you might dry up a handful of terrorist cells.

Why is accountability important?

Every time one of these events happens, we say this can never happen again. But much of what we focus on are technical fixes. We don't look at who is responsible for making the decisions that led to this happening. Famines only rarely result from situations outside of human control.

When you start to think about accountability, it's pretty clear nobody escapes unscathed. You can blame the donors for being late. You can blame the agencies for not having the courage to respond. You can certainly blame Al-Shabaab. Part of the reason we wrote the book was to put this discussion on the table, even though it can be uncomfortable for people in the humanitarian enterprise to address.

TAKE IT EASY.

When it's hot, our bodies don't respond to physical activity as well. High humidity further impairs your body's response. The best way to avoid dehydration and other types of heat-related injury is to kick back when the temperature is higher than usual. If you have cardiovascular disease, diabetes, some types of lung disease or a number of other conditions, you are at especially high risk for dehydration and heat-related injury.

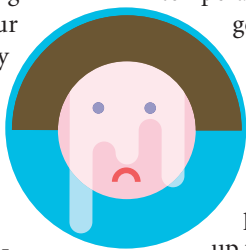
DRINK WHEN YOU'RE THIRSTY.

Forget the popular wisdom that everyone needs eight glasses of water per day—it's not based on current science. Healthy people typically need to consume fluid just until they are no longer thirsty, often referred to as "drink to thirst." But on hot days, do pay attention to the warning signs of dehydration, including lightheadedness, weakness, decreased energy and dark or infrequent urination. If you experience these signs, you should drink more, cease physical activity, get someplace cooler and seek medical attention, especially if you have diabetes or heart disease.



HYDRATE IN ADVANCE.

If you anticipate being exposed to hot temperatures, especially if you are going to be physically active, prepare by drinking 1 to 1.5 quarts of fluid in the two to three hours beforehand. Consider drinking even more if the activity will be prolonged and strenuous—up to 1.5 quarts for every 100 pounds of body weight.



DRINK DURING HEAT EXPOSURE.

The amount of fluid you need depends on your body size, age, gender, the temperature and humidity, and degree of physical activity. Aim for a minimum of one quart every two to three hours. If you get thirsty, drink more.

FLUID TYPES AND TEMPERATURES DON'T MATTER.

All types of beverages will help you stay hydrated, including water, carbonated beverages, flavored beverages and even milk or hot chocolate. Make sure you have ready access to drinks you like.



CAFFEINATED DRINKS ARE OK IN MODERATE AMOUNTS.

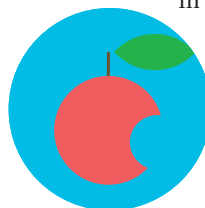
Contrary to prior belief, there is little evidence to suggest that caffeinated beverages act as diuretics, at least in the amounts that many people consume. But larger amounts, such as more than 16 ounces of coffee or 32 ounces of black tea, may cause you to urinate more, contributing to fluid loss. Also, remember that caffeine may have extra stimulant effects if you drink more than you usually do.

DRINK FRUIT JUICE AND SUGAR-SWEETENED BEVERAGES IN MODERATION.

These beverages help prevent dehydration, but they also contain calories, which can add up quickly when you guzzle them. Very sweet drinks may also make you feel thirstier, a physiological trick of absorbing all that sugar.

SPORTS DRINKS AREN'T NECESSARY FOR MOST PEOPLE.

Unless you engage in strenuous activity in the heat, it is unlikely that drinks that contain carbohydrate and electrolytes, such as sodium and potassium, will provide a clear benefit over other drinks. These drinks are more likely to benefit athletes who train or compete in hot temperatures.



FLUIDS IN FRUIT AND VEGETABLES COUNT.

Nonstarchy vegetables and fruit—such as cucumbers, lettuce and, of course, watermelon—contain water, which counts toward your fluid intake. The same is true for foods that are prepared with water, such as soup. But don't rely on these foods to completely meet your total fluid needs—you still need to drink.

SPICY FOODS DON'T HELP.

Eating spicy foods can make you sweat, which helps dissipate body heat. But it's likely that being in hot temperatures will have you sweating plenty without the need to reach for the ghost peppers.

READY, SET, GO!

Baby boomers will face many barriers to good nutrition as they age. It's time to get prepared.

BY JULIE FLAHERTY

PHOTOGRAPHS BY KATHLEEN DOOHER

GOOD FOOD HAS ALWAYS BEEN A PRIORITY for Vyril Robinson. As a child, she spent summers on her mother's farm, where she learned to harvest and "put up" fruits and vegetables. She learned to cook for a crowd as the youngest of 10 children. When she and her husband built their house in Burlington, Massachusetts, she planted a large garden and made her own preserves.

Now 79 and widowed, Robinson still loves fresh produce, but she's retired and lives on a fixed income, which makes it hard to justify the expense. So she was one of the best customers at the free weekly farmers market that the Burlington Council on Aging organized last year. She liked to try out new vegetables when the market provided interesting recipes—that's how she discovered her taste for baked kale. "It's just like eating potato chips," she said. "They are crunchy like that."

But Robinson doesn't think she'll make it back to the farmers market this year. She has back problems and emphysema and has had more than one heart attack. And with both her knees in need of replacement surgery, she has started using a walker ("I tried so hard to get off it," she said), which makes the eight steps down to the street from her house a new barrier. So she relies a bit more on the Meals on Wheels delivered to her door. It's a big help, although they do tend to cook the broccoli more than she likes.

Robinson's story highlights a widespread, though little recognized,





problem in seniors: malnutrition. Getting older creates obstacles to eating well at the very time that it's most important to do so. When seniors don't eat enough, don't eat the right foods or lose the ability to absorb certain nutrients, it can cause physical decline or exacerbate pre-existing conditions. Now, nutrition researchers at Tufts are joining a nationwide effort to address the problem, including educating baby boomers about the importance of diet long before they are living alone or dealing with physical limitations.

"The idea is that providing people in their 60s with a concept of how to eat will prepare them when their lifestyles change in their 80s," said Simin Nikbin Meydani, director of the Jean Mayer USDA Human Nutrition Research Center on Aging (HNRCA) at Tufts.

NEEDS CHANGE

Your body changes significantly as you age, a process that calls for changes in how you eat. For one thing, your muscle mass starts to shrink—a decline that actually begins in your

30s—and your metabolism will slow down, which means you'll need fewer calories than you once did. At the same time, your nutrient needs will stay the same or even increase. Your body may begin to have trouble absorbing certain nutrients, such as B12 and magnesium,

FREE AND FRESH, FOR SENIORS ONLY

They say that it stretches their food budget farther because their produce is covered for the week. And most report that they are eating more vegetables.

But just as important, the free weekly farmers market put on by the Council on Aging in Burlington, Massachusetts, offers senior citizens a whole lot of social engagement. "For some, it's their only outing for the week," said Marge McDonald, director of the council.

All the food at the market comes from the New Entry Sustainable Farming Project, an initiative of the Friedman School and other partners that trains beginning farmers and helps them sell their crops through the World PEAS Food Hub. In 2008, World PEAS began offering free or subsidized fresh produce to those in need, many of them older adults. Last year, the project supplied more than \$90,000 worth of free produce to 14 programs in Massachusetts, including the Kit Clark Senior

Center in Dorchester, Somerville/Cambridge Elder Services and councils on aging in Burlington, Peabody and Arlington.

Devin Ingersoll, the food-access facilitator at New Entry, says that project organizers weigh the specific challenges that seniors face in eating well. For instance, cooking can be difficult for this population, so project organizers include lots of foods that can be eaten raw, such as blueberries, apples, lettuce and cherry tomatoes. They're also mindful of the dietary restrictions that can accompany old age, so kale, that nutritional powerhouse, is offered only sporadically, as its high vitamin K content can interfere with blood-thinning medication.

The success of the program reflects something the AARP Foundation discovered when it surveyed people ages 50 and over about what would help them eat more nutritious foods. The most popular response was "ways to find affordable fruits and vegetables" where they live.



To celebrate Older Americans Month in May, the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts partnered with the Age-Friendly Boston project to give local senior citizens a tutorial on healthful grocery shopping.

so every bite will need to provide that much more nourishment.

“When you are younger, you don’t think it’s a big deal: You have a cup of tea, a bagel, that’s it,” said Shirley Chao, director of nutrition for the Massachusetts Executive Office of Elder Affairs, who received her Ph.D. from the Friedman School in 2008. But as you get older, the need for nutrient-rich foods becomes a big issue.

And what if you don’t get enough? Malnourished seniors may lose weight, get tired or become anemic. They are more likely to have diminished muscle strength—a prime risk factor for falls—and wounds that fail to heal properly. A 1995 study looked at a sample of patients admitted to an intensive care unit and found that 43 percent of them were malnourished; they were more likely to have complications and longer hospital stays than other patients.

With age, the immune system starts to malfunction, which means optimal nutrition is particularly important for fighting off illness when we get older, said Meydani, who also heads the HNRCA’s Nutritional Immunology Lab. “You have to think of the immune system as a factory,” she said. “The factory needs to be ready as soon as



it is attacked to produce all kinds of defensive mechanisms. And in order to produce those defensive weapons, it needs to have protein, essential amino acids, essential fatty acids, all kinds of micronutrients.” Infections can also diminish your appetite and decrease the body’s ability to metabolize nutrients, further decreasing the immune system’s arsenal. “It becomes a vicious cycle,” Meydani said.

For decades, officials have recognized malnutrition as a problem among older Americans. But with the eldest baby boomers turning 70 this year, there is a sense of urgency to find out just how bad the problem is. Lawmakers in Massachusetts and Ohio, for example, are considering legislation that would create commissions to gather data on

the nutrition status of seniors and look for ways to prevent malnutrition. That may be smart public policy, because it’s more than the seniors themselves who feel the effects of poor nutrition. A recent study published in the *Journal of Parenteral and Enteral Nutrition* estimated that the national cost of treating illnesses related to malnutrition (anything from heart disease to depression) was \$157 billion a year.

NEW CHALLENGES

So what causes malnutrition in seniors? To begin, there are financial constraints. A recent AARP Foundation survey of people ages 50 and older who live below 200 percent of the poverty line found that two in five had cut down on food or nutritious meals in the prior year,



because they couldn't afford them.

But it is not just low-income Americans who are at risk, Chao said. "People are surprised when they see Meals on Wheels going to well-to-do communities," Chao said. "What they don't understand is that when you get old, you face the same problems regardless of income." According to the U.S. Census Bureau, more than 38 percent of people ages 65 and over had at least one disability in 2010, with the most common involving walking, climbing stairs and doing errands. That makes chores like shopping and cooking impossible for many.

Then there's the fact that eating itself may no longer be as pleasurable for seniors. Medications can affect the ability to smell and taste, as does aging itself. Meydani points to studies showing a close correlation between loss of smell and illness and death in older adults. And the act of eating can become more difficult, thanks to lost teeth that make chewing arduous, or arthritis that makes handling a knife painful. Just as challenging for many seniors is that a meal may no longer be a social experience. That's because even as more people are living independently for longer periods—Chao said that there are more than 150 Massachusetts centenarians still living in their communities, an unprecedented number—many of them are doing so alone. Isolation, depression and just not caring to cook for one person can lead to many seniors simply not making nutrition a priority. "They have tea and toast in the morning; then for lunch and supper they just sort of get by," Chao said.

"That's the hidden malnutrition."

However widespread it may be in society, and however great its cost, malnutrition still too often goes unnoticed. "If you go to your physician, they will weigh you and check your heart, but they are not measuring your nutritional status," Meydani said.

SMALL CHANGES

Senior advocates are pushing for changes that could help address this silent epidemic. Meydani would like to see doctors monitor their patients' bloodwork for signs of malnutrition, and hospitals use a standardized system for keeping track of nutrition status. The Supplemental Nutrition Assistance Program (SNAP), formerly known as food stamps, could make it easier for seniors to use the SNAP benefits that are available to them (only two in five seniors who are eligible currently enroll).

To help seniors make good eating choices, HNRCA scientists recently released an updated version of MyPlate for Older Adults, an infographic that provides a simple, pictorial guide to a healthy diet (see "A Healthy Meals Cheat Sheet," page 21). A recent survey

conducted by the AARP Foundation, which sponsored and partnered with the HNRCA on the MyPlate project, found that while interest in eating nutritious foods increases with age, understanding of what's on a nutrition label declines. "There is a real need to fill that gap and ensure older adults have the knowledge and resources they need when they are choosing what to eat," said Alex Lewin-Zwerdling, a senior adviser for the AARP Foundation.

As MyPlate makes clear, better nutrition doesn't have to involve a major diet overhaul. Even small changes, such as switching from salads made with iceberg lettuce to ones with nutrient-rich spinach, could make a difference in overall health. "Tea and toast can turn into a bowl of oatmeal with a banana," Chao said. "It's just as easy to make."

To spread the word, HNRCA researchers recently helped the Harvard Pilgrim Health Care Foundation create a booklet, "Healthy, Delicious Food at Every Age," which highlights how seniors can shop for, cook and even grow nutritious food; the publication also describes some of the most common food and drug interactions. Researchers in the HNRCA's Nutrition,



Participants walked together from Chinatown to the Boston Public Market, where they met the vendors and hunted for items shown on the new MyPlate for Older Adults.

Exercise Physiology and Sarcopenia Laboratory also worked with three Boston senior centers to create the Fit-4-Life program, which combines nutrition education with instruction on aerobic and mobility exercises. At the same time, Chao said that

many nutrition programs, senior centers and councils on aging across Massachusetts have started offering classes on cooking for one or shopping with nutrition in mind.

Businesses also have a role to play. Chao said that many seniors have trouble finding the quantities and prices they want at the supermarket: They might not have use of, say, a large bag of potatoes, but they still want to get the bulk discount. “Maybe it is time to have a senior lifestyle aisle,” she said, in the same way that stores have aisles dedicated to organics and babies.

Such a section, with small packages

of precut vegetables or the like, may be on the horizon. “The private sector is becoming more and more interested in identifying solutions for older adults and healthy eating, in part because it is a huge market opportunity,” said Lewin-Zwerdling. That could mean foods that are formulated with seniors’ nutritional needs in mind, and easy-to-open packaging with easy-to-read labels.

Meanwhile, public health officials would like to see more seniors as engaged as Vyril Robinson. Shopping and cooking may be harder than they used to be, but she still cares about what she eats. She recently made vegetable soup from scratch and shared it with a neighbor. “You don’t want to live on sandwiches,” she said.

JULIE FLAHERTY, the editor of this magazine, can be reached at julie.flaherty@tufts.edu.

A HEALTHY MEALS CHEAT SHEET

Many seniors want to eat well; they just don’t know where to start. To help, scientists at the Jean Mayer USDA Human Nutrition Research Center on Aging (HNRCA) at Tufts have just released the latest version of MyPlate for Older Adults, a simple, easy-to-follow diagram for nutritious eating. It is based on the 2015-2020 Dietary Guidelines for Americans, and its overarching advice could apply to adults of any age. But the graphic and accompanying website provide tips and reminders that are particularly suited to the needs and concerns of seniors.

As a person gets older, “one needs to be a little more careful about choosing food. The amount of nutrients per calorie should be relatively high,” said Alice H. Lichtenstein, director of the HNRCA Cardiovascular Nutrition Laboratory and the Gershoff Professor at the Friedman School.

Lichtenstein, who served as vice chair of the 2015 Dietary Guidelines Advisory Committee, said that one

of the goals of creating the new infographic was to let seniors know that they have options. Getting to the store regularly for fresh produce may be difficult for those who no longer drive, or who “may be reluctant in the winter to go out,” Lichtenstein said. That’s why the modified graphic gives equal prominence to frozen fruits and vegetables, as well as to low-sodium canned versions, which have longer shelf-lives.

The graphic also acknowledges that seniors may no longer be cooking for a big family, or even a spouse. “With a bag of prepeeled carrots or frozen broccoli, you can snip it open and just take out a single serving,” she said.

The MyPlate for Older Adults points out that cheese and yogurt have something in common with fish, eggs, poultry and nut butter. “We moved them into the protein quadrant because dairy is an excellent source of high-quality protein,” Lichtenstein said.





Trouble Brewing

BY CLARE LESCHIN-HOAR PHOTOGRAPHS BY COLIN ORIANIS

Climate change affects not only how much food we grow, but how it tastes. For crops like tea, small differences could have big economic consequences.



1. Developing tea buds are often hand-picked to make green tea in the spring. 2. The tea team researchers explore insects known to increase tea flavor. 3. Workers trim plants when temperatures are high. 4. Plucking leaves at a Longjing plantation 5. Drying leaves that will become Oriental Beauty tea 6. A tiny, beneficial leafhopper on a leaf at the Shanfu garden in Fujian

WHETHER IT'S A FARMER'S CROPS OR our own skin, bug bites are something few of us seek out or covet. But the nibble of a green leafhopper is the secret to the sweet flavor and honeyed aroma of an oolong tea known as Oriental Beauty. The bug's bite sparks a chemical response in the plant, enhancing flavors that delight tea drinkers.

The leafhopper is considered a pest by many plantations, but certain farms in Taiwan and China now encourage the insects because growers have figured out that there's a useful (and economic) upside to letting them dine a little.

"But you want just the right amount of predation," says Sean Cash, an associate professor at the Friedman School of Nutrition Science and Policy at Tufts.

As any farmer can tell you, getting precisely the right balance of beneficial insects can be tricky. Changes in pests (too many, too few, too early, too late, the wrong ones) goes hand-in-hand with climate change, as Tufts Ph.D. student in biology Eric Scott is investigating in China. It is just one of the areas being studied by a global interdisciplinary team led by Tufts University researchers, who are in the midst of a four-year project examining the impact climate change has

on Chinese tea production.

Unlike many agricultural studies out there, this project isn't a single experiment, says Tim Griffin, director of the Agriculture, Food and Environment Program at the Friedman School. And it's one that includes a broad array of collaborators at Tufts as well as from Montana State University at Bozeman, Boston University, the University of Florida and the Tea Research Institute in Hangzhou, China.

While Americans may reach first for coffee, tea holds the world title as the most widely consumed beverage after water. In 2012, 4.6 million tons of it was grown in 50 countries. Although this calorie-free drink cannot directly prevent hunger, it's a crop that's economically important to the livelihoods of more than 83 million rural people in China and India alone. And it's also one that's vulnerable to climate change. Teams of biologists, chemists, economists and a host of other researchers involved in the project are studying the breadth of those climate impacts—everything from tea quality to consumer behavior to how farmers are adapting—and looking for methods to help mitigate risk to farmers' livelihoods.

Many researchers are already looking at crop yields and how we can

feed the world's population," says Cash. "This project is different because we're looking at the quality of the product—not just how much tea is being produced, but how good is it."

Nuances in quality may not matter as much when you look at such crops as wheat, corn, soybeans or rice, but when it comes to tea, small differences matter a great deal. "For example, you can grow wheat to have more protein, but most is grown for yields, and much less for the quality," says Colin Orians, a plant biologist at Tufts. "Tea is one where quality is really important to the final product. Grapes are also like that. You can't make a bad grape taste like a good wine."

All the tea we drink—green, oolong or black—is from the same species of plant, an evergreen perennial shrub called *Camellia sinensis*. Many of the style differences come from how it's processed after harvest. Says Cash: "It's the equivalent to 'how dark do you roast your coffee?'"

Processing, however, is not the only factor to affect flavor, aroma and nutrition, which make up a tea's quality. Weather conditions are keenly important, too. With climate change, Chinese farmers had noticed that the East Asian monsoons were arriving earlier and lasting longer. The researchers took a

close look at monsoon data and tea harvests using records dating back to 1980. They found that the monsoon season was ending later and later and brought heavier rainfall—conditions that were associated with reduced tea yields, possibly because it was harder to harvest and dry the leaves.

The extended monsoons also reduced tea quality. That's because while monsoon rains bring a flurry of plant growth, they also change the chemistry of tea leaves. Selena Ahmed, an ethnobotanist at Montana State University who did her postdoctoral research at Tufts University, led a 2014 study that analyzed a variety of Chinese tea samples, including tea harvested from the same fields at different times of the year and tea from varying elevations. The study, which included work by Cash, Griffin, Orians and Albert Robbat Jr., director of the Tufts University Sensory and Science Center (TUSSC), showed that rains prompted faster leaf growth, but important catechin and methylxanthine metabolites in the leaves dropped by 50 percent. These metabolites are partly responsible for the flavor, aroma and antioxidant content of the tea.

The precipitous drop in tea quality happens surprisingly fast. Chinese farmers have long known that leaves



1. Buds on a recently trimmed plant 2. Workers pluck tea leaves at a Longjing tea plantation. 3. Drying leaves at a plantation in Fujian that specializes in Oriental Beauty tea

and buds collected before the monsoon season begins bring a premium price. Monsoon teas sold for an average of half what they were getting for their premonsoon harvests, with the dramatic price dip starting within 48 hours of the rains.

Interestingly, although the monsoon tea had lower concentrations of catechins and methylxanthines, Robbat's group found that concentrations of other healthful chemicals, such as anti-cancer, anti-anxiety and antimicrobial compounds, increased after the rains.

"It was originally thought that as the mass of the leaf grows faster, the chemicals the plant produces would be lower, or diluted on a mass basis, but that's not what happens," says Robbat, an associate professor of chemistry. "It turns out that a lot of the health beneficial compounds are actually higher in monsoon tea."

Which means the less tasty monsoon-season tea, the one rejected by tea growers and buyers, might be better for us. But how much does tea's nutrition content matter to consumers? Is it more important than taste? Would they pay extra if they knew a farmer was making an effort to mitigate climate change impacts? To find out, the researchers looked at the data from an

anthropologic perspective, by talking to Chinese farmers and tea-drinking consumers.

They assembled a trained panel of 10 tea experts at Tufts. Their role wasn't to say whether a tea tasted good or bad, but to quantitatively measure aromas, mouthfeel and aftertaste.

"It's a way to measure the big sensory differences in tea, going back to the same fields year after year," says Cash.

Next, Cash and Rebecca Boehm, a doctoral student in the Friedman School's Agriculture, Food and Environment program, set up tasting sessions in specialty food stores and grocery stores around Boston. Working with Roy Desrochers, sensory practice leader at TUSSC, they developed a tasting protocol that included a controlled way to consistently brew hundreds of identical tea samples.

Tufts students offered blind samples of pre- and postmonsoon tea to consumers, asking them to rate the teas on a simple 1-to-9 scale of likability. They preferred the spring tea—much as researchers had expected. (Tasters described it as floral, honey and balanced, while saying the monsoon tea had a metallic, grassy, haylike taste.) And when tasters were told that climate change affected the quality of the tea, it

reinforced their opinions.

"When consumers knew what they were drinking, they liked the premonsoon tea even more, and that difference was statistically significant," says Boehm. "But we also wanted to know their willingness to pay for the spring vs. the monsoon tea, and we found that they were willing to pay a significant premium for spring tea and tea with a lower carbon footprint."

In fact, consumers were willing to pay the most for tea that had a low carbon footprint, followed by spring teas, fair-trade teas, teas with organic certification and antioxidant-rich teas. The findings, says Boehm, are relevant to everyone in the tea supply chain. And as growing conditions change even further, the researchers' study methods could be of use for other taste-sensitive crops, such as grapes and cherries.

For tea growers, the findings suggest that they may need to plant more rain-tolerant tea varieties, change the way they manage soil or shift traditional harvesting times. And as the research continues, scientists may even find a way to keep those leafhoppers nibbling at just the right rate.

CLARE LESCHIN-HOAR is a freelance writer specializing in food policy topics.



4. The Shaoxing Yuchacan Tea plantation 5. Roasting and drying the famous Longjing green tea that is highly sought after each spring 6. A germplasm garden at the Tea Research Institute in Hangzhou, one of many maintained in China for the study and preservation of tea varieties

LOW-ACID REDUX

Fewer grains and more fruits and vegetables
may keep your bones strong

STROLL THROUGH YOUR LOCAL GROCERY STORE, and you'll immediately notice America's love affair with grain. Entire aisles are devoted to break-fast cereals, bread, rolls, crackers and cookies. According to the U.S. Department of Agriculture, the amount of grain most Americans consume has grown by nearly 40 percent since the 1970s, adding up to 500 extra calories to our diets each day.

That increase may have an insidious effect on the body. According to Bess Dawson-Hughes, M75, it may be linked to bone loss late in life.

Dawson-Hughes is the director of the Bone Metabolism Laboratory at the Jean Mayer USDA

Human Nutrition Research on Aging at Tufts. She says that most humans reach their maximum bone density by age 25—but after that, things tend to go downhill, especially in middle age.

Most men lose about 1 percent of their bone mass annually after age 50, and women lose even more.

“At menopause, women lose roughly 3 percent of their bone mass annually for about five to eight years,” she says. That means more than 20 percent of the body's total bone density can disappear in less than a decade, leading to osteoporosis, painful fractures and a diminished quality of life.

Losing a certain amount of bone density is a

BY DAVID LEVIN

ILLUSTRATION BY MICHAEL PARKIN



normal part of aging, Dawson-Hughes notes, but the exact mechanism behind that bone loss is still unclear. She thinks it may have something to do with the way the body metabolizes all those cereals we're eating. Because grains contain sulfur compounds, they break down into byproducts like sulfuric acid, which in turn leads to an increase in the body's overall acidity. Although that

bone. Their study, published in the *Journal of Bone and Mineral Research*, involved 244 women and men over age 50. Half were given daily supplements of potassium bicarbonate (a potent alkali), the rest a placebo. Over the course of three months, the researchers took urine samples and measured the overall amounts of calcium they contained. High levels of calcium, she

she says. "I wouldn't be surprised if in the future we find that acid-base plays a role in bone health, but I think it's unlikely that it's the only thing that has an effect."

Still, Weaver says, that doesn't diminish the fact that a good diet is essential for bone health, a sentiment that Dawson-Hughes wholeheartedly supports. "Supplements are terrific for research purposes, because you can control the dose, but they're not a real solution," Dawson-Hughes says. "Most people with a dietary imbalance will need six to eight bicarbonate pills a day to achieve a neutral pH range, so it's hard to see how that would be sustainable over the long term."

Instead, she says, curbing the amount of grains we eat and switching to a diet higher in fruits and vegetables—which contain compounds that metabolize to alkali in the body—may have a similar effect. Leafy greens, for example, contain potassium and other compounds that metabolize to alkali in the body, effectively counteracting acids in the bloodstream.

Like all things in nutrition, it's not quite as simple as just eating a "balanced diet," however. According to Weaver, increasing consumption of fruits and vegetables overall is a step in the right direction, but it might not pinpoint the exact foods that could be most beneficial for bone health. Instead, prioritizing specific fruits and vegetables over others might be needed to get those health benefits.

This sort of diet intervention is something Dawson-Hughes wants to study next. "Once you define the parameters needed for bone health, the next step—and one we hope to take—is to test a diet intervention designed to bring the net acid in the body to neutral. If you knew that, you'd be on solid footing to make health-appropriate policy choices."

DAVID LEVIN is a freelance science writer in Boston.

“MORE THAN 20 PERCENT OF THE BODY'S TOTAL BONE DENSITY CAN DISAPPEAR IN LESS THAN A DECADE.”

sounds awfully dramatic on paper, the actual change in blood pH is thankfully minute—on the order of a few tenths of 1 percent—yet even this tiny change may trigger bone loss.

CHEMICAL BREAKDOWN

Dawson-Hughes says that some of this loss is caused by a chemical breakdown that happens when bone touches acidic blood. The rest, however, may be due to a specific defensive mechanism.

"As the pH goes down in the blood just a little bit, that activates a specific receptor in bone, creating a chain of events that results in bone resorption," she says. "It signals bone to break down, which dumps alkali into the circulation, neutralizing the acid. It's a defensive response—our bodies are basically defending against a dropping pH."

Ideally, this defense mechanism should keep our acid-base levels more or less in balance. With high-grain diets continually adding more acid into our bodies, however, this system may kick into overdrive to compensate, leading to accelerated bone loss.

The outlook for bone health isn't all doom and gloom, fortunately. In 2015, Dawson-Hughes and her team found that certain dietary supplements may counteract the effects of acid on

says, showed that the body was actively breaking down bone in order to counteract acid levels in the blood.

After three months, the team found that participants who had taken the supplements showed significantly lower calcium levels in their urine, a sign of less bone breakdown. In other words, Dawson-Hughes says, the study suggests that adding alkali like potassium bicarbonate into the body can curb bone loss by counteracting acids—at least, in theory.

"That's still controversial," says Connie Weaver, a nutrition researcher at Purdue University, and a former board member of the National Osteoporosis Foundation. "I would say the evidence is pretty convincing that diet patterns do influence bone health, but not all scientists agree exactly *how*."

SOME BONES ABOUT IT

Instead of being linked directly to the pH of our blood, changes in bone density could be related to other compounds in our food that have yet to be studied. Likewise, changes in blood pH, Weaver reasons, might also be a side effect of high protein diets—which can metabolize to acid as well—or some other nutrition mechanism that's changing our bones. "Diet is complex,"

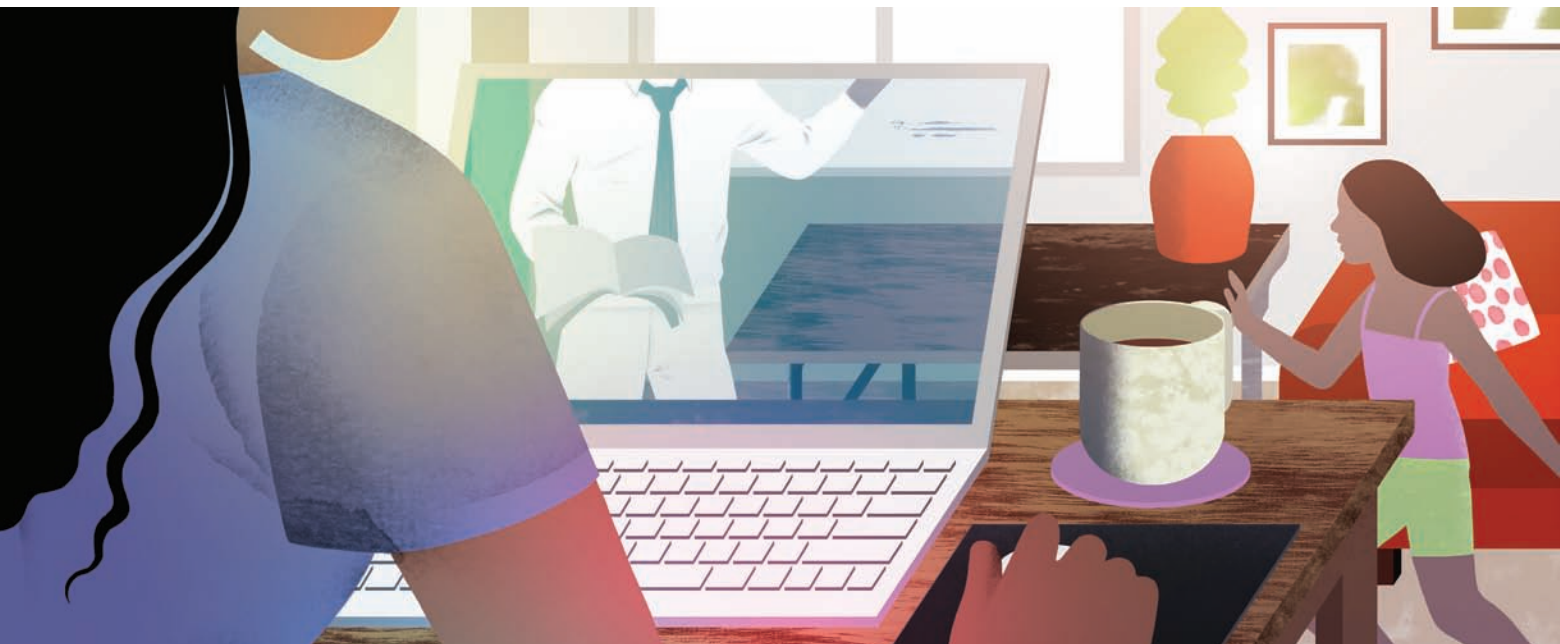
From All Corners

UNIVERSITY, SCHOOL & ALUMNI NEWS



NEVER SQUASH A DREAM

Martyn Botfield braves passing thunderstorms to harvest zucchini at the New Entry Sustainable Farming Project fields in Dracut, Massachusetts. The project, begun as a Friedman School initiative in 2008, trains beginning farmers, such as Botfield, who turned to farming two years ago after retiring from the pharmaceutical industry. This was his second harvest of the day: Zucchini grow quickly, and many that were undersized in the morning had reached the optimal 6- to 8-ounce weight by late afternoon.



Work, Learn, Live

Online certificate programs bring new students, new perspectives **BY JULIE FLAHERTY**

AS A PEDIATRICIAN in El Paso, Texas, Maria Lourdes Asiain has several patients—particularly teens—who are overweight, obese or diabetic. She often wished she could do more to advise them on diet and exercise. “My medical school and residency didn’t stress nutrition much,” she said.

After about a year of searching for the right way to increase her knowledge, she found what she was looking for: the Nutrition Science for Health Professionals online certificate program offered by the Friedman School.

She was concerned that it might be hard for her to be a student again—it had been 10 years since she had done a research paper, after all—but she was soon engaged by the coursework, which covers everything from clinical scenarios of patients who have chronic conditions to the lowdown on fad diets that patients might ask about.

“I’m surprised that I enjoyed it so much,” she said. “It’s very practical, which is what I looked for, but it’s challenging. Manageable, but challenging.” As a mother of two who works in private practice and does rounds at a hospital, she knew an online course made logistical sense. “I can do it while I’m taking my son to basketball practice or while I’m waiting for a C-section,” she said.

The program has already made a difference in her practice. She now

sets aside one day a week to meet with her adolescent patients who have nutritional concerns, and has new expertise to help them.

Working professionals like Asiain have found a unique learning experience through the Friedman School’s various Online Graduate Certificate Programs, says program director Diane McKay, G89, N97, N00.

“It’s a very flexible way for them to advance their knowledge, enhance their skill set, improve their marketability, and improve their ability to administer to their patients,” she said.

At the same time, she says the school has benefited from the virtual presence of its diverse online students, who live around the world and bring a range of ages and experiences to their coursework. “The different perspectives

they have on the same subject matter make it particularly enriching for the students and for me, as an instructor,” said McKay, an assistant professor who teaches several of the certificate courses.

Aside from the academic rigor, small class size and access to Tufts faculty, it’s the student interactions that set these programs apart from those at other universities, says Patrick Connell, director of online and blended learning at Tufts.

“We’re creating an environment where students and faculty can interact and communicate both live and asynchronously and spend a semester together experiencing pretty much the same thing that they would experience on campus,” he said.

The school offers five certificate programs, each consisting of three courses that can be completed in one year. Students may also take individual courses or choose from the different programs to meet their needs.

THE RIGHT BALANCE

When Brandon Burrows wanted to continue his education, he gave careful thought to the kind of online program he wanted. Some years back, he had earned his master’s in food science in a rushed eight months, an experience that left him burned out. This time, he wanted to make sure he could balance school, working fulltime as a research and development manager at a food ingredient company and spending time at home in Virginia with his wife and 1-year-old daughter.

It was only after he enrolled in the Friedman School’s certificate program in Sustainable Agriculture and Food Systems that he learned his job would soon require weekly travel and that his wife was pregnant with their second child. Was he still glad he went back to school?

“Absolutely,” he said recently. “It was well worth it.”

On business trips, he used the airplane as his classroom, watching

downloaded lectures on his laptop or phone and getting caught up on his reading assignments.

Because he wasn’t sure how applicable it would be, Burrows didn’t mention the program to his supervisors until he was partway through his first semester. But when he did tell them about the kinds of things he was learning, they were enthusiastic, and even offered to reimburse his tuition. Since then, he has helped his company think more comprehensively about its own social, economic and environmental sustainability.

Vanessa Mathews-Hanna works for a nonprofit in Canada that provides community development and disaster response in 35 countries. A colleague pointed her to the Tufts program in Delivery Science in International Nutrition, which lined up exactly with her interests.

“Child health has always been my passion and especially nutrition within that,” said Mathews-Hanna, whose duties have included managing a nutrition program for women and children in Bangladesh. Recently, she has been consulting on the creation of programs aimed at preventing childhood stunting. “I was greatly helped by the knowledge I gained with the international nutrition certificate,” she said.

She appreciated that all her instructors were seasoned professionals in the field and that the readings were very current. When she went to conferences, she was pleased to see that she had read papers by some of the headlining presenters.

“Once I put my daughter to bed, I just worked on the class,” said Mathews-Hanna, who has a 3-year-old daughter and was pregnant with her son while taking the courses. Despite the long days, she found the program motivating. “I appreciated the intellectual break from work that studying provides. It was just energizing.”

ON THE MOVE

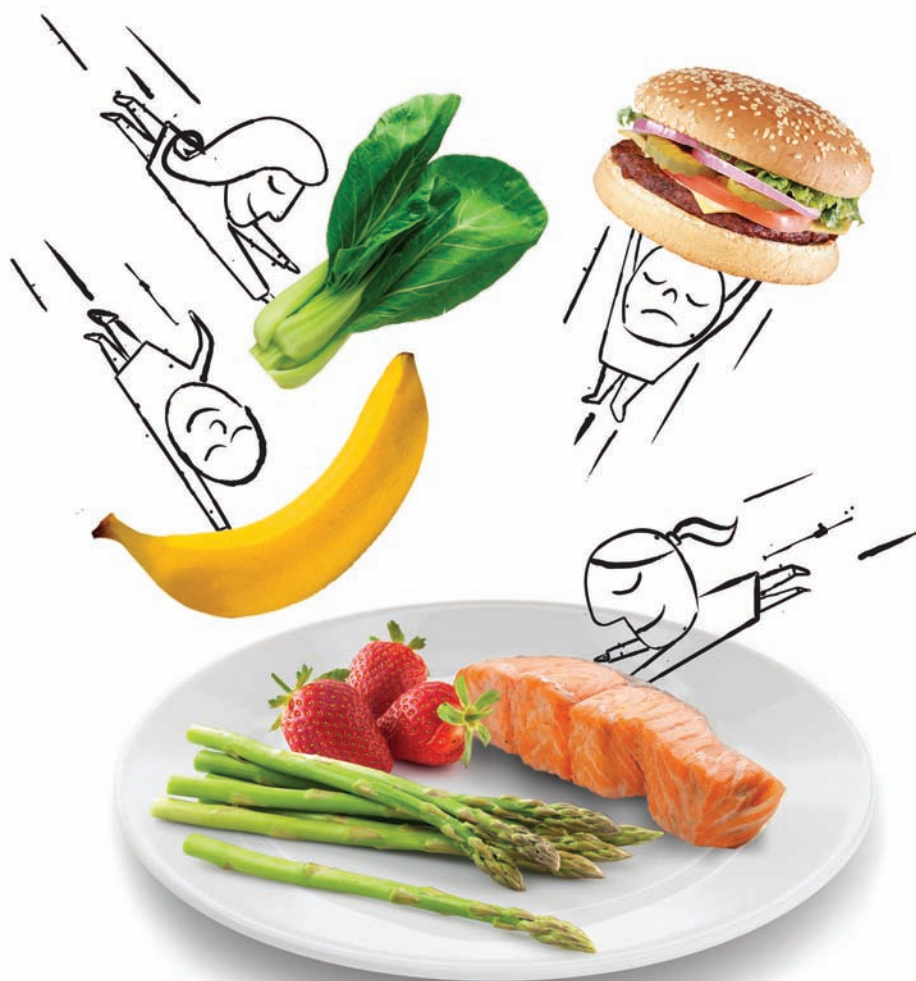
Congratulations to the following faculty members, who have been promoted to new positions at the Friedman School effective this coming academic year.

CHRISTINA ECONOMOS, N96, cofounder and director of Child-Obesity180 and the New Balance Chair in Childhood Nutrition, is now a full professor. Her research has addressed the interaction among nutrition, exercise, body composition, bone health and the built environment, with the goal of preventing osteoporosis and obesity, starting in early childhood.

CHRISTIAN PETERS, a faculty member in the Agriculture, Food and Environment program, is now an associate professor with tenure. His research focuses on the modeling of food systems to explore such topics as the land requirements of the human diet and the potential of local and regional production systems to supply food needs.

JENNIFER COATES, J94, N00, N06, is now an associate professor. Her research focuses on the development of methods for improving the design, implementation and evaluation of international nutrition and food security programs. She is also a senior researcher at the Feinstein International Center.

SARA FOLTA, N05, whose research focuses on community-based strategies for improving dietary intake, physical activity and body composition, is now an associate professor. She holds a secondary appointment at the Tufts Clinical and Translational Science Institute and the Jonathan M. Tisch College of Citizenship and Public Service.



The Good Life

John Hancock teams up with the Friedman School to promote wellness

A GOOD DIET is one of the most consequential choices you can make to enjoy a long, healthy life. But it can also be one of the toughest to get right—even though the stakes are so high. Poor diets are the leading cause of death in the United States, killing more people than all other risk factors, including smoking, drinking and drug use.

Most of us find it difficult to determine which foods are good for

you—and which are not. “An expanding world of media pundits, book authors, bloggers, social media, mobile apps, for-profit wellness companies and food marketers is creating an unfiltered firehose of often conflicting and contradictory messages,” says Dariush Mozaffarian, dean of the Friedman School of Nutrition Science and Policy at Tufts.

Now, through a new collaboration with John Hancock, the Friedman

School will help more people get it right. Last year, John Hancock introduced a new approach to life insurance that offers savings and rewards to encourage people to pursue a healthy lifestyle, including walking, exercising and medical checkups. This year the insurance company expanded the program to include a HealthyFood benefit, allowing policyholders to save money when they purchase healthy foods at more than 16,000 grocery stores nationwide.

Working with John Hancock and the new HealthyFood program, Friedman School researchers will help the insurer’s Vitality policyholders make smart dietary choices by providing credible, science-based expertise in health and nutrition, including a free online subscription to the school’s flagship monthly newsletter, the *Tufts Health & Nutrition Letter*.

“John Hancock is collaborating with us because of our focus on real-world impact, one of their main goals as well,” says Mozaffarian, a cardiologist. “Maintaining a healthy diet is one of the greatest opportunities, and challenges, facing society today, and it remains poorly addressed by traditional health care,” he says. “We’re excited to be part of this initiative to help people make better nutritional choices.”

“Over the past year, consumers have embraced the John Hancock Vitality solution,” says Michael Doughty, president of John Hancock Insurance. “However, combining physical fitness with good nutrition is even more impactful on your health. That’s why we are delighted to be collaborating with the Friedman School, one of the country’s leading authorities on nutrition. Now our policyholders will have access to expert information and guidance that will help them adopt healthier eating habits and improve their overall health.”

The Friedman School also will reap additional benefits from the collaboration, which renews the company’s

longstanding commitment to the Tufts Marathon Team, the largest known collegiate marathon program in the United States. The Tufts runners raise funds to support nutrition research and programs at the university, including efforts to stem the childhood obesity epidemic.

Thanks to the Boston Marathon bibs that John Hancock, the marathon's principal sponsor, provided, the Tufts

Marathon Team has raised more than \$5 million since its inception in 2003. Starting with the 2017 Hopkinton-to-Boston run, John Hancock will increase the number of slots, or bibs, it contributes to the team.

The collaboration will also enable the Friedman School to create new programs, activities and initiatives with broad social impact, such

as school- and workplace-based initiatives.

"I believe all universities, and in particular Tufts and the Friedman School, should be centers for public impact," Mozaffarian says. "To achieve that goal, we need to be more innovative about translating our scholarship and expertise into real-world change."

—LAURA FERGUSON

FEED THE WORLD, BUT FEED IT WELL

Groundbreaking agricultural scientist headlines 2016 commencement

Keeping agricultural production on pace with the growing global population is no longer the biggest food challenge we face, commencement speaker Pedro A. Sanchez told 115 graduates and their guests at the 35th graduation ceremony of the Gerald J. and Dorothy R. Friedman School of Nutrition Science and Policy, held on May 22 on Tufts' Medford/Somerville campus.

"The world will be able to feed itself by 2050. It ain't going to be easy, it won't happen everywhere, but I think the path is very clear," said Sanchez, director of the Agriculture and Food Security Center at Columbia University's Earth Institute who is widely recognized for changing the way technology is used to increase food production. "But whether the people in the world are going to be nutritionally secure and sound by 2050 is largely up to you."

Sanchez, the 2002 World Food Prize laureate and 2004 MacArthur Fellow, said this is a "fantastic time" to be a nutrition professional. "Get in there and do your thing," he said.

In his charge to the graduates, Dariush Mozaffarian, the dean of the school, said that small actions and choices, sewn together, drive the world: "Small choices about what to buy at the grocery store; small choices by industry that lead to healthier, more sustainable food systems; small choices by governments that empower women and livelihoods; small actions that lead to breakfast for a low-income child, improving their attention and learning on that day; small actions that lead to the acceptance of differences, the celebration of diversity and social justice."



1. Ashish Pokharel received a master of science degree. **2.** Katherine Docimo, N16, who gave the class address, said she would cherish the supportive and collaborative culture she found among Friedman School students. **3.** From left are Diane Candiottio, Julianne Burkholder, Jensine Yang and David Grist.

YOUR ALUMNI ASSOCIATION

A YEAR OF NEW HEIGHTS



AS PRESIDENT OF the Friedman School Alumni Association, I am able, once again, with tremendous pride, to look back upon a year of amazing accomplishments, goals surpassed and new heights reached. For the three

career panels we hosted this year, we were able to engage 13 alumni as panelists or moderators. In addition, our increasingly popular DC Alumni/Student Networking trip saw 26 alumni participants—including eight new ones—as well as 20 student participants. This event is a great example

of alumni and students partnering to strengthen our profession.

This dedication was also on display in April, when we hosted our annual All-Alumni Reunion. We welcomed nearly 100 alumni, students and guests back to the Friedman School across four different events, including the inaugural Friedman School Fun Run.

I would also like to highlight the continued success of our Mentoring Program, which this past year matched 12 students with alumni mentors, again exemplifying the collaborative relationship among Friedman alumni, students and faculty

Finally, my thanks to the Executive

Council, who, as part of their efforts to revitalize and reorganize the Alumni Association, worked this year to develop revised mission and vision statements for the group that will help guide us forward.

Stay tuned in 2016–17 for initiatives aimed at further supporting career development, outreach and engagement of alumni, including more web-based events and programs and opportunities for alumni around the country to share their expertise with their fellow alumni and students.

ANDREW SHAO, N00, President, Friedman School Alumni Association



1.



2.



3.



4.

REUNION 2016

Alumni, students and faculty gathered at the Boston Public Library on April 9 for the Alumni Association awards ceremony, which honors graduates of previous classes who have been humanitarians, innovators and leaders in their fields.

1. Simón Barquera, N96, N05, here with his daughter, received the Nutrition Impact Award. **2.** Clockwise from left are Claire Mance, N16; Claire Whitney, N16; Townsend Benard, N17; Ibukun Owoputi, N16; Dianna Bartone, N17, MPH17; Alexandra Simas, N16; and Melissa Hudec, N16. **3.** Professor Beatrice Rogers (left) with Anna Herforth, N05, who was presented with the Leadership and Expertise Award **4.** The Leah Horowitz Humanitarian Award was presented to Ratna Megawangi, N88, N91, (right) shown with her daughter.

Class Notes

N90

William Reid, senior vice president of product management at SCL Solutions, has been appointed interim regent of the American College of Healthcare Executives (ACHE) for the State of Washington. He has been a member of ACHE since 1993 and was recently honored by the Washington chapter with the ACHE Service Award for his commitment to advancing excellence in health-care management.

N96

LISA FREEMAN, J86, V91, received a Distinguished Achievement Award, the highest honor of the Tufts University Alumni Association. This year's awards ceremony, held on April 2, on the university's Medford/Somerville campus, recognized nine Tufts graduates for their career achievements, contributions to the university and service work. Freeman, an internationally recognized veterinary nutritionist, teaches on all three Tufts campuses. As a member of the faculty at Cummings School of Veterinary Medicine, she cares for animals that require specialized nutrition and studies the role of nutrition in heart disease. She leads several initiatives, including Cummings School's Residents Enhanced Veterinary Education and Academic Learning and Accelerated Clinical Excellence programs, the Tufts Clinical and Translational Science Institute, the One Health Program, and the Tufts Institute for Human-Animal Interaction. She also heads the Tufts Paws for People animal-assisted therapy program.

N98

Claire MacEvilly will relocate overseas to take a new position as the head of external affairs for Danone Ireland. She has been communications manager for Food for Health Ireland and has more than 20 years of experience working in the private and public sectors in the U.S., U.K. and Ireland.

N07

ELANOR S. STARMER, F07, has been named acting administrator of the USDA's Agricultural Marketing Service (AMS). She joined the federal agency in 2011 and most recently served as a senior adviser to Secretary Tom Vilsack. Starmers focus has been the creation of new market opportunities for farmers, ranchers and food businesses of all sizes. She says she looks forward to continuing this work at AMS and to coordinating with the Office of the Secretary on the Know Your Farmer, Know Your Food initiative (KYF2).

N08

CINDY IMAI has joined the academic affairs team at Tufts School of Dental Medicine as predoctoral clinical grading coordinator. She received her B.S. in nutritional sciences from UC-Berkeley, an M.S. in nutrition from the Friedman School and a Ph.D. in nutrition from the University of Iceland.

N13

ERIKA HVAL received the Legislative Advocacy Award from the New York State Dietetic Association for her efforts to improve awareness of how food, nutrition, government, economy and medicine interact. During her time at Tufts, Erika pursued a nutrition master's degree while taking part in the Combined Dietetic Internship program at the Friedman School.

ANNA PFALZER, a doctoral student at the Friedman School, is the recipient of the inaugural Cohn Award for her project "The Role of Salsalate and Curcumin Supplementation in

Obesity-Induced Colonic Inflammation and Tumorigenesis." The Cohn Award, created by JOAN COHN, J65, and her husband, Peter Cohn, established the award to provide funding to advance our understanding of aging, inflammation and chronic disease, and the role nutrition can play in keeping inflammation at bay. Joan Cohn is a member of the board of advisors to the Friedman School.

N16

EMILY FINNAN is the 2016 recipient of the Stanley N. Gershoff, Simon J. and Arpi A. Simonian Prize for Research Excellence in Nutrition Science and Policy at the Friedman School. She entered the Friedman School in the fall of 2014 and pursued an M.S. in the Biochemical and Molecular Nutrition program with a specialization in Nutrition Communication. She says she plans to take all of the experiences, knowledge and skills gained at Tufts into a full-time position as a pediatric clinical dietitian.

Tufts
Nutrition

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Keep 'Til You Steep

DIANE MCKAY, G89, N97, N00, a scientist in the Antioxidants Research Laboratory at the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts and an assistant professor at the Friedman School, serves as our expert.

Q *How long can you store tea before it starts to lose its taste and nutritional benefits?*

A Black, oolong, green and white teas all come from the same plant, *Camellia sinensis*. They differ in how the leaves are processed after harvesting and before drying. All will eventually lose their flavor, and the phytochemicals (primarily flavonoids) they contain will degrade.

However, dried tea leaves that are kept dry will not spoil, and as long as they are stored away from heat, water, light and air, the flavor and phytochemical content can be maintained for up to two years. The more fermented and intact the dried leaves are, the longer they will last. Black tea leaves are more fermented than green or white, and oolong

is somewhere in between. Measures of intactness vary from leaf, to broken leaf, to fannings and dust. Fannings are small pieces of leaves, while dust is the tiny particles left at the bottom of the barrel.

Tea bags most often contain fannings and dust because they brew quickly. Some tea bags do contain whole leaves, but they tend to be larger, to allow the leaves room to expand.

To keep your tea flavorful and flavonoid-rich for one to two years, transfer your tea bags or leaves to an airtight container as soon as possible after purchase, and store it away from the stove and sink.



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





WE DIDN'T GROW THE TOMATO. WE GREW THE FARMER.

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

Jean Mayer Human Nutrition
Research Center on Aging

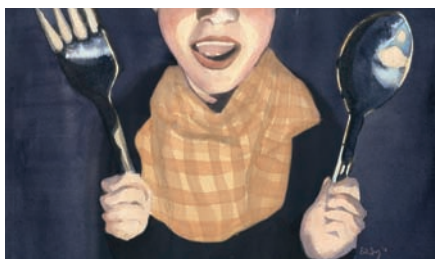
New Entry Sustainable
Farming Project

Tufts
UNIVERSITY

You can't have sustainable, locally grown food without small, local farmers. But in New England and elsewhere, they're a vanishing breed. So we're helping new farmers acquire the land, farming know-how, seed money, and business skills they need to thrive. At the same time, we help low-income communities gain access to fresh, healthy food. It's a great program, any way you slice it. Read more at [nesfp.org](https://nutrition.tufts.edu/givenow2).

If you would like to donate in support of Tufts' trusted nutrition science and sustainable farming program, visit nutrition.tufts.edu/givenow2.

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



4 Just Too Much Food



12 Avoidable Famine



14 Proper Quenching

READING THE TEA LEAVES

Climate change affects not only what foods we can grow and where, but how they taste. For crops like tea, shifts in rainfall patterns can upset the delicate flavor, drastically altering the price that consumers are willing to pay and the money that farmers earn.

FOR MORE ON THE STORY, TURN TO PAGE 22.