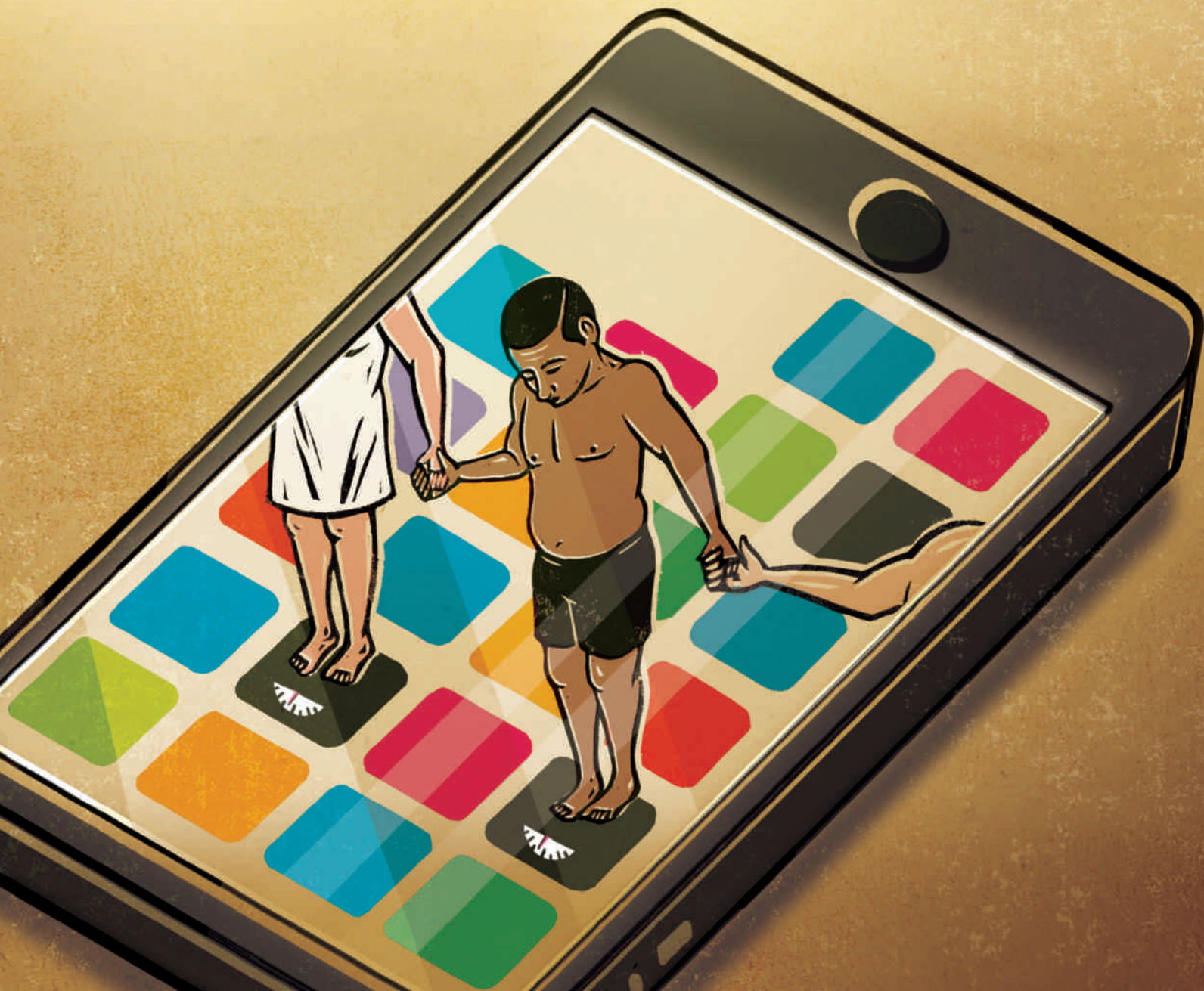


Tufts

NUTRITION

MAGAZINE OF THE GERALD J. AND DOROTHY R.
FRIEDMAN SCHOOL OF NUTRITION SCIENCE AND POLICY
AND THE JEAN MAYER USDA HUMAN NUTRITION
RESEARCH CENTER ON AGING
SUMMER 2014 VOL. 15 NO. 2



BODY BY SMARTPHONE

Can diet and fitness apps
really make us healthier?

PLUS: FAT, BUT NOT SICK • HOW TO SPOT QUACKERY • GREEN BUSINESS



Don't Go Cuckoo for Coconut Oil

Q ■ I understand that coconut oil has several benefits. I've heard about studies that show that its fatty acids can reduce belly fat and raise HDL (good cholesterol). What are some ways to add it to my diet?

For this installment of Ask Tufts Nutrition, Alice H. Lichtenstein, D.Sc., director of the Cardiovascular Nutrition Laboratory at the Jean Mayer USDA Human Nutrition Research Center on Aging and the Gershoff Professor of Nutrition Science and Policy at the Friedman School, serves as our expert.

A ■ There is no consistent body of data that I am aware of to indicate that coconut oil has documented specific beneficial effects; hence, there is no data that I'm aware of to suggest people should go out of their way to consume coconut oil.

There is some data, however, to suggest it is best to avoid consuming coconut oil because it is relatively high in saturated fatty acids. Saturated fatty acids raise LDL cholesterol, which is associated with increased risk of cardiovascular disease. We do know that not all saturated fatty acids have the same

effect; and yes, coconut oil may have some saturated fatty acids that are less likely than others to raise LDL cholesterol, the same way that chocolate contains a saturated fatty acid, stearic acid, that is less likely than others to raise LDL cholesterol. However, these foods do come with a mixture of saturated fatty acids.

As for the studies you mention, we don't make recommendations based on individual studies but on a mature body of data. Currently, the evidence for potential beneficial effects of coconut oil is very limited.

We do know that the preponderance of the evidence indicates that consuming unsaturated fat results in better health outcomes than eating saturated fat. So if you are going to adjust fat in your diet, replace saturated with unsaturated fat. The total fat intake should be moderate, between 25 and 35 percent of your daily calorie intake. Using unsaturated fats such as soybean oil, canola oil and corn oil when preparing foods and making salad dressings is a good idea. Fat is good, fat is important, and unsaturated fat has health benefits.

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

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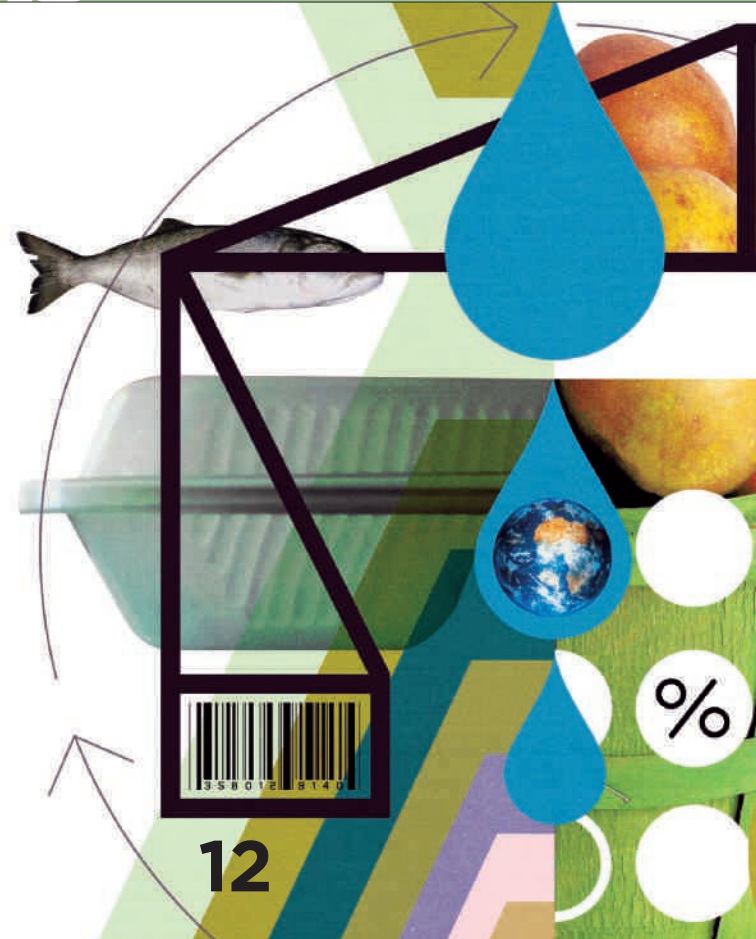
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Cover illustration by Blair Kelly

Novel Programs and Inroads



I HAVE HAD THE GREAT PLEASURE OF SERVING AS THE INTERIM dean of the Friedman School for the past three years, during a productive time for the school. We completed a comprehensive review of our curriculum, and as a consequence, new courses and programs were developed. Last September, we welcomed the first class into our new online “blended-learning” Master of Nutrition Science and Policy, which combines courses on the biological aspects of nutrition, the methods necessary to solve nutrition problems and ways to turn nutrition information into policy. In 2011, the Friedman School began offering fully online, nondegree, graduate-level certificate programs. Both of these online programs have proven extremely successful and have allowed us to meet our goal of providing students from around the world with the benefits of a Friedman School education.

On another front, in response to students’ requests for more coursework relating to the marketing and business aspects of food and nutrition, the Friedman School, in collaboration with the Carroll School of Management at Boston College, developed a three-year degree program leading to a M.S./M.B.A. in Food and Nutrition Science, Policy and Management. The first students will enroll in this new program in September.

The Friedman School has also made significant inroads into important national and international nutrition issues. On the national front, by bringing together the top leaders from academia, business, nonprofits and science, ChildObesity180 has become a primary force in reversing the trend of childhood obesity. Friedman faculty and students are also investigating the environmental impacts of agriculture practices and policy. On the international level, under the leadership of Friedman faculty, the U.S. Agency for International Development-funded project, “Feed the Future Innovation Lab for Collaborative Research on Nutrition,” is examining how integrated interventions of agriculture, nutrition and health can produce large-scale improvements in maternal and child nutrition in Africa and Asia.

As a significant conclusion to the last three years, on July 1, Dr. Dariush Mozaffarian will become dean of the Friedman School. A cardiologist and epidemiologist, he is a world-renowned researcher with interests in international nutrition policy and the relationship between nutrition and heart disease (see story, page 27).

I would like to take this opportunity to thank the faculty, staff and students at the Friedman School for making my time here so rewarding. Their dedication and motivation to improve nutrition around the world are unparalleled.

ROBIN KANAREK, PH.D.
INTERIM DEAN, FRIEDMAN SCHOOL OF NUTRITION SCIENCE AND POLICY

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

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Forward Together



SINCE 2011, WE HAVE HAD THE HONOR OF INTERIM DEAN Robin Kanarek's leadership at the Friedman School. With her sincere cooperation, we accomplished a lot in breaking down the invisible barriers between our institutions. The school and the Human Nutrition Research Center on Aging (HNRCA) are finding greater ease in collaboration, and we continue to find more areas of synergy. She leaves a well-paved path for both institutions to move ahead together. I thank her for everything she contributed and the style in which she carried it out.

With her exit, I am delighted to welcome Dariush Mozaffarian as the new dean of the Friedman School (see story, page 27). Before joining us, Dariush was an associate professor in the Department of Epidemiology at the Harvard School of Public Health, where he was co-founder and co-director of the Program in Cardiovascular Epidemiology. He was also an associate professor in the Division of Cardiovascular Medicine at Harvard Medical School and Brigham and Women's Hospital. This appointment is wonderful for the school, for the HNRCA's collaboration with it and for advancing nutrition science and policy. I look forward to working very closely with Dariush to take nutrition at Tufts to the next level.

The last few months at the HNRCA have been busy, with scientists and staff working hard to further our science, publish extensively and expand our outreach. As a result of this hard work, several HNRCA members have received high scientific honors, some of which are listed on this page. I am very proud to be a part of a center with such talented researchers who are leading the way in the study of nutrition and its role in supporting healthy and active aging.

Often, research projects that scientists embark on can take years to be completed; seeing our findings in *Tufts Nutrition* is a nice opportunity to be reminded of the real-world impact we make as a research scientists. I hope you find our contributions to understanding the relationships among nutrition, physical activity and healthy and active aging useful in your lives. This issue highlights some recent and particularly interesting nutrition research on a type of "healthy" obesity (from a metabolic standpoint), the effects of coffee on cognition in aging and a berry that might protect against the flu.

As the HNRCA starts down a road with a new partner, Dr. Mozaffarian, I am excited to see our continued impact on the world of nutrition science.

SIMIN NIKBIN MEYDANI, D.V.M., PH.D.
DIRECTOR, JEAN MAYER USDA HUMAN NUTRITION RESEARCH CENTER ON AGING

Laurels

The following honors were presented by the American Society for Nutrition (ASN):

Professor **JOEL MASON**, director of the HNRCA Vitamins and Carcinogenesis Laboratory, received the E.V. McCullom Award for generating and testing new concepts in nutrition. Associate Professor **NICOLA MCKEOWN**, a scientist in the Nutritional Epidemiology Program, received the General Mills Bell Institute of Health and Nutrition Innovation Award for advancing the understanding of whole grains. Professor **SIMIN NIKBIN MEYDANI**, director of the HNRCA and its Nutritional Immunology Laboratory, became president of the ASN on June 1. Professor **BEATRICE ROGERS** was named an ASN fellow in acknowledgment of her distinguished career in nutrition. Professor **ALLEN TAYLOR**, director of the HNRCA Laboratory for Nutrition and Vision Research, received the Pfizer Consumer Healthcare Nutritional Sciences Award for his contributions to the understanding of human nutrition.

Letter

A DOCTOR'S VIEW

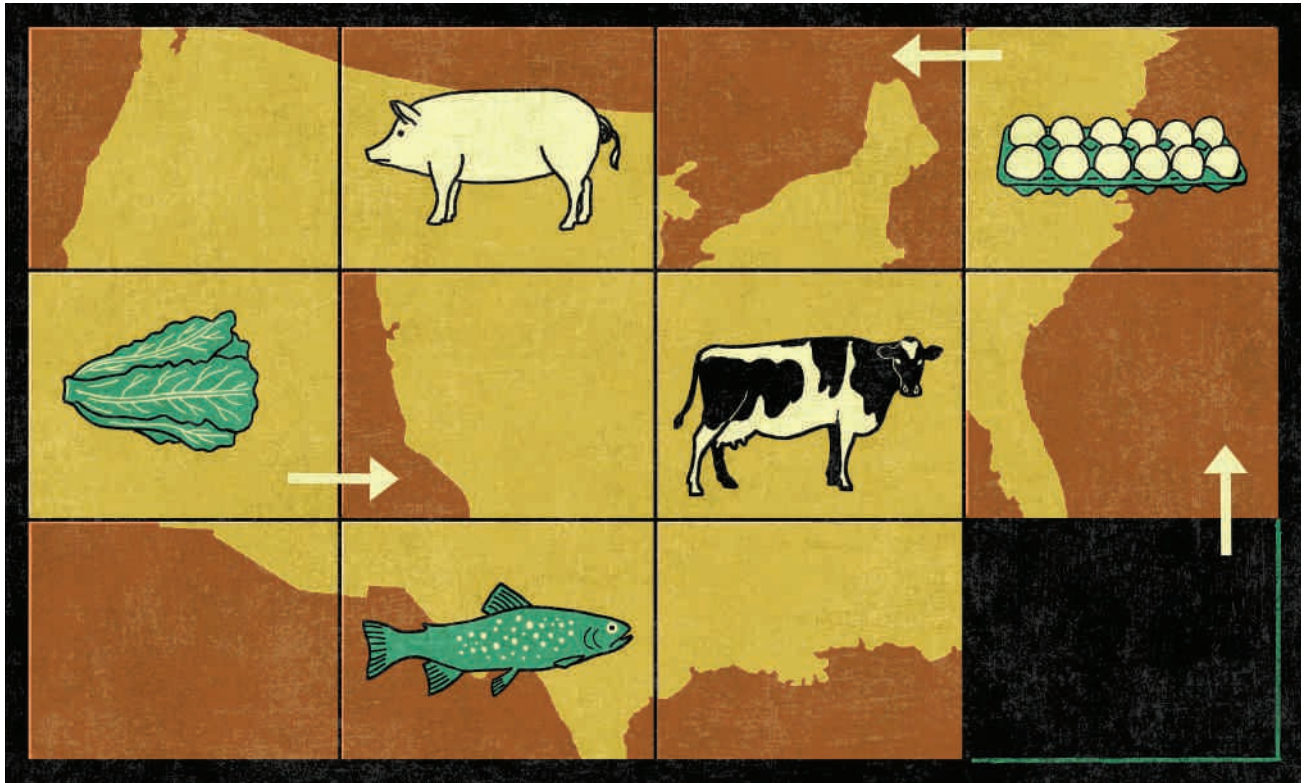
I found most of your article "Minding the Multi" (Summer 2013) to contain good, practical advice. However, I take offense at the statement: "One meaningful step toward personalized nutrition is if your doctor would just give you a little dietary assessment."

There has been a strong push for M.D.s to discuss diet, obesity prevention and lifestyle modifications during office visits. BMI is charted on every visit, and provides a springboard into discussion of diet. My office also employs a registered dietitian for patient consultations one to two days a week.

I would invite the participants in the article to observe an actual office encounter before they issue a blanket statement.

MICHAEL ZACKIN, M.D., PH.D., N96
WESTON, MA

The writer has been a pediatrician since 1991. —Editor



Growing Places

Farms may need to adapt when the climate changes

FOOD PRODUCTION IN THE UNITED STATES IS CONCENTRATED IN certain areas. Most of our country's pork comes from Iowa and North Carolina, for example, and most of the lettuce is grown in California's Salinas Valley. But certain livestock and crops may no longer thrive in their usual locales if global weather shifts.

"If irrigation in the Central Valley of California was reduced due to climate change, could other regions make up for that drop in production?" asks Tim Griffin, Ph.D., associate professor and director of the Agriculture, Food and Environment program at the Friedman School.

To find out, Griffin and colleagues analyzed current farmland use and food production in the Northeast, identifying the potential for increased food production in a 12-state region from Maine to West Virginia. The paper was published in the journal *Renewable Agriculture and Food Systems*.

They found the region to be most self-reliant when it came to animal-based products, particularly milk and eggs, producing about as much fluid milk as it consumes and about 70 percent of the eggs. For seafood, the region produces 45 percent of its shellfish needs and about 23 percent of its fish. Just under 30 percent of the chicken consumed is raised in the Northeast.

The region also produces 26 percent of the vegetables it eats, with starchy products, such as potatoes and corn, making up the largest share. Strong production of blueberries and cranberries helps make the region self-reliant for 18 percent of its fruit consumption.

Next, the researchers will look at the region's soil, climate, infrastructure and agricultural policies to see whether it can handle growing more food—or different foods—should the weather change.

GOJI BERRIES AND FLU VACCINE

In a study of older mice, wolfberries appear to interact with the influenza vaccine to offer additional protection against the flu virus. The results of the research, led by scientists at the Jean Mayer USDA Human Nutrition Research Center on Aging (HNRCA), were published in the *Journal of Nutrition*.

Older mice, with immune systems weakened by age, were placed on diets that included a small amount of wolfberry fruit, also known as goji berries. Over a period of several weeks, they received two flu vaccines before being infected with the flu virus. The researchers then tested the mice for influenza antibodies as well as the clinical symptoms of the disease, such as weight loss. The mice had more antibodies and lost



less weight than those that had not eaten wolfberries.

Further research is needed to determine whether wolfberries could have a similar vaccine-boosting effect in humans, whose immune systems inevitably weaken with age, says Professor Simin Nikbin Meydani, D.V.M., Ph.D., senior author and director of the HNRCA and its Nutritional Immunology Laboratory.

“The flu vaccine is only 40 percent effective in protecting older adults against flu infection, which is much lower than the protection afforded to younger people,” she says. “For those reasons, it is important to investigate complementary approaches that may enhance the effectiveness of vaccination.”

Your Brain on Coffee

WE KNOW COFFEE IS GREAT FOR A STIMULATING jolt of caffeine. But coffee, the primary source of antioxidants in the American diet, is also rich in polyphenols, compounds that have been linked to brain health. A study published in the journal *Age* suggests that it is not just the caffeine that has a good effect on the aging brain, at least in rats.

For eight weeks, Barbara Shukitt-Hale, Ph.D., a USDA research scientist in the Neuroscience and Aging Laboratory at the HNRCA, and colleagues fed 19-month-old rats a diet enriched with coffee—the equivalent of 0, 3, 5, 10 or 15 cups per day for a human. They then ran them through

a battery of tests to evaluate their balance, muscle strength, spatial learning and memory. The most significant improvement was in the rats that got the 10-cup equivalent.

The researchers repeated the experiment, giving the rats a caffeine supplement to mimic what they had consumed from the coffee. The caffeinated rats performed better than the control group, but not as good as those that received the coffee.

Shukitt-Hale notes that caffeine and polyphenols are not the only bioactive compounds in coffee. Future studies could look at how all these compounds work together to help the brain.



OVERHEARD

“Particularly in an era when dietary restraint is not our strong suit, returning to butter and fatty cuts of meat may likewise return us to the high rates of heart disease we had decades ago.”

— GERSHOFF PROFESSOR ALICE H. LICHTENSTEIN, D.SC., IN A LETTER TO *THE NEW YORK TIMES*, RESPONDING TO AN OP-ED COLUMN SUGGESTION THAT WE DON'T REALLY NEED TO AVOID EATING SATURATED FAT

As Kids Get Older, Snacks Get Poorer

THE AVERAGE AMERICAN KID SNACKS ABOUT THREE TIMES A DAY, totaling about a third of his daily calorie count. But whether those snacks are good choices has a lot to do with the child's age, according to a new study.

E. Whitney Evans, Ph.D., N13, and colleagues at the Friedman School asked 176 students at four Boston-area schools on two separate occasions to recall what they had eaten the previous day. The researchers then assessed the nutritional quality of each meal or snack and scored them based on the Healthy Eating Index (HEI), which measures how closely the diet adheres to the Dietary Guidelines for Americans.

Evans, who did the research under the guidance of senior author Aviva Must, Ph.D., N87, N92, professor and chair of the Department of Public Health and Community Medicine at Tufts School of Medicine, found that the younger children—the 9- to 11-year-olds—increased their HEI score with each meal or snack they consumed. Not so with the adolescents: while eating three meals a day contributed to the overall quality of their diets, the 12- to 15-year-olds brought the average healthiness of their daily diets down with each between-meal nosh.

The authors speculate that the adolescents may be making more of their own food decisions, particularly at snack time, than their younger peers.

Evans, who is now a postdoctoral research fellow at Brown University and the Weight Control and Diabetes Center at Miriam Hospital in Rhode Island, suggests that parents cement good snacking habits when kids are young and reinforce them when kids reach middle school. That way, when their allowance is burning a hole in their pocket, maybe they'll be thinking fruit and yogurt, not chips and fries.



A LEAN GENE IN MICE

Knocking out a single gene in mice makes them live longer and leaner, according to research from Tufts and Yale universities.

The gene, known as FAT10, is normally activated in the fat tissue of mice as they age. When Jason DeFuria, Ph.D., N11, who conducted the research as a doctoral student in the Obesity Metabolism Laboratory at the Jean Mayer USDA Human Nutrition Research Center on Aging (HNRCA), bred mice without that gene, the mice ate more, but burned fat at an accelerated rate. As a result, they had less than half of the fat tissue found in normal old mice.

Their skeletal muscle also ramped up production of an immune molecule that increased their response to insulin, resulting in reduced insulin levels, protection against Type 2 diabetes and a 20 percent longer lifespan. The study appeared in the *Proceedings of the National Academy of Sciences*.

Co-author Martin Obin, Ph.D., an adjunct scientist in the HNRCA's Nutrition and Genomics Laboratory and an associate professor at the Friedman School, notes that eliminating FAT10 alone won't fully address the dilemma of aging and weight gain. "Fighting infection requires energy, which can be provided by stored fat," he says. "Mice without the FAT10 gene might be too lean to fight infection effectively outside of the laboratory setting. More research is needed to know how to achieve that balance in mice and then hopefully, at some point, in people."



Cattle along the roadside in Ethiopia

USAID CONTRACT EXPANDS TUFTS' WORK IN ETHIOPIA

The Feinstein International Center at Tufts has received an \$8.5 million contract from the U.S. Agency for International Development (USAID), the largest in the center's history, to advance rural development in Ethiopia. The Agricultural Knowledge, Learning, Documentation and Policy Project will evaluate a wide range of agriculture, livestock, nutrition and food-security projects as part of USAID's Feed the Future initiative.

"One of our main roles is to help USAID and partners to better understand the impact of agricultural development projects," said Andrew Catley, Ph.D., a research director at the center and principal investigator on the project. "As agriculture grows and commercializes, we need to understand who benefits and who doesn't, and look at alternative livelihood options for people moving out of agriculture."

The current project builds on previous Feinstein Center research conducted through the USAID-funded Pastoralist Livelihoods Initiative. In the last decade, Catley and other Feinstein researchers have studied the impact that USAID development and humanitarian projects—such as emergency drought response—have had in Ethiopia; the results of their studies contributed to establishing good-practice guidelines and policy reform.

Magnesium Cuts Diabetes Risk

GETTING ENOUGH MAGNESIUM IN the diet may reduce the risk of diabetes, especially for those who already show signs of heading that way.

A Tufts study led by Adela Hruby, Ph.D., N10, MPH10, N13, found that healthy people with the highest magnesium intake were 37 percent less likely to develop high blood sugar or excess circulating insulin, common precursors to diabetes. Among people who already had those conditions, those who consumed the most magnesium were 32 percent less likely to develop diabetes than those consuming the least. The

second association held true even when researchers accounted for other healthful factors, such as fiber, that often go along with magnesium-rich foods.

The study, published in *Diabetes Care*, followed 2,582 participants in the Framingham Heart Study Offspring cohort for seven years. The study subjects had an average age of 54.

Only half of Americans get the recommended daily amount of magnesium in their diet, which is 400 to 420 milligrams for adult men and 310 to 320 milligrams for adult women. You can find it in whole grains, vegetables, fish, nuts and seeds and dark chocolate.



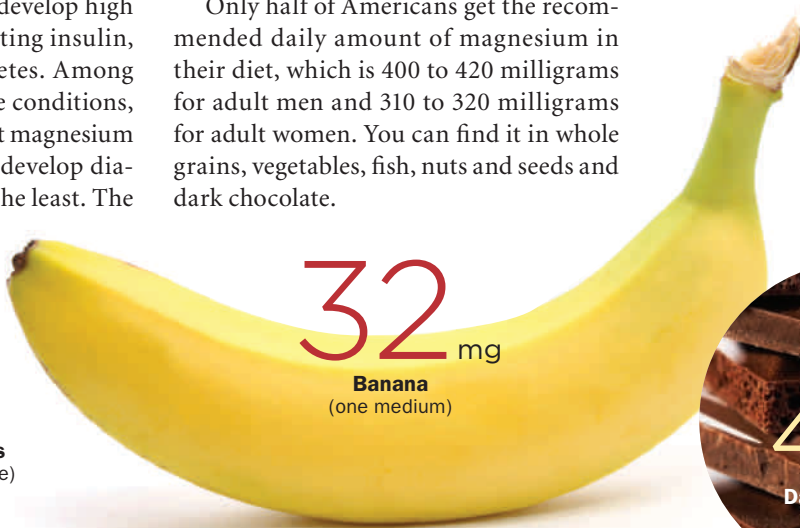
Brown rice
(one cup)
86 mg



24 mg
Raw spinach
(one cup)



43 mg
Dark chocolate
(one ounce)



32 mg
Banana
(one medium)



77 mg
Almonds
(one ounce)

GET YOUR MAGNESIUM HERE

SOURCE: USDA



Fat but Healthy

Some people can pack on the pounds and still avoid the harmful

complications of obesity BY MICHAEL BLANDING ILLUSTRATION BY BRIAN STAUFFER

WHAT IF YOU COULD GAIN AS MUCH weight as you wanted and remain relatively healthy? For a small percentage of people, that scenario isn't far-fetched.

We tend to think that obesity and poor health are constant companions. Indeed, studies have shown that being extremely overweight tends to lead to a host of medical problems, including heart disease, stroke and type 2 diabetes, which develop due to long-term adverse effects on the body's metabolism. As doctors have looked at the causes and effects of obesity, however, they've begun to notice something strange. Not everyone who is obese develops those metabolic diseases associated with obesity. In fact, a small subset of the population with a body mass index above 30

(the definition of obesity) seem to live normal, healthy lives compared to the majority of obese people.

"These people, called the metabolically healthy obese (MHO), are as fat as people who develop complications of obesity, yet they are protected from these complications," says Martin Obin, Ph.D., an adjunct scientist in the Nutrition and Genomics Laboratory at the Jean Mayer USDA Human Nutrition Research Center on Aging and an associate professor at the Friedman School. "Determining why MHO individuals are protected is going to tell us a great deal about how obesity causes chronic health problems."

Obin and Gerald Denis, Ph.D., an associate professor of pharmacology and medicine at the Boston University School of Medicine, explored this

phenomenon in a paper, “Metabolically Healthy Obesity: Origins and Implications,” published in the journal *Molecular Aspects of Medicine*.

The key, says Obin, seems to be in the way fat cells function in these metabolically healthy obese people.

Much of our body fat is contained in white adipose tissue (WAT), which stores excess energy as triglycerides in individual fat cells known as adipocytes. Triglycerides are released during times of need, such as starvation or during exercise. WAT can store more triglycerides by increasing the number or size of the adipocytes, Obin says. In obese people, “adipocytes become excessively large, and their metabolism and function become dysregulated.”

INFLAMMATION DAMAGE

When adipocytes get too large, they can become inflamed, causing them to secrete fatty acids that can lead to resistance to insulin (the hormone the body uses to dispose of excess sugar), a precursor to diabetes. “If you are a marathon runner, you can pack in the pasta meals and not become fat, because you are burning it,” explains Denis. “Otherwise, all those excess calories have to go somewhere. If the capacity of your adipocytes is exceeded, that puts stress on cells, some of which start dying, and that causes the inflammation.”

By contrast, a small portion of obese people have WAT that can store high amounts of fat without causing the adipocytes to become huge—and these folks don’t develop insulin resistance. “The result is that obesity in these individuals occurs with much less metabolic pathology,” Obin says, noting that the “reasons for this important difference are currently under intense investigation.”

On the other side of the equation, some individuals, mostly women, suffer from the unhealthy metabolic diseases typically seen in obesity, even though they are of normal weight. Call them “skinny but unhealthy.” Many of these women have the hormonal disorder polycystic ovary syndrome, which affects up to 10 percent of women. Even though half of women with the disorder are lean or even underweight, they still have higher secretions of fatty acids and insulin resistance.

The leading hypothesis to explain this key difference seems to be the way that white adipose tissue is distributed inside the body. Metabolically healthy obese people seem to have more WAT stored just beneath the skin rather than inside the body cavity. In addition, these individuals appear to have smaller adipocytes overall—meaning that when they get fatter, they create more adipocytes instead of their existing adipocytes

getting bigger. That could lead to less inflammation.

Increased physical activity also seems to hold the most dangerous effects of obesity at bay.

That’s why linebackers and sumo wrestlers can grow to enormous sizes that would be fatal in more sedentary people. “Sumo wrestlers are huge, but they

Not everyone who is obese develops heart disease and diabetes. A small number seem to be protected.

are very healthy,” says Denis. “Their blood profiles look great, and they have excellent glucose tolerance.” Unfortunately, the beneficial effects seem to disappear as soon as the physical activity stops. “To retire from being a sumo wrestler is a death sentence,” Denis says. “They are usually dead within a year, and so there is some urgency to develop safe ways to retire from professional sports where a high BMI is a normal requirement for a player.”

Studies in genetically modified mice have shown specific genetic pathways that seem to determine these differences in WAT. One strain of transgenic mice, for example, produces increased levels of adiponectin, an anti-inflammatory protein secreted from adipocytes. These mice display all of the features of metabolically healthy obese humans, including subcutaneous fat, smaller adipocytes and less inflammation. Obin and others have worked to knock out specific genes in order to reproduce this effect in other strains of mice, leading to increased secretion of adiponectin and other beneficial proteins and/or cutting down on inflammatory agents to produce healthier mice overall.

“I am surprised by the robustness with which abrogation of individual genes can uncouple adiposity from obesity complications, thereby generating fatter but fitter mice,” Obin says.

Currently, researchers are studying these genetic models to see if they can be translated to therapies to treat obesity in humans. “It’s not known whether it’s possible to convert from metabolically unhealthy to healthy without losing weight,” says Denis. The holy grail would be to create a pill that could recreate this cascade of beneficial factors to keep fat cells healthy and reduce obesity’s most harmful effects.

That wouldn’t rule out the need for exercise, however. Obesity causes other complications, such as back problems, for which there is no metabolic fix. It could, however, go a long way toward improving the quality of life for obese people and minimizing health-care costs. **TN**

Michael Blanding is a freelance writer in Brookline, Mass.



The Truth about the WAR on WHEAT

IF YOU BELIEVE THE BEST-SELLER LISTS, THE BIGGEST BAD IN THE supermarket aisles is not fat or sodium or sugar, but wheat. We have been warned that eating wheat makes our bellies fatter and triggers diseases ranging from diabetes to autism.

It's true that refined grains, including wheat, have been stripped of much of their natural nutrition, and that processed carbohydrates have contributed to America's obesity epidemic. But nutrition experts, the American Heart Association and the Dietary

Is this dietary staple actually bad for your belly and your brain? Here are the facts **BY DAVID FRYXELL**

Guidelines for Americans all recommend regular consumption of whole grains, including whole wheat. So do the best-selling authors know something that these experts don't?

"Americans tend to overconsume refined wheat products—energy-dense, nutrient-poor foods that are high in sugar and fat," says Nicola McKeown, Ph.D., an associate professor at the Friedman School and a scientific adviser to the Whole Grains Council. "So in this context, cutting out these foods will lead to weight loss. However, the troubling public health message that results from this is that wheat is the culprit," she says, noting that "there is a lack of scientific evidence to support the claims that eating wheat is an independent risk factor for weight gain.

The term "wheat belly" was popularized in 2012 by the cardiologist William Davis, M.D., in his book *Wheat Belly: Lose the Wheat, Lose the Weight and Find Your Path Back to Health*. Davis calls wheat the "world's most destructive dietary ingredient." His attack on the grain that accounts for one-fifth of the world's food

was followed late last year by *Grain Brain: The Surprising Truth about Wheat, Carbs and Sugar—Your Brain's Silent Killers*, a book by neurologist David Perlmutter, M.D., that hit the best-seller lists.

Grain Brain states that today's high-carb diets run contrary to how human brains evolved: "It turns out that humans have never eaten grain. In 99.9 percent of our time walking this Earth, we have never eaten grain." In an interview, Perlmutter explained, "Human genes have evolved over thousands of years to accommodate a high-fat, low-carb diet. But today we feed our bodies the opposite way." He advocates eating closer to the "ancient ancestral diet" that he characterizes as 75 percent fat, 20 percent protein and 5 percent carbs.

But Susan Roberts, Ph.D., director of the Energy Metabolism Laboratory at the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts, who has studied such ideas for her book *The "i" Diet*, says, "There is no evidence I'm aware of that early humans routinely ate a 75-percent fat diet. I personally recommend a moderate, rather than a high-carbohydrate diet for most people based on the weight of evidence. Sweeping statements about the grave danger of grains, in my opinion, are inconsistent with the substantial body of research on the health-giving benefits of whole grains. There are certainly some people who are healthier with a higher-fat, lower-carbohydrate diet, but we have no evidence that this is more than a small percentage of the population."

Is it true, as *Wheat Belly* asserts, that consuming wheat contributes significantly to belly fat? After all, it is widely accepted that abdominal fat surrounding the internal organs is linked to heart disease and diabetes. McKeown says, "It is true that many popular weight-loss diets target the grains food group, emphasizing eliminating these foods



completely from your diet. If you do cut out grains, you'll lose weight mostly because you are cutting out calories associated with an energy-rich food group." However, she notes, "This is a short-term, effective weight-loss strategy. The long-term sustainability of this approach is questionable, as any one-time, low-carb dieter will attest."

She adds, "The sources of our carbohydrates matter, as does the food form." Research by McKeown and her colleagues found that higher intakes of refined grains lead to more visceral adipose tissue (VAT)—essentially, belly fat. But the same 2010 study also concluded that increased consumption of whole grains was associated with lower VAT in adults. Compared to individuals who ate no whole grains, those consuming at least three servings daily, including whole wheat, rice and oatmeal, had 10 percent lower belly fat, even after accounting for other dietary and lifestyle factors. Those findings supported an earlier study by McKeown and colleagues that concluded that "higher intakes of cereal fiber, particularly from whole-grain sources, are associated with lower total percent body fat and [less] trunk fat mass in older adults."

But because grains can be high in calories, McKeown and colleagues cautioned, "Emphasis needs to be placed on the substitution of refined

grains with whole grains rather than the addition of whole grains to a diet already high in refined grains."

Is it also true that "modern grains are silently destroying your brain," as *Grain Brain* claims? Eating a diet that is high in carbohydrates seems to be associated with mental decline. In a 2012 study published in the *Journal of Alzheimer's Disease*, for example, scientists reported that people age 70 and older who ate the most carbohydrates in relation to protein and fat were at nearly four times the risk of developing mild cognitive impairment than their counterparts who ate fewer carbs. A study published in 2013 in the *New England Journal of Medicine* also concluded that higher glucose levels—which can be caused by too many carbs—may be a risk factor for dementia.

But cutting out too many carbohydrates may deprive your brain of fuel. In 2009, Tufts researchers found that women on an Atkins-style, low-carb diet suffered a gradual decrease in memory performance. Researchers theorized that low-carb diets could have a negative impact on thinking and cognition because the brain doesn't store glucose, its primary fuel, instead relying on the body to produce it from carbohydrates in the diet. Tufts psychology professor Holly A. Taylor, Ph.D., corresponding author on the study, explains, "The brain needs glucose for energy, and diets low in carbohydrates can be detrimental to learning, memory and thinking."

While wheat isn't the bogeyman that these popular books claim, don't depend on it as your only source of grains. McKeown advises, "I would choose a variety of whole grains, including brown rice, oats, quinoa, farro and popcorn." **TN**

David Fryxell is the managing editor of the Tufts Health & Nutrition Letter, where a version of this article first appeared.

Contribute to the Science

An ongoing study by scientists at the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts is examining the effects of a whole-grain-rich diet on intestinal health and immune response in adults. Interested in taking part? Boston-area men and women ages 40 to 65 can learn more at tinyurl.com/TNwheat.



Companies are
realizing that sustainability
issues are here to stay

WHEN GREEN IS THE ONLY OPTION

PREFER FARMERS MARKETS TO SUPERMARKET CHAINS? Organic Vermont goat cheese to Velveeta? Then there's a market segment with a hip acronym just for you: LOHAS, or people livin' a Lifestyle of Health and Sustainability.

LOHAS consumers are an influential group, and businesses are responding to their nudges for foods grown more responsibly and closer to home. The word "sustainability" is sprinkled all over food companies' annual reports and stirs the imagination of food entrepreneurs large and small. But sifting the ingenuity out of a food system that once brought us frozen TV dinners and Twinkies, and baking it into long-term sustenance for the planet, is likely decades away.

"We're still at the front end of it," says Tim Griffin, Ph.D., an associate professor and director of the Agriculture, Food and Environment Program at the Friedman School.

"Private investors are starting to see some profit in it; large multinationals are paying attention, and a lot of people want to do the right thing. But it's not easy."

Sustainability never was a humble concept. Growing out of the environmental movement of the late 1960s, sustainable agriculture hit the buzzword circuit in the 1980s, with Wes Jackson's publication of *New Roots for Agriculture*. In it, he laid out the environmental cost of an industrialized farm system and argued for ditching pesticides and herbicides in favor of more natural techniques.

Early efforts sowed greener farming that used less water and fewer chemicals. Sustainability was defined in terms of the proverbial three-legged stool: economically viable, environmentally friendly and socially just. Kick out one leg, and the whole thing topples over, so the philosophy goes.

BY M.E. MALONE, N14, MPH14 ILLUSTRATION BY STUART BRADFORD

Today the checklist for what makes a food practice sustainable is equally noble but even more complex. To wit:

OXFAM INTERNATIONAL'S "Behind the Brands" scorecard rates multinational corporations on seven checklist items related to the treatment of land, people and resources of countries from which it sources food.

THE NATIONAL CAPITAL COALITION is building "natural capital accounting" metrics to assign dollar values to the resources we're gobbling up in the name of food and other product production.

THE ELLEN MACARTHUR FOUNDATION supports efforts to better define and implement a utopian ideal of a "circular economy" whereby technological, biological and chemical resources are repurposed and reinvested back into the soil or other place of origin.

While shifting consumer values may drive some of the corporate world's focus on all things green, Shauna Sadowski, N05, believes the evolving definition of sustainability is rooted in a bottom line that's about much more than profits.

"This is very much a business imperative," she says. "The world's food supply depends on goods that come from natural resources, and natural resources are finite. If you run out of fresh water, you aren't going to get it back."

Sadowski is director of sustainability for Annie's Inc., maker of organic macaroni and cheese and other food products, and also president of the board of directors of the national Sustainable Food Trade Association. The association recently published a series of metrics companies can use to evaluate how they grow, transport and package their foods. The checklist covers 11 action areas, including land use, sourcing and waste reduction.

"I think companies are starting to realize that it is an operational risk in the long run if you don't actually pay attention to these things. 'How does where I'm sourcing from affect my business, and what are the landscape of issues I need to account for?' are key questions to ask, she says.

Sustainability is systems-based, she says, which means that a company has to

pay attention to a variety of factors—environmental, social and financial—to really know the size of its sustainability footprint. Sadowski's notion of what it means to act responsibly and sustainably continues to evolve; she credits the Friedman School's interdisciplinary approach to agriculture, food and the environment for a solid foundation.

"I'm still learning, but I feel as if things are coming full circle. I have the opportunity to consider ways to operate within the business models we already have and make improvements," she says. "But also, I have the opportunity to identify new ways of doing things that actually change the existing business model by integrating sustainability principles in how business is done. Thus, sustainability can be an opportunity for innovation."

For example, she says, businesses need to think—from the earliest design stages—about the entire life cycle of a product. What are its impacts on emissions, water use, biodiversity, labor and the community? It's about much more than what happens to the cardboard box after a mac-and-cheese dinner.

Venture capital and food advocacy money is also flowing to food businesses committed to sustainability, according to Alex Linkow, who directs the nonprofit Fair Food Fund program based in Boston. Linkow's group received seed funding in 2012 and now sponsors loans and business development tools for New England farmers and companies that bring farm products to market. A three-day boot camp last winter attracted food firms looking to scale up sustainable practices while strengthening their financial plans and marketing strategies.

"A number of food entrepreneurs are bright, intelligent, creative, high-energy folks who don't necessarily have a business background," Linkow notes. "There's a certain amount of capacity-building that's necessary."

The Friedman School is also translating the school's thought leadership into guidance for organizations that want to knead sustainable practices into their corporate cultures. Griffin, along with faculty members Sean Cash, Ph.D., and Jennifer Obadia, Ph.D., N11, will each teach an online course as part of the school's new certificate program

in Sustainable Agriculture and Food Systems.

Three online graduate-level courses will be offered sequentially in 15-week sessions starting in the fall. So far, the program has received interest from students from a range of enterprises, including an antihunger organization in the nation's capital and a European Union-based private food company.

"Companies realize that sustainability issues are here to stay," says Obadia. At the same time, she notes, many of the foods we eat are multi-ingredient products that don't come from a single source. "A lot of goodwill for sustainable practices can get lost along the food chain," she notes. "There really is so much to know and think about."

SUSTAINABILITY IN ACTION

So what does it mean to be a sustainable company? For some, it means embracing organic practices. At Stonyfield Farm in New Hampshire, Britt Lundgren, N06, has been director of organic and sustainable agriculture since 2011. "I think over the years Stonyfield has had a tremendous amount of success with making changes to

BUYS

GOOD GOOD GOOD

Most of the foods we purchase don't have labels that scream: "Buy me, I'm sustainable." It can be hard enough to buy what's best for our health. So how do we shop for foods that are good for the planet, too?

There are no hard-and-fast rules—and plenty of exceptions to each one. Here are a few ways to guide your thinking and your spending.



the way we do business with environmental sustainability in mind,” she says.

Two years ago, the company started tracking its greenhouse gas emissions in real time using special software. Milk production accounts for more than half of the emissions; packaging, manufacturing and transporting are responsible for almost 30 percent. Refrigeration in stores and customers’ homes makes up 7 percent.

Stonyfield is also among thousands of companies that elect to be certified by the U.S. Department of Agriculture’s National Organic Program, which aims to “foster cycling of resources, promote ecological balance and conserve biodiversity” (see “Organic Nation,” page 16).

“It certainly adds costs to our supply chain,” Lundgren notes, “but it’s a choice we’ve made because we believe our consumers want assurances” that the product matches their food preferences and values. “It’s a big part of our identity.”

Beyond organic standards, Lundgren notes that most of the dairies in the Stonyfield network have 70 or fewer cows, and she is

“WHAT’S YOUR METRIC FOR JUSTICE VERSUS WHAT’S YOUR METRIC FOR HOW MUCH GREENHOUSE GAS YOU EMIT?”

—TIM GRIFFIN

working on buying more dairy products from farmers based in New England.

Some companies aim to balance shopper demand with finite resources. Gorton’s of Gloucester, among the oldest fish companies in the Northeast, celebrated the 60th anniversary of the fish stick last year at the same time it forged a partnership with the New England Aquarium to help the company source, catch and package seafood in ways that won’t overtax the environment or fish supplies.

Consumers are also demanding transparency and traceability. Red’s Best, a smaller Boston-based fish dealer, supplies a bar code with every piece of fish sold. Buy some knobby conch, and a scanner can tell you the name of the boat, the fisher and type

of equipment that snared the creature.

But while sustainable practices are winning more converts and blog postings, National Geographic’s “Greendex” ranks U.S. consumers dead last among 17 countries based on the environmental impact of our consumption patterns.

Griffin also notes that even committed companies find it easier to focus on improvements to practices that can be measured by the bottom line. Quality of life for farm workers or equitable access to healthy foods can be harder to quantify. “What’s your metric for justice versus what’s your metric for how much greenhouse gas you emit?” he asks. “It’s so much easier to measure energy efficiency and say, ‘Yup. We are 20 percent better than we were only five years ago. I don’t know what that metric looks like if you want to treat people 20 percent better.’”

Sadowski acknowledges the complexities, but adds that more and more companies are thinking about “the triple bottom line—people, planet and profits.” The Sustainable Food Trade Association’s guidance for members includes more than 200 metrics businesses can use to improve their practices along all three dimensions.

And complexity isn’t always a bad thing, Sadowski says. Whenever she talks to people about her job, she’s impressed with the dedication to a more sustainable food system.

“People are really interested in what’s happening, what foods they put in their bodies. The level of engagement and complexity of questions I get from younger people is great,” she says. “Whether or not they work in the industry, they want to play some kind of a role. They want to know what they can do.” **TN**

M.E. Malone, a former reporter for The Boston Globe, is a graduate of the Food Policy and Applied Nutrition Program. She also holds a master’s of public health from Tufts School of Medicine.

BUY ORGANIC WHEN YOU CAN

Be aware, though, that organic foods grown farther away from where you purchase them require extra fuel for transport. If your food budget is limited, splurge for organic produce when the conventionally raised version makes the “dirty-dozen” list due to excess pesticide residue. The Environmental Working Group (ewg.org) publishes a new list each year.

BUY LOCAL Join a local farm, visit a farmers’ market, join a food co-op, dine at restaurants that source their food from nearby farms. There’s a caveat here, too. Local does not

always equal sustainable. Talk to the vendors and learn about their practices.

MAKE PRODUCT DECISIONS BEFORE YOU HEAD TO THE SUPERMARKET

Google your favorite cereal or energy bar to learn more about the maker’s sourcing policies and values. Or visit a site like sustainablefoodlab.org to see the names of companies leading the way.

FIND ALTERNATIVES TO THE GROCERY STORE

Plug your ZIP code into a form on eatwellguide.org to find local food businesses dedicated to sustainability. Within 10 miles of the Friedman School, five

bakers, eight caterers, 68 restaurants and one food truck made the list, which is sponsored by an environmental foundation.

Associate Professor Sean Cash, Ph.D., offers a few caveats of his own. Checklists and scorecards may be good ways to inform consumers, he says, and a range of products also sport labels that tell and sell a story to eco-conscious consumers.

“But even a highly motivated consumer might become overwhelmed,” he says. His advice? “We need to pick what matters to us most and shop accordingly. If we try to do it all, we end up paralyzed in the aisle.”

—M.E. MALONE



BY JULIE FLAHERTY

Organic

NATION

PHOTOGRAPH BY
CHRIS HARTLOVE

Melissa Bailey oversees the standards that
shape a burgeoning \$35 billion industry

MELISSA BAILEY HAS BEEN DIRECTOR OF THE STANDARDS DIVISION for the National Organic Program at the U.S. Department of Agriculture since 2010. She helps the USDA develop the rules for how all sorts of agricultural products—from cotton fibers to chicken wings—become certified as organic.

Bailey, who studied biology as an undergraduate, earned a master's in animals and public policy from Cummings School of Veterinary Medicine at Tufts in 2003. Her interest in how farmers support conservation efforts led her to the Friedman School's Agriculture, Food and Environment Program, where she soon became intrigued by the way agriculture intersects with the environment, labor and economics. In her dissertation for her Ph.D. in agricultural policy, which she received in 2010, she investigated livestock-production systems and water-quality policies.

Tufts Nutrition talked with Bailey about what it means for a food product to be certified organic, how the organic rules are made and what she would change about the system if she could.

What keeps you up at night?

It can quite literally be the amount of work that we have on our plates. We have 34 staff responsible for a \$35 billion (and growing) industry in the United States, so each staff person is essentially overseeing a billion dollars of product. And our program globally oversees approximately 25,000 certified operations that operate in 133 countries. For example, a farmer can be based in Mexico and get certified to the USDA organic standards.

The National Organic Standards Board, the 15-member panel that advises the National Organic Program, is made up of volunteers who are appointed through a nomination process by the secretary of agriculture. Critics contend that the board is overly represented by (and influenced by) large agricultural companies. What is your take?

The makeup of the board is well established through our underlying statute, the Organic Foods Production Act. The law guides the membership of who will represent the organic community in different categories. So at any point in time, you have four farmers or organic growers, three environmentalists, three consumer public interest advocates, two handlers and processors, one retailer, one scientist and one USDA-accredited certifying agent. I believe this structure does bring a diversity of opinion together.

While some of the members may represent large operations, other members work

for nonprofit organizations, cooperatives or small or mid-sized companies. So I think by its very nature and design, the board represents the diversity of the organic community.

How does the National Organic Standards Board influence what ingredients can be used in certified organic products?

The default rule for organic certification is that natural materials are allowed in organic production and synthetic materials are not. The National List of Allowed and Prohibited Substances is a list of exceptions to this rule.

There are certainly some natural substances that we wouldn't want to allow in organic production—for example, arsenic or strychnine—so those are on the prohibited list. Then there are some synthetic substances that are allowed, and these were all recommended by the National Organic Standards Board. The board considers the need of the substance for organic production and handling, how it affects human health and the environment and its compatibility with sustainable agriculture when making these recommendations.

For example, pheromones have long been used as an effective, nontoxic way to confuse insects that might otherwise infest organic crops, especially fruit. Another example would be vaccines for animals, which are important disease-prevention tools, especially since antibiotic therapy is prohibited under the organic standards. Then there are

processing aids such as baking soda, which is needed to leaven the dough for organic pan-cakes, baked goods or other products.

What does the organic label tell consumers about their meat, eggs and dairy?

A good way to talk about this is to walk through the production of a specific food such as organic cheddar. Before milk can be turned into cheese, organic milk has to come from a certified organic cow. The cow cannot be given growth hormones or antibiotics, and its feed must be certified organic. The feed comes from land not treated with any prohibited substances—for example, synthetic fertilizers and most synthetic pesticides—and that land cannot be treated with prohibited substances for at least three years prior to harvest or grazing. The land itself must be managed in a way that maintains soil fertility and minimizes erosion, while having distinct and defined boundaries to ensure that prohibited substances don't come into contact with organic fields.

The organic dairy cow grazes on organic pastures for the entire grazing season, which must be at least 120 days a year. And it has to receive at least 30 percent of its nutrition from pasture during the grazing season. Throughout the cow's life, it has to be raised in living conditions that accommodate its natural behaviors and support its welfare.

The cow is milked, and the milk gets transported to a certified-organic processing facility. The milk goes through a cheddaring process, during which an enzyme such as rennet would be added to separate the curd and whey—that would be an example of a substance on the National List that is allowed in organic food products.

If there is one thing you could change about the way organic farming is handled, what would that be?

I would like to see more farmers engage in the further development of the organic standards, whether it is at National Organic Standards Board meetings or during our rule-making process—and not just current organic farmers, but also farmers who are deciding if they want to pursue organic certification. We really want to see more of those people involved in helping us build success in this growing market. **TN**

DEBUNK *the* JUNK

BY JULIE FLAHERTY

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RED FLAGS
to help you sort
**SPECIOUS
NUTRITION
ADVICE**
from
**THE GOOD
STUFF**

Honest-to-goodness nutrition news is actually pretty rare.

“Nutrition is not a science of breakthroughs,” explains Professor Jeanne Goldberg, Ph.D., G59, N86, founder and director of the Friedman School’s Nutrition Communication Program, which trains professionals to explain research findings in ways that the public can understand. Nutrition research often moves the needle only a little bit at a time. “It’s evolution, not revolution,” Goldberg says.

Only in the last couple of decades has the media had the appetite to report on every nutrition study that comes out. Before that, studies would be read by other scientists, assimilated into the collective research consciousness, and the most useful information would eventually make it to the newspapers. Today, many more studies, deserving or not, get their day in the sun, which is one reason consumers complain that nutrition researchers are always flip-flopping on their advice. In fact, “some 90 percent of the general recommendations that people need to eat a healthy diet are known and probably understood by them,” says Rachel Cheatham, N05, N08, an adjunct assistant professor who teaches a course on consumer marketing for the Friedman School’s new online

certificate program, Nutrition Science for Communications Professionals. Yet there are only so many times that people can hear they should eat more vegetables and fruits and get exercise. “The basic message is boring,” says Goldberg.

So for consumers who are hungry for nutrition news, the Food and Nutrition Science Alliance, a partnership of several professional scientific associations, including the Academy of Nutrition and Dietetics, the American College of Nutrition and the American Society for Nutrition, published a list of “10 Red Flags of Junk Science” to help consumers evaluate nutrition recommendations—be they from a news article, a diet book or a product label—with a critical eye.



Have you given up carrots because of their glycemic index?



Do you consider sugar “white death”?



Is chocolate now a health food?

RECOMMENDATIONS THAT PROMISE A

1 Quick Fix

This is often the case with supplements that guarantee you'll lose weight fast. We would like to believe that eating novel foods such as mangosteen and acai berries will speed us along our quest for svelteness, even if the claims don't have the science to back them up. Effectiveness studies on new supplements tend to be small and sponsored by the manufacturers. The current supplement setting the Internet abuzz, African mango extract, claims to be a surefire route to dropping pounds, says Assistant Professor Diane McKay, Ph.D., G89, N97, N00, director of the graduate online certificate program at the Friedman School. But if the claims were true, she asks, "Do you really think the ads would appear on late-night infomercials, tabloid newspapers and the side panel of your browsing screen?"

McKay, who teaches the foundations of nutrition course for the communications certificate, says the quick fix often goes hand in hand with a "persecution claim." A little conspiracy theory does a lot to answer a consumer's question about why they haven't heard about a product's health benefits before, or why it isn't front-page news: the government/establishment/pharmaceutical industry doesn't want you to know about it.

Such products will also throw in some false medical

jargon for good measure. McKay is particularly amused by raspberry ketones, a weight-loss supplement promoted on the *Dr. Oz Show*. You may have heard of ketones in relation to weight loss, as they are created when your body breaks down fat for energy. That doesn't mean they are good for you.



"A ketone is a byproduct of metabolism that you don't want at a high level in your body," McKay says. Besides, no raspberry ketone studies have been done on humans, only animals. So don't be won over by official-sounding science terminology.



CLAIMS THAT SOUND TOO GOOD TO BE TRUE

This one goes hand in hand with the "quick fix." Whether the recommendation is to eat more chocolate (flavonoid-rich!) or enjoy a bun-less burger with cheese and bacon (low-carb!), "the public likes it when the advice is consistent with what they want to do," says Goldberg. Scrutinize the science behind the recommendation to see if it is really a reason to indulge, or just wishful thinking.

2 DIRE DANGER FROM A SINGLE PRODUCT OR REGIMEN

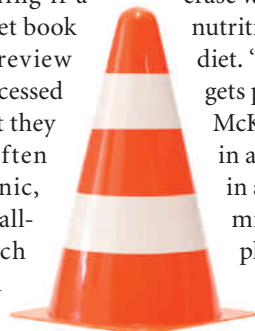
WARNINGS OF

The target may change from year to year, but the attack is always similar: Fat makes you fat, carbohydrates are toxic, sugar is white death. Cheatham says it can be a good thing if a headline or a new diet book triggers people to review how much sugar, processed carbs or saturated fat they tend to eat. "But often what happens is panic, divisiveness and this all-or-nothing approach that swings from

paleo to vegan," she says.

While it's true that consuming too many added sugars is unhealthy, abstaining from all sugars—natural or added—can erase whole categories of nutritious foods from your diet. "I hate it when fruit gets prosecuted," says McKay, pointing out that in addition to the sugar in a pear, you get fiber, micronutrients and phytochemicals. She is dismayed when she

sees people shunning carrots, chock-full of beta-carotene and fiber, because of their glycemic index. "Worrying about the sugar and ignoring all the good things in a carrot is almost a crime," she says. She sees the same problem with eschewing whole grains along with processed carbs: the former provide us with fiber, B vitamins, some iron, some magnesium, "so if you eliminate that entire group, you are also eliminating those nutrients," she says.



4 SIMPLISTIC CONCLUSIONS DRAWN FROM A COMPLEX STUDY

“People think at the end of a study you have the truth; it’s black or white,” says McKay. But what we often end up with are nuanced shades of gray.

Adela Hruby, Ph.D., N10, MPH10, N13, a research fellow at the Harvard School of Public Health who teaches the course on interpreting nutrition evidence for the communications certificate program, says that many studies simply can’t be boiled down to a headline. She points to an Australian study published last year involving one of the primary polyphenols in coffee: chlorogenic acid, or CGA. Mice that were fed a high-fat diet and a high amount of CGA—what the researchers considered the equivalent of five cups of coffee per day for a human—developed more visceral fat than other mice. Even though the mice drank not a drop of coffee, the headlines of news stories about the study included “Drinking 5 cups of coffee will lead to obesity” and “Wrong amount of coffee could kill you.”

“Coffee isn’t just its CGA—there’s a lot more to a food than a single polyphenol,” Hruby says. “And we can’t extrapolate from mice models so directly to humans. That’s been shown time and again.”

Perhaps more important, the stories didn’t take into account all the previous research on coffee, which has been observed to be protective against a wide range of conditions.

RECOMMENDATIONS

5 BASED ON A SINGLE STUDY

In March, a study published in the *Annals of Internal Medicine* failed to find a strong link between saturated fat intake and heart disease. Within two weeks, Mark Bittman, a columnist for *The New York Times*, was ready to declare that “Butter is Back.”

“People thought, ‘Yeah! Saturated fat is no longer the enemy. We can go back to eating butter and chicken skin and all the things we miss,’” says Cheatham.

The British Heart Foundation, which helped fund the study, said that while it

“wouldn’t shy away” from the results, it wouldn’t immediately change national dietary guidelines, which currently suggest a diet low in saturated fat.

“We need more research in this area, and also need to examine the findings alongside the full body of evidence rather than other individual papers,” Jeremy Pearson, the foundation’s associate medical director, wrote on *theguardian.com*.

The point, says McKay, is that with any nutrition study, you have to look at how it fits in with everything else that has been

found to date, and there is a lot of evidence showing that saturated fat raises cholesterol, a risk factor for heart attack and stroke.

“If all of a sudden you saw a study that said oatmeal is bad for you, when up to that point all you’ve heard is good things, be a skeptic,” she says.

That doesn’t mean ignore studies that go against the prevailing wisdom. “Sometimes things don’t fit in how we expect them to, so we have to adjust our thinking,” McKay says. “You need heretics to move things forward.”



6

Where can you turn to check whether the supplement you are holding has scientific evidence behind it? Government agencies such as the Centers for Disease Control and Prevention, the Food and Drug Administration, the Department of Agriculture and the National Institutes of Health all maintain websites with a wealth of science-based nutrition information. You can also see what the Academy of Nutrition and Dietetics, the American Heart Association and the American Institute for Cancer Research have to say.

“These are solid, reputable organizations with professionals who take painstaking care to look at the evidence and promote the evidence responsibly,” McKay says. “They certainly do a good job of trying to distinguish fact from fiction and telling consumers the whole story.”



7 LISTS OF “GOOD” & “BAD” FOODS

“Foods aren’t independently good or bad, as in you should always eat or you should never eat,” says Goldberg. A little ice cream can be OK, if you otherwise practice restraint, and every vegetable you consume doesn’t have to be at the top of the ORAC (oxygen radical absorbance capacity) scale for measuring antioxidants. But figuring out balance and moderation can be hard on consumers who are simultaneously baraged by fast-food commercials and obesity statistics.

“At some point, people just want some definitive direction on what to eat, and they would like it—unfortunately—to be very easy and fairly mindless,” Cheatham says. That’s why a *Huffington Post* list of “7 Foods You Should Avoid at All Costs” or a diet with a fast set of rules, such as the paleo diet or a raw foods diet, is appealing.

Are there foods we should eat less often? Of course. But although the Center for Science in the Public Interest once famously described fettuccine Alfredo as “a heart attack on a plate,” Goldberg says it is fine to indulge occasionally. “One dinner is not going to do you in.”

RECOMMENDATIONS MADE

8 TO HELP SELL A PRODUCT

If the health article you are reading conveniently ends with a sales pitch for a supplement, or if all the studies referenced at the end of a diet book are by the person who wrote the book, your quackery alarm should go off. That said,

with the recent cuts in government funding for nutrition research, you will find more and more studies—often, good-quality studies—funded by groups that clearly have a stake in the outcome: a calcium study funded by the dairy industry, for example. “It doesn’t mean that that study should be dismissed,” says Cheatham, “but there may be other research that either had null findings or contrary findings that didn’t get published.” Putting research into context, which is a large part of what the Nutrition Communication program and the online certificate program teach, is probably the single most important variable in health communications, says Cheatham.

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

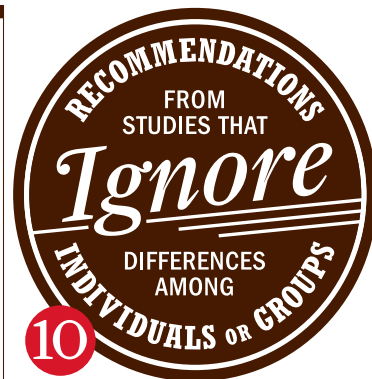
THE FRIEDMAN GRADUATE CERTIFICATE PROGRAM IS DESIGNED TO MEET THE NEEDS OF WORKING PROFESSIONALS AND OTHERS INTERESTED IN EXPANDING THEIR KNOWLEDGE, ENHANCING THEIR SKILL SET AND ADVANCING THEIR CAREER. FOR MORE INFORMATION ON NUTRITION SCIENCE FOR COMMUNICATIONS PROFESSIONALS AND OTHER CERTIFICATE OFFERINGS, VISIT NUTRITION.TUFTS.EDU/CERTIFICATES.

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RECOMMENDATIONS BASED ON STUDIES

NOT PEER REVIEWED

A nutrition study isn’t worth its salt if it hasn’t been published in a peer-reviewed journal. That means that a group of outside reviewers have deemed the research well-conducted, the results credible and the findings significant. Hruby recommends a short guide to the peer-review process put together by a charitable trust named Sense about Science. The booklet is called, appropriately, “I Don’t Know What to Believe” (tinyurl.com/TNpeer).



One size doesn’t fit all when it comes to nutrition science. “If it was a study that was done in healthy young males, what makes you think the results are going to apply to postmenopausal females or kids?” McKay asks.

Hruby is reminded of a recent review that found no evidence that multivitamins prevent cardiovascular disease. She points out that the analysis included only adults without known nutrition deficiencies. “So, if the blanket message is don’t take multivitamins/multiminerals, frankly, I think that’s the wrong message. We know that certain groups are at higher risk for nutrient deficiency than others and that supplements can help make up for this shortfall.” ^{TN}



120
80



Body by Smartphone

WE LOVE OUR SMARTPHONES. SINCE THEY MARCHED OUT OF THE CORPORATE world and into the hands of consumers about 10 years ago, we've relied more and more on our Blackberry, iPhone and Android devices to organize our schedules, our social lives, our finances and now, even our bodies.

Americans are increasingly downloading health and fitness apps designed to help them get in shape, lose weight or manage a variety of health issues. Because our phones are always with us, these apps promise to make it easier to start the long-term lifestyle changes that promote good health, such as getting more exercise and eating more balanced diets. And now that 91 percent of Americans own a mobile device, health and fitness apps are available to traditionally underserved communities, too. But can these little bits of software really make the difference in the seemingly intractable problem of getting people to eat better and exercise more?

"Thirty-one million pounds and counting." That's how much weight people using one of the more popular weight-loss apps,

There are thousands of mobile apps on the market aimed at diet and fitness. Can they really make us healthier?

called Lose It!, have lost since its debut in 2008, according to Charles Teague, CEO of Lose It!'s parent company. Teague was a panelist at a Friedman School seminar on mobile fitness technology in February. (The whole thing is available on iTunes here: tinyurl.com/TNhealthapps)

Lose It! is like a lot of weight-loss programs, such as the venerable Weight Watchers, in that you need to keep track of what you eat each day and try to meet certain nutrition and calorie goals.

"This approach has been around 20 to 30 years; it's not like we have some breakthrough," says Teague. Indeed, many if not most fitness apps, including Calorie Counter, MyFitnessPal and countless others, follow a similar formula.

"Studies have shown it's very useful to track diet and physical behaviors," says Jennifer Sackel, Ph.D., N01, an associate professor at the Friedman School and co-author of a recent diet book that advocates small and steady lifestyle changes. "Tracking allows you to see how you're progressing. You're more likely to make changes when you get that positive feedback."

BY JACQUELINE MITCHELL ILLUSTRATION BY BLAIR KELLY

The advantage of an app, Teague says, comes from the smartphone itself. Because we never put our phones down, dieters are more likely to keep a running tally of what they eat throughout the day rather than trying to think back every night and recall what they ate. An app is likely to produce more accurate food records. But more important, Teague says, mobile apps for diets can engage users at the moment of decision, rather than after the fact, when it's too late.

"We can say, while you're standing in line at Starbucks, can you really afford that caramel macchiato? Or should you maybe get a black coffee if you want to stay within your calorie budget today?"

Lose It! and its competitors boast a host of other features meant to make dieting less of a chore. App users can set reminders to track calories after each meal or to get some exercise during the work day. The premium version of Lose It! lets users plan meals ahead of time, track micronutrients and interact with other health-monitoring devices, including wireless scales and blood pressure cuffs. But the crucial elements of Lose It!—the food diary, the exercise log, the ability to connect with friends via social media—come with the basic, free version of the app.

"That can't be overstated," says Teague. "That massively increases access. Our user adoption spans across all kinds of socioeconomic classes and demographics. Computers might limit access. Cell phones really don't."

Recent research into how people use their

mobile devices backs up those claims. As of January 2014, nearly 60 percent of American adults owned smartphones, according to the Pew Research Center. Pew figures from 2012 showed that 20 percent of smartphone owners had downloaded at least one health and fitness app. African-Americans and Hispanics—two groups that disproportionately lack access to health-care services—were more likely than whites to own smartphones and use their mobile devices to look for health or medical information online.

DUBIOUS DATA?

But what kind of information are they finding there? Diet-logging apps such as Lose It! might be based on well-established nutrition science, but they are among tens of thousands of other health and fitness apps available. It's hard to pin down a precise figure, in part because the category is not well defined. Some apps are meant for consumer use, some as reference for health-care providers, but business analysts' estimates range from 40,000 to 97,000 such apps for iPhone, Android and Blackberry smartphones. (It's not surprising, then, that the iPhone's next operating system will include a dedicated app, called Health, to help people aggregate the data from their various wellness apps.) Yet apart from user rating systems, they aren't being vetted by experts for their efficacy, safety or basis in nutrition or fitness science.

One 99-cent app has a BMI calculator that anyone can find for free online.

Another offers so-called "brain wave recordings" at a whopping \$9.99 that claim to help the brain feel "motivated and satisfied without the need to eat." South Beach, paleo, blood type, fast metabolism, low glycemic, juice and all kinds of "detox" diets are well-represented.

Last fall, the Food and Drug Administration published guidelines for developers of medical apps that blur the line between software and medical devices. That includes the accessories that turn smartphones into heart monitors or convert the phones' cameras into otoscopes parents can use to peer into a child's potentially infected ears. But the agency specified it won't be regulating apps intended for "general patient education" or "generic aids." That's likely the category many diet and exercise apps would fall into.

So how can consumers know which ones to choose? Few scientists have had a chance to take a hard look at the crowded field of apps that has sprung up in just the last three or four years. In a study published in the journal *Translational Behavioral Medicine* in 2011, public health researchers conducted what they considered the first survey of 204 weight-loss apps available in Apple's App Store in 2009. Scientists from George Washington University and Duke University Medical Center created a list of 13 "evidence-informed" weight-loss strategies endorsed by the federal government, including keeping food records, getting more exercise, and eating more fruits and

Danielle Nierenberg, N00, thinks mobile apps are poised to change not only personal nutrition but the entire food system for the better. As president and co-founder of Food Tank, a nonprofit that advocates for sustainable agriculture practices, she has come across lots of apps for those interested in eating better, wasting less food, finding sustainable sources of seafood or buying seasonally.

"Whether you're a farmer or an eater or a shopper, apps can be an interesting way to connect with what's going on in the food movement," she says. "The ones that make the most impact are those where it's not just a one-way conversation; they are the ones that connect people to one and another."

Apps for a Healthy Planet

SEASONS (What Is It Production Ltd., \$1.99). Helps eaters follow the natural growing seasons of fruits and vegetables in their region. They can also search a database of fruits, vegetables, herbs and nuts for descriptions, information on seasonality and photos.

SEAFOOD WATCH (Monterey Bay Aquarium, free). Offers recommendations and information about sustainable farming or fishing practices for sushi and seafood. It can be used at restaurants and markets to make ocean-friendly seafood choices.

WHAT'S ON MY FOOD? (Pesticide Action Network, free). Identify chemicals found on foods commonly sold at the grocery store. Search the database to find out which pesticides are the most dangerous and for a crash course on pesticides for amateurs.

“The social aspect is **a big thing**.
It has to be cool to engage in a healthy lifestyle.”

—JENNIFER SACHECK

vegetables. The team found the vast majority of apps available at the time incorporated three or fewer of the 13 strategies.

That was five years ago—eons ago in Internet time—but in a more recent study published last fall, also in *Translational Behavioral Medicine*, public health researchers from the University of South Carolina found that not much has changed. Of the 57 apps they assessed—this time targeting pediatric obesity—the team found that fewer than half included any evidence-based recommendations at all. Among those that did, many suggested healthier eating and getting more exercise, but failed to recommend starting the day with a good breakfast or cutting back on time in front of the television—two proven ways to accomplish both goals. That’s “likely because they are not areas of behavior change that app developers have thought of,” the authors wrote, concluding that “app developers and public health practitioners should work collaboratively to integrate evidence-based practices and expert recommendations.”

That’s just what Kris Widican, N06; Emily Stone, N08; and Caroline Carney, N11, all graduates of the Nutrition Communication program at the Friedman School, do in their roles at Good Measures, the Boston-based

company behind the nutrition app of the same name, which is “designed with the input and the oversight of registered dietitians,” says Widican, an R.D. and Good Measures’ director of clinical content development.

People who sign up for the program—which is offered as a wellness benefit through employers or insurance policies—use the Good Measures app in concert with a registered dietitian specially trained in behavior change. Members work with the R.D. to determine their nutritional goals and health concerns, which they can then enter into the app. Every time users log meals or snacks, the program provides them with a score, called the Good Measures Index or GMI, which lets them know how well they are meeting the nutritional parameters they set.

That instant feedback helps people make healthier choices throughout the day. The program will also offer meal and snack suggestions that will nudge people closer toward reaching their own goals, whether they want to lose weight, lower cholesterol or keep sodium levels in check.

The Tufts-trained nutritionists “were instrumental in helping our team understand the relative importance of different nutrients, such as fiber, saturated fat and sodium,” says Carney, director of program development.

“That in turn makes a difference in the meals that the system then suggests.”

The program builds what Widican calls a “virtual pantry” of meals as it begins to learn each user’s tastes and preferences from their food logs. That is, if an individual logs heavy pasta dinners several times a month, Good Measures might suggest a dish with a small portion of whole grain pasta topped with several servings of vegetables and lean protein.

“That’s really attractive,” says Carney, an R.D. “People want to make changes, but they want to make slow changes. They don’t want to throw everything out of the fridge and stock it with chia seeds and goji berries.”

Right now, the team is working with experts at the Joslin Diabetes Center in Boston to tailor the program for individuals with diabetes. That way, the same food—say, a serving of watermelon—would provide a different GMI for a user with diabetes versus one without the disease.

“We can tailor feedback to a particular person’s clinical needs right down to the nutrient,” says Widican. “And that’s really interesting because we may also be able to measure the effects of different diets on relevant biomarkers and health outcomes.”

Lose It!’s 18 million registered users already have entered reams of data about

LOCAVORE (Hevva Corp., free). Helps consumers find out what local foods are in season and locate the closest farmers markets that provide them. The app has tons of information on individual producers in a user’s area and provides seasonal recipes to best use fresh, local ingredients.

FIND FRUIT (Neighborhood Fruit, 99 cents). For fruit that’s as fresh as possible, forgo the supermarket and use the Find Fruit app to locate fruit trees growing in public spaces. Users can also search fruit trees in their area according to seasonality, type and proximity.

HARVESTMARK TRACEABILITY (YottaMark Inc., free). Allows users to trace their fresh food back to the farm it came from

by scanning any fruit or vegetable bearing the HarvestMark logo and pulling up the item’s information on the app. It also offers instant updates on any food recalls affecting HarvestMark produce.

FOOD COMMUNITY (Nommunity.com, free). Consumers can search and discover local vegan, vegetarian, kosher, gluten-free, locally grown and organic restaurants. They can also connect and collaborate with a community of people with the same dietary preferences.

URBAN FARMING ASSISTANT STARTER (iHuerting, free). For those planning on growing their own vegetables, the app sets reminders for when to water, fertilize and care for plants. It also helps identify organic solutions to pests, diseases and other gardening issues.

SOURCE: FOODTANK.COM

what they eat, how they exercise and how that translates on the scale. The company, Teague says, is still figuring out how to turn all that information into new insights about weight management.

TO ERR IS HUMAN

“I think these apps still have a way to go for research purposes,” says Cheryl Gilhooly, Ph.D., N02, MPH02, N07, manager of the dietary assessment unit at the Jean Mayer USDA Human Nutrition Research Center on Aging (HNRCA). “But it’s coming. We’ll be able to make all these improvements with time.”

Gilhooly served as the intervention leader on a nutrition study known as CALERIE, led by Susan B. Roberts, Ph.D., director of the HNRCA’s Energy Metabolism Laboratory. The Comprehensive Assessment of Long-Term Effects of Reducing Intake of Energy required enrollees to keep detailed food records for two years.

At the time—the study ended in 2011—the participants used a program called Diet Mate Pro designed for PDAs. Both of those things have gone the way of the dinosaur, Gilhooly notes, a real concern for scientists planning long-running trials. But the experience gave her great insight into what features go into a powerful weight-management app.

From the researchers’ perspective, they need to be able to access people’s diet logs remotely. They also require a level of dietary detail that may get lost when using consumer apps, such as details of a recipe, cooking method or micronutrient content not normally listed on food labels.

That’s why, for now, many nutrition researchers still rely on 24-hour recall of foods consumed, a standardized assessment often obtained through an in-person interview. Gilhooly suspects that as younger generations come through her research unit, they’ll expect to be able to keep track of all this information with their phones or tablets. But she foresees future dieters will struggle with many of the same issues today’s dieters do.

Whether analog or digital, food diaries are one of the most effective weight-loss tools we have, Gilhooly says. That’s despite the fact that the records always suffer from some degree of uncertainty—much of it human error, she says. And apps can keep

track only of what the user enters.

There are many reasons for people’s inaccuracy. We forget what we ate. We aren’t great at judging portions. We don’t know what’s in the food we’re eating or how to match foods to the ones in the apps’ databases.

“Restaurant foods are really tough with some of these apps,” Gilhooly says. “Some are adding more restaurant listings, but if you were eating right here in downtown Boston, not necessarily in a chain, that’s a much different story. How are you going to enter that when that food isn’t even in the food database?”

Still, the real trick, Gilhooly says, is getting people to keep records in the first place—and stick with it. So far, apps don’t have any better track record of changing behavior over the long term than any other kind of intervention.

“It’s very similar to the Weight Watchers story. People come and go,” says Gilhooly. “Finding ways to keep users engaged will be important to help with ongoing success.”

TIPPING POINT

Putting too much emphasis on an app’s diet and exercise tracking abilities may overlook the smartphones’ real advantage: connectivity.

“How do we get people to engage the program?” Lose It! CEO Teague asks. “How do we get them to stick with it? Mobile plus social is very interesting.”

Lose It!, like many of its competitors, allows its users to form groups with other users, whether they know them in real life or not. These apps also can link to Facebook pages or Twitter accounts so people can crow about their accomplishments to their existing social networks. “I can get positive feedback almost immediately,” says Teague. “That’s very strong reinforcement.”

Sacheck, the Friedman School professor, will be using social networking in her work to get school kids to exercise more. She’s found that one way to encourage kids to walk or run more is to set up an online competition between schools. “The social aspect is a big thing,” she says. “It has to be cool to engage in a healthy lifestyle.”

Anecdotally, Sacheck has seen it on her own Facebook page. She sees friends log miles run, 10K times beaten, Tough

Mudder obstacle courses completed—and then “the ‘Great Jobs!’ roll in from everywhere,” she says. “We all respond to that sort of positive reinforcement.”

Sacheck would also like to see the day when an app or fitness monitor not only tells a user what they’ve done, but suggests why and how they could do a little more. She’d like to see a diet-tracker notice that someone isn’t consuming dairy and then offer a web link to alternative sources of vitamin D. She’d also like to see a calorie counter congratulate people on their activity levels, and then suggest engaging in some higher-intensity workouts.

“The technology today is at the tipping point. Initially, it helps people’s awareness. But I think the novelty can wear off if there’s not going to be more to it,” Sacheck says.

And, of course, as useful as linking to the Internet would be for dieters and exercisers, it could be that smartphones’ most useful trick is why Alexander Graham Bell first invented phones in the first place—letting us talk to each other. Some apps are already moving in that direction.

Good Measures’ subscribers have the chance to interact in real time with dietitians and nutritionists who have access to users’ dietary logs. The unique arrangement allows people to use Good Measures’ technology to make all the changes they can on their own, and then take advantage of an expert’s help to make some of the bigger ones.

“We have people we work with who come to us already having learned insights from the app,” says Good Measures’ Stone. “It’s amazing how it forwards the conversation. Then their counseling session can be more focused on deeper behavior change needs.”

Maybe Good Measures’ model provides a glimpse into the future of health and fitness apps or apps in general for that matter. Their usefulness might lie less in compiling and providing information than in creating powerful connections among people.

“For any meaningful and sustained behavior change, you need not just the expertise of a registered dietitian, but of someone who cares and is supporting you along the way,” Widican says. “That human component is essential.” **TN**

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Friedman School Welcomes New Dean

Dariush Mozaffarian, cardiologist and public health researcher, calls nutrition “the greatest global priority” for the next two decades by Julie Flaherty

DARIUSH MOZAFFARIAN, A CARDIOLOGIST AND EPIDEMIOLOGIST whose research has illuminated the connections between lifestyle and heart disease and informed nutrition policy internationally, has been appointed dean of the Friedman School, the only graduate school of nutrition in the United States. He assumed the post on July 1.

Mozaffarian had been an associate professor in the Department of Epidemiology at the Harvard School of Public Health (HSPH), where he co-founded and co-directed the Program in Cardiovascular Epidemiology. He was also an associate professor in the Division of Cardiovascular Medicine at Harvard Medical School and Brigham and Women’s Hospital.

Mozaffarian says he is excited to lead a school that recognizes nutrition as “the greatest global priority for the next 20 years” in light of its impact on health, disability and the environment.

“This is nutrition’s time, and the Friedman School, in combination with all of Tufts’ nutrition efforts—such as those at the Jean Mayer USDA Human Nutrition Research Center on Aging (HNRCA), the medical school, the dental

school and Cummings School of Veterinary Medicine—makes Tufts a powerful place to study not only nutrition but policy,” he says.

In announcing the appointment, Provost and Senior Vice President David Harris describes Mozaffarian as a perfect fit for Tufts. “His work is a blend of nutrition science and policy in the U.S. and internationally. His research expertise, professional and personal experiences and perspectives make him uniquely qualified to lead the Friedman School and to be a university-wide leader in the area of nutrition,” he says.

The director of the HNRCA, Simin Nikbin Meydani, agrees: “He is a world-class scholar, a visionary and someone whom I look forward to partnering with to take nutrition at Tufts to the next level.”

William A. Masters, professor and chair of the Department of Food and Nutrition Policy at the Friedman School and a member of the dean search committee, says Mozaffarian will be a great leader.

“He has a clear vision for the Friedman School, for nutrition at Tufts and for how our research, education and outreach efforts can nourish the world,” he says. “His ambitions match our own. Our students, faculty, staff and partners around the world will benefit hugely from his leadership as we enter the next phase of the Friedman School’s growth and development.”

Mozaffarian has written or co-written more than 200 scientific articles about the diet and lifestyle factors that contribute to heart disease and stroke, which are the leading causes of death worldwide, as well as on diabetes and cognitive decline.



Dariush Mozaffarian

Throughout his career, he has used scientific evidence to inform nutrition policy, noting that providing basic nutrition advice to people, and relying on personal responsibility, hasn't been enough to improve public health. More recently, he has been collecting robust, quantitative evidence on the effectiveness and cost-effectiveness of various nutrition policy approaches.

"There is a gap between what the policymakers are doing and what the nutrition scientists know we should target," he says. "And to bring all that together is probably the most important task for health. We know enough now to have clear sets of dietary priorities and to know which policies we need to enact."

Mozaffarian's interests, like those of the Friedman School, are worldwide. As chair of the Global Burden of Diseases Nutrition and Chronic Diseases Expert Group, he led an

international team looking at issues of diet and chronic disease, including the first analysis of sodium intake of populations worldwide. They found that sodium intakes exceed recommended levels in almost all countries.

Mozaffarian has served on numerous committees and advisory boards for national and international organizations, including the World Health Organization, the U.N. Food and Agriculture Organization and the Chicago Council on Global Affairs. A fellow of the American Heart Association, he was a member of the association's task forces on reducing trans fats and sodium and was key in writing its 2020 strategic impact goals.

He received a B.S. in biological sciences from Stanford University, an M.P.H. from the University of Washington, an M.D. from Columbia University and a doctorate in epidemiology from the Harvard School of Public Health. He joined the HSPH

faculty in 2006, eventually co-founding the school's Program in Cardiovascular Epidemiology.

He is board-certified in internal medicine and cardiovascular medicine and is a fellow of the American College of Cardiology.

His wife, Rebecca Mozaffarian, N06, MPH06, earned a master's in Food Policy and Applied Nutrition from the Friedman School and an M.P.H. from Tufts School of Medicine.

Mozaffarian is the fourth dean of the Friedman School, which was founded in 1981. He succeeded interim dean Robin Kanarek, the John Wade Professor of Psychology in the School of Arts and Sciences and an adjunct professor at the Friedman School. Kanarek, a Tufts faculty member since 1977, also served as the dean of the Graduate School of Arts and Sciences from 2002 to 2007.

RIDING A FOOD FAD TO AN OPPORTUNITY

Until a couple years ago, Shaun Paul's knowledge of chia was limited to the kitschy terracotta Chia Pet figurines. But recently, chia seeds, promoted as a nutritional powerhouse, have earned a growing consumer following and a prominent place on the shelves of health food stores. Demand is so high, in fact, that Paul, a research fellow with Tufts' Global Development and Environment Institute, wondered if organic farmers in developing countries could use the chia craze as a way to bolster their livelihoods.

It would be an ironic return for an ancient crop. Chia originated in Mexico and Guatemala some 3,500 years ago, when the seeds were a staple food of the Mayans and Aztecs. The Spanish conquistadors, in attempting to squash the local culture, banned the indigenous peoples from eating it. Today chia is still grown in Guatemala, but mostly as an afterthought.

"The old-codger farmers throw some chia seed off next to their corn where the corn isn't growing," Paul says.

Elsewhere, farmers who treat it as a business have been well rewarded. Chia grows optimally within 15 degrees of the equator, and Paul reports that farmers in Mexico, Peru, Paraguay, Argentina and Australia have reaped annual returns of 150 to 350 percent on their investments.

Chia's fans describe it as a nutrient-packed "superfood," with some companies touting its health benefits as just short of magic. Marketing hype aside, chia does count as nutrient-dense: Two



tablespoons have about 10 grams of fiber, along with protein, iron, calcium, magnesium and zinc. It is also an excellent source of the omega-3 fatty acid ALA.

Because chia consumers tend to support sustainable agricultural practices, Paul traveled around Guatemala speaking with members of farmer cooperatives that are already organic-certified. Across the board, he found they were interested in diversifying their crops with something such as chia. "Many of these places are dependent on coffee, and there is a coffee blight running through the Americas," he says. "Some of these co-ops have lost 90 percent of their organic coffee crops."

The chia market is no small potatoes. Chia seeds are showing up as ingredients in everything from cherry lime drinks and chocolate peanut butter bars to gummy vitamins. One company that makes chia products, Nutiva, told Paul that it would be willing to place orders for up to 1,500 metric tons, enough to provide income to some 2,000 small farmers.

But is it a fad, or is it sustainable? Paul sees chia's popularity as indicative of two larger trends among consumers: a desire to eat foods that are naturally healthy and a preference for brands that benefit not only themselves, but other people and the planet. Paul doesn't see those trends ending anytime soon.

Diversity Council Issues Final Report

THE UNIVERSITY COUNCIL ON Diversity's final report, released in December, outlines specific measures to achieve greater diversity among the student body, faculty and staff and to ensure that Tufts promotes and embraces a culture that is welcoming to all.

Among the report's recommendations are hiring a chief diversity officer, increasing financial aid to attract and retain talented students who traditionally have not considered Tufts, examining curricula and other programs to make sure they support diversity and inclusion, and articulating more clearly how central these values are to Tufts' mission and vision.

The report stresses that fostering diversity and inclusion is the shared responsibility of the entire university community. "The council believes that Tufts is well positioned to be an institutional leader and live up to its values in these areas," the report states.

"Diversity drives excellence in our academic mission," says President Anthony Monaco, who established the Council on Diversity in early 2012 and underscored the importance of the initiative by chairing the group. "Having faculty, staff and students who come from different backgrounds and have different perspectives enriches everyone in our community."

A diverse campus environment, he notes, is equally essential to the success of Tufts graduates, who will live and work in an increasingly multicultural society.

The council, made up of faculty, staff and undergraduate and graduate students, consulted extensively with the wider Tufts community during its 18-month review. Joanne Berger-Sweeney, dean of the School of Arts and Sciences, served as council vice chair.

The group's work helped shape the university's strategic plan, "Tufts: The Next 10 Years," which the Board of Trustees approved in November. One of the plan's four major themes seeks to engage and celebrate commonalities and differences within the Tufts community, and the council's recommendations will help

advance those shared values, Monaco says.

The members of the council worked from a broad definition of diversity that encompasses many aspects of personal and group identity, among them race, ethnicity, socioeconomic status, religion, gender, cultural background and sexual identity.

Through focus groups and community engagement, surveys and quantitative research, three council working groups examined particular areas of the university experience—undergraduate

the university's last major fundraising campaign, Tufts still provides less financial aid than many of its peers. Related to affordability is the need to expand the so-called pipeline programs, reaching out to students who traditionally have not applied here. For instance, the School of Medicine recently started a program with the University of Massachusetts Boston to attract students who might not otherwise consider careers in medicine or biomedical research. The council's report calls for



"Having faculty, staff and students who come from different backgrounds and have different perspectives enriches everyone in our community," says Tufts President Anthony Monaco.

students, graduate and professional students, and faculty and staff. Joyce Sackey, dean of multicultural affairs and global health at the School of Medicine, chaired the Graduate and Professional Student Experience Working Group.

THE CASE FOR FINANCIAL AID

Recognizing that the cost of a Tufts education has a bearing on the university's ability to attract students from minority and other underrepresented groups, the council urges continued fundraising for scholarships and fellowships.

Despite the strong efforts made during

more such efforts.

Because faculty members play a key role in mentoring students, the council says the diversity of the faculty should more closely mirror that of the student body. "Study after study shows that providing a supportive and welcoming environment for students helps them achieve, and not having that kind of environment impairs their full achievement," says Berger-Sweeney.

"At Tufts, diversity and excellence must be inextricably linked," Monaco says. "Only then can we achieve our collective potential as a community." To read the full report, go to president.tufts.edu/strategic-initiatives/diversity.

Rooted in the Local

Businesswoman helps sustainable farming program thrive by Catherine O'Neill Grace

TRISHA PÉREZ KENNEALY AND NASRIN MOROVATY COME TO THE FARM-to-table movement from different directions, but they share a mission: providing locally sourced, environmentally sustainable produce to Massachusetts diners.

“My connection with Tufts is through the New Entry Sustainable Farming Project,” says Kennealy, who opened the Inn at Hastings Park in Lexington, Mass., last winter.

New Entry is a joint project of Tufts’ Friedman School of Nutrition Science and Policy and Community Teamwork Inc., based in Lowell, Mass. The program works with people of limited resources who are interested in small-scale commercial agriculture. The organization provides a range of training, from marketing to land access to crop management, and runs a community-supported agriculture program (CSA) to distribute the farmers’ products.

For the past three years, Kennealy has helped organize a spring fundraiser for Tufts’ New Entry that highlights locally grown food. This year, she donated a one-night stay and dinner at her new inn to be auctioned at the event. All money raised supports the organization’s Farm Fresh Food for All initiatives, including one that enables people receiving Supplemental Nutrition Assistance Program (SNAP) benefits, often referred to as food stamps, to purchase a CSA share at half price.

Kennealy, who spent her early childhood in Puerto Rico before moving to Lexington, has an M.B.A. from Harvard. She left a successful career as an investment banker to train at Le Cordon Bleu culinary school in London. As a

chef and a mother of three, she is committed to knowing where the food she serves comes from.

“I’m Puerto Rican,” she says. “In their backyard, my grandmother and grandfather had avocados, coffee, guavas and bananas. It was a moveable feast.” She wants everyone to have a similarly direct connection with the food on their table.

Groups like New Entry have led to a renaissance of interest in agriculture, Kennealy says. New Entry is working nationally to get other farm incubator programs started.

“In New England, we have such a vibrant history related to agriculture,” she says. “I’m trying to support local farmers. What I admire most about New Entry is that they really understand the science *and* the art of agriculture.”

Kennealy and executive chef Matthew Molloy have been connecting with New Entry as they develop menus for the inn’s restaurant, Artistry on the Green. That means meeting local farmers like Nasrin Morovaty, who came to the United States from Iran with her husband on a student visa in 1977. After the revolution in their country, they remained in the U.S. and have raised their daughter here.

Having completed New Entry’s farm business planning course, Morovaty does small-scale farming at the organization’s incubator training farm in Dracut, Mass. She grows herbs, such as Thai basil, sage, mint, oregano and summer savory, as well as beets, salad greens, eggplant and other crops. “There are so many edible things that can be grown sustainably,” she says. “I want to teach people that there is more to eat than lettuce.”

Through supporting New Entry, both as a business owner and a donor, Kennealy says, “I want to make a commitment to people who are developing the agricultural skills that are so needed in our community.”



New Entry Sustainable Farming Project farmer Nasrin Morovaty, left, and Trisha Pérez Kennealy, owner of The Inn at Hastings Park



**Megan Lehnerd, N14,
at a farmers market in
Government Center**

Fresh Ideas for Promoting Produce

Block Scholar wants to make healthy eating affordable for everyone by Kathy Hubbard

MEGAN LEHNERD, N14, WANTS TO IMPROVE community health by making fresh fruits and vegetables available and affordable for everyone. This summer, she's studying whether offering coupons for healthier snacks will encourage more kids to avoid the usual sugary treats.

With Associate Professor Sean Cash, Ph.D., Lehnerd is working on a community-based health intervention called CHOMPS (Coupons for Healthier Options for Minors Purchasing Snacks). The coupons are being distributed in partnership with Shape Up Somerville—a Tufts initiative for preventing childhood obesity that got schools, families and the community involved in changing kids' eating habits and physical environment—and Somerville convenience stores that children and teens visit often.

A graduate of the Friedman School's Agriculture, Food, and Environment program, Lehnerd co-led a program that teaches nutrition and gardening to third-grade classes in Boston's Chinatown

neighborhood. She also partnered with the Boston Collaborative for Food and Fitness as part of her Albert Schweitzer Fellowship, which supports graduate student projects that address health disparities in vulnerable communities. At the Codman Square Farmers Market, she promoted Boston Bounty Bucks, which encourages people from underserved communities to purchase fresh produce at farmers markets.

None of these efforts would have been

grant support for her studies.

"The Friedman School is unique in how it looks at all the aspects that feed into nutrition and creating better food systems," Lehnerd says. "Thanks to the Block Scholarship, I was privileged in being able to continue my education, and I am working to pay that forward."

As a member of the 2014 class gift committee, Lehnerd asked classmates for donations to the class gift, which supports

The scholarship supports students committed to working in direct service to U.S. communities.

possible without the scholarship Lehnerd received. Funded by Ellen H. Block, BSOT66, chair of the Friedman School's Board of Advisors, the scholarship supports outstanding master's degree students who are committed to working in direct service to U.S. communities after graduation. Lehnerd has been accepted into the Friedman School's doctoral program and is working to identify

student financial aid and community-building activities within the Friedman School. "As a beneficiary of philanthropy, I see great value in bringing students together to contribute to the success of future classes," she says. "Uniting to provide support through the class gift helps to show that we valued our experience at Friedman enough to give back to future classes."

Commencement 2014

Chef Jody Adams says the way to people's stomachs is through their hearts

THE THOUGHT OF OVEN-FRESH, WHOLE-WHEAT BREAD AND SUCCULENT lamb filled Cohen Auditorium on Tufts' Medford/Somerville campus as award-winning chef Jody Adams gave the address at the 33rd commencement ceremony of the Friedman School on May 18.

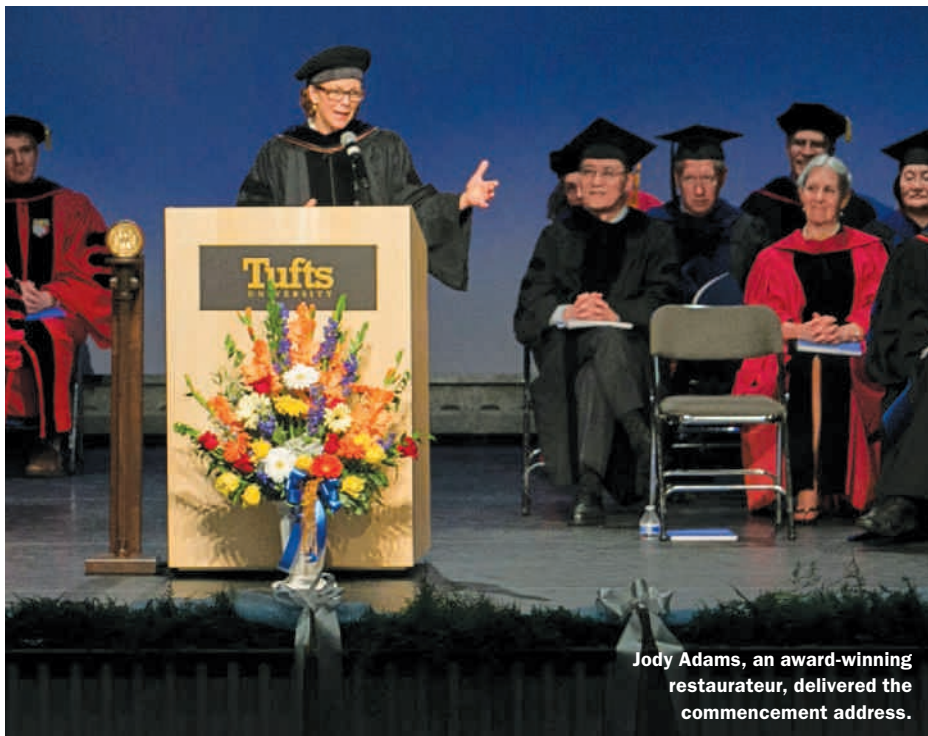
Adams, who owns the Boston restaurants Rialto and Trade and is known for her commitment to hunger relief, touched on some of the memorable recipes in her career as she told the 99 graduates to follow their passion and keep learning. (The whole-wheat bread, for instance, is from a recipe she created specifically for a hospital in Haiti after the 2010 earthquake.) She talked about exiting her comfort zone when she competed on the television show "Top Chef Masters," where she scrambled to create dishes out of unexpected ingredients—including a giant clam and the frozen leg of a mature goat—to impress celebrated food critics. "Do the things that scare you—again and again and again," she said.

Adams said that although the graduates know way more about nutrition science and policy than she does, she could offer one piece of advice as a chef and restaurateur. "Food affects people's hearts—their sense of who they are—as much as it does their stomachs," she said. "Ask yourself, does what you're doing take note of that? Speaking from experience, I can assure you—if you don't include the one, you'll never reach the other."

Blanche Ip, N12, N14, one of 11 Friedman School graduates receiving a doctoral hood this day, gave the class address.

"When I started at Friedman, I prided myself on being independent and self-sufficient," she said. But she soon realized that figuring out the appropriate scientific questions to ask, and then answering them, was going to mean asking for guidance from both her professors and her classmates.

"I hope you have taken a lesson from Friedman on the importance of working together as a team, just like the gut microbiome," she said, referring to the trillions of microbial cells that live in our digestive



Jody Adams, an award-winning restaurateur, delivered the commencement address.



system and work with the human body to help govern our health. “Convergence is a new paradigm that can yield critical advances in a broad array of sectors, from health care to food, agriculture and water. Let us all collaborate, converge, embrace and make a difference.”

Earlier in the day, at the university-wide commencement ceremony, Anne-Marie Slaughter, a former Princeton University dean and U.S. State Department official, was the keynote speaker at Tufts’ 158th commencement. A work life without time for family and friends and pleasure and play is an unfulfilled life, she told the more than 3,400 graduates.

In addition to Slaughter, Tufts President Anthony P. Monaco presented honorary degrees to James M. Lawson Jr., an architect of the American civil rights nonviolence movement; Jill Lepore, J87, the David Woods Kemper ’41 Professor of American History at Harvard and a staff writer at *The New Yorker*; Haruki Murakami, the Japanese novelist who has been praised for his work as a writer and translator; and James A. Stern, E72, A07P, a financier and philanthropist who is chairman emeritus of the Tufts Board of Trustees.

At left: Victoria Diaz-Bonilla Callaway received a master’s degree. Below, Tawanda Muzhingi, N08, N14, left, received his doctoral hood from Guangwen Tang.



Alumni and friends had fun posing in the photo booth. At left, Meaghan Pierannunzi, N14; Barbara Patterson, N14; and Zoe Schweitzer, N14

At right, clockwise from top left, Hilde Steffey, N05; former faculty member Kathleen Merrigan; Colleen O’Brien, N05; Gabrielle Serra, N05; and Anna Herforth, N05



Lindsay Peterson, N10; Catherine Wright, N11; and Lesley Sykes, N11

REUNION MOMENTS

The All-Alumni Reunion on April 4 and 5 honored Sai Krupa Das, N02, who received the Leadership and Expertise Award; Amy Myrdal Miller, N97, recipient of the Nutrition Impact Award; Linda Eckerbom Cole, N06, who received the Leah Horowitz Humanitarian Award; and Interim Dean Robin Kanarek, who was given a Service to the School Award. In her keynote address, Kathleen Merrigan, former U.S. Deputy Secretary of Agriculture and former director of the Agriculture, Food and Environment program, offered high praise, saying, “There is nothing I am more proud of in all my accomplishments through my career than my students who are doing great things.”

Exciting Changes



THIS PAST SPRING BROUGHT MANY EXCITING CHANGES FOR THE FRIEDMAN SCHOOL and the Alumni Association. Some are changes that we look forward to each year, such as the induction of the graduating class to the Alumni Association and new membership on the association's Executive Council. Others are special occurrences, such as the appointment of Dariush Mozaffarian, a cardiologist and public health researcher, as the fourth dean of the Friedman School.

With the Alumni Association firmly established in its 10th year, we are better positioned than ever to help Dean Mozaffarian achieve his vision for the school. The association's leadership team, the Executive Council, comprises a dedicated array of alumni who have experienced tremendous success in their careers. As president of the Alumni Association, I aim to embrace this diversity of expertise and professional experience to help connect students and alumni as we transition into a new and exciting era for the school.

Like my predecessors, Liz, Suzanne, Sai and Abby, I am passionate about the Friedman School. I believe we all share in the responsibility to build, maintain and promote the school's reputation. With this in mind, I hope you will take an active role in the Alumni Association so that we can create a stronger, more connected network to support the professional pursuits of current Friedman students. If you would like to become more involved or have suggestions regarding alumni programming, please feel free to contact me at ashao@herbalife.com. I look forward to seeing you at Alumni Association events and programs.

Sincerely,

ANDREW SHAO, NOO
PRESIDENT, FRIEDMAN SCHOOL ALUMNI ASSOCIATION

Keep in Touch with Us

THE FRIEDMAN SCHOOL

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

Like us on Facebook, and if you are an alum, faculty member or student, join the Friedman School Alumni Association Group Pages on www.facebook.com and www.linkedin.com.

Send a class note to:
nutrition-alumni@tufts.edu

THE HNRCA

Stop by our Web pages for news, recent research findings, upcoming events and information on how to volunteer for research studies.

Like us on Facebook at www.facebook.com/JMHRCA and follow us on Twitter at twitter.com/JMHRCA.

Current and former HNRCA employees can join our groups on www.linkedin.com.

Reach us at:
HNRCA-Communications@tufts.edu.

Alumni ALUMNI.NUTRITION.TUFTS.EDU **Friends** NUTRITION.TUFTS.EDU/FRIENDS **HNRCA** HNRCA.TUFTS.EDU

N85 Alicia Karas, V89, an assistant professor at Cummings School of Veterinary Medicine at Tufts and head of the Pain Consultation and Referral Service at the Foster Hospital for Small Animals, presented a daylong series of lectures at the American Animal Hospital Association conference in Nashville, Tenn., on March 22. Her lectures included “Comfort, Calming and Communication: It Isn’t Just About Drugs” and “Assessing Acute Pain in Dogs and Cats.”

N96 Lisa Freeman, J86, V91, head of the nutrition service at the Cummings School of Veterinary Medicine at Tufts, attended the North American Veterinary Conference in Orlando, Fla., in January and lectured on “Getting Started in Pet Therapy,” “Assessment of Quality of Life in Heart Failure” and “Mythbusters: Answering Owners’ Common Questions about Pet Food.”

N97 Amy Myrdal Miller is the 2014 recipient of the Nutrition Impact Award given by the Friedman School Alumni Association.

N00 En-Pei Isabel Chiang is the 2014 recipient of the E.L.R. Stokstad Award, which recognizes scientists for outstanding fundamental research in nutrition.

Andrew E. Shao, president of the Friedman School Alumni Association and vice president for global product science and safety at Herbalife in Torrance, Calif., has been appointed an ex-officio member of the Board of Advisors to the Friedman School.

N01 Silvina Choumenkovitch

moderated an alumni career panel titled “Careers in Nutrition Science” on February 26. The other panelists were **Jennifer Buell, N03, N08; Virendar Kaushik, N09; Deborah Kennedy, N93, N03;** and **Taylor Salinardi, N12.**

N02 Sai Krupa Das, N02, is the 2014 recipient of the Leadership and Expertise Award given by the Friedman School Alumni Association.

N03 Deborah Kennedy, see N01.

N05 Charlotte Block, see N08.

N06 Linda Eckerbom Cole is the 2014 recipient of the Leah Horowitz Humanitarian Award given by the Friedman School Alumni Association.

N08 Jennifer Buell, see N01.

Dustin Burnett writes that one of his studies, “Improved Metabolic Health Alters Host Metabolism in Parallel with Changes in Systemic Xenometabolites of Gut Origin,”

was published in January in the online journal *PLOS One*.

Rachel Cheatham, N05, N08, moderated an alumni career panel titled “International Policy” on April 4. The other panelists were **Charlotte Block, N05; Linda Eckerbom Cole, N06;** and **Julie MacCartee, N11.**

Cindy Mari Imai finished her Ph.D. in February at the University of Iceland and continues to enjoy the Icelandic landscape as a nonstudent.

Saah N’Tow has moved to Liberia, where she works for the government as a member of the president’s Cabinet. She serves as deputy minister of youth development at the Ministry of Youth and Sports.

N09 Virendar Kaushik, see N01.

N11 Jesse Appelman is now a farm-policy research associate freelancer at the Cornucopia Institute.

Alanna Eisenberg and her husband, Ben, announced the arrival of their daughter, Avery Solene Eisenberg, on October 15, 2013. The family is happy, healthy and discovering their new world every day.

Julie MacCartee, see N08.

N12 Katie Andrews and her husband, Mike, welcomed their son, Benjamin Derek Gionfriddo, on March 13, 2014. She reports that he is already an early riser, like his mom, and an avid Boston sports fan, like his dad.

Taylor Salinardi has a new job at Arbor Pharmaceuticals as a medical science liaison.

N13 Perrin Braun is a health policy analyst for the Commonwealth of Massachusetts.

TUFTS DEGREE ABBREVIATIONS

A:	Liberal Arts Undergraduate
BSOT:	Boston School of Occupational Therapy
G:	Graduate School
J:	Jackson College
L:	Sackler School of Graduate Biomedical Sciences
M:	Medical School
MPH:	Master of Public Health
N:	Friedman School
P:	Parent of a Student
V:	Cummings School of Veterinary Medicine



NEW TO ALUMNI RELATIONS

Kelly Melcher has joined the Friedman School as the associate director of alumni relations, working with the Alumni Association Executive Council to foster alumni engagement around the globe. Before joining Tufts in February, Melcher spent six years at Jumpstart, which serves preschool children in low-income neighborhoods; she designed, launched and directed its national alumni network. In addition to her extensive experience managing volunteers, she was a Peace Corps volunteer and is an AmeriCorps alum. She is a graduate of the University of Rochester and a native of Cornville, Maine. (Yes, she thinks it’s a ridiculous name, too.) You can reach her at kelly.melcher@tufts.edu.



Waste Not

Americans waste about 35 million tons of food every year—enough, by some estimates, to fill the Rose Bowl every day. Discarding food squanders natural resources and hurts the environment, as rotting food in landfills is a significant source of methane, a potent greenhouse gas. It squanders money, too: An average family of four throws out between \$1,500 and \$2,400 worth of food annually.

That last number is apt to motivate people to start thinking about less wasteful ways to shop and cook. Katrina Brink, N13, took it as a starting point for her Denver-based business, The Empowered Kitchen (www.empoweredcooking.com).

Brink offers cooking classes that use healthy, seasonal recipes and focus on saving money and reducing waste. Food waste, she says, is an issue that affects both the developed and the developing world—but for very different reasons. In the developing world, the problem is primarily one of distribution: The food that is grown can't get to the people who need it.

In developed countries like the U.S., however, food is tossed all along the line—from less-than-perfect produce left in the field or that grocery stores can't sell, to uneaten food on restaurant plates, to the “forgotten” food that goes bad in our refrigerators. “I refer to the crisper drawer as the place where vegetables go to die,” she says.

Brink offers her classes through community-education venues around Denver, as well as in people's homes and at workplace events. A summer class, for example, might focus on easy salads, chilled soups or no-bake lasagna—recipes that can be prepared quickly on a hot evening and will efficiently use a week's worth of produce with little waste. Some tricks: saving scraps to make stock, making pesto from the leftover bits of vegetables, and turning bread ends into bread crumbs.

“A lot of it comes down to menu planning, buying smaller amounts of things, knowing how to store different kinds of fruits and vegetables,” she says. In other words: putting the “crisp” back in the crisper.

—HELENE RAGOVIN

THE EMPOWERED KITCHEN WILL OFFER A CLASS ON JULY 22 THROUGH THE TUFTS UNIVERSITY ALUMNI ASSOCIATION. VISIT TUFTSALUMNI.ORG/EVENTS-REUNIONS/CALENDAR/ FOR MORE INFORMATION.



Nutrition scientist,
Proud alumna,
Engaging professor,
Dr. Diane McKay.

You may have heard Diane on NPR or seen her quoted in *Good Housekeeping*, *Scientific American*, or *U.S. News & World Report*. Diane McKay's research has made her an authority on the role nutrients play in promoting health, as well as on the effects of antioxidant-rich foods and beverages like hibiscus tea, walnuts, and cranberry juice.

As a nutrition scholar and Friedman School alumna, she's at the top of her field. More important, she's a great teacher, known for engaging students both in the classroom and online (nutrition.tufts.edu/certificates).

Your generous gifts make our work possible by supporting nutrition research on aging and advancing nutritional well-being. To make your contribution to the Friedman School, visit nutrition.tufts.edu/givenow2.

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THE WAR ON WHEAT

We have been warned by best-selling books that eating wheat makes our bellies fatter and triggers diseases ranging from diabetes to autism. But nutrition experts, the American Heart Association and the Dietary Guidelines for Americans all recommend regular consumption of whole grains, including whole wheat. So do the best-selling authors know something that these experts don't? For more on the story, turn to page 10.