

# Teaching Kitchens in the Learning and Work Environments: The Future Is Now

Global Advances in Health and Medicine  
Volume 9: 1–9  
© The Author(s) 2020  
Article reuse guidelines:  
sagepub.com/journals-permissions  
DOI: 10.1177/2164956120962442  
journals.sagepub.com/home/gam



David M. Eisenberg, MD<sup>1</sup>  and Anthony Imamura, BEnvD<sup>2,3</sup>

## Abstract

The learning and working environments of today's hospitals and health systems are designed to predict, diagnose, treat, and manage disease. However, the food environments in these settings are often extraordinarily unappealing, unhealthy, and can adversely impact the well-being of health professionals. What if future health-care sites were designed as showrooms of the most appealing and nutritious foods? What if future cafeterias included ventilated "Teaching Kitchens" as extensions to the everyday "grab and go" check-out lines? What if health-care providers, trainees, staff, and community members had access to foods that were healthy, delicious, affordable, sustainable, and easy to prepare? Most importantly, what if health professionals learned to make these healthy, delicious recipes as part of their required training? "See one, do one, teach one" could become, "See one, taste one, make one, teach one". Teaching Kitchens could serve as both learning laboratories and clinical research centers, whereby teaching kitchen curricula could be tested, through sponsored research, for their impact on behaviors, clinical outcomes, and costs. What if spaces adjacent to Teaching Kitchens were designated "Mindful Eating Spaces," where self-selected patrons could enjoy a "Culinary Feast alongside a Technological Fast" in an effort to carve out a brief oasis of mindful, resilience-building reflection during any given day? This article describes the rationale for and necessary components of such a futurist "Teaching Kitchen" within future working and learning environments. Importantly, if and when Teaching Kitchens are built within health-care settings, they may serve as catalysts of personal and societal health enhancement for all.

## Keywords

teaching kitchens, culinary medicine, learning environment, working environment, wellbeing, food is medicine

Received August 4, 2020; Revised September 3, 2020. Accepted for publication September 9, 2020

## Food in the Health-care Environment: A Puzzling Paradox

Today's health professionals learn and work in environments guided by science and technology. They serve as translators and curators of an ever-evolving biomedical and clinical enterprise. Their offices, hospitals, schools, and research institutes are cathedrals of innovation, with expanding portfolios of medical, surgical, radiological, and genetic tests and therapeutic interventions. These are their "currency". In short, our health-care learning and working environments tend to be venues built to predict, diagnose, treat, and manage disease with increasing accuracy and effectiveness. At their best, they perform these services with extraordinary care, sensitivity, and empathy.

Why then, do these same valued centers of disease prevention, treatment, and management serve some of

the most unappealing, unappetizing, and toxic foods in human history? Let us not forget 3 facts: 1) At the top of the list of leading risk factors for deaths in the United States is the category of "dietary risk"<sup>1</sup>; 2) Both patients and their health-care providers eat every day. Usually 3 or more times per day; and 3) There is ample evidence that a medical provider's personal behaviors (e.g., not

<sup>1</sup>Department of Nutrition, Harvard T.H. Chan School of Public Health, Boston, Massachusetts

<sup>2</sup>Culinary Medicine, MedStar Health, Washington, District of Columbia, USA

<sup>3</sup>Culinary Arts & Design, MedStar Health, Washington, District of Columbia, USA

### Corresponding Author:

David M. Eisenberg, Department of Nutrition, Harvard T.H. Chan School of Public Health, Boston, MA 02115, USA.

Email: deisenbe@hsph.harvard.edu



smoking or quitting smoking, exercising regularly, wearing sunscreen, etc.) are among the strongest predictors of how that same health-care professional will proactively counsel their patients about these same behaviors.<sup>2</sup> As such, what if health-care learning and working environments provided the best food; what if these settings were conceived of as showrooms of delicious, health-enhancing, affordable, and sustainable foods? What if health-care practitioners were trained—and required—to showcase competencies in advising patients on what to eat more of or less of and why and, importantly, how to predictably change their patients' eating and lifestyle habits for the better? What if our learning and working environments modeled healthy, sustainable, and mindful eating practices; would this not have benefits for both health professionals and staff as well as the patients and communities they serve? We all eat. Why not model, teach, and study innovative practices whereby patients, medical professionals, and staff build, showcase, and perpetually refine radically new, appealing- and health promoting-food environments?

### **Teaching Kitchen: An Essential Learning Laboratory**

This article describes a prototypical “teaching kitchen” envisioned as a “learning laboratory” to be incorporated into any hospital, medical or public health school, allied health school, university, college, or large medical/surgical/community health setting. (Note: The same “teaching kitchen” prototype can, and should, be considered for incorporation into schools as well as corporate and other nonhealth-care settings.)

“Teaching kitchens” are learning environments that include a kitchen; however, they are more than culinary instruction sites. Teaching kitchens typically include instruction in most, if not all, of the following areas: 1) nutrition education, specifically what to eat more of or less of and why; 2) hands-on culinary instruction—basic cooking skills for the home cook; 3) information about physical activity and its critical importance in health optimization; 4) mindfulness and its critical relationship to diet, portion control, satiety and resilience; 5) the judicious use of web-based resources and technologies; and 6) motivational interviewing strategies and health coaching techniques whereby personal motivations can be identified and leveraged to successfully induce sustained behavioral change. As such, “teaching kitchens” to be built in future learning and working environments include a kitchen; however, supplemental instruction in exercise, nutrition education, and/or behavior change are individually viewed as necessary but insufficient skills to optimally promote health and wellness. As envisioned, Teaching Kitchens serve as real or virtual life

skills learning laboratories intended to promote health and wellness. All of the abovementioned components of teaching kitchens can be taught within a designated teaching kitchen space, with the possible exception of selected physical activity demonstrations. Alternatively, teaching kitchens can be primarily used for experiential culinary instruction in parallel to didactic (or experiential) presentations relating to exercise, mindfulness, nutrition science, and/or behavior change strategies.

The notion that teaching kitchens can and should be incorporated into hospitals and other healthcare settings was proposed in 1998 by David Eisenberg. He discussed this aspiration with the Chairman of the Department of Nutrition at the Harvard T.H. Chan School of Public Health, Dr Walter Willett, and with the Dean of Culinary Education at the Culinary Institute of America, Mark Erickson. This discussion led to the creation of a continuing medical educational conference entitled “Healthy Kitchens, Healthy Lives: Caring for Our Patients and Ourselves” ([www.healthykitchens.org](http://www.healthykitchens.org)). In this 3-day conference, which has been offered annually since 2006, health professionals receive state-of-the-science updates with respect to nutrition, diet, and lifestyle (including exercise, mindfulness, motivational interviewing, and behavior change strategies) as these relate to disease risk and management. Attendees observe chef educators translate nutrition science into demonstrations of healthy, delicious, affordable, sustainable, easy-to-prepare recipes from an international range of ethnic cuisines with more than 300 recipes tasted. They participate in hands-on cooking classes intended to prove that these same basic culinary skills are within their reach and that they should not be intimidated in trying to make healthy, delicious meals for themselves and their families. All of which can enable clinicians to better advise their patients regarding practical steps to enhance health, wellness, and quality of life.

### **Is a Teaching Kitchen Curriculum Effective in Improving Health and Behaviors?**

Between 2013 and 2015, educational components of the annual Healthy Kitchens, Healthy Lives Conference were distilled into a prototype “teaching kitchen curriculum” by researchers at the Harvard T.H. Chan School of Public Health and the Culinary Institute of America. This curriculum was offered to a population of non-health professionals in the form of a prospective, HIPAA (Health Insurance Portability and Accountability Act)-approved observational trial. The goal was to test the hypothesis that by teaching individuals (in this case nonchef employees of the Culinary Institute of America) how to eat, cook, move, and think more healthfully, sustained changes could be

achieved in 1) self-care behaviors, for example, diet, exercise, stress management and 2) biomarkers including weight, blood pressure, lipids, blood sugar control, and so on. This study<sup>3</sup>, published in 2015, involved 2 cohorts of 20 study subjects per cohort. These groups met weekly for 2.5 hours during which time they observed technique-driven, recipe-inspired culinary demonstrations. In addition to the weekly culinary demonstrations and tastings, classes also involved didactic and experiential instruction relating to 1) mindfulness, 2) exercise, 3) use of web-based resources, 4) behavioral change strategies along with personalized health coaching. In addition, subjects met in a working “teaching kitchen” every other Saturday morning for 4.5 hours. During these hands-on cooking sessions, subjects learned the cooking techniques observed over the prior 2 weeks. As an example, 1 week focused on salads and dressings, another on whole grain preparation, another on soup or vegetable preparations, and so on. The entire educational intervention lasted a total of 16 weeks and subjects were followed for a total of 12 months. The results included decreases in observed blood pressure, weight, waist circumference, and lipids at 4 months, and these were sustained at 6 months. Subjectively, study participants felt “liberated” and “more in control” than at any other point in their lives. Study authors asked each subject to write a personal statement about their experience at the end of the study. One study graduate stated, “I relate my story to Dorothy’s from *The Wizard of Oz*. She had her red shoes the whole time, giving her the choice and ability to go home whenever she was ready. I too had the red shoes, and this program showed me that I could make healthy living changes whenever I was ready.” Study authors concluded that a teaching kitchen curriculum is feasible and may improve behavioral and clinical outcomes.<sup>3</sup>

At least 3 additional clinical trials, one based at the Cleveland Clinic<sup>4</sup> published in 2011, another based at McGill University<sup>5</sup> published in 2012, and a third based at Tulane University<sup>6</sup> published in 2015 also suggest that teaching kitchen curricula which combine nutrition education with hands-on culinary instruction and behavioral change strategies can predictably alter behaviors, biomarkers, and clinical outcomes across a variety of patient populations, clinical, and geographic settings. Moreover, other reviews have concluded that (a) the association between cooking skills and diet quality has been established<sup>7–10</sup> and (b) additional prospective studies are warranted.<sup>11–15</sup>

### **Establishment of the Teaching Kitchen Collaborative**

At the 2015 “Healthy Kitchens, Healthy Lives” Conference, the audience of 425 was asked if any in

attendance had built or soon would build a teaching kitchen within their respective medical (or nonmedical) organization. More than 100 registrants raised their hands. This observation catalyzed the establishment of the Teaching Kitchen Collaborative (<https://teachingkitchens.org/>), an invitational network of hospitals, medical schools, colleges, universities, corporations, and community-based organizations with teaching kitchens, representatives of which have voluntarily met on a regular basis to (a) share emerging models of teaching kitchens along with specific successes and challenges within each model; (b) work on the co-creation of best practices with regard to both the facilities and curricular content of emerging teaching kitchen models; and (c) coalesce as a de facto research network to build, test, refine, and document the impact of teaching kitchen curricula on the behaviors, clinical status, and costs of care for a variety of stakeholder populations served by Teaching Kitchen Collaborative members. Importantly, the Teaching Kitchen Collaborative which is currently composed of 33 members with teaching kitchens (29 nonprofit members and 4 corporate sponsors) oversees the training of patients, employees, health professionals, health professionals in training, for example, medical, nursing, nutrition students; K-12 students; college and university students; inner city teens; children and families; veterans; and others, all of whom appear to benefit from customized teaching kitchen curricula based on the same core elements, namely, nutrition education, hands-on culinary instruction, exercise prescription, mindfulness training, and health coaching. The fact that many of the Teaching Kitchen Collaborative’s teaching kitchens have been established within high visibility hospitals, for example, Boston Medical Center, Providence Milwaukie Hospital, University of Texas School of Public Health, MaineGeneral Health, and 125 VA hospitals; health systems, including Cleveland Clinic, Kaiser Permanente and MedStar Health in metro-Washington, D.C.; community settings including the YMCA (Young Men’s Christian Association) and the Free Library of Philadelphia and Turner Farm in Cincinnati; and in corporate settings, for example, Google, Barilla, and the Compass Group, suggest that teaching kitchens can be viewed as shared educational assets which are increasing in number both nationally and internationally. Teaching Kitchens are being developed as learning laboratories for a wide array of at-risk populations.

### **Collaborations Between Architects, Chefs, and Health Professionals to Design Optimal Teaching Kitchens**

A previously unexplored challenge and opportunity relates to the question of whether and how a teaching kitchen can be built within an existing or new hospital,

medical school, corporate worksite, or community setting. One approach may be to consider a collaboration involving architects and chefs (or architects with dual training as chefs) to design a teaching kitchen within an existing cafeteria; or, in a soon-to-be-built cafeteria in a health-care setting. (See Figures 1 and 2 for photos of representative examples of existing built-in, mobile and “pop-up” teaching kitchens within hospitals, health systems, corporate worksites, and community settings.)

If we consider cafeterias within most hospitals, universities, corporate worksites, and community settings, the majority consist of “grab-and-go” enterprises, with food offerings of variable quality, predicated on the desire to feed people what they want, to be fast and convenient, and to turn a modest profit. Importantly, most hospital, corporate, and school cafeterias are vacant much of the time. This extraordinary excess capacity can be put to better use, as current and future cafeterias could become ideal venues for teaching kitchens in working and learning environments.

What if cafeterias within hospitals, worksites, and schools were built as showrooms of healthy, delicious,

affordable, sustainable, easy-to-prepare foods? What if every cafeteria included a teaching kitchen demonstration area and, ideally, multiple hands-on cooking stations where physicians, students, patients, staff, and the community could learn why and how to prepare nutritious, delicious recipes? The same dishes taught in the teaching kitchen could be showcased for regular consumption by all patrons in these same cafeterias. What if the patrons provided their feedback to select those healthy, delicious recipes which were not only popular but also which could and should be included within each local teaching kitchen curriculum? What if teaching kitchens built as “extensions” of hospital cafeterias were also used as clinical research centers whereby patients and/or study subjects meeting entry criteria (eg, being overweight, obese, pre-diabetic, diabetic, etc.) could be recruited and engaged in educational interventions and followed over time to assess sustained changes in behaviors, biomarkers, clinical outcomes, and costs?

One of the necessary missing links within this futuristic scenario relates to the need for a ventilated ceiling of any teaching kitchen within an existing cafeteria situated



**Figure 1.** Built-in Teaching Kitchens at Hospitals and Universities.



**Figure 2.** Mobile and Pop-up Teaching Kitchens in Community, Corporate, Health Care, and University Settings. **Stanford:** Photo credit: Keith Uyeda / Copyright: 2020 R&DE. **Veterans Health Administration:** Photo credit: Caitlin Robson, RD from the Cincinnati VAMC.

in a hospital, university, or corporate/community cafeteria space. This is essential for safety purposes. Happily, architectural prototypes of ventilated ceilings which push and pull air into and out of teaching kitchen facilities already exist. However, none of these air handling systems have, as of yet, been situated within a cafeteria of an existing hospital, worksite, college, or university. This is not to say this cannot be done.

### Imagining Future Hospitals, Schools, and Community Centers as Sites for Healthy Eating and Modeling of a Culture of Health and Aligning Financial Incentives to Make This Possible

The proposition here is for a forward-thinking CEO, university president, medical school dean, YMCA

benefactor, or governmental official to build or retrofit a cafeteria within their current learning and working environment and to create a ventilated ceiling across a portion of that cafeteria space. If and when this occurs, this teaching kitchen prototype, as an extension of a cafeteria, could 1) be the learning laboratory where health-care communities learn how to shop for and easily prepare healthy, delicious, affordable meals; and 2) be used as a translational research laboratory whereby patients (or others as “study subjects”) are invited to alter their existing eating patterns, improve their cooking habits, movement and exercise routines, and other self-care practices so they could be formally studied within a sponsored research protocol. Such research studies could assess changes over time in behaviors, cardiovascular, microbiotic and genetic biomarkers, clinical outcomes and costs; and the overhead from sponsored research in these areas could theoretically pay for the buildout

and continued operation of a novel, ventilated-ceiling teaching kitchen within a medical learning and working environment. As such, teaching kitchens can serve as both “learning laboratories” and as functioning clinical research centers capable of hosting- and funding- a broad range of sponsored research programs and studies.

In addition, the most well-received recipes made available within hospital cafeteria-based teaching kitchens could be included in the hospital’s on-demand dining menus and be made available for pick up by staff as they finish their workday. It is also interesting to envision the option of prepping the ingredients for these popular dishes, so that employees and staff who attend teaching kitchen classes could then pick up these prepped ingredients as they leave work, and go home to cook and eat with their families (thereby eliminating the need for any “meal-in-a-box” retail alternative). Studies can be designed to test whether this approach will enhance employee satisfaction along with employee productivity, health, and wellbeing.

Currently, physicians and allied health professionals, with the exception of registered dietitian nutritionists,

are not required, as part of their training or licensing examinations, to demonstrate clinical competence with respect to advising patients about diet, exercise, or stress management skills.<sup>16–18</sup> For nearly a century, we have had anatomy laboratories to educate health professionals about anatomy, biochemistry laboratories to educate trainees about biochemistry, and more recently, computer laboratories to educate students about information technology. Why not insist on the inclusion of Teaching Kitchens in hospitals and health professional schools to educate health professionals about nutrition and practical advice to patients about shopping, cooking, and eating more healthfully?

Importantly, these futuristic teaching kitchens can and should be situated adjacent to a designated “mindful eating space,” where cellphones and voices are silenced during a mindful moment of eating. A space where, to paraphrase the Buddhist teacher, Thich Nhat Hanh, “When you eat, just eat.” A space within our otherwise overstimulated learning and working environments where an individual can enjoy a momentary “culinary feast” alongside a “technological fast” to re-establish balance and enhance



**Figure 3.** Mindful Eating Spaces, Harvard T.H. Chan School of Public Health and University of Western States.

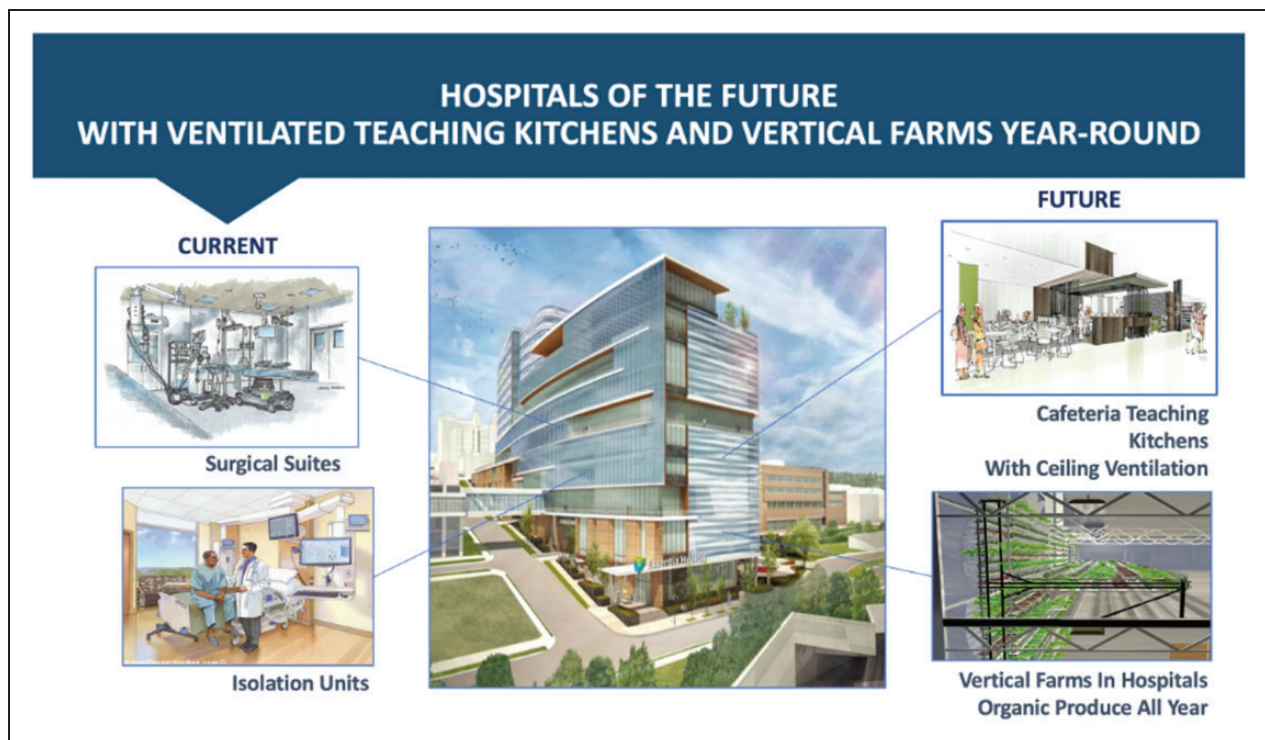
resilience during a given workday. Importantly, such “mindful eating spaces” already exist. See Figure 3 for examples of the mindful eating spaces at the Harvard T. H. Chan School of Public Health and the new campus of the University of Western States in Portland, Oregon.

Existing and future hospitals, universities, and corporate worksites all require extensive air handling capacities. Those daring enough to contemplate a cafeteria with a ventilated ceiling could utilize these existing ventilation systems to incorporate teaching kitchens and vertical farms whereby many of the consumable vegetables, produce, and herbs could be grown 365 days a year in a controlled and pesticide-free environment (see Figures 4 and 5 for architectural illustration examples of hospitals of the future).

Given the realities of the current COVID pandemic, there are several unforeseen truths which bring a sense of urgency to an exploration of this futuristic, aspirational design of a teaching kitchen within our hospitals, medical schools, and clinical worksites. First, poor nutrition, obesity, hypertension, and diabetes lead the list of risk factors not just for increases in cardiovascular morbidity and mortality but also COVID-related morbidity and mortality. Second, the recent pandemic has exposed the shortcomings of our national food supply system and the need to rethink how foods are grown, processed, subsidized, shipped, priced, and delivered across the

health-care ecosystem. Third, an estimated 40% of pre-COVID restaurants nationwide will likely close permanently<sup>19</sup> and the future “restaurant landscape” is unlikely to showcase, or be focused on, the provision of healthy, delicious, sustainable, local, seasonal foods. Fourth, the NIH recently published its 10-year strategic plan with respect to nutrition research,<sup>20</sup> and there have been calls for the establishment of a new Federal authority for robust cross-governmental coordination of nutrition research and other nutrition-related (federal) policy.<sup>1</sup> Finally, as we move, inexorably, from a fee-for-service reimbursement model to a capitated, “pay for performance” reimbursement model, Teaching Kitchens will become highly valued assets.

So, what if our future learning and working environments include teaching kitchens as educational classrooms, as learning laboratories, as revenue-generating clinical research centers, and as showrooms of health-promoting, delicious, affordable, sustainable, easy-to-prepare foods for all? What if these healthcare-of-the-future citadels showcase nutritious, delicious, sustainable foods along with state-of-the-art diagnostic and therapeutic innovations? Who said these were incompatible? They certainly are not. They simply have never been put together before. And, in truth, some magical pairings, such as chocolate and peanut butter, were simply meant to be experienced together.



**Figure 4.** Envisioning Future Hospitals with Central Air Handling Systems to Power Surgical Amphitheatres, Isolation Units, Teaching Kitchens And Vertical (Aka “Urban”) Farms.



**Figure 5.** Hospitals of the Future as Treatment Centers and Showrooms of A Culture of Health and Sustainability.

Which forward-thinking health-care leaders will have the courage and commitment to invest in a learning and working environment that includes spectacular food and an appreciation of mindfulness alongside its routine cafeteria, and on-demand (in-patient) menu offerings?

We and the communities we serve all eat. Why not eat more healthfully, but with no less pleasure, and teach the next generation of health professionals and the public to do the same?

Steven Kay, one of the acknowledged inventors of the internet, is quoted to have said, “The best way to predict the future is to invent it.”

Let us see who is willing to go first.


#### **Declaration of Conflicting Interests**

The author(s) declared the following potential conflicts of interest with respect to the research, authorship, and/or publication of this article: David Eisenberg, MD, is the executive director of the Teaching Kitchen Collaborative; co-director of the Harvard-CIA Healthy Kitchens, Healthy Lives educational conference; scientific adviser to Campus for Health, LTD, Japan; scientific adviser to Cookpad, Inc., Japan; scientific adviser to Better Therapeutics, Inc.; and a member of the Health and Wellness Advisory Board of Barilla, Inc., Italy.

#### **Funding**

The author(s) received no financial support for the research, authorship, and/or publication of this article.

#### **ORCID iD**

David M. Eisenberg  <https://orcid.org/0000-0002-6822-0857>

#### **References**

1. Fleischhacker SE, Woteki CE, Coates PM, et al. Strengthening national nutrition research: rationale and options for a new coordinated federal research effort and authority. *Am J Clin Nutr.* 2020;112(3):721–769.
2. Frank E. Physician health and patient care. *JAMA: J Am Med Assoc.* 2004;291(5):637.
3. Eisenberg DM, Righter AC, Matthews B, Zhang W, Willett WC, Massa J. Feasibility pilot study of a teaching kitchen and self-care curriculum in a workplace setting. *Am J Lifestyle Med.* 2017;13(3):319–330.
4. Ricanati EHW, Golubić M, Yang D, Saager L, Mascha EJ, Roizen MF. Mitigating preventable chronic disease: progress report of the Cleveland clinic’s lifestyle 180 program. *NutrMetab.* 2011;8(1):83.
5. Dasgupta K, Hajna S, Joseph L, Da Costa D, Christopoulos S, Gougeon R. Effects of meal preparation training on body weight, glycemia, and blood pressure: results of a phase 2 trial in type 2 diabetes. *Int J Behav Nutr Phys Act.* 2012;9(1):125.



6. Monlezun DJ, Kasprovicz E, Tosh KW, et al. Medical school-based teaching kitchen improves HbA1c, blood pressure, and cholesterol for patients with type 2 diabetes: results from a novel randomized controlled trial. *Diabetes Res Clin Pr.* 2015;109(2):420–426.
7. Mills S, White M, Brown H, et al. Health and social determinants and outcomes of home cooking: a systematic review of observational studies. *Appetite.* 2017;111:116–134.
8. Seguin RA, Aggarwal A, Vermeulen F, et al. Consumption frequency of foods away from home linked with higher body mass index and lower fruit and vegetable intake among adults: a cross-sectional study. *J Environ Public Health.* 2016;2016:1–12.
9. Wolfson JA, Bleich SN. Is cooking at home associated with better diet quality or weight-loss intention? *Public Health Nutr.* 2015;18:1397–1406.
10. Hartmann C, Dohle S, Siegrist M. Importance of cooking skills for balanced food choices. *Appetite.* 2013;65:125–131.
11. Polak R, Phillips EM, Nordgren J, et al. Health-related culinary education: a summary of representative emerging programs for health professionals and patients. *Global Adv Health Med.* 2016;5(1):61–68.
12. Polak R, Tirosh A, Livingston B, et al. Preventing type 2 diabetes with home cooking: current evidence and future potential. *Curr Diab Rep.* 2018;18:99.
13. Reicks M, Trofholz AC, Stang JS, Laska MN. Impact of cooking and home food preparation interventions among adults: outcomes and implications for future programs. *J Nutr Educ Behav.* 2014;46(4):259–276.
14. Reicks M, Kocher M, Reeder J. Impact of cooking and home food preparation interventions among adults: a systematic review (2011–2016). *J Nutr Educ Behav.* 2018;50(2):148–172.e1.
15. Hasan B, Thompson WG, Almasri J, et al. The effect of culinary interventions (cooking classes) on dietary intake and behavioral change: a systematic review and evidence map. *BMC Nutr.* 2019;5(1):1–9.
16. Eisenberg DM. Nutrition education in 2040—an imagined retrospective. *J Graduate Med Educ.* 2015;7(3):489–491.
17. Eisenberg DM, Burgess JD. Nutrition education in an era of global obesity and diabetes: thinking outside the box. *Acad Med.* 2015;90(7):854–860.
18. Aspary, KE, Horn LV, Carson JAS, et al. Medical nutrition education, training, and competencies to advance guideline-based diet counseling by physicians: a science advisory from the American heart association. *Circulation.* 2018;137(23):e821–e841.
19. Kaufman MS, Goldberg LG, Avery J. Restaurant revolution: how the industry is fighting to stay Alive. Harvard Business Research for Business Leaders, Harvard Business School. <https://hbswk.hbs.edu/item/restaurant-revolution-how-the-industry-is-fighting-to-stay-alive>. Accessed July 29, 2020.
20. National Institutes of Health. 2020-2030 strategic plan for NIH nutrition research. May 2020. <https://www.niddk.nih.gov/about-niddk/strategic-plans-reports/strategic-plan-nih-nutrition-research>. Accessed July 29, 2020.