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"Teaching Kitchens": from nutrition and lifestyle coaching to culinary medicine

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Abstract

Healthy eating is a key element to a healthy life, it is crucial to good health and it is part of a correct lifestyle. Professionals in Nutrition Science, Health Care and Culinary Arts share their expertise and findings in nutritional studies during the conference "Healthy Kitchens, Healthy Lives®", and have recently built a network named the Teaching Kitchen Collaborative. During the Healthy Kitchens, Healthy Lives educational meeting, faculty members from Harvard's T.H. Chan School of Public Health, Harvard Medical School, and other leading institutions provide the state of the science on diet and nutrition, exercise, mindfulness practice, behavioral change strategies and health coaching. In sum, this conference offers the opportunity to learn about foods that can reduce the risk for health problems, about strategies to fight obesity and ways to replace unhealthy habits. It also includes practical cooking demonstrations intended to translate the relevant science. This conference also provides health professionals with practical advice for their patients. In addition, the new "Teaching Kitchen Collaborative", also developed by faculty from Harvard and the Culinary Institute, may lead to the development of a research network whereby this information and these skills are routinely offered to the lay public.

Grandma was right: "we are what we eat". And since the dawn of time, humans have fawned over grandma's recipes. Cooking is the practice of preparing food by combining, mixing, and heating ingredients. The process of cooking yields food that is safe to eat, that is healthy and that guarantees reproductive fitness in humans. The ability to cook food proved to be a transformative motor of human evolution. Most probably, cooking made us humans[1]. Since the discovery of fire, culinary art has been open to everybody, and it has represented a central column of human culture. Over the centuries, healthy cooking and healthy eating have forged human families, built communities, prevented wars and diseases. Cookbooks cemented the unity of entire nations – as in the case of the book *"Science in the kitchen and the art of eating well"*, published in 1891 by the Italian gastronomist Pellegrino Artusi[2]. Culinary art is not restricted to an elite clientele in top chef restaurants. The skill set required for the choice of the right ingredients and for the practice of cooking can be acquired by everybody. As noted by Pellegrino Artusi, there is science and a well-established knowledge base in the kitchen, and eating well is something that everybody can enjoy by practicing cooking. The fathers of modern-day medicine highlighted the importance of food and diet in clinical and preventive medicine. The Greek physician Hippocrates of Kos (460 BC-370 BC) is often quoted with "*Let food be your medicine, and medicine be your food*". Galen of Pergamon (129-216) understood the dynamics and physiology of nutrition, digestion, and absorption. He described the effects on the health of a range of food and he wrote a guide to a healthy diet that influenced profoundly the field of medicine[3]. Interestingly, in Galenic medicine, the term 'diet' encompasses also the concept of lifestyle and wellness: not just food and drink but also physical exercise, baths, massage, and climate.

Avicenna (980-1037), who wrote "*The Canon of Medicine"*, indicated the principles of a healthy and balanced nutrition[4] - principles that became rules in the Ottoman Empire. The ancients noted that excessive consumption of food or beverages along with a lack of physical activity could be harmful. In Hippocratic times this was a rare condition, and the treatment strategy was simple, as exemplified by the aphorism: "*Disease which results from over-eating is cured by fasting*". During the last century, technologic and economic advancements have led to significant increases in food supply, food consumption and sedentary lifestyles in several countries. Industrial processing has enabled the mass production of highly palatable foods (and "food-like substances") that contain large amounts of sugars and solid fats. These foods stimulate an appetite that is not sufficiently counterbalanced by satiation, leading to excessive food intake[5-7].

On one side, these foods frequently lack important nutrients and vitamins, such as omega 3 fatty acids and vitamin D – and diminished dietary intake could account for an increased risk for autoimmune diseases[8,9]. On the other side, consumption of sugars and solid fats has largely exceeded dietary needs in a significant fraction of the human population.

Obesity and Diabetes are becoming more and more threatening, and the numbers of newly diagnosed patients are growing at an epidemic rate[10]. Healthcare costs are rising sharply as a result of unbalanced diet and lifestyle choices. In the last 50 years, diabetes prevalence has shifted from 1% to 9.3% of the U.S. population, with a cost estimated to be more than $245 billion per year[11,12]. Worldwide, 1.5 billion people are overweight (Body Mass Index, BMI≥25.0 kg/m^2) and 500 millions of them are classified as obese (BMI≥30.0 kg/m^2)[13]. There is scientific evidence that overweight individuals tend to have more health problems and a shorter life expectancy than average-weight persons; those who are overweight since younger ages are at an even increased risk[14].

In a study carried out in the year 2000, the USA and the UK were identified as the two developed nations with the highest rates of obesity. France and Italy, at that time, were found to have a significantly lower prevalence of obese individuals. One possible explanation, the authors proposed, may relate to each culture's time spent cooking. The study showed that, on average, an Italian citizen spent 19 minutes more per day cooking compared to an American or an English citizen[15]. Cooking can certainly make people healthier and it definitely has an essential role in people's lives.

Consuming food not prepared at home has been linked to an unhealthy diet and weight gain[15-17]. Between 1986 and 2012 a study by Dr Zong and colleagues monitored 96,000 individuals over more than a decade (for a total of 2.1 million person/years of follow-up) and showed that consuming meals prepared at home (MPAH) was associated with a lower risk of gaining weight and developing type 2 diabetes (T2D)[18] over time. T2D incidence was identified through self-report methodology and confirmed using a validated supplementary questionnaire. The study found that participants eating 5 to 7 midday MPAH per week had 9% lower T2D risk than those with 0 to 2 midday MPAH per week. Participants having 5 to 7 evening MPAH per week had 15% lower T2D risk than those with 0 to 2 evening MPAH per week. Participants eating 11 to 14 MPAH per week showed a 14% lower weight gain compared to those eating 0 to 6 MPAH per week[18,19].

Consuming meals prepared at home can thus be considered a positive lifestyle choice. But why is it that so many in the general population choose not to prepare meals at home? Although convenience and costs should be taken into consideration, a possible cause for this may also relate to a growing absence of cooking skills. "Culinary literacy", it can be argued, is at an all-time low in the US and is simultaneously decreasing across much of the world.

Therefore, teaching people how to cook means offering them the tools to fight overweight while enhancing their wellbeing and reducing their long-term risk of chronic disease. Learning what to cook and how to cook it is a key step to feeling well and being healthy[20].

The "Healthy Kitchens, Healthy Lives®" (HKHL) conference was created in 2006 by faculty leaders from The Culinary Institute of America and the Harvard T.H. Chan School of Public Health, Department of Nutrition. The intention of this conference is to bring together medical, public health, and culinary experts in a collaborative effort to educate health professionals about food and cooking; and, to educate culinary experts about nutrition science and its implications in designing and providing healthier menu options. This confe-

rence is an occasion to build novel ideas and skills relating to nutrition science, cooking, exercise, mindfulness training and health coaching[21].

The conference aims to teach how to choose the right ingredients, how to combine them appropriately, and how healthy diet and preparation techniques ultimately affect all populations, adults, and children. Since 2006 the conference has taken place 12 times, and more than 5000 professionals have attended it so far.

The participants are tutored by demonstrators from the Culinary Institute of America (C.I.A.), who offer practical demonstrations on how to prepare healthy meals and how to use specific foods for a healthy diet[22].

The conference is ideal for healthcare and culinary professionals and for all those who are interested in nutrition science combined with strategies for selecting, preparing, and enjoying a variety of health-promoting foods and beverages.

During the course, participants are instructed on fundamental nutritional principles, such as: choosing healthy carbohydrates, proteins, and fats; choosing healthy beverages; creating weekly menus; using the Harvard Healthy Eating Plate as a model for meal planning; reducing sodium intake and being mindful of portion size[22].

The program includes information about the differences between the American cuisine and other international cuisines, such as Asian, Latin American and Mediterranean, all of which have examples of nutritious, easy to make, inexpensive yet delicious recipes. It highlights how important healthy cooking is, particularly if combined with regular exercise. Participants learn how to identify reliable and misleading information related to nutrition from different sources, including online journals, newspapers and the food industry, in order to become nutritionally responsible and aware. Teaching – through practical demonstrations in the kitchen – what to cook, and how to make these dishes oneself is an essential part of the conference, as the medical literature is full of examples where a physician's personal behaviors have been shown to be the strongest predictors of that physician's advice to his or her patients about these same behaviors, e.g. vaccination, not smoking, wearing seatbelts, wearing sunscreens, etc[23,24].

Nowadays many people eat mindlessly, and it is likely that this behavior also contributes in a substantive way to obesity and overweight. Mindless eating, especially when it involves fat-rich, hyper-processed foods, predictably leads to obesity, cardiovascular diseases, and type 2 diabetes[25,26]. Therefore, nutritional awareness, ideally gained through mindfulness practice, may translate into lower risks of diseases linked to sub-optimal eating habits[27].

Mindfulness training, now increasingly popular and available, has the potential to help individuals become more aware of what they eat and accomplish weight loss and/or weight maintenance by reducing unhealthy eating habits[27,28].

U.S. academic institutions such as Georgetown University, Stanford University, the University of Cincinnati and Oregon Health Sciences University are offering mindfulness training as part of their medical education[29].

From its inception, the conference's founder, Dr. David Eisenberg, envisioned a time when health professional would build "teaching kitchens" to be used as learning laboratories in hospitals, medical and allied health schools, and health delivery systems (as well as k-12 schools, university campuses, corporate worksites and community venues). After participating in the HKHL conferences over time, many alumni of the conference were inspired to create their own prototype "teaching kitchens". According to surveys of attendees in both 2015 and 2016, more than 30% of the participants at both annual conferences confirmed that their host organizations had built or soon would build a teaching kitchen[22]. For this reason, the "Teaching Kitchen Collaborative" was established by The Culinary Institute of America and the Harvard T H Chan School of Public Health in 2016.

A total of 26 organizations became founding members in 2016, and the Collaborative increased its members to 32 in 2017. The list of current university, healthcare, corporate and community-based members is presented in Table 1. This initiative was made possible thanks to the philanthropic support of the Sampson Foundation of Pennsylvania, the Peter Alfond Foundation of Maine, and the Meshewa Farm Foundation of Cincinnati. Additional support has been provided by member-grantors, including Google, The Compass Group of North America, and Barilla/Barilla Center for Food and Nutrition. The Teaching Kitchen Collaborative seeks to develop (1) best practices; (2) strategies whereby teaching kitchens can be

Table 1. List of current university, healthcare, corporate and community based members of the Teaching Kitchen Collaborative.

Name	Location	Member Type
Barilla and Barilla Center for Food & Nutrition (BCFN) Foundation	Italy	Member-Grantor
Compass Group, North America	Charlotte, North Carolina	Member-Grantor
Google, Inc.	Mountain View, California	Member-Grantor
Harvard University	Cambridge, Massachusetts	Founder/Leader
The Culinary Institute of America	Hyde Park, New York	Founder/Leader
Boston Medical Center	Boston, Massachusetts	Member
Cleveland Clinic	Lyndhurst, Ohio	Member
Dartmouth-Hitchcock Culinary Medical Program	Lebanon, New Hampshire	Member
Hackensack Meridian Health Network	New Jersey	Member
Kaiser Permanente San Francisco Medical Center	San Francisco, California	Member
L.A. Kitchen	Los Angeles, California	Member
MaineGeneral Health	Augusta, Maine	Member
Northeastern University	Boston, Massachusetts	Member
Northwell Health	New Hyde Park, New York	Member
Northwestern University	Chicago, Illinois	Member
Oregon Health and Science University and Providence Milwaukie Hospital	Portland, Oregon	Member
Palo Alto Medical Foundation	Palo Alto, California	Member
Princeton University	Princeton, New Jersey	Member
Stanford University	Stanford, California	Member
Turner Farm, Inc., in collaboration with University of Cincinnati	Cincinnati, Ohio	Member
University of California, Berkeley	Berkeley, California	Member
University of California, Los Angeles	Los Angeles, California	Member
University of California, San Diego Health System	San Diego, California	Member
University of California, San Francisco	San Francisco, California	Member
University of Minnesota	Minneapolis, Minnesota	Member
University of New Hampshire	New Hampshire	Member
University of South Carolina School of Medicine Greenville	South Carolina	Member
University of Texas Medical Branch and Osher Lifelong Learning Institute, Galveston	Galveston, Texas	Member
University of Vermont Medical Center	Burlington, Vermont	Member
Vanderbilt University Medical Center	Nashville, Tennessee	Member
YMCA of Greater Pittsburgh – Sampson Family Branch	Pittsburgh, Pennsylvania	Member

formally evaluated for their impact on health behaviors, health outcomes, and costs; and (3) multi-site demonstration projects whereby teaching kitchen prototypes can be replicated, scaled and assessed for their proposed cost-effectiveness. Importantly, among the populations of highest interest to the Teaching Kitchen Collaborative are adults and children with increased risk for chronic disease, including persons with pre-diabetes, type 1 or type 2 diabetes, and those with metabolic syndrome and other diet and lifestyle related diseases.

Unlike the "Healthy Kitchens, Healthy Lives" educational conference for health professionals and chefs, the Teaching Kitchen Collaborative aims to teach the lay public essential life-skills at the level of the individual and the community. Teaching these skills across a range of populations, including patients, students, corporate employees, and retirees is expected to be beneficial at both a personal and societal level.

Medical professionals and health educators who attend the annual Healthy Kitchens, Healthy Lives conferences and/or work with forward thinking members of the Teaching Kitchen Collaborative obtain tools and develop skills to utilize when giving nutritional advice and instructions to their patients. This represents a new approach to health care education and practice. Much needed and anticipated research in this area will further define the value of these new initiatives. Doctors, nutritionists, and politicians who become familiar with these programs may be better positioned to impact positively the health of various populations and the future of our communities[30].

"Healthy Kitchens, Healthy Lives®"
Conference Website:
http://www.healthykitchens.org/

"Teaching Kitchen Collaborative"
Website:
http://www.tkcollaborative.org/

Teaching Kitchen Collaborative Co-Chairs and Coordinator

- **David Eisenberg**, MD, Director of Culinary Nutrition and Adjunct Associate Professor, Department of Nutrition, Harvard T.H. Chan School of Public Health; Co-Director, Healthy Kitchens, Healthy Lives Conference (Teaching Kitchen Collaborative Co-Chair).
- **Greg Drescher,** Vice President – Strategic Initiatives and Industry Leadership, The Culinary Institute of America, Co-Director, Healthy Kitchens, Healthy Lives Conference (Teaching Kitchen Collaborative Co-Chair).
- **Allison Righter,** MSPH, RDN, Faculty – CIA Culinary Science Department (Teaching Kitchen Collaborative Coordinator).

Conflict of Interests:

The Authors declare that they have no conflict of interests.

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