



International Conference “Food Values”

The Renaissance of the Mediterranean Diet and Significance for a 21st Century World
Casina Pio IV, Vatican City - February 14th, 2017

Introduction

On February 14th 2017 conference speakers and guests from a broad range of backgrounds including the scientific community, the media, politics, food production and culinary arts and education met to discuss and debate the value we place on our food, in the context of increasing recognition of the importance of traditions and food quality to ensure health and sustainability as we witness an urgent modern crisis of chronic disease and obesity in much of the world.

The objective of this one-day conference, presented with the gracious hospitality of the Pontifical Academy of Sciences, Vatican City, presided over by His Excellency Msgr. Marcelo Sanchez Sorondo was to reaffirm the link between natural, sustainable food and the health of individuals and communities. The value of food must relate to our respect for heritage, cultures and the preparation of meals and the effect on nutrition, enjoyment and health. There is increasing evidence that societies - where the cost, and indeed perceived value of food is falling with increased availability and industrialisation - are experiencing an increased burden of chronic illness and obesity.

Over the last few decades a considerable body of evidence has been published demonstrating the relationship between diet and health. Many studies have evaluated the associations between food groups, foods or nutrients and diseases, and a consensus about the role of nutritional factors in the aetiology of common diseases such as cardiovascular and neoplastic diseases has gradually emerged. The Mediterranean diet has been extensively reported to be associated with a favourable health outcome and a better quality of life. However, despite the increasing evidence about benefits on health, recent data indicate that adherence to this eating pattern is decreasing, including in the Mediterranean regions, particularly among children and adolescents. Modern societies need to reaffirm the link between natural, sustainable food and the health of individuals and communities.



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The "old ways" which value food as an essential and central part of life are to be promoted, rather than viewing food as an abundant convenience, to be bought as cheaply as possible and consumed in large quantities - refuelling in busy lives- causing obesity and chronic illness. The Conference objective was to acknowledge the link between food quality, processing, cultural traditions and health/wellbeing using the Mediterranean diet as the most established example and to reaffirm and celebrate the vital links between what we eat and our wellbeing, as well as describing the potential cost of failure to value food and its place in a sustainable and healthy world. The value of heritage diets such as the Mediterranean diet is finally becoming understood, and it is vital that this enlightenment results in a renaissance of such traditions for people around the world and passed to future generations.

This is an opportunity to reawaken peoples' relationship with what they eat in the environment in which they live and significantly improve their health and quality of life.



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Programme

OPENING SESSION

9:30 H.E. Msgr. Marcelo Sánchez Sorondo | *Word of Welcome*

9:45 Paolo Pasquali | *Introduction*

FOOD AND HEALTH

The science of the Mediterranean lifestyle

Chairperson: Simon Poole

10:00 David L. Katz | *Food and health in the modern world – the cost of convenience*

10:40 Francesco Sofi | *Mediterranean diet for health and beyond*

11:00 Francesco Visioli | *Beneficial components of the Mediterranean diet*

11:30 Stefano Benedettelli | *Ancient grains and health: from land to fork*

12:00 Antonia Trichopoulou | *Health, culture and sustainable environment: the Mediterranean diet paradigm*

12:30 Discussion

12:45 Lunch at the Casina Pio IV

FOOD TRADITIONS AND CULTURAL HERITAGE

Valuing the old in the modern world

Chairperson: Paolo Pasquali

14:00 Giorgio Locatelli | *Food and stories: inspiring people to value cooking*

14:30 Greg Drescher | *Menus of changes: advancing plant-forward food cultures*

15:00 Jean-Xavier Guinard | *Sensory properties of foods – olive oil as an example of values and taste*

15:30 Sara Baer Sinnott | *Encouraging old ways and tastes in the new world*

16:00 Discussion

FOOD VALUES

The urgent need for a new approach

Chairperson: Francesco Sofi

16:30 Daniele Del Rio | *Food & nutrition education and communication: the road to the future*

17:00 Fabrice DeClerck | *Sustainable food for future*

17:30 Simon Poole | *Inspiring a renaissance in food values*

18:00 Discussion

18:30 H.E. Msgr. Marcelo Sánchez Sorondo & Paolo Pasquali | *Concluding Remarks*



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PRESIDENT OF THE CONFERENCE

• **H.E. Msgr. Marcelo Sánchez SORONDO**
Chancellor, Pontifical Academy of Sciences, Vatican City

LIST OF PARTICIPANTS



Ms. Sara Baer Sinnott

• *President of the Oldways, Boston, U.S.*



Prof. Stefano Benedettelli

• *Associate professor of Plant Genetics, University of Florence, Italy*



Mr. Fabrice DeClerck

• *Programme Leader, Agrobiodiversity and Ecosystem Services Programme, Biodiversity International*
• *Leader of the Ecosystem Services and Resilience Research Theme, WLE*



Prof. Daniele Del Rio

• *Associate professor of Human Nutrition, University of Parma, Italy*
• *Scientific Director, Need for Nutrition Education/ Innovation Programme (NNedPro), Cambridge, U.K.*



Mr. Greg Drescher

• *Vice President - Strategic Initiatives and Industry Leadership of The Culinary Institute of America, U.S.*



Prof. Jean-Xavier Guinard

• *Professor and Sensory Scientist, University of Davis, California, U.S.*



Dr. David L. Katz

• *Founding Director of the Yale-Griffin Prevention Research Centre, Yale University, U.S.*



Dr. Paolo Pasquali

• *Mugello Cradle of Renaissance, Vicchio, Florence, Italy*



Mr. Giorgio Locatelli

• *Chef & Patron, Locanda Locatelli, London, U.K.*



Dr. Simon Poole

• *Physician, Author & Commentator, Cambridge, U.K.*



Prof. Francesco Sofi

• *Associate Professor of Clinical Nutrition, University of Florence, Italy.*



Prof. Antonia Trichopoulou

• *Head WHO Collaborating Centre for Nutrition and Health, Athens Medical School*
• *President Hellenic Health Foundation*



Prof. Francesco Visioli

• *Associate Professor of Human Nutrition, University of Padua, Italy*



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SCIENTIFIC COMMITTEE:

Dr. Paolo Pasquali, Dr. Simon Poole, Prof. Francesco Sofi

ORGANIZING SECRETARY:

Dr. Monica Dinu, Dr. Giuditta Pagliai, Prof. Francesco Sofi

ABSTRACTS

FOOD AND HEALTH IN THE MODERN WORLD - THE COST OF CONVENIENCE

David L. KATZ¹

¹ *Founder/President, The True Health Initiative, U.S.*

Diet is among the most powerful of influences on human health, for good or for ill. Dietary patterns at the level of populations have a major impact on every aspect of planetary health as well, from climate to biodiversity. While competing claims abound about diet and health, the simple truth is that a monumental volume of evidence, a global consensus of experts, and time-honored dietary traditions all converge to support the same fundamental theme of eating well.

This talk will explore the relevant evidence, and characterize that theme. The case will be made that we can love food that loves our health and the planet back. Among the best roads from here to there are those that lead to Rome and the dietary traditions of the Mediterranean region.



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MEDITERRANEAN DIET FOR HEALTH AND BEYOND

Francesco SOFI^{1,3}

¹Department of Experimental and Clinical Medicine, University of Florence, Italy, ²Unit of Clinical Nutrition, Careggi University Hospital, Florence, Italy, ³Don Carlo Gnocchi Foundation, Onlus IRCCS, Florence, Italy

The relationship between nutrition pattern and health has been studied intensively for over than half a century. Since first results coming from one of the landmark studies in this field, the Seven Countries' Study, the effect of nutrition on human health has been amply reported by many case-control, prospective cohort and randomized clinical trials, by providing evidence that diet may significantly affect the health state of the population. A correct dietary intake, associated with a correct lifestyle, may in fact contribute to the maintenance of a healthy status. Conversely, wrong dietary habits may favour the incidence of different chronic diseases. Despite a wide consensus on the goals of nutritional habits required to prevent such disease, many concerns are expressed on the ideal diet for the prevention of cardiovascular diseases, which remain the leading cause of death and disability among the industrialized countries. Numerous diets have been proposed to the attention but to date, only a Mediterranean-style dietary pattern showed consistent findings in terms of protection versus the major chronic degenerative diseases.

Over the last years, despite evidences on the beneficial effects of the single components of Mediterranean diet have been reported, research interest has been focused on the whole dietary pattern rather than on a single nutrient since individual analyses of nutrients and food can ignore important interactions between components of a diet and, more importantly, because people do not eat isolated nutrients. Therefore, dietary scores estimating the adherence to the Mediterranean diet have been operationalised and have been found to be associated with a reduction of overall mortality, cardiovascular diseases, hypertension and obesity. Recent meta-analyses have been published so far, by demonstrating that a higher adherence to Mediterranean diet is associated with a significant reduced risk of incidence and mortality from all causes and from cardiovascular, neoplastic and neurodegenerative diseases.

However, the existing literature is somewhat confusing and led to debates for different issues such as the measurement of the adherence to the Mediterranean diet, the use of a wide variety of dietary indices with various food components and the large heterogeneity across the studies. Very recently, we conducted an umbrella review, which, for the first time, estimated the association between adherence to Mediterranean diet and 34 different health outcomes including overall mortality, cardiovascular outcomes, cancer outcomes, cognitive disorders, metabolic disorders, as well as inflammatory parameters. The overall analysis comprised 12 meta-analyses of observational studies and 14 meta-analyses of RCTs, for a total population of over than 12,700,000 subjects. Most summary estimates yielded significant results, supporting the notion that a greater adherence to Mediterranean diet is associated with reduced risk of chronic diseases and overall mortality. Furthermore, meta-analyses of RCTs demonstrated that subjects allocated to a Mediterranean diet had, as compared with subjects following a control diet, better anthropometrical, metabolic and inflammatory risk parameters.



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BENEFICIAL COMPONENTS OF THE MEDITERRANEAN DIET

Francesco VISIOLI¹

¹*Department of Molecular Medicine, University of Padua, Italy*

Undernutrition is different from malnutrition in that the latter is characterized by excessive caloric intake coupled with insufficient micronutrient consumption. Several micronutrients are now being intensively investigated, but the vast majority of them are very often labelled as antioxidants. For sure, the near totality of epidemiological studies and several human trials show that an adequate micronutrient, e.g. vitamins, minerals, polyphenols, essential fatty acids intake is associated with positive modulations of surrogate markers of degenerative disease, notably cancer and cardiovascular disease.

However, solid scientific evidence of their ‘in vivo’ antioxidant activities is scant. So, how do micronutrients improve cardiovascular prognosis? Their mechanisms of action are manifold and include anti-oxidant, anti-inflammatory, and detoxifying activities. The latter, mediated by the nuclear factor erythroid 2-related factor 2 (Nrf2), probably plays a major role and provides grounds to the theory of hormesis, i.e. mild stress that triggers defence mechanisms even though human evidence is still lacking.

Inflammation is involved in the onset and maintenance of several degenerative diseases and, while useful in the short-term to fight infections and promote wound healing, a longer term anti-inflammatory action represents an important target for selected food components. Several enzymes involved in inflammation depend on cellular “peroxide tone”. Polyphenols and omega 3 fatty acids have been shown to exert anti-inflammatory actions, via multiple mechanisms of actions, which include interference with signal transduction and direct inhibition of pro-inflammatory enzymes.

Increasing evidence also suggests that polyphenols can modulate the microbiota in the large intestine, potentially acting as prebiotics, thus influencing the immune response and modulating some aspects of lipid metabolism.

In summary, despite the lay public’s perception, the beneficial activities of micronutrients are not limited to their antioxidant activity, but are also due to a variety of mechanisms, often interrelated. Whatever their precise mechanism of action, the general advice to the public to consume a balanced diet with plenty of vegetal products now rests on firm ground.



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ANCIENT GRAINS AND HEALTH: FROM LAND TO FORK

Stefano BENEDETTELLI¹

¹*Department of Agrifood Production and Environmental Sciences, University of Florence, Italy*

Consumed by billions of people, wheat (*Triticum spp.*) is the major staple food in many diets, providing a large proportion of the daily energy intake. It is a cereal grain derived originally from the Levant region, but is currently cultivated worldwide. In 2016, the global production of wheat exceeded 749 million tonnes, making it the second most-cropped cereal after maize. Within the context of a balanced diet, wheat represents a healthy source of multiple nutrients, dietary fibre and bioactive compounds, especially if consumed as a whole-grain. Regular whole-grain consumption has been extensively associated with reduced levels of the most relevant risk factors for cardio-metabolic diseases such as total and LDL-cholesterol, triglycerides, blood glucose, blood pressure and body mass index. Recently, a meta-analysis confirmed the association between the consumption of whole grains and a substantial and significant decreased risk for cardiovascular disease, cancer, and all cause and cause specific mortality.

The mechanisms by which wheat confers protective effects on human health are attributed to the physical properties and structure of grains (granular size of semolina, amount and type of fibre, quantity and quality of phytochemicals, amylose and amylopectin content). Given the increased worldwide mortality attributable to nutrient- or diet-related chronic diseases, over the last years, there is currently a great interest in improving wheat to ameliorate health potential. In particular, ancient wheat species have gained increasing attention since several studies have suggested that they could present a healthier and a better nutritional profile than modern wheats, by providing more vitamins, minerals and nutraceutical compounds. In addition, given that ancient varieties are cultivated with environmentally sustainable organic agriculture, and given the current concerns for environmental sustainability, these varieties may represent an alternative potential.

Although there is no precise definition, it is generally accepted that ancient wheat has remained unchanged over the last hundred years. In contrast, modern species have been extensively modified and subject to cross-breeding in what is commonly referred to as the “Green Revolution”. This term was developed to refer to a set of research and technological transfer initiatives that occurred between the 1930s and the late 1960s. The principle results of this revolution were the development of modern varieties characterized by higher yield, a reduced susceptibility to diseases and insects, an increased tolerance to environmental stresses, a homogeneous maturation (to optimize harvest) and a higher gluten content (to improve bread and pasta quality). Whilst these intensive breeding programs helped to increase production and technological quality, a concomitant decrease in genetic variability as well as a gradual impoverishment of the nutritional and nutraceutical properties of the wheat occurred, mainly determined by the complete replacement of ancient local breeds with modern varieties.



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HEALTH, CULTURE, AND SUSTAINABLE ENVIRONMENT: THE MEDITERRANEAN DIET PARADIGM

Antonia TRICHOPOULOU^{1,2}

¹Hellenic Health Foundation, Athens, Greece, ²WHO Collaborating Centre for Nutrition and Health, Athens Medical School, Greece

In purely descriptive terms, the traditional Mediterranean diet (Med Diet) is the dietary pattern prevailing among the people of the olive tree-growing areas of the Mediterranean basin before the mid-1960s, that is, before globalization made its influence on lifestyle, including diet. Med Diet is a highly diversified heritage, with variations from country, to ecosystem to culture. Although different they may be considered as variants of a basic Med Diet.

Med Diet has been documented to be a very healthy diet. The health attributes of this diet could be partly attributed to traditional foods, which this diet incorporates. The traditional Med Diet, however, is more than just a diet; it is a whole healthy lifestyle pattern that has been acknowledged by UNESCO in 2010 as an Intangible Cultural Heritage.

Med Diet has been acknowledged by the Food and Agriculture Organization of the United Nations (FAO) as an example of a sustainable diet in which nutrition, biodiversity, local food production and local culture are closely interconnected. The traditional Med Diet is considered as sustainable because it is inextricably linked to biodiversity, it includes a variety of food practices and food preparation techniques; its main food groups are beneficial to health; it reflects an adherence to culture and traditions; it instigates respect for seasonality; it contains foods less demanding in primary energy and has limited environmental impact, due to low consumption of animal products and thus a smaller water footprint and lower greenhouse gas emissions compared to other current dietary patterns. It is important to preserve the cultural heritage of the Med Diet as an outstanding resource of sustainable development, as it contributes to promoting local production and consumption, encourages sustainable agriculture and safeguards landscapes.

Despite being widely documented and acknowledged as a healthy diet Med Diet is paradoxically becoming less the diet of choice in most Mediterranean countries. The erosion of the Mediterranean diet heritage is alarming as it has undesirable impacts not only on health, but also on social, cultural, economic and environmental trends in the Mediterranean region.

The broader understanding of the many sustainable benefits of the Med Diet, can contribute to its revitalization by increasing its current perception from simply a healthy diet to sustainable lifestyle model.



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FOOD AND STORIES: INSPIRING PEOPLE TO VALUE COOKING

Giorgio LOCATELLI¹

¹*Chef & Patron, Locanda Locatelli, London, U.K.*

Many people overlook the value of the conviviality of food and the benefits this has on wellbeing. Over time there has been an increased loss of the “feel good factor” in modern food. This, in part, has come from the focus on diet being broken down into food types. We talk about gluten, dairy, protein, fat, sugar in conjunction with diet so regularly. These terms characterise discussions of diet more and more as increased focus is taken away from crucial ideas of the social nature of food which is key to the relationship between diet and wellbeing. More specifically our wellbeing can also be influenced by HOW we eat food.

The Mediterranean diet is not solely about the food being consumed and relationship it has to the environment but also the circumstances and surroundings in which it is eaten. We are able to calculate illnesses that can be influenced by diet such as diabetes and heart disease. However, it is very difficult to calculate the value in the conviviality of food and this is an area to which we must draw our attention.



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MENUS OF CHANGES: ADVANCING PLANT-FORWARD FOOD CULTURES

Greg DRESCHER¹

¹ *Vice President, Strategic Initiatives and Industry Leadership of The Culinary Institute of America, U.S.*

Five years ago, The Culinary Institute of America (CIA) in partnership with the Harvard T. H. Chan School of Public Health - Department of Nutrition launched its Menus of Change national leadership initiative in the United States (www.menusofchange.org). Designed to integrate the scientific evidence around optimally healthy food choices and environmental sustainability - together with critical culinary and business insight - this initiative provides a roadmap for innovation for a growing number of American chefs and U.S.-based foodservice companies, large and small. A related initiative, co-led by The Culinary Institute of America and Stanford University, The Menus of Change University Research Collaborative, is accelerating change in that sector in partnership with 30 leading American colleges and universities. The Menus of Change Principles of Healthy, Sustainable Menus and Annual Report both highlight the value of culturally-based models of healthy eating with special emphasis on the now well-researched traditional Mediterranean Diet. With a clear mapping of goals around shifting food choices, and compelling examples of existing dietary patterns and business case studies that support that vision, much of our work is now focused on strategy. To clarify what we view as priorities for change and most promising strategies, we are highlighting the value of the term “plant-forward,” which we are defining as: “A style of cooking and eating that emphasizes and celebrates, but is not limited to, plant-based foods - including fruits and vegetables; whole grains; beans, other legumes, and soy foods; nuts and seeds; plant oils; and herbs and spices - and that reflects evidence-based principles of health and sustainability.” This framing emphasizes the paramount importance of reducing red meat, first and foremost, and secondarily foods from all animal sources in the diet. But it does it in a way that elevates the need for menu categories and R&D between what we might call “regular” menu options and vegetarian and vegan choices, paving the way for broader acceptance. In short, this gets us to the same place as the traditional, Mediterranean Diet. But a complementary focus on “plant-forward” provides a useful recalibrating of descriptions of the Mediterranean Diet which all too often have drifted towards prioritizing Mediterranean flavors over getting the plant-to-animal-foods ratio, or balance, correct. Our new plant-forward chef global recognition initiative is designed to help accelerate this important trend. In addition, we need to insist on a continuously higher level of production and processing quality in plant-based foods and a deepening of culinary literacy among chefs in the art of transforming whole plant-foods into menus and dishes that are widely acclaimed and financially supported. It is also important that an enlightened focus on food quality, flavor excellence, and culinary insight be understood and adopted by the public health, environmental and academic communities - and by governments - because of their pivotal importance in successfully enhancing dietary patterns.

The traditional, healthy, sustainable Mediterranean Diet is not a set of ingredient or recipes - or merely a dietary pattern. It is a food culture. To secure this food culture - this world heritage - for the future, we'll need to form new alliances that better connect chefs and other change drivers in the food system with university researchers, NGO's, and policy leaders at every level of government.



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SENSORY STRATEGIES FOR DIETARY CHANGES

Jean-Xavier GUINARD¹

¹*Professor and Sensory Scientist, University of Davis, California, U.S.*

Taste, smell and chemesthesis - the components of flavor, and sight, hearing, touch, kinesthesia and temperature all contribute to our sensory perceptions of the foods and beverages in our diet. And our brain processes that information in two ways. It analyzes it and determines whether we like the food or beverage, or not. While our sensitivities to most of the stimuli in our diet are normally distributed, there are still significant inter-individual differences in sensitivity to consider when designing strategies for healthier food choices. Indeed, we find preference segmentation, as the result of mostly learned preferences for smell, for most food and beverage categories. It then behooves us to uncover that segmentation, define sensory drivers of liking and then characterize the demographic and psychographics of each preference segment for optimal product formulation and marketing. It remains that we have an innate liking for fat, sugar and salt and innate dislikes for the often bitter, sour, pungent and astringent properties of antioxidants. So, it can be a tall order to design healthy foods, dishes and menus that appeal to consumers. With the Healthy Flavors Research Initiative, and in collaboration with the Culinary Institute of America and UC Davis Dining Services, we are developing and testing sensory and culinary strategies for healthier recipes with uncompromised sensory appeal. Our working hypothesis is that less healthy ingredients in a dish can successfully be replaced with healthier ones without loss of palatability if those healthier ingredients also have flavor-boosting properties.

Using a combination of descriptive analysis with a trained panel and preference mapping with consumers, our proof-of-concept research demonstrated that beef could be partially substituted with mushrooms in taco blends without reduction in flavor or acceptance for most the consumer population we tested because of the mushrooms' umami properties. We have since used the same experimental approach to research the substitution of butter with olive oil in select recipes and shown that while butter-based versions of three of the four recipes received higher overall hedonic ratings, some of the recipes prepared with buttery and nutty or grassy and fruity olive oils appealed to some preference segments in the consumer population we tested. We have also investigated the feasibility of using gustatory, olfactory and trigeminal stimuli alone or in combination to boost the acceptance of dishes in which meat was partially substituted with vegetables using consumer tests and Check-All-That-Apply (CATA) methods. We found that the use of trigeminal stimuli (such as chili peppers, black pepper or ginger) or a combination of all three types of stimuli were the most effective sensory strategies for increasing the appeal of dishes with higher proportions of vegetables. Another research initiative in our laboratory examines likes and dislikes for, and intake of vegetables in children, as influenced by their mothers and peers, with the aim of increasing their vegetable intake. We conclude that the sensory properties of select plant-based ingredients can be used to boost the flavor and appeal of healthier dishes and menus, thus increasing the potential for success of flexitarian diets. Next steps in our research approach will include the development of sensory, culinary and nutrition education



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strategies and personalized apps for dietary change. All in line with a renaissance of the Mediterranean Diet indeed.

ENCOURAGING OLD WAYS AND TASTES IN THE NEW WORLD

Sara BAER-SINNOTT¹

¹*President, Oldways, Boston, U.S.*

When Oldways, along with the Harvard School of Public Health and a renowned international group of nutrition scientists, introduced the Mediterranean Diet Pyramid in 1993, in America, olive oil was considered an unusual ethnic product and most of the country was afraid of fat. Today, Americans have grown to appreciate Mediterranean-inspired foods from hummus to olives and from pasta to legumes. Yet, many are still confused about what constitutes a healthy diet thanks to pseudo-scientists, diet book authors, bloggers, the media and many others who are often more interested in attention-grabbing headlines than science.

Despite the semblance of discord so prominent in media representations, there is, actually, a vast, global consensus among experts in diverse fields about the fundamentals of diet that favor both human and planetary well-being. The consensus? As documented in the Oldways Finding Common Ground Consensus Statement, it is the old ways – overall healthy eating patterns, heritage diets like the Mediterranean Diet that are good for people and good for the planet.

The more than 25-year old mission of Oldways is to promote these old ways – from cultures around the world – in order to improve public health. This presentation will detail the ways in which Oldways encourages old ways and tastes in the new world.

We are optimistic, and believe that it takes more than a village to make change. This conference is very timely, as we learn that the top consumer trends for 2017 are authenticity and healthy living. With calls to action by governments, industry and the medical/scientific community, there is the great potential to make a difference through a Renaissance of the Mediterranean Diet (and other heritage diets) in the 21st Century.



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**FOOD AND NUTRITION EDUCATION AND COMMUNICATION:
THE ROAD TO THE FUTURE**

Daniele DEL RIO^{1,2}

¹Department of Food & Drug, University of Parma, Italy, ²NNEdPro Global Centre for Nutrition and Health, St John's Innovation Centre, Cambridge, U.K. (on behalf of the NNEdPro Chair/Directors)

Good nutrition is essential for human wellbeing, yet malnutrition (undernutrition and obesity) affects nearly all countries worldwide. The contribution of dietary choices to cardiovascular and metabolic risk is growing year upon year, almost always ranking diet-related factors among the first in describing the loss of disease adjusted life years (DALYs), particularly in industrialised countries. Among the reasons behind this gap, three must, at least in my opinion, be readily faced. Firstly, basic and applied research in food and nutrition has not yet been subjected to rigorous quality control as is the case in medical/pharmaceutical research. Secondly, there is inadequate investment in evidence-informed food and nutrition education to match the global challenges described above. Providing high-quality food and nutrition knowledge and skills to future and practicing healthcare professionals, food scientists and technologists as well as to those with key training and advisory roles, is one sustainable way that we can work towards building healthier populations in multiple countries. Finally, much better care in communicating nutritional recommendations, as well as knowledge translation based on new discoveries and breaking evidence, is a fundamental step to make the population more aware of the incredible impact of their dietary choices on their personal health

This talk will discuss these three points from the viewpoint of a person directly involved in all of them, in the framework of two international research teams fully devoted to research, education and, perhaps a little less, to communication, and in a custom made University spin-off company. One is the Laboratory of Phytochemicals in Physiology, at the Department of Food & Drug at the University of Parma. A dynamic group of young scientists devoted to understanding the impact of dietary phytochemicals in the context of chronic disease risk. The other one is the Need for Nutrition Education/Innovation Programme in Cambridge, an independently incorporated collaborative group for knowledge generation, translation and evaluation, composed of several partner organisations including the British Dietetic Association, the Society for Nutrition Education and Behaviour, Ulster University School of Biomedical Sciences, Wolfson College in Cambridge and Cambridge University Health Partners. The custom made spin-off is, finally, "*Madegus*", which is fully focused and dedicated to transferring good nutritional knowledge and lifestyle to school children.

Hopefully, sharing this experience, cautiously balanced on three very connected pillars, will help pave the way to a novel approach that should be pursued with strategic investment of resources over a protracted period of time, if we really want to change the world. At least from a food and nutrition perspective.



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SUSTAINABLE FOOD FOR FUTURE

Fabrice DECLERCK^{1,2}

¹Science Director, EAT Foundation and the Stockholm Resilience Center, ²Senior Scientist, Bioversity International, Rome

Environment, and nutrition are two hard-fast biophysical boundaries which humanity must adhere to in order to avoid significant societal costs and reductions in quality of life. Current food production practices are the biggest threat to sustainability and a major force behind breaching multiple planetary boundaries. Food production contributes to between 19 and 29% of total GHG emissions, uses of 69% of freshwater resources, and 34% of the terrestrial, ice-free surface of the planet accounting for 31% of wild biodiversity loss. It is the primary driver for the substantial breach of the planetary boundary for phosphorous, and nitrogen. And contributes to 25% of premature mortality linked to outdoor air pollution. The foods we produce from agricultural systems struggle to nourish a growing global population where nearly 2 billion suffer from nutrient deficiencies, and another 2 billion suffer from obesity. As daunting as addressing these two challenges may seem, transformation of food systems is emerging as a significant solution space that is unique in its capacity to motivate change from the individual, to the global level. In essence, global sustainable development is achievable through food.

Changes in what foods we produce, how we produce them, and where we produce them has the capacity provide both food and nutritional security, providing the ingredients of healthy, culturally sensitive, and enjoyable meals as is demonstrated by the Mediterranean diet. Mounting evidence suggests that producing food for diversified diets is often complementary with improving agriculture's sustainability record shifting agriculture from a net source of environmental degradation to a means of environmental restoration. Agricultural lands now cover over 40% of the global land surface area, thus forming the largest terrestrial biome. While agriculture and the environment have been presented as diametrically opposed because, in most cases, the former has destroyed natural habitats and the ecosystem services they provide there is an increasing body of ecological and environmental research is showing that agricultural landscapes can also be important providers of these services. To facilitate this transformation, world food systems need to: (1) Become fossil fuel free or decarbonized in the next 30-40 years; (2) Contribute to zero loss of biodiversity to halt the six global mass extinction of species on earth; (3) Safeguard water resilience in all landscapes; (4) Feed humanity on current agricultural land, or in other words with zero expansion of new agricultural land from natural ecosystems; (5) Minimize human interference with global N and P cycles; (6) Halt their contribution to poor air quality – both in production practices, and in halting the mass biomass burning associated with agricultural land expansion.

This transformation will only be achieved through a systemic, whole-of-society departure from business as usual to an innovative and coordinated action around the way food is produced and consumed. This transformation while challenging, is possible. As with the Mediterranean diet, sustainable food systems can serve as the central attractor to change by celebrating food that culturally specific, environmentally appropriate, and healthy.



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INSPIRING A RENAISSANCE IN FOOD VALUES

Simon POOLE¹

¹ *Physicians, Author & Commentator, Cambridge, U.K.*

Many modern industrial and post-industrial societies are seeing an ever-increasing burden of chronic disease and obesity, contributed to by increasing access to poor quality food. There have also been considerable changes in our view of what we eat, the way we eat and how we prepare our food. Yet paradoxically there is increasing evidence that the lifestyles associated with more traditional cultures, notwithstanding other determinants, are often conducive to longer and healthier lives, and exist in more sustainable environments. We have considerable knowledge and evidence to describe what a good diet should look like.

It can therefore be asserted that there is an urgent need to rediscover those older relationships with the way we prepare and enjoy the food we eat. There is a need for a more enlightened view of the potential damage arising from modern methods of food processing and a better understanding of the benefits of placing a greater value on what and how we eat. Those of us privileged to have some understanding of the urgent need for a new paradigm on matters of nutrition and lifestyle have a duty to disseminate this message to colleagues, governments, industry, the media and policy makers.

There are levels of health inequalities in relation to nutritional education for example which are, quite simply, morally indefensible. “Food illiteracy” i.e. the lack of education to enable healthy eating choices is endemic in many societies. Those involved in communicating the compelling case for change face many challenges which vary from insufficient priority placed on matters of nutrition, to ideological barriers and potential conflicts of interest.

There are however examples of inspirational work in different countries which has resulted in change which has benefitted individuals and populations. Much can be learned from the way in which climate change has become a political imperative hitherto due to pressure from the scientific community and the propagation of the need for change. A renaissance in the value we place on food is urgently needed to reverse what is a growing health crisis in many parts of the world.



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CONFERENCE REPORT

The Conference was formally opened by His Excellency Msgr. Marcelo Sanchez Sorondo who welcomed speakers and guests from around the world.

Msgr. Sorondo addressed those gathered in the Casina Pio IV, acknowledging the importance of daily victuals in history, the life of the Church and beyond, the importance of bread, wine and oil in the Sacraments, as well as the pressing modern concerns of malnutrition, food security, sustainability and climate change. Msgr Sorondo confirmed the importance of the Food Values Conference in debating these issues and establishing agreement about the actions needed to improve the health of the population and the planet.

Dr Paolo Pasquali then thanked Msgr. Sorondo for the generous hospitality and support afforded to the Conference. Dr Pasquali called upon the Conference to mark the beginning of a series of initiatives to promote Food Values with a particular emphasis on education and the practical aspects of creating a healthier food environment. Dr Pasquali then invited the Chairperson of the morning session, Dr Simon Poole to introduce the speakers on subjects relating to:



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Part I - Food and Health: The Science of the Mediterranean Lifestyle

Proceedings were Chaired by Dr. Simon Poole

FOOD AND HEALTH IN THE MODERN WORLD

Dr. David Katz

Dr Katz opened the scientific proceedings by considering the contribution of lifestyle factors to morbidity and mortality, citing the wealth of evidence which demonstrates the degree to which ill health, chronic disease and early death can be prevented.

Having believed that our destinies are shaped irrevocably by our genetic make-up, there is now an emerging understanding that even our DNA, including telomeres, as DNA markers of potential longevity, can be influenced by the choices we make. Imagine a world where perhaps as much as eighty percent of illness can be prevented through behavioural and environmental change. Dr Katz illustrated this by describing the control we have over our “Feet, forks and fingers”, in relation to exercise, diet and smoking habits. However, despite this knowledge, society is beset by contradictory advice and confusion in the form of misinformation, “fad” diets and we observe the widespread consumption of unhealthy, processed and “convenience” foods.

Whilst there are many examples of dietary patterns which can be associated with good health, including for example vegetarian diets, the DASH diet and the Mediterranean Diet, there are common themes which align with Michael Pollan’s famous exhortation to “eat food, not too much, mostly plants”. The principles of evidence based healthy eating have been explored in the Scientific Report of the US 2015 Dietary Guidelines Advisory Committee and further scientific consensus reached at the Oldways Finding Common Ground Conference in the same year. The Mediterranean Diet, given specific mention in these recommendations, can be described at least in the evidence presented in the EPIC studies in terms of high consumption of vegetables, fruits and nuts, olive oil



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and legumes, with moderate consumption of ethanol, some contribution from fish, cereal and dairy products with low consumption of meat and meat products.

Dr Katz discussed the challenges of the contribution of increasing meat consumption to environmental harm and climate change in the context of world population growth. However, on a more optimistic note, evidence was cited of examples across the world, for example communities such as those described in the “Blue Zones”, and also those where dietary habits have changed, where a healthier and more sustainable environment can be created. Finally, Dr Katz described the consensus of the “True Health Initiative” where experts from different fields have found agreement and are working through the initiative to promote the principles of diets such as, though not limited to, the Mediterranean Diet.

MEDITERRANEAN DIET FOR HEALTH AND BEYOND

Prof. Francesco Sofi

*Professor Sofi described the “What, Why, How and Where” of the Mediterranean Diet. **What** is the Mediterranean Diet, **Why** is it a paradigm of a healthy diet – the evidence, **How** we estimate adherence to the Mediterranean diet, and **Where** we are now in the context of modern populations and the traditions of the Mediterranean diet.*

The diet was first described by Professor Ancel Keys as the traditional diet of Southern Italy in the 1950s, and further extensive evidence has concluded that it is best described as a minimally processed diet rich in fruit and vegetables, olive oil, wholegrains, legumes, nuts, herbs, moderate consumption of ethanol mainly in the form of wine, and with fish and poultry eaten more frequently than red meat. There is evidence which confirms the inverse relationship between all-cause mortality and fruit and vegetable consumption, in addition to reduced rates of stroke with increased fish intake. Furthermore, data shows that the Mediterranean Diet is cardio-protective and that regular olive oil consumption can reduce the risk of depression. It is important to be able to accurately describe the Mediterranean Diet and to measure adherence in order to be able to draw conclusions from primary



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studies, meta-analyses or case-controlled cohort randomised controlled trials such as the Predimed study which found a thirty percent reduction in MI, Stroke and cardiovascular death in those who followed a Mediterranean Diet pattern supplemented with nuts or extra virgin olive oil in comparison with a population on a control diet.

The work of Professor Trichopoulou was cited in refining the system of scoring which demonstrates greater adherence to the Mediterranean Diet and an inverse association with total mortality. Descriptions of the different methods of reviews of studies were followed by an in-depth analysis of the data showing reduced rates of mortality, cardiovascular disease, cancer, neurodegenerative diseases and other parameters. The scientific case for the Mediterranean Diet has clearly been made. By using measurements of adherence to the Mediterranean Diet, we can plot movements towards or away from the traditional diet. Although the data relates to the period 1961 to 2003, the movement of the majority of populations, especially from the Mediterranean area, away from adherence to the Mediterranean Diet is a salutary reminder of the crisis in nutrition faced by the world as less healthy foods are substituted for those that have been associated with better outcomes. There is an urgent need to reverse this trend and create the narrative to describe the “slow”, local, fresh, sustainable and pleasurable way of eating in the Dieta Mediterranea”

BENEFICIAL COMPONENTS OF THE MEDITERRANEAN DIET

Prof. Francesco Visioli

Professor Visioli firstly dealt with the need for a precautionary approach to the interpretation of data and the importance of ensuring that science is robust and can make distinctions between associations and evidence of causation. With some further observations of the history of the description of the dietary patterns of the region, the presentation moved on to compare the patterns in countries further afield, showing that concordance with high Mediterranean Diet scores can be applied to countries around the world, with inverse associations with all-cause mortality.



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From the epidemiological data in very large populations, food can also be viewed from the position of pharma-nutrition, nutrigenomics and biochemical perspectives. Extra virgin olive oil, the staple fat of the Mediterranean region was considered in particular, since it is a fundamental element of the Mediterranean Diet. Hydroxytyrosol, a polyphenolic compound and its derivatives are important “minor” components of olive oil. Increasing quantities are measurable, and have an effect on taste, tending to impart more pungent and bitter flavours. The importance of these phenolics has been recognised by the EFSA (European Food Safety Authority) with extra virgin olive oils with a specified minimum levels of hydroxytyrosol and its derivatives being able to carry a health claim. The effect of these compounds on oxidative stress was demonstrated. The role of other compounds for example lycopene in tomatoes was also discussed. In conclusion, the importance of the study of micronutrients in foods was clear, such as the benefits provided by polyphenols in extra virgin olive oil, in order to make sense of the epidemiological data on health and diet as a whole.

ANCIENT GRAINS AND HEALTH FROM LAND TO FORK

Prof. Stefano Benedettelli

Professor Benedettelli introduced the important subject of grains as an example of the impact of modern processes of food production on the quality of traditional foods. Bread is a staple in many traditional diets, and has been a vital source of nutrients for generations. However in particular wheat has become the subject of intense scrutiny and debate in relation to conditions such as celiac disease, wheat allergy, non-celiac sensitivity and a possible role in irritable bowel syndrome. The effect of gliadins, gluten as well as fructans is attracting interest. The genotype of wheat, modified through breeding programs aimed to improve field production as well as agronomic techniques are considered to be increasing the incidence of wheat sensitivity. The domestication of wheat has resulted in changes to genotype and further reductions in biodiversity have been observed in the last century with the move towards high yielding varieties with earlier maturing kernels and reduced plant height to make harvesting easier. There have been quantitative increases in storage proteins such as gluten as well as changes to chemistry as a result of agronomic techniques including the widespread



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use of pesticides. The use of brewer’s yeast with high gluten strong flour results in bread which is more efficiently produced for markets but which results in a greater likelihood of gluten sensitivity, poorer micronutrient composition and with a less beneficial effect on the gut microbiota in comparison with techniques such as those employing sourdough. Further comparisons can be made between modern grain varieties and ancient grain varieties, where it can be demonstrated that ancient varieties contain significantly higher levels of important micronutrients including polyphenols, flavonoids and mineral content. Further remarkable evidence was presented of studies showing a much improved profile of biomarkers related to cardiovascular risk, including cholesterol levels and inflammatory markers, in individuals who had substituted Khorasan grain for modern flour. The move towards modern industrial processes of production of staple foods of traditional diets can have a profound effect on the quality of those foods, with the potential to significantly reduce its nutritional value.

HEALTH, CULTURE AND SUSTAINABLE ENVIRONMENT: THE MEDITERRANEAN DIET PARADIGM

Prof. Antonia Trichopoulou

Professor Antonia Trichopoulou described the Mediterranean diet as the dietary pattern found in the olive growing areas of the Mediterranean region in the late 50’s and early 60’s. It is a social practice based on the set of skills, knowledge, practices and traditions ranging from the landscape to the cuisine, manifested through related festivals and celebrations and intercultural dialogue. It is characterised by high olive oil consumption, legumes, unrefined cereals, fruits, vegetables, moderate consumption of dairy products – mostly cheese and yoghurt, moderate consumption of alcohol, moderate to high consumption of fish, with low consumption of meat and meat products.

The study of traditional foods of Greece was discussed demonstrating positive associations with measures such as inorganic content, for example richness in minerals, as well as the concordance with known health qualities including many of those formally defined as potential nutritional health claims by the European Food Safety Authority. The antioxidant capacity of common, simple dishes such as



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eggplant salad was demonstrated based on the values of constituent ingredients. There is significant biodiversity, including many varieties of common foods such as grains and fruits, and cultivation and use of such local products promotes the balance between the land and its people, contributing to a sustainable environment and employment of local people. Sustainable diets are those with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations.

Several studies have shown that the Mediterranean Diet has a lower environmental impact than other dietary patterns because it is mainly a plant based diet with low consumption of animal products resulting in a smaller water footprint and lower greenhouse gas emissions. It is observed that countries, communities and cultures that maintain their own traditional food systems are better able to conserve local food specialities with a corresponding diversity of crop varieties and animal breeds. They are also more likely to show a lower prevalence of diet-related chronic diseases. However, there is accumulating evidence that Mediterranean populations are departing from their traditional eating habits, so it is essential that as individuals and social groups we should do our best to transmit the knowledge and practice of the traditional Mediterranean Diet to the generations to come, in order to contribute to better health, preserve cultural traditions, support agricultural economies and protect the environment.



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Part II - Food Traditions and Cultural Heritage: Valuing the Old in the Modern World

Proceedings were Chaired by Dr. Paolo Pasquali

FOOD AND STORIES: INSPIRING PEOPLE TO VALUE COOKING

Cav. Giorgio Locatelli

Mr Locatelli opened the afternoon’s session by describing his upbringing with traditional foods of the Mediterranean, which was at the heart of his early life. There is clearly a bridge between the nutritional science now demonstrating beyond doubt the healthfulness of this pattern of eating, and the everyday practices of those families and communities who enjoy this way of life. There is a particular way of eating, with conviviality at mealtimes an important communal experience, which creates a special relationship with the enjoyment of good quality food. The preparation of meals together is fundamental to this way of life with deep rooted connections with the land and local traditions. The value of this social intercourse is difficult to measure, but is fundamental to the Mediterranean lifestyle.

Mr Locatelli described how in his work he emphasises the importance of the environment and sharing meals together. There are also programmes where chefs can regularly attend schools in order to encourage students to become familiar with food and cooking and to value precisely the principles inherent to the Mediterranean Diet. Mr Locatelli has also been involved in initiatives which include teaching cooking to prison inmates. There is now good evidence that opportunities such as this can significantly reduce reoffending rates and increase the possibility of successful social reintegration, demonstrating that valuing food is also about valuing people themselves.



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MENUS OF CHANGE: ADVANCING PLANT-FORWARD FOOD CULTURES

Mr. Greg Drescher

Mr Greg Drescher explained that The Culinary Institute of America is a private, not-for-profit college dedicated to providing the world's best professional culinary education. Expenditures on food (foodservice and retail in aggregate) and healthcare each exceed \$1 trillion annually.

It is estimated that 75% of chronic diseases are linked to diet and lifestyle, and are therefore preventable. Why is the collaboration between these sectors so limited, the potential for convergence so under-imagined? In its vision for the future, the Institute has a strategic vision which encompasses 4 themes: “A Passion for Knowledge - Professional Excellence and Innovation Because We Care; Health and Wellness - Food Is Life; World Cuisines and Cultures and as A Catalyst for Progress; Sustainability and Food Ethics”.

The institute collaborates with the Harvard Chan School of Public Health recognizing that driving change around food choices is one of the most transformative actions we can take to promote global health and sustainability. One of the priorities over the past 20 years has been to better connect American chefs to the “gold standards” of world food cultures through education, conferences and festivals resulting in greater knowledge of traditional, plant-forward food cultures together with the specific insights of current scientific research inspiring a broader, more effective (and delicious) strategy for change.

The “menus of change” programme inspires through informatics, dashboard assessment and a number of other tools, providing culinary strategies to encourage dietary shift and improved food choices. Examples include the use of spices to enhance the flavor and attractiveness of vegetables and “protein flip” to reduce the consumption of meat based products. Collaboration with food service for research centers describes a “Plant Forward” strategy - A style of cooking and eating that emphasizes and celebrates, but is not limited to, plant-based foods—including fruits and vegetables (produce); whole grains; beans, other legumes (pulses), and soy foods; nuts and seeds; plant oils; and herbs and spices—and that reflects evidence-based principles of health and sustainability. The Plant Forward



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paradigm seeks to elevate the status of vegetables, plant proteins, and other plant-sourced flavors among chefs, the food media and the general public.

It is essential that we better engage scientists, physicians, government policy leaders, NGO's, and others in the public health and environmental area to champion culinary-centric, flavor-literate strategies rooted in food culture that go way beyond acknowledgments of “healthy food needs to taste good.” For a renaissance of food values, status of food and education issues are critical, but for a renewal and expansion of Mediterranean food culture we need more excellence in the growing, processing and preparation of its plant-based core.

SENSORY PROPERTIES OF FOODS

Prof. Jean-Xavier Guinard

Professor Jean-Xavier Guinard from the University of California introduced recent evidence which illustrated the links between sensory perception of foods and how this relates to dietary preferences and thus lifestyle choices. He described the complex perceptions which dictate our response to foods which include sight, taste, smell, chemesthesis, touch, kinesthesia, hearing and temperature, with aroma constituting the olfactory sensation perceived when volatile compounds are sniffed through the nose, and flavour being the sensation produced via the chemical senses from a product in the mouth.

There are many factors which dictate behaviour including cultural and contextual variables as well as those which relate to the properties of the food products themselves. Food choice, assuming availability, and the value placed on foods themselves will depend on sensitivity to those sensory stimuli as well as flavour preferences. These preferences which may result in attraction to, or avoidance of, certain foods may be innate, such as the like of sweetness and saltiness, or dislikes for bitterness or sourness tastes. This may relate to the sweetness signalling easily digestible calories, and being associated with hedonic/ pleasurable sensations, and bitterness indicating potentially toxic chemicals. Many plant bioactive compounds such as bitter, pungent, acidic or astringent phenolics,



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glucosinolates and other antioxidant chemicals have beneficial physiological effects at low concentration but may be toxic in high amounts. Our innate dislike of these sensory qualities may be designed to make us stay away from high consumption of potentially harmful chemicals. However, preferences can be overridden for psychological, physiological and/or pharmacological reasons. In addition, exposure to and familiarity with flavours tends to increase positive associations with those flavours. Examples of how this can work in practice to shape consumer behaviour were provided with several studies under the umbrella of the “Healthy Flavours Research Initiative” – a partnership between UC Davis and the Culinary Institute of America. These demonstrated for example that due to the flavour enhancing umami principles, mushrooms can be used as a healthy substitute for meat and a mitigating agent for sodium reduction in sensory acceptability. Other examples included successful presentation of an increased ratio of fruit to cake in deserts as well as a favourable response achieved by substituting butter with extra virgin olive oil in various dishes without compromise of acceptability. Consumers can be educated into culinary practices that emphasise extra virgin olive oil over other dietary fats.

ENCOURAGING OLD WAYS AND TASTES IN THE NEW WORLD

Ms. Sara Baer Sinnott

Ms Baer Sinnott introduced Oldways as a nonprofit food and nutrition education organization, with a mission to improve public health through cultural food traditions and lifestyles. The vision is to describe and promote the value in preserving cultural and culinary traditions for future generations, and to communicate that heritage foods and ways of eating are delicious, healthy, sustainable and nutritionally sound.

Oldways devises practical and positive programs and consumer-friendly health-promotion tools grounded in science and food – like the Mediterranean Diet Pyramid and other cultural models for healthy eating. The landmark 1993 International Conference on the Diets of the Mediterranean in association with Harvard University led to the first version of the Mediterranean Diet Pyramid, which has subsequently been refined, where further evidence has informed updates. It has also led to



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the use of other dietary pyramids as a common form of communication to encourage dietary change. Oldways has brought together scientists, chefs, journalists, food writers, producers and retailers in culinary and cultural symposia. Through the “Mediterranean Diet Month”, “Fresh Fridays” and other initiatives, Oldways continuously reaches out to health professionals, universities, retailers, producers, food service providers and consumers to encourage debate and greater understanding of the inseparable links between cooking, nutrition and eating. Oldways celebrates good food and nutrition with menus, recipe ideas and tips for healthy eating and works with industry through initiatives such as the Whole Grains Council and the Mediterranean Food Alliance for example to encourage best practice. Blogs, teaching aids and web resources are available to support the messaging, translating the science into everyday understanding for health professionals and consumers.

The evidence for cost differentials between the Mediterranean Diet and Standard Diets was explored and it was demonstrated that the evidence is mixed, and the need was acknowledged to propose methods to ensure affordability through strategies such as cooking, planning ahead, eating more of the less expensive foods, reducing meat consumption – its use as a condiment, mixing high quality carbohydrates with vegetables, and eating more whole grains, to achieve greater satiety. Oldways extends its use of diet pyramids to other traditional dietary patterns such as the African Heritage Diet, showing demonstrable improvements in markers of health when these principles are applied. Such heritage diets share many common themes, including the value placed on food and eating, illustrated by a quote from Michael Pollan – “I have yet to hear of a traditional diet – from any culture, anywhere in the world – that is not substantially healthier than the “standard American diet.” The more we honor cultural differences in eating, the healthier we will be.”

Oldways have also led the way in gathering scientists together to reach consensus on what constitutes a healthful diet, such as the “Finding Common Ground” conference in Boston in 2015, where advocates of different dietary paradigms were brought together to successfully debate and discover common themes. This Food Values conference was described as- A Call to Action by governments, medical/scientific communities, and industry to make a difference through a Renaissance of the Mediterranean Diet and other plant-based heritage diets.



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Part III - Food Values: The Urgent Need for a New Approach

Proceedings were Chaired by Prof. Francesco Sofi

FOOD AND NUTRITION EDUCATION AND COMMUNICATION: THE ROAD TO THE FUTURE

Prof. Daniele Del Rio

Professor Daniele Del Rio outlined the urgent need for healthy nutrition in the 21st Century, with current energy intake often in excess and micronutrient intake insufficient, resulting in obesity and chronic disease. The economic cost of chronic disease is unsustainable, with cardiovascular and cerebrovascular disease estimated to cost £300 billion Euros per Year in Europe alone as a result of direct health and care costs as well as loss of productivity with chronic diseases such as stroke, heart disease, cancer and dementia contributing to the majority of total care costs.

The Research needs to connect with education and practice with examples such as linking dietary factors, nutrient biomarkers, metabolic status and inflammation with cognition in the elderly showing the importance of communicating research findings in such important areas. NNedPro was cited as an initiative which can advance this communication - a virtual strategic partnership between doctors, dietitians, nutritionists, researchers, educators and other professionals to deliver better nutrition education. Nutritionists, dietitians, doctors, scientists, educators, with public health specialists, policymakers, patients and the public working in partnership setting the stage for a more evidence-based, applied and higher impact nutrition workforce for better healthcare including lessening chronic disease burden. There are projects to better educate the health professional workforce as well as initiatives to teach cooking and food values in schools and in family groups.

Research simply must translate into communication to the public as well as influence policy makers, regulators, the food industry, the media and beyond. Professor Del Rio called for nutrition education to be mandatory in every school and part of the training of every healthcare professional.



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SUSTAINABLE FOOD FOR THE FUTURE

Prof. Fabrice DeClerck

The urgent need to value food and sustainable diets as a pivotal influence on climate change and global sustainability was presented by Professor Fabrice De Clerk. Food exists in the context of a scientific, political and business landscape and has an impact on human health and the environment.

Diets can be described in terms of environmental risk as well as effects on rates of chronic disease and early mortality, and considered in terms of the distance from the safe and ideal. Metrics can be used to establish what shifts need to occur for agricultural systems to provide for optimum nutritional consumption. Locally sustainable dietary and agricultural patterns such as those consistent with the plant based Mediterranean Diet have been shown to be better not only for human health but also less harmful to the environment. Whilst there is increasing global homogeneity of food supplies which has consequences for food security, there has been some political interest in local sustainability, perhaps best illustrated by President Obama’s presentation of seeds from the White House gardens to Pope Francis during a visit to the Vatican.

We need to think of an agriculture that contributes to environmental protection rather than environmental degradation. For this we need an integrated approach, we cannot think of these goals in isolation. Many of these are socioecological goals, rather than simply ecological or agricultural. Conserving agricultural diversity can help to conserve cultural identity. Agriculture currently contributes 5.4 Gt CO₂-eq direct GHG emissions per year. This is expected to rise 8 Gt CO₂-eq per year by 2030, about 1 Gt in excess of the allowable budget of 7 Gt, and well in excess of the goal of sub-zero net emissions by 2050.

Dietary patterns can be considered in terms of the environmental footprint of constituent parts, for example the contribution of the production of vegetables, fruits, nuts, fish, poultry, red meats etc. to greenhouse gas emissions and appropriation of land for use as pasture and croplands. Improvements in production technologies coupled with massive scaling up of carbon storage in agricultural systems would have the theoretical potential to bring net agricultural emissions close to zero by 2050, particularly through high levels of carbon sequestration in agricultural soils. Human activities are



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causing an accelerating decline of the world's stocks of biological diversity at rates 100 to 1,000 times pre-human levels. Agricultural activities negatively impact 53% of threatened terrestrial species. Widespread extinction attributable to anthropic drivers lead to biotic impoverishment (reductions in local biodiversity) and biotic homogenization (increasing dominance by domestic species). The importance of pollinators was discussed as an example. As much as 50% of the production of plant-derived sources of vitamin A requires pollination throughout much of Southeast Asia, whereas other essential micronutrients such as iron and folate have lower dependencies, scattered throughout Africa, Asia and Central America. Micronutrient deficiencies are three times as likely to occur in areas of highest pollination dependence for vitamin A and iron, suggesting that disruptions in pollination could have serious implications for the accessibility of micronutrients for public health.

Agriculture is the largest disruptor of both the nitrogen and phosphorous cycles. The proposed boundary for phosphorous stands at no more than 6.2 million tonnes applied to land per year and nitrogen at and 62 million tonnes applied to land per year. Despite this, phosphorous applied to land per year is currently at 14Mt, while nitrogen is at 150 Mt per year; and both are still increasing. Furthermore, agricultural pollution contributes considerably to global premature deaths. 20% of the 3,297,000 premature deaths are attributable to agriculture, and 5% to biomass burning Professor De clerk concluded by quoting Wangari Maathi, Nobel Peace Prize Recipient 2004: “There can be no peace without equitable development; and there can be no development without sustainable management of the environment in a democratic and peaceful space. This shift is an idea whose time has come.”

INSPIRING A RENAISSANCE IN FOOD VALUES

Dr. Simon Poole

Dr Simon Poole co-organiser of the Conference summarised the case for creating change, to inspire a renaissance in how we value our food in the context of lifestyle. Reflecting on what had brought such internationally renowned speakers and audience members together in such auspicious



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surroundings today, the presentation opened with a quote from Michael Dyson, Professor of Sociology at Georgetown University: “I think public intellectuals have a responsibility – to be self-critical on the one hand, to do serious, nuanced work rigorously executed; but to also be able to get off those perches and out of those ivory towers and speak to the real people who make decisions; to speak truth to power and the powerless with lucidity and eloquence.”

The urgent case for enlightenment and rebirth of a traditional way in which food and food cultures are valued is illustrated by rapidly rising levels of obesity, an increasing burden of chronic disease, social isolation, the disconnect between the consumption and production of food and the environmental cost of convenience. We have lost many values in our modern food culture – those of intangible cultural heritage, food cherished as a social experience, skills in food production and preparation, an appreciation of local sustainability, and a reduction in the nutritional value of many foods. There is a clear scientific case for change, and many of the qualities we now recognise for their positive impact on health are elemental to the Mediterranean Diet and other heritage diets described, for example in the “Blue Zones”.

Science is describing issues such as the importance of glycaemic index, macronutrient and micronutrient and mineral content, minimal added sugar content, relative fatty acid composition and antioxidant potential which are intrinsic to the Mediterranean Diet. The discourse needs to draw parallels with action on climate change, which of course are linked as other speakers have illustrated. There is at least a general consensus on the importance of political leadership, societal and individual commitment to acting in ways which attempt to address environmental issues. A similar paradigm needs to exist in the way we value food, not only for the pressing need to contribute to reducing environmental harm from our current methods of food production, but also to secure better nutrition and to reverse the significant impact and burden of chronic lifestyle related disease. Whilst valuing the benefits of traditional diets and sustainability, it is of course essential that food security is also addressed to ensure the necessary quantity and quality of agricultural production.

There are many challenges to change, with current food environment being influence heavily by commercial interests, political influence, media representation and societal attitudes to food, and the medical approach lifestyle related chronic disease. There could be said to be “too much marketing,



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too much money, too much media and too much medicine”, with marketing being subject to limited controls resulting in a predominance of discounted unhealthy foods, the global food sector being occupied by a number of highly influential producers, the media frequently portraying confusing headlines and with health professionals being poorly trained in nutrition. Studies demonstrate that dietary changes are at least as powerful as pharmacological agents in affecting markers of disease, and yet physicians acknowledge low levels of training, confidence and time spent in encouraging lifestyle change.

Whilst we witness unprecedented levels of largely preventable chronic disease accompanying the spectre of irreversible harm to our planet, we can also describe the knowledge from previous traditions where lifestyles can be shown to hold the solutions to these pressing problems. Significant contributions are being made to public health by organisations such as Oldways, the True Health Initiative, the Slow Food movement and a number of other non-governmental organisations. Scientists and health professionals can add to the understanding, and the media can be instrumental in bringing this awareness to the public in a measured and responsible way. Producers and retailers of foods consistent with these standards are pivotal, as are chefs and those involved in education, such that future generations are literate in issues of food quality and preparation. Governments clearly have a moral obligation to act, and there are examples, such as sugar taxation, where legislation has achieved significant change, however such initiatives are at present wholly inadequate in relation to the challenges we face. It is the responsibility therefore to speak “truth to power” to describe the need for the call for a Renaissance in the value we place on food. The Statement from the Conference organisers was circulated as a Call to Action, aligning the narrative of the Food Values Conference, Pontifical Academy, Vatican City 2017.



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A Statement from the Conference

On February 14th 2017 conference speakers and guests from a broad range of backgrounds including the scientific community, the media, politics, food production the culinary arts and education met to discuss and debate the value we place on our food, in the context of increasing recognition of the importance of traditions and food quality to ensure health and sustainability as we witness an urgent modern crisis of chronic disease and obesity in much of the world.

The objective of this one-day conference, presented with the gracious hospitality of the Pontifical Academy of Sciences, has been to reaffirm the link between natural, sustainable food and the health of individuals and communities. The value of food must relate to our respect for heritage, cultures and the preparation of meals and the effect on nutrition, enjoyment and health. There is increasing evidence that societies - where the cost, and indeed perceived value of food, is falling with increased availability and industrialisation - are experiencing an increased burden of chronic illness and obesity.

The traditional Mediterranean Diet and lifestyle is now considered to be one of the most healthful patterns of eating and living. Whilst debates rage elsewhere on matters of macronutrients and other aspects of food science, there has been consistent reporting of the increasing body of evidence that the foods and food combinations in the Mediterranean Diet (as well as other heritage diets with similar principles) have a remarkable positive influence on health. The benefits of the Mediterranean Diet and other heritage diets were confirmed once again when scientists from around the world met in November 2015 to find consensus on healthy eating fundamentals at Oldways Finding Common Ground Conference.

The discovery that past ways of living can enlighten our present day understanding, heralds the possibility of a renaissance in the value we place on what we eat, where we look back to rediscover and redefine our connection with food and prevent much of the disease burden on individuals and society.



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The Conference called for the following urgent issues to be addressed:

1. **Governments - Policy makers**, whilst ensuring food security, must consider the nutritional, cultural, social and contextual value of food in respect to all policies, legislating when necessary to actively promote a more sustainable and healthy environment based on traditional relationships with food and agriculture.
2. **Education - “Food Illiteracy”** is endemic in many parts of the world, and education is the key to improving skills in preparing food and ensuring a greater understanding of its value and the role it plays in health and well-being. There is a compelling case for the scientific evidence on nutrition to be communicated by the medical and scientific community in a clear way, with more responsible media reporting of that data. Institutions specifically involved in education have a unique role to play in promoting understanding of the value of food in its broadest context to the next generation.
3. **Industry** - Those making profit from producing food must have greater regard to their responsibility for the impact of their products, and the marketing thereof, on the health and well-being of consumers.



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BIOGRAPHY OF SPEAKERS

SARA BAER-SINNOTT is President of Oldways, a nonprofit food and nutrition organization, improving public health through cultural food traditions and lifestyles. She joined the Oldways staff in 1992, working on the Food, Culture and Discovery Symposiums in Spain and the first International Conference on the Diets of the Mediterranean, where the Mediterranean Diet Pyramid was introduced. She assumed the presidency of Oldways in May 2010, and she has helped develop groundbreaking programs including Traditional Diet Pyramids, African Heritage & Health program, the Whole Grains Council, Mediterranean Foods Alliance, Healthy Pasta Meals, High Five Children’s Cooking Curriculum, Culinary Travel, and many others. Sara Baer-Sinnott is also co-author of The Oldways Table with Oldways’ Founder Dun Gifford. Before joining Oldways, Sara was the Special Projects Editor at Inc. Magazine, and she’s also worked for state and federal government agencies.

STEFANO BENEDETTELLI is Associate Professor of Plant and Genetics at the Department of Agrifood Production and Environmental Sciences, University of Florence. For the past decades he has investigated the applicability of multivariate statistical analyses in programmes aimed at genetic improvement. He has worked on genetic markers to develop genetic maps of wheat, at the Plant Science Department, TAMU University, College Station, Texas, and on the evaluation of existing genetic variability in durum wheat populations at the Agroforestry Institute of C.N.R. Porano (TR) Italy. Prof. Stefano Benedettelli’s research currently concerns wheat characterisation based on nutritional and functional properties, in order to improve the qualitative aspects of pasta and bread making. He studies salt tolerance and germoplasm conservation of wheat species, and genetic variation in reserve proteins in cultured wheat and associated wild relatives.

FABRICE DECLERCK leads the Agroecological Intensification and Risk Management Program at Bioversity International, and the Ecosystem Services and Resilience working group of the CGIAR Research Program on Water Land and Ecosystems. He is a landscape and community ecologist whose primary research interests centre on the ecological mechanisms that drive the relationship between biodiversity and ecosystem services in agricultural landscapes and how these mechanisms can be used to increase the livelihoods of the farming communities of developing countries. He is interested in exploring the application of ecological tools and concepts in diverse fields including human nutrition, pest and disease regulation, biological connectivity and its relation to resilience, and poverty alleviation. Fabrice was named the Young Professional of the Year by the Association for International Agriculture and Rural Development in 2005, and was Humboldt State University’s Man of the Year in 1995.

DANIELE DEL RIO is Associate Professor of Human Nutrition at the Department of Food Science, University of Parma. He received his Ph.D in 2004 after 3 years of research activity based at



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the University of Parma and at the University of Glasgow (UK). He is an Honorary Visiting Scholar at the UK Medical Research Council Human Nutrition Research Unit in Cambridge, a Visiting Fellow of the Wolfson College, University of Cambridge and the Scientific Director of the Need for Nutrition Education/Innovation Programme, an independent knowledge generation and research platform overseen by the British Dietetic Association. Prof. Del Rio has been Principal Investigator or co-Investigator in several National and International Research Projects and is author of more than 100 publications in peer reviewed international journals. He has been listed among the "ISI highly cited researchers" by Thomson Reuters in 2014.

GREG DRESCHER is vice president of strategic initiatives and industry leadership at The Culinary Institute of America (CIA), where he oversees the college's leadership initiatives for the foodservice industry. He is the creator of the college's influential Worlds of Flavor International Conference & Festival (www.worldsofflavor.com). In 2008, he was appointed by the President of the National Academy of Sciences' Institute of Medicine to its "Committee on Strategies to Reduce Sodium Intake in the United States". He has previously served on the Board of Executives for The Robert Mondavi Institute of Wine and Food Science at UC Davis, and the Board of Advisors of UC Davis' Agricultural Sustainability Institute and its Olive Center. Additionally, he has previously served on the Foodservice Board of Directors for the Produce Marketing Association, as well as the Awards Board of the James Beard Foundation. In 2011, he was inducted as a member of the Accademia dei Georgofili.

JEAN-XAVIER GUINARD is Professor of Sensory Science at the Department of Food Science and Technology, University of California. He was trained as a Food Engineer in France and later received a Master's Degree in Food Science and a Ph.D. in Microbiology from the University of California. Prof. Guinard teaches undergraduate, graduate and extension food science, sensory science and consumer science courses. In 1998, he served as Head of Consumer research with the Danone Group in France. He is also the Associate Editor of Food Quality and Preference. His research activities focus on the sensory properties of foods and beverages, how humans perceive them, and how they affect food intake and consumer behavior. These activities fit into the mission of the College of Agricultural and Environmental Sciences at the University of California, by furthering the understanding of food intake and of consumer behavior and by improving the quality of the food supply.

DAVID KATZ is an Internist and Preventive Medicine specialist, and a nutrition expert. He is the founding director of Yale University's Yale-Griffin Prevention Research Center, and current President of the American College of Lifestyle Medicine. He has received two Honorary Doctorates. In 2005, he was appointed the associate director for nutrition science at the Rudd Center for Food Policy and Obesity at Yale. In 2000, he founded the Integrative Medicine Center at Griffin Hospital



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in Derby, CT. He has been a member of the governing board of the American College of Preventive Medicine since 2002, and has also been president of the Association of Teachers of Preventive Medicine since 2004. Dr. Katz has published approximately 200 scientific articles and textbook chapters, and 15 books, including multiple editions of leading textbooks in both Preventive Medicine, and nutrition. In 2015, he established the True Health Initiative.

GIORGIO LOCATELLI is an Italian chef working in London, UK. He opened Zafferano in 1995, winning "Best Italian Restaurant" at the London Carlton Restaurant Awards for two consecutive years and his first Michelin star in 1999. He opened his second restaurant, Spighetta, in 1997, and Spiga in 2009. In 2002, Mr. Locatelli and his wife opened his first independent restaurant, Locanda Locatelli. The restaurant, which serves traditional Italian dishes, was awarded a Michelin star in 2003, which has been retained every year since. He has featured in four TV series and has published 2 cookery books, “Made in Italy”, which has received the Best Food Book award at the Glenfiddich Food and Drink Awards 2007, and “Made in Sicily”. He was also on featured BBC2 the British food revival. In October 2016, he was awarded the Commendatore OMRI by the Italian Ambassador for services to Italian gastronomy, the equivalent of a British knighthood.

SIMON POOLE is a full-time family physician and author who studied at St Mary's Hospital Medical School, University of London, and has been a General Medical Practitioner since 1992. He chaired the Cambridge Medical Committee for eight years, is a regional representative of the British Medical Association, a member of the Council of the Royal College of General Medical Practitioners and a contributor to many UK national public health strategy initiatives. His research concerns medical aspects of the Mediterranean Diet, as contributor to the National Institute for Health and Care Excellence in relation to recommendations for the Mediterranean Diet. Mr. Poole consults, writes and speaks to diverse audiences including patient groups, commerce, and the food industry on matters relating to the health benefits of the Mediterranean Diet and lifestyle. He is the author of the first non-commercial UK website dedicated to the Mediterranean Diet (www.tasteofthemed.com).

FRANCESCO SOFI is Associate Professor of Food Science and Clinical Nutrition at the Department of Experimental and Clinical Medicine, University of Florence and M.D. at the Unit of Clinical Nutrition, University Hospital of Careggi, Florence. Vice President of the Master Degree in Food Science of the University of Florence, he teaches also at the Master Degree Course of Medicine and at the Course Degree of Dietitian and Obstetrics of the University of Florence. He is vice director of the Interdepartmental Centre for Research on Food and Nutrition of the University of Florence. He is now member of the National Committee for Health Research of the Minister of Health. Prof. Sofi is author of about 150 scientific studies, published in peer-reviewed International Journals. He is one of the researcher included in the list of Top Italian Scientists, for researcher with H-index > 30 (www.topitalianscientists.org). He won several national and international prizes.



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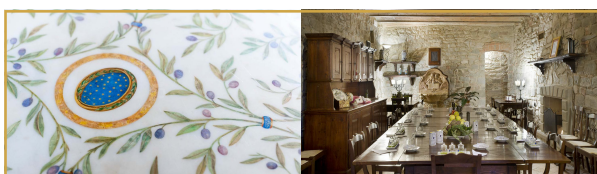
ANTONIA TRICHOPOULOU is President of the Hellenic Health Foundation, Director of the World Health Organization Collaborating Centre of Nutrition, University of Athens and Professor Emeritus, School of Medicine, University of Athens. She has served as president of the Federation of the European Nutrition Societies (FENS) and as chairperson or key member of numerous Greek, European Commission and World Health Organization Committees. She was decorated by the President of the Greek Republic with the Golden Cross of Honor for her work in nutrition and public health. In 2011, she received the FENS Award for her “outstanding nutritionist career”. Her scientific work has focused on public health nutrition and nutrition epidemiology, with emphasis on the health effects of the Mediterranean diet and traditional foods. Antonia Trichopoulou has been included in the 2014 Thomson Reuters list of the Highly-Cited Researchers in the field of Social Sciences, General.

FRANCESCO VISIOLI is Chief Scientist at the Madrid Institute for Advanced Studies-Food, and Assistant Professor at the College of Pharmacy, Oregon State University. He created a method to evaluate the nutritional profile of foods (foodprofile.org). From 1996 to 2010 he was full Professor of physiopathology at the Université Pierre et Marie Curie (Paris), where he directed the “Micronutrients and cardiovascular disease” unit. He has a publication record of over 160 papers and book chapters, and gave invited lectures in over 60 meetings. Prof. Visioli is member of the Board of Directors of the International Society for the Study of Fatty Acids and Lipids (ISSFAL), member of EFSA’s expert database, and member of several learned societies. Currently, he is the Editor-in-Chief of Pharmacological Research, Associate Editor of Lipids and of PLEFA, and First Editor of the British Journal of Nutrition, in addition to being a member of the Editorial Board of several other journals.

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