Jaén
PARAÍSO INTERIOR

INUOlive

V CONGRESO INTERNACIONAL EN ACEITES DE OLIVA, OLIVAR Y SALUD

V INTERNATIONAL CONGRESS ON OLIVE OILS, OLIVE GROVES & HEALTH

8 - 11 MAYO 2024

8TH - 11TH MAY 2024

BOOK OF ABSTRACTS

ORGANIZA

Universidad de Jaén

Instituto Universitario de Investigación en Olivar y Aceites de Oliva

SUBVENCIONA

DIPUTACIÓN DE JAÉN

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BOOK OF ABSTRACTS

INTRODUCTION

There is growing scientific evidence to support the numerous health benefits of following an eating pattern inspired by the principles of the Mediterranean Diet (MD). The positive aspects of MD have already been confirmed, and the use of olive oils, especially extra virgin olive oil (EVOO), as the main fat, is this diet's most distinctive feature. According to numerous scientific studies, EVOO consumption is associated with better health.

The '**V International Congress on Olive Oils, Olive Groves and Health'**, held in Jaén from 8 to 11 May, organised by the University Institute of Research on Olive Grove and Olive Oils (INUO) of the University of Jaen with the sponsorship of the Diputación Provincial de Jaén, placed the province of Jaén at the epicentre of research in the important field of health. A large number of experts took part, presenting the latest advances in research into the benefits of olive oil and its constituents for human and planetary health. This congress addressed such important issues as the role of olive oils in nutrition, disease prevention, sustainability and the challenges of climate change.

During the congress, the beneficial effect of EVOO in preventing many diseases was confirmed. It has potential as a preventive factor in diseases with the highest morbidity and mortality burden worldwide, such as Alzheimer's disease, other dementias and other neurodegenerative diseases, cardiovascular diseases, cancer and diabetes.

Some of the results presented at this congress have helped us to understand the mechanisms by which EVOO may exert these beneficial effects. This may help us to have confidence in the true causal relationship of these findings and to evaluate possible effects on other diseases where these mechanisms may also be involved.

In addition, some studies and results have shown that the model of the Mediterranean dietary pattern, especially with EVOO, can be extrapolated to other environments and populations that do not consume EVOO.

On the other hand, sustainable food production is essential to feed the world's growing population. Better agronomic practices are urgently needed to ensure that food is nutritious and accessible to all, as well as being environmentally friendly and adapted to the changing conditions of climate change.

This document is a compilation of the presentations and papers given at the Congress, which experts from around the world attended.

ACKNOWLEDGEMENT AND THANKS ARE GIVEN TO THE ORGANIZING COMMITTEE

ORGANIZING COMMITTEE

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Joan Sabaté
Professor of Nutrition and Epidemiology at Loma Linda University School of Public Health, California, United States.

José M. Ordovás Muñoz
Professor of Nutrition and Genetics. Tufts University, Boston, United States.

Qi Sun
Associate Professor, Department of Nutrition and Epidemiology. Harvard TH Chan School of Public Health, Boston, United States.

Francesco Visioli
Professor of Human Nutrition, Department of Molecular Medicine, Universitá degli Studi di Padova (Italy) and Associate Researcher at IMDEA-Food (Madrid, Spain).

Esther López-García
Professor of Preventive Medicine and Public Health. Autonomous University of Madrid, Spain.

Rosa Lamuela-Raventós
Professor of the Department of Nutrition and Bromatology, University of Barcelona, Spain.

Domenico Praticò
Professor of Neural Sciences, Lewis Katz School of Medicine. Director, Alzheimer's Center at Temple University, Philadelphia, United States.

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Manuel Parras Rosa
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WEDNESDAY 8TH MAY

5PM
OPENING CEREMONY
Plenary Hall of the Diputación Provincial de Jaén

Luis Planas Puchades. Minister of Agriculture, Fisheries and Food.
Francisco Reyes Martínez. President of the Diputación Provincial de Jaén.
Nicolás Ruiz Reyes. Rector of the Universidad de Jaén.
Jaime Lillo. Executive Director of International Olive Council (COI).
Juan Bautista Barroso Albarracín. Director of Instituto Universitario de Investigación en Olivar y Aceites de Oliva, Universidad de Jaén.

8PM
WELCOME COCKTAIL
Cobaleda Nicuesa Palace

THURSDAY 9TH MAY
(Venue: IFEJA Ferias JAEN)

8AM-9AM
REGISTRATION

9AM-9.45AM
OPENING LECTURE: HEALTH AND DISEASE OF 21ST CENTURY…AND BEYOND
Óscar H. Franco.
Professor of Public Health, Director of the Department of Global Public Health & Bioethics at the Julius Center for Health Sciences and Primary Care, and Chair of Healthy Living at University Medical Centre Utrecht, Utrecht University, Netherlands.

9.45AM-10.45AM
SESSION 1. METABOLIC SYNDROME AND CARDIOVASCULAR RISK FACTORS
Chair: Joan Sabate.
Professor of Nutrition and Epidemiology at Loma Linda University School of Public Health, California, USA.

OLIVE OIL AND METABOLIC RISK
Pilar Guallar-Castillon.
Professor of Preventive Medicine and Public Health Department. Universidad Autónoma de Madrid, Spain.

OLIVE OIL CONSUMPTION, ADHERENCE TO THE MEDITERRANEAN DIET AND METABOLIC SYNDROME
Estefanía A. Toledo.
Professor coPI of the CIBEROBN. Department of Preventive Medicine and Public Health, Universidad de Navarra, Spain.

10.45AM-11.15PM
COFFEE BREAK

11.15AM-12.15PM
SESSION 2. CARDIOVASCULAR DISEASES
Chair: Esther López-García.
Professor of Preventive Medicine and Public Health. Universidad Autónoma de Madrid, Spain.

MEDITERRANEAN DIET IN SECONDARY PREVENTION OF CARDIOVASCULAR DISEASE
José López Miranda.
Professor of Internal Medicine, Department of Medical and Surgical Sciences, Faculty of Medicine. Universidad de Córdoba. Head and Director of Clinic Management Unit of Internal Medicine at the Reina Sofía University Hospital, Córdoba, Spain.

OLIVE OIL AND MEDITERRANEAN DIET, THE IDEAL MODEL IN CARDIOVASCULAR PREVENTION
Miguel A. Martínez-González.
Professor of Public Health at Universidad de Navarra, and group leader at CIBEROBN, Spain. Adjunct Professor, Department of Nutrition. Harvard TH Chan School of Public Health, Boston, USA.

12.15PM-01.15PM
SESSION 3. AGEING
Chair: José M. Ordovás.
Professor of Nutrition and Genetics at Tufts University, Boston, USA.

HUNDRED YEARS OF… HEALTH! EXTRA VIRGIN OLIVE OIL AND HEALTHY AGING
Ligia J. Dominguez Rodríguez.
Professor of Internal Medicine and Geriatrics, Department of Medicine and Surgery. Universitá degli Studi di Enna "Kore", Italy. Postgraduate School of Geriatrics. Universitá degli Studi di Palermo, Italy.

MEDITERRANEAN DIET, OLIVE OIL AND AGING
Esther López-García.
Professor of Preventive Medicine and Public Health. Universidad Autónoma de Madrid, Spain.

01.15PM-02.00PM
TASTING SESSION
Chair: Sebastián Sánchez Villasclaras.
Professor of Chemical Engineering. Instituto Universitario de Investigación en Olivar y Aceites de Oliva. Universidad de Jaén, Spain.

02.00PM-03.15PM
LUNCH BREAK

02.00PM-03.15PM
POSTER SESSION

03.15PM-04.15PM
SESSION 4. BREAST AND COLON CANCER
Chair: Francesco Visioli.
Professor of Human Nutrition at the Department of Molecular Medicine of the Universitá degli Studi di Padova (Italy) and Associate Investigator at IMDEA-Food (Madrid, Spain).

DIETARY LIPIDS AND BREAST CANCER
Eduard Escrich y Raquel Moral.
Multidisciplinary Group for the Study of Breast Cancer. Faculty of Medicine, Universidad Autónoma de Barcelona. Real Academia de Medicina de Cataluña, Spain.

NUTRITION AND CANCER
María José Sánchez Pérez.
Escuela Andaluza de Salud Pública (EASP). Scientific Director of the Instituto de Investigación Biosanitaria de Granada (ibs.Granada).

04.15PM-05.15PM
SESSION 5. GUT MICROBIOTA DISORDERS
Chair: Qi Sun.
Associate Professor, Departments of Nutrition and Epidemiology. Harvard TH Chan School of Public Health, Boston, USA.

OLIVE OIL AND MICROBIOTA
Francisco Tinahones.
Professor, Department of Medicine and Dermatology, Faculty of Medicine. Universidad de Málaga, Spain.

SHAPING GUT MICROBIOTA THROUGH MEDITERRANEAN DIET
Mònica Bulló Bonet.
Professor, Department of Biochemistry and Biotechnology. Universidad Rovira i Virgili, Tarragona, Spain.

05.15PM-06.45PM
ROUNDTABLE OLIVE OIL, SUSTAINABILITY AND NUTRITION
Chair: Óscar H. Franco.
Professor of Public Health, Director of the Department of Global Public Health & Bioethics at the Julius Center for Health Sciences and Primary Care, and Chair of Healthy Living at University Medical Centre Utrecht, Utrecht University, Netherlands.

INTEGRATING AI AND OLEICULTURE: ADVANCING AGRICULTURAL DEVELOPMENT AND HEALTH
Vasilis Vasiliou.
Professor of Epidemiology and Department of Environmental Health Sciences Chair at Yale School of Public Health (YSPH), the Yale School of the Environment and at Yale School of Medicine, USA.

OLIVE OIL, PRECISION NUTRITION, AND THE MEDITERRANEAN DIET: INTEGRATING AI AND ML FOR ADVANCING HEALTHY AGING AND SUSTAINABILITY
José M. Ordovás-Muñoz.
Professor of Nutrition and Genetics at Tufts University, Boston, USA.

CONSIDERATIONS ON THE ENVIRONMENTAL SUSTAINABILITY OF OLIVES AND OLIVE OIL. THE ROLE OF OLIVE OIL IN SUSTAINABLE DIETS
Joan Sabaté.
Professor of Nutrition and Epidemiology at Loma Linda University School of Public Health, California, USA.

FRIDAY 10TH MAY

09AM-10AM
SESSION 1. PHENOLIC COMPOUNDS: RECENT STUDIES IN DISEASE PREVENTION
Chair: Rosa Lamuela-Raventós.
Professor of the Department of Nutrition and Bromatology at the Universidad de Barcelona, Spain.

OLIVE OIL (POLY)PHENOLS GREATLY CONTRIBUTE TO HEALTH. HISTORY AND RECENT EVIDENCE.
Francesco Visioli.
Professor of Human Nutrition at the Department of Molecular Medicine of the Universitá degli Studi di Padova (Italy) and Associate Investigator at IMDEA-Food (Madrid, Spain).

POLYPHENOLS AND CARDIOMETABOLIC HEALTH: EVIDENCE FROM POPULATION HEALTH RESEARCH
Qi Sun.
Associate Professor, Departments of Nutrition and Epidemiology. Harvard TH Chan School of Public Health, Boston, USA.

10AM-11AM
SESSION 2. NEURODEGENERATIVES DISEASES
Chair: Domenico Praticó.
Professor of Neural Sciences, Lewis Katz School of Medicine. Director, Alzheimer's Center at Temple University, Philadelphia, USA.

NUTRITION AND COGNITIVE DECLINE: THE ROLE OF THE MEDITERRANEAN DIET AND ITS COMPONENTS
Mary Yannakoulia.
Professor of Nutrition and Eating Behaviour, Department of Nutrition and Dietetics. Harokopio University, Athens, Greece.

OLIVE OIL AND DERIVED PHENOLICS AGAINST ALZHEIMER'S DISEASE AND RELATED DEMENTIAS: FROM BENCH TO BEDSIDE
Amal Kaddoumi.
Professor of Neuropharmacology, Department of Drug Discovery and Development, Harrison College of Pharmacy, Auburn University.

11AM-11.30PM
COFFEE BREAK

11.30AM-12.30PM
SESSION 3. OLIVE OIL, HEALTH AND NUTRITION
Chair: Vasilis Vasilious.
Professor of Epidemiology and Department of Environmental Health Sciences Chair at Yale School of Public Health (YSPH), the Yale School of the Environment and at Yale School of Medicine, USA.

MEDITERRANEAN DIET AND ENERGY RESTRICTION, PHYSICAL ACTIVITY, AND NUTRITIONAL SUPPORT IN THE PREVENTION OF CARDIOVASCULAR DISEASES AND OTHER CHRONIC CONDITIONS. THE PREDIMED-PLUS TRIAL
Miguel Delgado-Rodríguez.
Professor of Preventive Medicine and Public Health. Instituto Universitario de Investigación en Olivar y Aceites de Oliva. Universidad de Jaén, Spain.

INCREASING OLIVE OIL INTAKE AND ADHERENCE TO THE MEDITERRANEAN DIET IN NON-MEDITERRANEAN POPULATIONS
Jayne Woodside.
Director and Professor of Human Nutrition within the Centre for Public Health at Queen's University, Belfast, United Kingdom.

12.30AM-02.30PM
SESSION 4. OLIVE OIL IN AVANT-GARDE CUISINE. MICHELIN STARS
Chair: Francisco Javier Lozano.
Provincial Councillor for Promotion and Tourism. Diputación Provincial de Jaén.
Juan Carlos García. Restaurant Vandelvira. Baeza, Jaén, Spain.
Pedro Sánchez. Restaurant Bagá, Jaén, Spain.

02.30PM-03.30PM
LUNCH BREAK

02.30PM-03.30PM
POSTER SESSION

03.30PM-04.30PM
SESSION 5. CLIMATE CHANGE, OLIVE OIL PRODUCTION AND CONSUMPTION
Chair: Antonio J. Manzaneda Ávila.
Professor of Ecology. Instituto Universitario de Investigación en Olivar y Aceites de Oliva. Universidad de Jaén, Spain.

THE OLIVE TREE AND CLIMATE CHANGE. CARBON BALANCE OF THE OLIVE GROVE
Juan Antonio Polo Palomino.
Head of the Olive Oil Technology and the Environment Department. International Olive Council (IOC), Madrid, Spain.

EFFECTS OF CLIMATE CHANGE ON OLIVE REPRODUCTIVE BIOLOGY AND ITS IMPACT ON PRODUCTION AND QUALITY
Juan de Dios Alché Ramírez.
Researcher at Estación Experimental del Zaidín-CSIC, Granada, Spain.

4.30PM-6.00PM
ROUNDTABLE. GLOBAL MARKETS AND OLIVE OIL CONSUMPTION
Chair: Manuel Parras Rosa.
Professor of Marketing and Market Research. Instituto Universitario de Investigación en Olivar y Aceites de Oliva. Universidad de Jaén, Spain.

Rosa Vañó Cañadas.
Marketing Director of Castillo de Canena Olive Juice SL, Spain.

Teresa Pérez Millán.
Director manager at Organización Interprofesional del Aceite de Oliva Español.

6PM-6.45PM
CLOSING CEREMONY
Francisco Reyes Martínez. President of the Diputación Provincial de Jaén.

Nicolás Ruiz Reyes. Rector of the Universidad de Jaén.
Estefanía Ainhoa Toledo Atucha. Scientific Coordinator of Congress. Universidad de Navarra, Spain.
Juan Bautista Barroso Albarracín. Director of Instituto Universitario de Investigación en Olivar y Aceites de Oliva, Universidad de Jaén.

9 PM
CLOSING DINNER
Parador de Jaén

SATURDAY 11TH MAY

9 AM-10.30 AM
CLOSING REMARKS

10.30 AM-1.00 PM
GUIDED TOUR TO BAEZA

1.00 PM-4.30 PM
VISIT TO AOVELAND- THE VISITABLE OIL MILL

SPEAKERS

AMAL KADDOUMI

Ph.D., is a Professor of Neuropharmacology in the Department of Drug Discovery and Development at Harrison College of Pharmacy at Auburn University (USA).

Dr. Kaddoumi's research area is in translational and experimental therapeutics that include drug development, identification of novel therapeutic targets, and translational research devoted to finding therapies for neurodegenerative diseases, including Alzheimer's disease (AD) and cerebral amyloid angiopathy (CAA). The primary research goals of Dr. Kaddoumi's research are to investigate the contribution of cerebrovascular dysfunction to the pathogenesis of AD and CAA and to develop therapeutic strategies to restore AD-associated dysfunctional blood-brain barrier (BBB) and improve cognitive function.

One of the major research projects in Dr. Kaddoumi's laboratory is to study the protective effect of extra-virgin olive oil (EVOO) against AD and CAA. Findings from preclinical and clinical studies from her laboratory showed EVOO to prevent and slow the progression of AD pathology.

ANTONIO J. MANZANEDA ÁVILA

Has been Professor and Researcher in Ecology at the Department of Animal Biology, Plant Biology and Ecology at the University of Jaén since 2011. Full Professor of Ecology since January 2021. He obtained his PhD at the CSIC (Estación Biológica de Doñana), with a 60-day stay at the University of Umea (Sweden). He has carried out several research stays abroad, both during his postdoctoral period (Duke University, USA: 2006-2010) and later at the University of Virginia Tech, USA (2017). He has published 57 research articles (41 in Q1: Science, PNAS, Trends in Plant Science, New Phytologist, Molecular Ecology, The Plant Journal, Ecology, Evolution, Journal of Ecology, Ecography, Oecologia). He has led and participated in more than 20 competitive research projects (11 as PI or co-IP) in evolutionary ecology and agroecology for a total of more than €9 million.

He acts as PI and/or project coordinator in Horizon Europe Soil Mission, Marie Curie Actions, National Plan Ministry Projects, Ecological Transition Projects, Andalusian Regional Government Excellence Projects, etc.). He has given numerous guest lectures, including two as keynote speaker. Associate editor of the journal Functional Ecology 2017-2023 and regular reviewer (+150 articles) of the main international journals indexed in JCR in the field of Ecology and Plant Sciences. He is a regular reviewer of projects for different national and international agencies such as US NSF, Horizon Europe programmes (CL6, MSCA-PF, European Commission),

AEI, ANEP, and UEFISCDI, among other international organizations and universities. Interested in transfer issues, he is a co-promoter of the TIERRAS DEL LINCE© brand, designed to market sustainable EVOO in the Land Stewardship model. He has also registered two patents for plant varieties (Brachypodium) with the Spanish Plant Variety Office. He is a scientific advisor on environmental sustainability issues to Tierras del Yeguas AOVE© and FINCA AGROPECUARIA LAS CAÑADAS, S.L., with whom he has R&D contracts. Director of the Scientific Equipment and Infrastructure Secretariat of the University of Jaén (2018-2023).

DOMENICO PRATICÒ

Domenico Praticò obtained his MD from the University of Rome "La Sapienza", School of Medicine, where is also completed a residency program in Internal Medicine. He continued his post-graduation training at the University College Dublin, Ireland, and then at the University of Pennsylvania, where he was appointed Assistant Professor then Associate Professor. In 2007 he joined Temple University, School of Medicine, as Associate Professor, and since 2011 he has been Professor of Neural Sciences. In December 2017, he was bestowed with the Scott Richards North Star Foundation Chair in Alzheimer's research and appointed as the founding Director of the Alzheimer's Center at Temple. His main area of investigation is clinical pharmacology focusing on the cellular and molecular mechanisms involved in brain health, brain aging and the pathogenesis of neurodegenerative diseases such as Alzheimer's disease.

Dr. Praticò is the author of more than 300 original articles and 25 chapters in thematic books. During his career, he has received many awards for his research accomplishments including the Irvine H. Page Award, Zenith Award from the Alzheimer's Association, Dorothy Dillon Eweson Lectureship from the American Federation for Aging Research, the Paul W. Eberman Faculty Research Award and The Marconi Science Award.

EDUARD ESCRICH I ESCRICHE

Professor of Medical Physiology (1984-2019) and Human Nutrition (2011-2019) at the Faculty of Medicine of the Autonomous University of Barcelona (UAB). Director and/or professor of doctoral studies (1978-2019) at various universities and professor at the Summer Universities of Córdoba (2005-10), Menéndez Pelayo International (2007-12) and Aranjuez (2013). Co-editor and co-author of a textbook on human physiology. Founder and director of the International Seminars on General Aspects and Basic Research in Breast Cancer (33 editions, 1145 lectures, 701 different speakers).

His area of work and research is in the field of oncology, especially breast cancer: Hospital Clínic de Barcelona, Leon Berard and Gustav-Roussy Oncology Hospitals (France) and the Faculty of Medicine -since 1984- (UAB). More than 60 researchers have been trained in his laboratory. As a principal investigator, he has obtained 1 European COST project, 8 competitive projects, 12 research agreements, 8 research grants and 6 thematic networks. He has also participated as a researcher in 1 European COST project and 2 competitive projects.

He has also established 4 collaboration agreements with other institutions, 2 national and 2 international. Author of more than 170 publications, including 5 books and 17 book chapters, and editor or co-editor of 4 of them. He has supervised 14 doctoral theses and 20 dissertations or research papers. He has presented more than 190 papers and more than 250 communications at international and national congresses.

ESTEFANÍA TOLEDO ATUCHA

Dr Toledo has been Professor in the Department of Preventive Medicine and Public Health at the University of Navarra since 2015. She graduated in Medicine in 2005 from the University of Navarra and completed her Preventive Medicine and Public Health speciality in 2010. In 2008 he obtained his PhD with extraordinary award at the University of Navarra. Between 2011 and 2014 he had a "Río Hortega" research training contract grant. She completed a postdoc stay in 2008 at the Department of Community Health at Brown University (Providence, RI, USA) and two stays as a visiting researcher at Harvard University School of Public Health, one in 2012 (6 months) and one in 2014 (1 month). She is co-director of the edition of the book "Friendly Biostatistics", 4th edition. Barcelona: Elsevier España, S.L., 2020 and co-author of >40 chapters in several books aimed at students of Biostatistics, Epidemiology and Preventive Medicine and Public Health. She is co-principal investigator of her group in CIBER Fisiopatología de la Obesidad y Nutrición (CB12/03/30017). The complete list of publications can be found with the identifier researcher ID H-6211-2014. Her area of research focuses on nutritional epidemiology and the role that diet and lifestyles can play in the prevention of chronic diseases.

Since 2006 she has collaborated as a co-investigator in the PREDIMED (PREvención con DIeta MEDiterránea) trial for the prevention of cardiovascular disease with Mediterranean diet. She has participated as co-investigator in the PREDIMED-Plus trial since the design phase and

has led several articles in the SUN Project. In PREDIMED-Plus she is PI for her node of an international project to assess the effect of intervention on markers of atrial fibrillation and in SUN she leads the lines of cancer and cognitive function.

ESTHER LÓPEZ-GARCÍA

Dr Esther López-García is a professor in the Department of Preventive Medicine and Public Health at the Autonomous University of Madrid. Her research focuses on the prevention of unhealthy ageing through diet and lifestyle in the field of population epidemiology. In particular, her work has helped to characterise dietary exposures associated with the development of impaired physical function, hearing loss, risk of falls, frailty and multimorbidity. It also aims to understand the underlying biological mechanisms, in particular the metabolomic profiles that explain the associations. This work is being carried out in cohort studies from Spain, the United States and the United Kingdom.

She currently advises the Spanish Agency for Food Safety and Nutrition as Director of the Observatory for the Study of Obesity, and was previously a member of its Scientific Committee for the period 2020-2023. Dr López-García is a member of the Nutrition Group of the Spanish Society of Epidemiology.

FRANCESCO VISIOLI

Francesco Visioli is a Professor of Human Nutrition at the Department of Molecular Medicine of the University of Padova (Italy) and an Associate Investigator at IMDEA-Food (Madrid, Spain). His research ranges from in vitro studies of bioactivity (test tubes, cell cultures) to in vivo tests, performed on laboratory animals and/or humans. Dr Visioli is the recipient of the 2023 FENS Award and the Editor-in-Chief of PharmaNutrition. According to the Stanford ranking, he is the top Italian researcher in Nutrition & Dietetics n(c-score: 4.02).

FRANCISCO JOSÉ TINAHONES

Francisco José Tinahones Madueño. Doctor of Medicine, University of Cordoba. Director of the Endocrinology and Nutrition Service at the Virgen de la Victoria Hospital in Málaga. Professor of Medicine at the Faculty of Medicine in Málaga. Former President of SEEDO (Spanish Obesity Society). Former President of SAEDYN. Scientific Director of the Biomedical Research Institute of Malaga (IBIMA. Bionand Platform). Member of the Scientific Committee of CIBERobn and the PREDIMED-PLUS study. Author of more than 600 original publications in peer-reviewed, indexed medical journals (Nature, Lancet, JAMA, etc.). Cumulative Impact Index of more than 3000 publications. H-index of 92. Principal investigator in more than 40 public competitive projects. 27 doctoral theses supervised. National SEEN prize for group development, SEEDO gold medal and SED national Rodríguez Miñón prize for the best senior researcher in diabetes.

JAYNE WOODSIDE

Jayne Woodside is a Professor of Human Nutrition within the Centre for Public Health at Queen's University Belfast. She is also the Director of that Centre. She specializes in the conduct of human nutrition intervention studies with whole foods and whole diets examining clinically relevant endpoints and in interventions to promote long-term dietary change, and has led a number of dietary interventions focused on the Mediterranean Diet. She has published widely in the nutrition field (>250 original papers) and is currently funding from the UK Prevention Research Partnership, UKRI (MRC and BBSRC), NIHR, EU and the Northern Ireland Research and Development Office.

JOAN SABATÉ

Joan Sabaté MD, Ph.D., is a Professor of Nutrition and Epidemiology at Loma Linda University School of Public Health and a board-certified physician in Internal Medicine. He was the principal investigator of a nutrition intervention trial that directly linked the consumption of walnuts to significant reductions in serum cholesterol, published in the New England Journal of Medicine in 1993. He is a co-investigator of the Adventist Health Studies, the largest cohort of vegetarians relating dietary intake with health outcomes. For the past 25 years, he has been the principal investigator of many human nutrition intervention trials investigating the health effects of nuts, avocados, and other plant foods. Dr. Sabaté has authored >200 high-impact research articles (h-index 74, >35,000 citations) and has contributed to public health, including being a member of the US 2020 Dietary Guidelines Advisory Committee. Dr. Sabaté directs the Environmental Nutrition research program at the Loma Linda University School of Public Health, which focuses on sustainable diets, explores the interrelationships between food choices' environmental and health impacts, and ultimately seeks to improve food systems' sustainability, health, and equity.

JOSÉ LÓPEZ MIRANDA

José López Miranda was born on 3 May 1962. He graduated in Medicine and Surgery from the University of Córdoba in 1986 with an honours degree. He obtained his doctorate from the University of Cordoba in 1991. In 1991-92 he was a post-doctoral fellow at the New England Medical Center/Human Nutrition Research Center on Aging at Tufts University in Boston, under the supervision of Prof. EJ Schaefer and JM Ordovas. In 1995 he was appointed Director of Studies Chairman of the Teaching Committee and Chairman of the Ethics Committee for Clinical Research, Hospital Universitario Reina Sofia. In 1999-2000 he was appointed Medical Director of the Alto Guadalquivir Hospital in Andújar (Jaén). He was then appointed General Coordinator of Research and Teaching at the Reina Sofia University Hospital and, from March 2001 to June 2004, Medical Director of the Reina Sofia University Hospital. In 2002 he was appointed Professor of Medicine at the Faculty of Medicine of the University of Cordoba and in 2007 he was appointed Director of the Department of Internal Medicine at the Reina Sofia University Hospital. He currently holds the following positions Professor of Internal Medicine at the Faculty of Medicine of the University of Cordoba since 2010; and is Head of the Internal Medicine Service at the Reina Sofia University Hospital. From January 2015 to June 2019, he held the position of Deputy Director of Clinical Research at the Maimonides Biomedical Research Institute of Cordoba - IMIBIC, and from 2005 to January 2021, he held the position of Vice Dean of Hospital Affairs and Teaching Director at the Faculty of Medicine of the University of Cordoba. Professor López-Miranda's research focuses mainly on dietary and genetic factors predisposing to cardiovascular diseases, metabolic diseases and their interaction with the environment, with a special emphasis on diet and, in particular, the gene-diet interaction that determines cholesterol levels, insulin resistance, metabolic syndrome, obesity, endothelial function, type 2 diabetes and cardiovascular diseases. His unit's research focuses on human nutrition, personalized nutrition and the interaction of genetic polymorphisms and diet on lipoprotein metabolism, postprandial metabolism, insulin sensitivity, obesity, cardiovascular disease, type 2 diabetes and metabolic syndrome.

JOSÉ M. ORDOVÁS-MUÑOZ

José M. Ordovás-Muñoz is a scientist and leader of the Nutrition and Genomics Team at the Human Nutrition Research Centre on Ageing (HNRCA). His research focuses on the genetic factors that predispose people to heart disease and obesity, and the interaction of these genetic factors with environmental and behavioural factors. In particular, Dr Ordovás is investigating the effect of diet on genetic factors. He has published more than 780 scientific articles in peer-reviewed journals and has written numerous reviews and books on these topics. Dr Ordovás is exploring new areas of nutrigenomics related to the regulation of gene expression by microRNA and DNA methylation, and the relationship between genes, chronobiology and obesity. He and his team are currently studying the APOA2 gene, diet, inflammation and gut health, as well as populations at high risk of heart disease, and the TCF7L2 gene and dietary prevention of type 2 diabetes.

He is a Professor of Nutrition and Genetics at the Friedman School of Nutrition Science and Policy and a Professor at the Graduate School of Biomedical Sciences at Tufts University. Dr Ordovás also chairs the Core Scientific Advisory Committee for Functional Genomics at the same school. Throughout his career, Dr Ordovás has received numerous awards for his scientific achievements, including the USDA Secretary's Award, the Centrum American Nutrition Society Award, the Mary Swartz Award presented by the Dietetic Association, the Garry-Labbe Award presented by the American Association for Clinical Chemistry, and the Francisco Grande Memorial Lecture for Research Excellence in Nutrition.

JUAN ANTONIO POLO PALOMINO

He is an agricultural engineer specializing in agri-food economics, policy and sociology from the School of Agricultural and Forestry Engineers at the University of Cordoba, and has been an active member of several expert panels on climate change and sustainability.

He is currently in charge of the Olive Oil and Environment Department of the International Olive Council, where he is developing the strategic line of interaction between the olive grove and climate change: "The olive grove as part of the solution to climate change", among other activities, we can highlight the consolidation of the international network of olive germplasm banks under the FAO International Treaty on the Exchange of Plant Genetic Material, among others.

In 2009 he led the first study carried out in Spain on the carbon footprint of the food industry according to international standards (PAS 2050), and since then he has participated in more than a hundred studies and projects related to carbon footprint, carbon balances, life cycle analysis, sustainability and climate change for public and private entities in the agri-food sector, especially in the olive oil sector.

JUAN DE DIOS ALCHÉ RAMÍREZ

Juan de Dios Alché Ramírez holds a PhD in Biological Sciences from the University of Granada. Since 2009 he is a Research Scientist at the Zaidín Experimental Station head of the Reproductive Biology and Advanced Plant Imaging Group (BReMAP) from 2012 to the present and a member of the Scientific Commission of the EEZ. He has been the scientific manager of the Confocal and Transmission Electron Microscopy Service (CTEM) of the EEZ (2010-2014) and Head of the Department of Biochemistry, Cellular and Molecular Biology of Plants (2011-2014).

LIGIA J. DOMINGUEZ

Prof. Ligia J. Dominguez, MD was born in Colombia where she graduated in medicine and completed her residency in Internal Medicine at the "Universidad del Rosario" in Bogota. She then joined the Division of Endocrinology, Metabolism and Hypertension at Wayne State University (Detroit, MI) carrying out basic and clinical research, and completing the specialization in Endocrinology. She moved to Italy in 1996, continuing her clinical and research interests in the fields of diabetes and its complications, nutrition, and bone and mineral metabolism, in relation to ageing. Dr. Dominguez is currently a full professor of Internal Medicine and Geriatrics at the Kore University of Enna (Italy), where she teaches at the Schools of Medicine and Surgery, Nursing and Exercise Sciences, and at the Postgraduate School of Geriatrics at the University of Palermo (Italy). She has authored over 300 publications in peer-reviewed national and international scientific journals and has been invited as a speaker at national and international meetings.

MANUEL PARRAS ROSA

Manuel Parras Rosa holds a Doctorate in Business Administration and Management from the University of Seville and is a Professor of Marketing and Market Research at the University of Jaén.

Author and co-author of 17 monographs, 37 book chapters, 70 articles in national, international and professional journals and 75 presentations at national and international conferences. Researcher in 60 European, international, national and regional R+D+i research projects and contracts, of which he has been the responsible researcher in 21. His research areas are: agri-food marketing, olive oil marketing and olive oil cooperatives. Head of the UJA Marketing Research Group (SEJ-3).

UJA Marketing (SEJ-315) until 2007. Evaluator for the National Evaluation and Forecasting Agency (ANEP) in the field of olive groves and olive oil. He has given conferences on olive oil marketing by invitation in Australia, Brazil, Belgium, Croatia, Egypt, United States, Italy, Morocco, Portugal, Turkey and Uruguay.

National Prize for Publications in Agriculture, Fisheries and Food (social sciences category), awarded by the Ministry of Agriculture, Fisheries and Food, 1996. Jaén Essay Prize, 1998, awarded by the General. Unicaja Prize for Research in Economic Development and Agricultural Studies (Dissemination/Didactic Modality), 2000. Arco Iris Prize for Cooperativism, 2005, in the category of best research on cooperativism.

In the field of university management, he was Director of the Office for the Transfer of Research Results (OTRI) of the University of Jaén from 1 October 1997 to 21 July 1999. Vice-Rector for Relations with Society, University of Jaén, from 21 July 1999 to 15 July 2002. President of the Olive Oil and Oils Innovation and Technology Centre (CITOLIVA), from 18 December 2002 to 18 November 2006. Secretary of the Board of Directors and the Executive committees of the Scientific and Technological Park of the Olive Grove and Olive Oil (GEOLIT), from 2000 to 2006. He is currently President of the Economic and Social Council of the Province of Jaén, a position he held from 2002 to 2007.

Rector Magnifico of the University of Jaén, by Decree 98/2007, of 3 April, and Decree 115/2011, of 19 April, of the Governing Council of the Junta de Andalucía (April 2007-April 2015). From January 2012 to April 2015 he was President of the Board of the Conference of Rectors of Spanish Universities (CRUE).

MARÍA JOSÉ SÁNCHEZ PÉREZ

María José Sánchez Pérez graduated in Medicine from the University of Granada (UGR) in 1996. Specialist in Clinical Microbiology and Parasitology (MIR 1993-1996), Expert in Epidemiology and Clinical Research (UGR, 2000) and Expert in Health Promotion in Health, Education and Social Contexts (UGR, 2018). She joined the Andalusian School of Public Health (EASP) in 1997, where she worked as a research and technical assistant at the EASP, attached to the Cancer Registry of Granada. Since 2003 she has worked as a lecturer, from 2007 to 2016 she took over the Research Directorate and since 2009 the Directorate of the Granada Cancer Registry. Since November 2017, she has been the Scientific Vice-Director of the Institute of Biosanitary Research of Granada (ibs.GRANADA) and since 2013 the Coordinator of the Cancer Area and the Disease Registry Platform. She has extensive experience in the design and development of epidemiological studies and research projects related to the etiology, care and survival of cancer patients, having led and/or collaborated in more than 25 research projects at European, national and regional levels. The results of these projects have resulted in more than 150 publications in the last 5 years. She is also Principal Investigator of a research group of the CIBER of Epidemiology and Public Health (CIBERESP), a research group of the Institute of Biosanitary Research of Granada (ibs.GRANADA) and of the PAIDI Research Group 'Research in Public Health and Health Services' (CTS-177). Since December 2017, she has been coordinator of the Epidemiology and Control of Chronic Diseases Programme of CIBERESP and coordinator of the Cancer Epidemiological Surveillance sub-programme. She is the coordinator of the Epidemiology and Public Health Evaluation Committee of the Research Call of the Ministry of Health of the Government of Andalusia, and the Vice-Chair of the Evaluation Committee of the Primary Care Research Call of the Andalusian Health Service. She has been an ANEP evaluator since 2007. As a teacher, she participates and coordinates the University Expert in Epidemiology and Clinical Research of the University of Granada (21st edition) and other face-to-face or virtual courses related to epidemiology, research methodology, population cancer registries, cancer prevention, genetic counselling and hereditary cancer.

She is a lecturer in the Inter-University Doctoral Programme in Health Sciences at the Universities of Seville, Jaén and EASP, and has been a member of its Academic Committee (2013-2018). President of the Spanish Network of Population Cancer Registries (REDECAN, 2014-2017). Coordinator of the EPIC-Spain study. Advisor to the Directorate of the Andalusian Comprehensive Oncology Plan since 2015. Spanish representative in the GRELL Steering Committee and in the Steering Committee of the European High Resolution Studies on Cancer. Elected member of the Steering Committee of the European Network of Cancer Registries (2017-2020).

MARY YANNAKOULIA

Mary Yannakoulia is a Professor of Nutrition and Eating Behaviour in the Department of Nutrition and Dietetics, at Harokopio University, Athens, Greece. Her research interests are related to factors that influence human eating behaviour, adherence to diet and lifestyle interventions, as well as diet and ageing/cognitive decline. She is particularly interested in the Mediterranean diet, its features and health benefits, especially in relation to cognitive decline, as well as the potential transferability of the main concepts of this pattern to non-Mediterranean populations. In 2009 she received a Fulbright research award to study Mediterranean diet about metabolic syndrome, whereas in 2023 the Honorary European Dietetic Fellowship Award of the EFAD. She has been the PI in 6 research projects with national or international funding and in many others she has acted as co-PI or collaborator. She has co-authored >280 scientific publications in peer-reviewed journals (including, Lancet Neurology, Metabolism, and Heart) (Scopus: > 8,500 citations, h-factor 47; Google Scholar: > 14,000 citations, h-factor 66).

MIGUEL A. MARTÍNEZ-GONZÁLEZ

Prof. Miguel A. Martínez-González is a medical epidemiologist, Professor of Public Health at the University of Navarra, Adjunct Professor of Nutrition at Harvard TH School of Public Health (Dpt. of Nutrition) since 2016, and group leader at CIBEROBN, with >30 years of experience in epidemiologic research on chronic diseases, nutrition and lifestyles. As Principal Investigator (PI), he has designed and directed large trials and cohorts, including SUN, PREDIMED and PREDIMED-Plus, which have shed unparalleled light and scientific evidence from Spain with worldwide impact. Since 2013, he designed and is PI of the PREDIMED-Plus trial, funded by the European Research Council with an Advanced Research Grant.

Since 2013, he has also been actively involved, as co-PI, together with Frank B. Hu (Harvard University), in several NIH-funded grants on cardiovascular disease or type 2 diabetes assessing metabolomics in the context of Mediterranean diet interventions.

In 1995 he founded and started the Department of Preventive Medicine and Public Health at the University of Navarra, which today is one of the most fruitful and leading Departments in Spain. Since then, Prof. Martínez-González has published more than 1000 articles and abstracts indexed in Web of Science and he is one of the most cited scientists in Spain in the ranking of all scientific areas in recent years. He has been mentor of a large group of Full Professors and Associate Professors of Epidemiology and Public Health.

He is the editor of the main textbooks in Spanish on Biostatistics (Elsevier), Epidemiology (Ariel-Planeta) and Public Health (Elsevier). In 2022, he chaired the Committee for designing a large national cohort in Spain (IMPaCT) similar to the UKBiobank, which is currently undergoing its recruitment phase.

As a popularizer, his recent publications with Editorial Planeta stand out: "Salud a Ciencia Cierta (Evidence-based Health)" (2018) and "¿Qué comes? (What do you eat?)" (2020), "La sanidad en llamas (The Health System on fire)" (2021) and "Salmones, hormonas y pantallas (Salmon, hormones and screens)" (2023).

In 2023 he attained a second Advanced Research Grant del ERC to develop between 2024 and 2028 the largest ever conducted trial on the health effects of alcohol.

He received several distinctions and awards both in the US (Grace Goldsmith Award, Rankin-Skratud lecture) and in Spain, including the prestigious Premio Nacional de Investigación en Medicina Gregorio Marañón 2022 given by the King and Queen of Spain in March 2023.

MIGUEL DELGADO-RODRÍGUEZ

Born in Córdoba in 1958. Graduated in Medicine (1981), Epidemiologist in the National Health Service (1982). Doctor of Medicine (1985), University of Granada. Specialist in Preventive Medicine and Public Health (1986). Master in Public Health, UCLA -University of California at Los Angeles- (1987). Professor of Preventive Medicine and Public Health at the University of Cantabria (1992) and at the University of Jaén since 1999. President of the National Commission of Preventive Medicine and Public Health (2008-2014). Scientific Director of the Network of Biomedical Research Centres in Epidemiology and Public Health (CIBERESP, 2010-2017), Carlos III Institute of Health, Madrid (Ministry of Health). Supervisor of 50 doctoral theses. Principal investigator in 30 projects funded by national public bodies. Author of 450 papers and 218 book chapters. Index h of 66.

MÒNICA BULLÓ

Mònica Bulló is a Professor of the Department of Biochemistry and Biotechnology-Rovira i Virgili University, Director of the Nutrition and Metabolic Health Research Group, Director of the Tecnatox Center and Research Collaborator at the Institute of Neurosciences-UB. Bulló was recently awarded the ICREA Academia distinction. She has extensive experience in epidemiological studies and clinical trials evaluating the relationship between diet/dietary components with obesity, T2D, CVD, cognitive impairment and dementia through the modulation of metabolomics, epigenomics and microbiome. Bulló was member of the Board of Directors of different national scientific societies (SENBA, SEEDO, CCNIEC-IEC) and currently belongs to the International Board of Diabetes and Nutrition Study Group (DNSG-EASD), the International Carbohydrate Quality Consortium (ICQC), member of the Scientific Committee of the Pere Virgili Health Research Institute and member of the Hub Food&Technology-Redessa. She has published more than 270 papers in high impact factor Journals, with an H-index of 84 and more than 19.000 citations. She has occupied the first positions (1st woman) in the AD Scientific Index 2021, 2022, 2023, 2024 within researchers from the URV and is in the top 3% in the world. Highly committed with societal science, she collaborates with patients' associations and is very active in social media and press.

OSCAR H. FRANCO

Prof. Oscar H. Franco is Professor of Public Health, and Director of the Department of Global Public Health & Bioethics at the Julius Center for Health Sciences and Primary Care, and Chair of Healthy Living at University Medical Centre Utrecht, Utrecht University. Furthermore, Oscar is an Adjunct Professor at the Harvard T.H. Chan School of Public Health, the University of Bern, the National University of Mar del Plata, Argentina; Honorary Professor at Universidad Javeriana, Bogota, Colombia, Huazhong University of Science and Technology, Wuhan, China; and scientific advisor for the French television channel France24 (until end 2023). Prof. Franco has published over 800 publications and has a H-index of 112 (WoS).

Prof. Franco obtained his MD at Pontificia Universidad Javeriana, Bogotá, Colombia in 1998. In 2001 he moved to the Netherlands to complete MSc and DSc degrees in clinical epidemiology and a PhD in public health and cardiovascular disease prevention (2005) at the Erasmus University Medical Center. Following a postdoc at Erasmus MC, he moved to the UK where he was a senior public health epidemiologist at Unilever England, assistant professor of public health at the University of Warwick, and then director of the MPhil program and clinical lecturer in public health at the University of Cambridge. In 2012 Prof. Franco returned to ErasmusMC to the department of epidemiology where he worked as professor of preventive medicine and the principal investigator of the cardiovascular

epidemiology group. He also founded and directed the Rotterdam Intergenerational Ageing Research Center, ErasmusAGE, and he was cofounder and CEO of Erasmus Epidemiology Resources. From 2018 until 2022, Oscar moved to the University of Bern as Professor of Epidemiology and Public Health and Director of the Institute of Social and Preventive Medicine (ISPM) at the University of Bern, Switzerland.

PILAR GUALLAR CASTILLÓN

Dr Pilar Guallar Castillón (MD, PhD, MPH) has been working in the field of nutritional epidemiology for more than 20 years and has more than 200 publications in the Web of Science (WOS) with an H-index of 53 (WOS). She is a specialist in Preventive Medicine and Public Health (via MIR Hospital Universitario 'La Paz'), Professor in the Department of Preventive Medicine and Public Health at the Autonomous University of Madrid (UAM). She has been teaching epidemiology and public health at undergraduate and postgraduate level for more than 25 years. She is a member of the Cardiovascular and Nutritional Epidemiology Research Group of the UAM and of the CIBER of Epidemiology and Public Health (CIBERESP, Group 25), and is also a collaborating researcher at the Institute for Research in Food and Health Sciences (IMDEA Food). Her main research interests are the prevention of cardiovascular diseases and healthy ageing, with a particular focus on nutritional and environmental epidemiology.

He has 238 publications (63 in the last 6 years), most of which are in the first quartile and decile of their respective fields. He has worked for many years on dietary patterns and healthy ageing.

Finally, Dr Pilar Guallar Castillón is ranked 155th in the ranking of the most relevant Spanish and foreign researchers in Spain, according to Google Scholar. She is currently a member of the Scientific Committee of AESAN (Spanish Agency for Food Safety and Nutrition; Ministry of Social Rights, Consumption and Agenda 2030) and coordinator of the Medical Degree at the Autonomous University of Madrid.

QI SUN

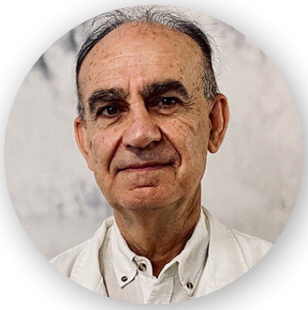
Dr. Qi Sun is an Associate Professor in the Departments of Nutrition and Epidemiology, Harvard T.H. Chan School of Public Health. He is also an Associate Professor of Medicine at Channing Division of Network Medicine, Brigham and Women's Hospital and Harvard Medical School. Dr. Sun's primary research interests are to identify and examine biomedical risk factors, particularly dietary biomarkers, in relation to type 2 diabetes, obesity, and cardiovascular disease through epidemiological investigations. His research is primarily based on several large-scale cohort studies, including the Nurses' Health Studies and the Health Professionals Follow-up Study. Dr. Sun is also interested in understanding the role of environmental pollutants, such as perfluoroalkyl substances and legacy persistent organic pollutants, in the etiology of weight change and type 2 diabetes. His research has led to more than 300 peer-reviewed publications. Dr. Sun is currently leading a few NIH-funded projects that focus on food biomarker discovery and validation, as well as relationships between obesogens and weight change, in human populations.

ROSA LAMUELA-RAVENTÓS

Professor of the Department of Nutrition and Bromatology at the University of Barcelona, she is the founder and leader of the Polyphenol Research Group SGR 00334 2021 (polyphenolresearch.com), which is part of the scientific excellence groups of the CIBEROBN. Currently, she holds the position of principal researcher of the María de Maeztu Excellence Unit of the Institute of Nutrition and Food Safety of the UB, INSA-UB. For five consecutive years (2017-2021), she has been included in the list of the most influential scientists in the world published by Clarivate Analytics (Highly Cited Researchers). He has published more than 400 scientific articles with more than 46,000 citations, which translates into an H index of 98 (Scopus). In recognition of her excellence, in 2018 she was awarded the XXV Danone Institute Award for Scientific Career "Dr. Carles Martí Henneberg."

ROSA VAÑÓ CAÑADAS

With a degree in Economics and Business Administration from the Complutense University of Madrid, she has had a long career and extensive management experience in various multinational companies in different sectors. After holding various positions of responsibility in American multinationals - the last nine years at The Coca-Cola Company as Director of the Carbonated Beverages Division - she founded Castillo de Canena Olive Juice in 2003 with her brother Francisco Vañó, and in a short space of time has managed to position this young brand as a benchmark for innovation and quality in the high-end olive oil market throughout the world. During these years at the helm of Castillo de Canena, Rosa Vañó has consolidated the international expansion of the company, which is now present in more than 50 countries; a spectacular growth based on the high quality and prestige of its oils, as confirmed by numerous national and international awards. In 2008 Rosa received the Businesswoman of the Year Award and in 2024 the recognition for Agro Woman in Internationalisation. Since 2011 she has been a member of the Florentina Georgofilli Academy (the oldest agricultural academy in Europe), the Extra Virgin Alliance Board (USA) and since 2022 she has also been a member of the INUO Advisory Committee. She has been President of the Andalusian Academy of Gastronomy and Tourism and is currently an academic and member of the Board of the Royal Academy of Gastronomy.



SEBASTIÁN SÁNCHEZ

Sebastián Sánchez Villasclaras is a Professor of Chemical Engineering in the Department of Chemical, Environmental and Materials Engineering at the University of Jaén, Academic Director of the University Degree in Virgin Olive Oil Tasting, Director of the 'Bioprocesses' Research Group (TEP-138) and Head of the Process Engineering Unit at the University Institute of Research on Olive Grove and Olive Oil (INUO). He graduated in Chemical Sciences from the University of Granada in 1978, specializing in Industrial Chemistry, and has been a Doctor of Chemical Sciences since 1985. He also has extensive experience in olive oil technology, chemical composition analysis, sensory characterization of olive oils and the use of by-products and waste from olive groves, oil mills, extractors and refineries, opting for the circular bioeconomy. He has co-authored 115 research papers and book chapters in national and international scientific journals. He has co-directed 21 doctoral theses and as many undergraduate theses and research memoirs in the above areas of work. He has participated in and directed 37 research projects and contracts funded by public and private bodies at national and international level.

TERESA PÉREZ MILLÁN

Teresa Pérez Millán has been director of the 'Interprofesional del Aceite de Oliva Español' since 2008. She holds a degree in Agricultural Engineering from the Universidad Politécnica de Madrid, specialising in the agri-food industry and management: Olive oil expert. Director of the organisation and head of the technical team. Since the first extension of the standard, she has designed the strategies for the different areas of activity in conjunction with the governing bodies and has managed their implementation.

VASILIS VASILIOU

Vasilis Vasiliou is the Susan Dwight Bliss Professor of Epidemiology and the Chair of the Department of Environmental Health Sciences at Yale School of Public Health (YSPH). He is also Professor at the Yale School of the Environment and at Yale School of Medicine. He received his BSc in Chemistry (1983) and PhD in Biochemical Pharmacology (1988) from the University of Ioannina, Greece. He then trained as Fogarty Fellow in molecular toxicology and pharmacogenetics at the College of Medicine of the University of Cincinnati (1991-1995). In 1996, he joined the University of Colorado School of Pharmacy where he rose through the ranks to become Professor and Director of the Toxicology Program.

In 2014, he joined the faculty of Yale University in his new position. He has built a rather successful department at YSPH through recruitment and the development of innovative research and education programs. His laboratory utilizes state-of-the-art integrated system approaches that include metabolomics, lipidomics, exposomics, tissue imaging mass spectrometry, deep learning, as well as human cohorts and genetically engineered mouse models to elucidate mechanisms, and to discover biomarkers and novel interventions for human disease.

At Yale the director of the NIEHS/NIH-funded Yale Superfund Research Center and of the NIAAA/NIH-funded R24-Resource Center for Mouse Models and Metabolomics Tools to Investigate Alcohol Metabolism and Tissue Injury.

He also co-leads an NIAAA/NIH-funded T32 Translational Alcohol Research Program (TARP) Training Program for post-doctoral fellows, and an NIHES/NIH -funded R25 Summer Research Experience in Environmental Health (SREEH) Training Program that introduce undergraduate students in Connecticut (CT) to Environmental Health Research.

ORAL PRESENTATIONS

THURSDAY 9TH MAY

OPENING LECTURE

Óscar H. Franco
Professor of Public Health, Director of the Department of Global Public Health & Bioethics at the Julius Center for Health Sciences and Primary Care, and Chair of Healthy Living at University Medical Centre Utrecht, Utrecht University, Netherlands.

HEALTH AND DISEASE OF 21ST CENTURY…AND BEYOND

The 20th century witnessed the rise of noncommunicable disorders (NCDs) and the consolidation of cardiovascular disease (CVD) as the number one cause of morbidity and mortality globally, a trend that has been maintained in the 21st century. The emergence of CVD and NCDs in general has resulted from improvements in living conditions, hygiene, sanitation, and healthcare, among others, that have contributed to substantial decreases in child and maternal mortality and have resulted in people living ever longer. This has led to widespread interest in ageing and healthy ageing; however, questions remain regarding how can we shape our own trajectories of life? These questions have sparked, motivated, and challenged my career. Although I might not have answers to these questions, I will share my personal and quixotic attempts to find the answers, together with personal reflections about the future of medicine.

SESSION 1. METABOLIC SYNDROME AND CARDIOVASCULAR RISK FACTORS

Pilar Guallar-Castillon
Professor of Preventive Medicine and Public Health Department. Universidad Autónoma de Madrid, Spain.

OLIVE OIL AND METABOLIC RISK

The relationship between olive oil (OO) consumption and metabolic risk is of increasing interest. A meta-analysis showed an inverse association for total mortality, cardiovascular mortality and cardiovascular events. Furthermore, in two large American cohorts, OO intake was associated with a lower risk of cardiovascular disease and coronary heart disease. Similar results have been observed in large Spanish cohorts. Despite this evidence, there are not enough studies to show an association between OC use and blood lipids, obesity, glucose metabolism or blood pressure.

Regarding lipid metabolism, adherence to an OC-enriched Mediterranean diet has been associated with less atherogenic LDL particles and improved HDL functionality. However, in a clinical trial, no differences in LDL or HDL were observed after 12 weeks of a diet enriched with 30 ml of extra virgin OC.

Concerning obesity, consumption of the OC-rich diet was not associated with differences in weight in the PREDIMED study. A meta-analysis showed a small reduction in BMI associated with OC use in people with non-alcoholic fatty liver disease.

Regarding glucose metabolism, three meta-analyses showed that OC use was inversely associated with the risk of diabetes.

For glucose metabolism, three meta-analyses showed that OC use was inversely associated with the risk of diabetes.

The results for blood pressure are equivocal. While one clinical trial showed that OC use was inversely associated with diastolic blood pressure, a meta-analysis showed a reduction in systolic blood pressure.

Estefanía A. Toledo
Professor coPI of the CIBEROBN. Department of Preventive Medicine and Public Health, Universidad de Navarra, Spain.

OLIVE OIL CONSUMPTION, ADHERENCE TO THE MEDITERRANEAN DIET AND METABOLIC SYNDROME

The metabolic syndrome results from the clustering of cardiovascular risk factors, including insulin resistance, excessive body weight, dyslipidemia, and high blood-pressure. Several definitions for metabolic syndrome have been established although nowadays the Harmonizing Definition proposed by the International Diabetes Federation Task Force on Epidemiology and Prevention and the American Heart Association/ National Heart, Lung, and Blood Institute has become the most frequently used one.

The metabolic syndrome is associated with a twofold risk of cardiovascular disease, and a fivefold risk of type 2 diabetes and 70% relatively higher risk of sudden death.

Approximately one out of four adults worldwide meet the criteria for metabolic syndrome, although there are some definitional discrepancies. Prevention and management of metabolic syndrome, therefore, turns to be of utmost importance from a public health perspective.

The Mediterranean diet is recognized as one of the healthiest dietary patterns. As for metabolic syndrome prevention, a meta-analysis of prospective cohort studies found a 27% relative risk reduction associated with high adherence to the Mediterranean diet. In addition, in the CORDIOPREV study, a higher adherence to a Mediterranean lifestyle was associated with a lower risk of developing metabolic syndrome. No long-term randomized trial has so far shown that a dietary intervention fostering adherence to the Mediterranean diet may reduce the risk of developing metabolic syndrome.

On the other hand, once the metabolic syndrome has been already established, the Mediterranean diet may also be helpful to prevent its consequences and even revert this condition.

Accordingly, in a cohort study with more than 8000 participants with metabolic syndrome conducted in the US, a higher adherence to the Mediterranean diet was associated lower all-cause mortality as well as cardiovascular mortality.

Moreover, in the diabetes cohort, a prospective cohort study with a representative sample of the Spanish population, a higher adherence to the Mediterranean diet was associated with a higher remission of metabolic syndrome.

Interestingly, as for the reversion of metabolic syndrome, there is evidence from two randomized trials which showed that dietary interventions promoting the adherence to the Mediterranean diet were successful in reverting this condition. As such, in the PREDIMED trial, participants at high cardiovascular risk were randomized in a 1:1:1 ratio to three different dietary interventions fostering (a) the adherence to a Mediterranean diet supplemented with extra-virgin olive oil, (b) the adherence to a Mediterranean diet supplemented with mixed nuts, or (c) the reduction of total fat intake. Consistently, a smaller trial conducted in Italy also found that a Mediterranean-style diet could help to revert metabolic syndrome.

Olive oil, and especially extra-virgin olive oil, is a cornerstone of the Mediterranean dietary pattern. Unfortunately, no large prospective study has assessed whether a higher consumption of total or extra-virgin olive oil may lower the risk of metabolic syndrome as a whole or, alternatively, revert it, though both the PREDIMED and the CORDIOPREV trials, found encouraging results.

SESSION 2. CARDIOVASCULAR DISEASES

José López Miranda
Professor of Internal Medicine, Department of Medical and Surgical Sciences, Faculty of Medicine. Universidad de Córdoba. Head and Director of Clinic Management Unit of Internal Medicine at the Reina Sofía University Hospital, Córdoba, Spain.

MEDITERRANEAN DIET IN SECONDARY PREVENTION OF CARDIOVASCULAR DISEASE

Lifestyle and diet affect cardiovascular risk. Both Mediterranean and low-fat diets have demonstrated effectiveness in the primary prevention of cardiovascular disease. However, there is still no consensus regarding the optimal dietary model for secondary prevention.

The CORDIOPREV study (Coronary Diet Intervention with Olive Oil and Cardiovascular Prevention) is a prospective, randomized, single-blind, controlled trial which involves patients aged 20–75 years with established coronary heart disease (CHD), randomly assigned in a 1:1 ratio to either a Mediterranean diet rich in extra virgin olive oil (35% fat, 22% monounsaturated fatty acids, <50% carbohydrates) or a low-fat diet rich in complex carbohydrates (28% fat, 12% monounsaturated fatty acids, >55% carbohydrates), with a follow-up period of 7 years. Clinical investigators were blinded to treatment assignment; participants were not. Dietary interventions were administered by a team of dietitians. The primary outcome, assessed by the intention to treat, was a composite of major cardiovascular events, including myocardial infarction, revascularization, ischemic stroke, peripheral artery disease, and cardiovascular death.

Between October 1, 2009, and February 28, 2012, a total of 1002 patients were enrolled, with 500 (49.9%) in the low-fat diet group and 502 (50.1%) in the Mediterranean diet group. The mean age was 59.5 years, with 82.5% of patients being men. The primary endpoint occurred in 198 participants: 87 in the Mediterranean diet group and 111 in the low-fat group (crude rate per 1000 person-years: 28.1 [95% CI 27.9–28.3] in the Mediterranean diet group vs 37.7 [37.5–37.9] in the low-fat group, log-rank p=0.039). Multivariable-adjusted hazard ratios (HRs) of the different models ranged from 0.719 (95% CI 0.541–0.957) to 0.753 (0.568–0.998) in favour of the Mediterranean diet. These effects were more evident in men, with primary endpoints occurring in 67 (16.2%) of 414 men in the Mediterranean diet group vs 94 (22.8%) of 413 men in the low-fat diet group (multiadjusted HR 0.669 [95% CI: 0.489–0.915], log-rank p=0.013), than in 175 women, for whom no difference was found between groups.

We also evaluated endothelial function [assessed by flow-mediated dilation (FMD) of the brachial artery], since endothelial dysfunction is considered a crucial step in the development of atherosclerosis, with the evaluation of different underlying mechanisms involved in endothelial function modulation [endothelial microparticles (EMPs) and endothelial progenitor cells (EPCs) and in vitro cellular processes related to endothelial damage and endothelial repair] and the quantification of intima-media thickness of both common carotid arteries (IMT-CC).

Patients who followed the Mediterranean diet had higher FMD (3.83%; 95% CI: 2.91-4.23) compared with those in the low-fat diet (1.16%; 95% CI: 0.80 to 1.98). We observed higher EPC levels (group difference: 1.64%; 95% CI: 0.79-2.13, p=0.028) and lower EMPs (group difference: -755 EMPs/µl; 95% CI: -1,010 to -567, p=0.015) after the Mediterranean diet compared with the low-fat diet. The Mediterranean diet also produced lower intracellular ROS production, cellular apoptosis and senescence and higher cellular proliferation and angiogenesis than the low-fat diet (all $p<0.05$).

Carotid ultrasonography studies showed that the Mediterranean diet decreased IMT-CC at 5 years (−0.027±0.008 mm; $p<0.001$), and 7 years (−0.031±0.008 mm; $p<0.001$), compared to baseline, while the low-fat diet did not modify IMT-CC at any point in the dietary intervention.

In conclusion, the Mediterranean diet proved superior to the low-fat diet in preventing major cardiovascular events in patients with CHD. In addition, the Mediterranean diet improved the endothelial function compared with a low-fat diet, and this effect is associated with a better balance of vascular homeostasis, leading to a decrease in atherosclerosis progression, as shown by reduced IMT-CC. Our results are relevant to clinical practice, supporting the use of the Mediterranean diet in the dietary treatment of patients with CHD.

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OLIVE OIL AND MEDITERRANEAN DIET, THE IDEAL MODEL IN CARDIOVASCULAR PREVENTION

The traditional Mediterranean diet is the best evidence-based model for cardiovascular prevention.

Olive oil is the main source of lipids in the traditional Mediterranean diet.

In addition to a couple of major randomized secondary prevention trials (Lyon Heart and CORDIOPREV) and a large primary prevention trial (PREDIMED) that have demonstrated strong benefits against hard cardiovascular end-points, there is an unprecedented body of high-quality prospective observational epidemiological evidence supporting these beneficial effects in long-term and well conducted cohort studies with adequate control for confounding.

The key elements of the Mediterranean traditional pattern are the abundant use of extra-virgin olive oil and high consumption of unprocessed or minimally processed foods of natural plant-based origin (fruits, vegetables, nuts, and legumes) together with fish. Another element not to forget is the needed reduction in processed meats, red meats, and ultraprocessed products.

Moderate consumption of wine, preferably red wine with meals, is an element of this traditional pattern.

Although removing wine consumption from the Mediterranean diet has been associated with a reduction in its preventive efficacy, doubts have been recently raised on possible adverse effects of even low-to-moderate wine consumption.

A new large Spanish trial, the University of Navarra Alumni Trialist Initiative (UNATI), funded by the European Research Council (ERC) will randomize 10 000 drinkers aged 50 to 75 years to advice on abstention or moderate consumption and will represent the largest trial to date on the effects of interventions on alcohol.

SESSION 3. AGEING

Ligia J. Dominguez Rodríguez
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HUNDRED YEARS OF . . . HEALTH! EXTRA VIRGIN OLIVE OIL AND HEALTHY AGING

The Aging of the world population is a unique demographic phenomenon occurring in the last 150 years, which entails drastic changes in all aspects of society. This phenomenon is expected to continue with an estimated global mean life expectancy increase of 4.4 years for men and women by 2040. This triumph of humanity is overshadowed by the possibility of adding years of life with chronic non-communicable diseases (NCDs), which are now the primary cause of mortality, morbidity, and disability. They comprise cardiovascular disease (CVD), type 2 diabetes (T2D), cancer, and neurodegenerative diseases, among others, which are responsible for about 70% of world mortality, morbidity and health expenses. Therefore, efforts should aim to avoiding these diseases to promote longevity and healthy ageing.

Compelling evidence supports the concept that nutritional determinants have a major impact on the risk of age-associated NCDs, as well as on mortality. The dietary pattern with the greatest evidence of association with a reduction of several NCDs and mortality is the Mediterranean diet. Olive oil is a key component of the Mediterranean diet traditionally used as the main culinary and dressing fat in Mediterranean countries. Accruing evidence support its health benefits in the risk of many of the age-related NCDs and mortality, both in Mediterranean populations and elsewhere. These benefits appear to be mediated by its high content of monounsaturated fatty acids, especially oleic acid, and other minor components including polyphenols and vitamin E, contributing to its anti-inflammatory and antioxidant properties.

Results from two cohort studies, the Nurses' Health Study and the Health Professional's Follow-up Study, showed that higher olive oil intake (>7g/d) was associated with 19% lower CVD mortality risk, 17% lower cancer mortality risk, 29% lower neurodegenerative disease mortality risk, and 18% lower respiratory disease mortality risk, compared to those who never consumed olive oil. Replacing 10g/d of margarine, butter, mayonnaise, and dairy fat with the equivalent amount of olive oil was associated with 8-34% lower risk of total and cause-specific mortality. A recent outcome-wide systematic review and meta-analysis of prospective cohort studies and randomized controlled trials assessed the association between olive oil consumption and the primary risk of diverse outcomes. There was a 16% reduced risk of CVD for every additional 25 g/d of olive oil consumption and a 22% lower relative risk of T2D; olive oil consumption was inversely associated with all-cause mortality. Interestingly, data from the ENRICA cohort showed that virgin olive oil consumption was inversely associated with cardiovascular mortality, but common olive oil (not containing phenolic compounds) was not.

Frailty, a condition that can be considered a hallmark of unhealthy aging, is characterized by reduced strength and endurance and lessened physiological functioning, which increases the vulnerability to even minor stressors. In a sample of non-institutionalized older adults from the Seniors-ENRICA-1 cohort followed up for 3.5 years, those with a daily consumption of total olive oil of ~3 tablespoons had a 53% (22–71%) lower risk of developing frailty than those with a consumption of ~1 tablespoon. These beneficial associations held for virgin olive oil but not for the refined olive oil.

Other aging-related worrying conditions with a significant impact on disability and, consequently, on quality of life are neurodegenerative diseases including cognitive decline and dementia. In experimental

studies, senile SAMP-8 mice, animal model of Alzheimer's disease, that received olive oil had improved learning and memory performance vs. those receiving butter or coconut oil. There are also clinical data pointing to the effect of olive oil on cognitive function. In the PREDIMED trial, after a median follow-up of 4.1 years, the groups who followed the Mediterranean diet supplemented with olive oil or nuts exhibited improved cognitive function compared to the control low-fat diet group, with particular improvements noted in memory and frontal cognition tests.

It is currently accepted that promoting a healthy diet and lifestyle, at any age, can bring great benefits in terms of reduced morbidity and mortality. The use of extra virgin olive oil and its adequate diffusion represent a promising and feasible option for the prevention of age-related NCDs thanks to its antioxidant and anti-inflammatory actions.

Esther López-García
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MEDITERRANEAN DIET, OLIVE OIL AND AGING

Healthy ageing has been defined as "the process of developing and maintaining the functional ability that enables wellbeing in older age". Aging is not necessarily linked to disability and some individual's success avoids the progression to that end. In our work we focused on understanding how diet has an impact on the development of the first indicators of disability, including physical and cognitive impairment, as well as sleep disorders. We also try to understand how diet modifies the risk of developing intermediate variables in the process of disability, such as frailty syndrome, the development of multimorbidity and the risk of falling. These situations are defined as complex health states, consequences of multiple underlying factors and alterations in several organ systems. Lastly, we are examining how diet can modulate the pathways of disability even in advanced stages.

We estimated the association between adherence to the Mediterranean diet and the risk of developing physical function impairment, assessed through objective measures of function, including agility, mobility, gait speed, or grip strength, in a cohort of Spanish adults. We estimated that a 2-point increase in adherence to the MEDAS score was associated with 13% risk reduction. Closely related to physical function impairment is the risk of falling. Our results showed that people with higher adherence to Mediterranean diet were less likely to fall than those with the lowest adherence to this diet. Frailty is different from physical impairment and an advanced stage in the process of disability. We examined this association in the Nurses' Health Study cohort. A decreased risk of frailty was found among those women with a higher adherence to the adapted Mediterranean diet score. We estimated that an increase in 2 points in adherence was associated with 13% lower risk of frailty. Substitution of 5% of energy from monounsaturated fat for an equal exchange of saturated fat was associated with a lower risk of frailty. Lastly, in a population of older adults, a higher diet quality, as measured by the MEDAS score, was associated with lower number of chronic conditions. In prospective analysis, a higher adherence to the score was associated with a lower rate of chronic disease accumulation over time.

The Mediterranean diet pattern has been associated with less risk of developing physical impairment, falls, frailty, and sleep disorders. This suggests that the beneficial effect of this diet happens in different stages of the process of disability. In addition, the evidence of the impact of the Mediterranean diet on complex multimorbidity is still scarce, but results suggest that this diet is beneficial to prevent multimorbidity. Lastly, the beneficial effects found can be completed with other healthy lifestyle factors.

SESSION 4. BREAST AND COLON CANCER

Eduard Escrich i Escriche
Multidisciplinary Group for the Study of Breast Cancer. Faculty of Medicine, Universidad Autónoma de Barcelona. Real Academia de Medicina de Cataluña, Spain.

DIETARY LIPIDS AND BREAST CANCER

Among all dietary components, fats have been experimentally shown to be the factors most closely associated with breast cancer, colon and rectal cancer and, probably, prostate cancer. The Multidisciplinary Group for the Study of Breast Cancer at the Autonomous University of Barcelona is studying the effects and mechanisms of action of two common dietary lipids, omega-6 and extra virgin olive oil (EVOO), on breast cancer. The research will be carried out in an experimental in vivo model, in human tumours and in human and experimental cells in vitro.

The experimental results indicate that omega-6 lipids, when in excess, stimulate experimental breast cancer, while EVOO slows the progression of the disease. The omega-6 tumours are of a higher clinical and anatomopathological degree of malignancy, while those of EVOO are of a similar degree to those of the normolipid control diet groups. These effects are mediated by diverse and complex mechanisms of action, different for each type of lipid. Among all the mechanisms discovered, the main ones for each type of lipid are highlighted below.

Diets rich in omega-6 lipids induce changes in the lipid composition and membrane domains of tumour cells that increase the activation of the important c-ErbB's-Ras cell proliferation pathway and its key effectors. On the other hand, excessive consumption of these fats increases body weight and accelerates the onset of puberty, both of which are risk factors for breast cancer. Increased body weight is associated with the severity of the disease. They also act as carcinogens by altering xenobiotic detoxification pathways and inducing genotoxicity in DNA. Genome-wide functional studies have suggested an increased proliferation/apoptosis balance and a pro-inflammatory microenvironment in breast tumours due to the effect of the omega-6 diet. In addition, these tumours are morphologically and molecularly highly undifferentiated.

Conversely, tumours from animals fed the EVOO diet show molecular features of breast cancer inhibition. The cells of these tumours have membrane non-proliferative and apoptotic characteristics.

The c-ErB-Ras pathway is inhibited mainly due to the inactivation of PI3K/Akt. These diets induced apoptosis in tumour cells, which could be triggered mainly by the intrinsic or mitochondrial pathway (increased levels of procaspase-9 and active caspase-9 expression). Also, through the caspase-independent pathway initiated by AIF and endonuclease G protein, a pathway that may be linked to the former caspase-dependent pathway. On the other hand, EVOO diets do not modify sexual maturation and maintain body weight, even in excess. The effect of EVOO on weight maintenance is mediated by anorexigenic neuropeptides, such as oxytocin and alpha-MSH, and the lipolysis/lipogenesis balance in adipose tissue (increase in phospho-PKA, HSL, MGL and decrease in FAS).

The study of the whole genome (transcriptome) and gene ontology analyses, which describe the attributes of genes and gene products, of the mammary gland and tumours show that omega-6 lipids decrease the expression of genes related to the immune system and apoptosis, while those of EVOO modify genes related to metabolism.

Based on the information previously obtained in an epigenetic study of experimental tumours, the research team has promoted a line in which the effect of dietary habits on the epigenetic mechanisms of human breast cancer is analysed by carrying out a DNA methylation study (global -LINEI-, and gene-specific by analysing the methylation status of I2 genes: BRCAI, pI6, RAR62, RASFIA, NESI, MASPINA, CDHI, ESRI,

PRB, TWISTI, CXCLI2, HLA-A). In addition, dietary markers reflecting lipid intake were determined in peripheral blood. On the other hand, all participants (healthy volunteers and breast cancer patients) had their dietary habits assessed using a food frequency questionnaire and an assessment of adherence to the Mediterranean diet using a 14-item test. Their physical activity was also assessed using an Activity Frequency Questionnaire. Epigenomic alterations have been characterised in human tumours and there is a clear carcinogenic effect of these alterations. Some of the altered factors would be candidates for markers of breast cancer risk in healthy individuals and/or prognosis in those with the disease (RASF1A, BRCA1, ESR1, LINE1).

Women with MC eat more fats of all types than healthy women. Age, certain reproductive factors (age at 1st gestation, menopause), lifestyle (alcohol) and nutritional factors (calories, protein, saturated and total fat) are directly associated with these alterations or inversely (physical activity).

María José Sánchez Pérez
Escuela Andaluza de Salud Pública (EASP). Scientific Director of the Instituto de Investigación Biosanitaria de Granada (ibs.Granada).

NUTRITION AND BREAST AND COLON-RECTAL CANCERS: SCIENTIFIC EVIDENCE FOR PRIMARY PREVENTION

Cancer is a public health problem with an increasing number of cases expected to reach 28 million worldwide by 2040.

Cancer is a multifactorial disease, only 10% of which is genetic and the rest is related to environmental factors such as lifestyle, diet, obesity, alcohol, tobacco and infections.

The International Foundation for Cancer Research and the American Institute for Cancer Research (IFRC/AICR) estimate that about 40% of cancer cases could be prevented if the population followed healthy lifestyle recommendations.

Several scientific studies have shown that a high intake of vegetables is associated with a 6% reduction in breast cancer risk in women, particularly in women who are hormone receptor-negative.

In postmenopausal women, there is scientific evidence that alcoholic beverages, body fat, adult weight gain and adult height increase the risk of breast cancer, while physical activity, body fat in young adulthood and breastfeeding decrease the risk.

A diet rich in fibre, mainly from vegetables (> 10 g/day: ~ 1 portion of 150 g spinach) is associated with a lower risk of breast cancer (10%).

The positive association between saturated fat intake and breast cancer: a high intake (> 45 g/day: 1 portion of butter + cheese + sausage) compared to a low intake (< 15 g/day) increases the risk of breast cancer by 13%.

This evidence confirms that a high adherence to the Mediterranean diet is associated with a lower risk of breast cancer, by 6%. In studies on Extra Virgin Olive Oil consumption, women who consume more EVOO tend to have a 23% lower risk of breast cancer, especially for hormone receptor-negative breast cancer.

SESSION 5. GUT MICROBIOTA DISORDERS

Francisco Tinahones
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OLIVE OIL AND MICROBIOTA

Studies linking the gut microbiota as a possible factor influencing human health began to appear at the beginning of this century, and the number of publications on the subject continues to grow exponentially.

The microbiota has been linked to virtually all of the most common diseases: metabolic, autoimmune, cancer and mental illness.

One of the theories supporting this causal link between the increase in modern diseases and the microbiota is precisely the important changes that our microbiota has undergone in recent decades due to radical changes in our lifestyles and the use of drugs. The possibility of preventing or modifying the course of these diseases by manipulating the microbiota was soon raised. The use of probiotics, prebiotics, postbiotics and even faecal transplantation has been tested in numerous pathologies.

Changes in the microbiota that have been tried with probiotics or faecal transplants in humans have not had the expected results. The Mediterranean diet has been shown to have undoubted health benefits. Theories to explain this beneficial effect include its effects on the gut microbiota, where it has a prebiotic effect. Although most studies point to positive changes in the microbiota, it is not yet clear which component of the diet is primarily responsible for these changes. Olive oil may be a good candidate, but there is currently a lack of evidence in humans. There is more consensus on the prebiotic effect of minor components of olive oil, including polyphenols, which have been shown to have a beneficial effect on the microbiota in animal models and in other studies of other foods in humans.

Mònica Bulló Bonet
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SHAPING GUT MICROBIOTA THROUGH MEDITERRANEAN DIET

The role of specific foods or dietary components in shaping gut microbiota and fecal metabolites and their impact on human health is widely recognized. However, regardless of the dietary context in which specific food is consumed, the interest of full dietary patterns becomes an area of growing interest. Mediterranean Diet has named the best diet for healthy eating, with strong evidence for reducing non-communicable diseases and improving many metabolic derangements. However, the role of Mediterranean Diet (MD) or MD's key foods on gut microbiota composition and function, although promising, is still in its infancy. Our research has demonstrated changes in gut microbiota composition after 1 year of weight loss induced by an energy-restricted MedDiet and physical activity promotion program. Additionally, we reported significant changes both in taxonomic composition and microbiota activity after consuming a MD that were associated with a better cardiometabolic profile in subjects with obesity and metabolic syndrome, compared to those consuming a healthy food in the context on an unhealthy diet. Similarly, results of other studies also support a beneficial role of MD shaping gut microbiota towards a healthier profile. However, research on this topic is still in its infancy, and a more comprehensive knowledge regarding the complex interactions between dietary patterns, specific food or food's components, gut microbiota physiology and the host metabolism is required to way forward on community and personalized nutrition.

SESSION OLIVE OIL, SUSTAINABILITY AND NUTRITION

Vasilis Vasiliou
Professor of Epidemiology and Department of Environmental Health Sciences Chair at Yale School of Public Health (YSPH), the Yale School of the Environment and at Yale School of Medicine, USA.

INTEGRATING AI AND OLEICULTURE: ADVANCING AGRICULTURAL DEVELOPMENT AND HEALTH

The integration of Artificial Intelligence (AI) into oleiculture (olive cultivation) holds transformative potential for advancing agricultural development and public health.

This session discussed the synergistic role of AI in improving the efficiency, productivity and sustainability of olive farming. AI technologies, including machine learning and data analytics, are revolutionizing traditional agricultural practices by analyzing vast amounts of data from soil health, weather patterns, and crop performance. These insights help farmers make informed decisions, leading to optimized irrigation, pest control, and harvesting processes, ultimately improving yield and reducing environmental impact. Moreover, the application of AI in oleiculture aligns with broader public health goals. Enhanced agricultural practices contribute to the production of high-quality olive oil, a staple of the Mediterranean diet known for its health benefits. The adoption of sustainable farming techniques ensures the long-term availability of nutritious food, promoting overall health and well-being. This initiative underscores the importance of interdisciplinary collaboration in addressing global challenges. By bridging the gap between cutting-edge technology and traditional agriculture, this approach not only fosters agricultural development but also supports public health initiatives through sustainable and health-conscious practices.

José M. Ordovás-Muñoz
Professor of Nutrition and Genetics at Tufts University, Boston, USA.

OLIVE OIL, PRECISION NUTRITION, AND THE MEDITERRANEAN DIET: INTEGRATING AI AND ML FOR ADVANCING HEALTHY AGING AND SUSTAINABILITY

As the global population ages, the prevalence of chronic diseases rises, underscoring the need for dietary strategies that promote longevity and prevent age-related conditions. Olive oil, a key component of the Mediterranean diet, has been associated with numerous health benefits, including reduced risk of chronic diseases and support for healthy aging. The integration of artificial intelligence (AI) and machine learning (ML) into precision nutrition, alongside considerations of health disparities, sustainability, and the broader non-biological benefits of the Mediterranean diet, offers promising avenues for enhancing public health outcomes.

This review synthesizes discussions on the nutritional benefits of olive oil, its role in healthy ageing, and the application of AI and ML in optimizing dietary recommendations through precision nutrition. We examine socio-economic and geographical disparities affecting access to high-quality olive oil, the importance of sustainable and ethical production practices, and the policy implications for public health. Additionally, we explore the non-biological benefits of the Mediterranean diet, including

its social, environmental, and psychological impacts. The potential of AI and ML to address these areas by analyzing large datasets, predicting health outcomes, and offering personalized dietary advice is critically analyzed.

Olive oil's rich composition of monounsaturated fatty acids and polyphenols plays a crucial role in mitigating cardiovascular diseases, diabetes, and certain cancers, while supporting cognitive and bone health. Precision nutrition, enhanced by AI and ML, can personalize dietary advice, taking into account individual genetic, environmental, and lifestyle factors, thereby maximizing olive oil's health benefits. However, significant health disparities exist in access to quality olive oil, calling for targeted public health interventions. Sustainable and ethical considerations are paramount in olive oil production, with AI and ML offering tools to improve supply chain transparency and reduce environmental impact.

AI and ML promise significant advancements in understanding the complex interactions between diet and genetic predispositions, optimizing agricultural practices for sustainability, and tailoring public health campaigns to diverse populations. These technologies also hold potential for addressing health disparities by identifying at-risk communities and enhancing the accessibility of personalized nutrition advice.

The integration of olive oil into a Mediterranean diet, supported by advancements in AI and ML, presents a comprehensive strategy for promoting healthy aging and preventing chronic diseases. Precision nutrition, enabled by AI and ML, offers a pathway to tailor dietary recommendations, enhancing the health benefits of olive oil. Addressing health disparities, ensuring sustainable and ethical production, and leveraging the non-biological benefits of the Mediterranean diet are essential for equitable health outcomes. Future research should focus on harnessing AI and ML to bridge accessibility gaps, improve sustainability, and fully realize the potential of personalized nutrition in public health.

Joan Sabaté
Professor of Nutrition and Epidemiology at Loma Linda University School of Public Health, California, USA.

CONSIDERATIONS ON THE ENVIRONMENTAL SUSTAINABILITY OF OLIVES AND OLIVE OIL. THE ROLE OF OLIVE OIL IN SUSTAINABLE DIETS

This presentation addresses the role of Olive oil on Environmentally Sustainable Diets. Planetary and human health are impacted by food production and consumption practices.

Olive oil offers a sustainable and healthful option, suggesting potential use as a primary global fat source. Prioritization of olive oil production may subdue greenhouse gas emissions, but current agricultural practices imply additional stress on water resources. Further research, data collection and publication are warranted to explain the potential role of olives and olive oil as a sustainable food on its own and within healthier dietary patterns.

FRIDAY 10TH MAY

SESSION 1. PHENOLIC COMPOUNDS: RECENT STUDIES IN DISEASE PREVENTION

Francesco Visioli
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OLIVE OIL (POLY)PHENOLS GREATLY CONTRIBUTE TO HEALTH. HISTORY AND RECENT EVIDENCE

The consumption of olive oil has long been associated with better health. However, research into the mechanisms of action of olive oil and its components only began around 30 years ago. The first evidence concerned the inhibition of LD oxidation by oleuropein and hydroxytyrosol in now obsolete in vitro models. Subsequently, researchers were able to demonstrate the dose-dependent uptake of olive oil (poly)phenols and their diverse health-promoting effects. Thanks to technological advances, we can now study the nutrigenomic and proteomic effects of olive oil (poly)phenols and perform toxicology tests that enable novel food status and the incorporation of such molecules into functional foods. In the case of (poly)phenols, the quality of olive oil is extremely important for human health: producers and media should emphasize the importance of producing and buying the highest quality olive oil one can find.

Qi Sun
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POLYPHENOLS AND CARDIOMETABOLIC HEALTH: EVIDENCE FROM POPULATION HEALTH RESEARCH

Polyphenols are a group of non-nutrient phytochemicals that consist of a few families of phenolic compounds, including lignans, flavonoids, stilbenes, and phenolic acids. Plant-based foods, such as whole grains, dark chocolate, fresh fruits and vegetables, tea, coffee, extra-virgin olive oil, red wine, etc, are the primary food sources of these compounds. Epidemiological studies and clinical trials demonstrated remarkably consistent results that collectively suggest a beneficial role of these polyphenols in the prevention and management of cardiometabolic conditions, including type 2 diabetes, cardiovascular disease, and obesity. In the era of precision nutrition, accumulating evidence suggests that the beneficial effects of consuming polyphenol-rich foods may vary among individuals. One potential reason for the individualized responses to polyphenol intake could be that polyphenols intimately interact with the human gut microbiome to produce more bioactive phenolic metabolites that subsequently modulate human cardiometabolic health. Biomarkers of polyphenol intake, multi-omics research, and human gut microbiome research together will substantiate our understanding of the mechanisms underlying polyphenols' beneficial effects, which will also inform the development of individualized dietary advices to enhance the health benefits of consuming polyphenols. On the other hand, consuming a healthful plant-based diet that is rich in polyphenols will likely promote human health at population levels.

SESSION 2. NEURODEGENERATIVES DISEASES

Mary Yannakoulia
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NUTRITION AND COGNITIVE DECLINE: THE ROLE OF THE MEDITERRANEAN DIET AND ITS COMPONENTS

Age-related cognitive decline poses a significant public health challenge worldwide. As there is no effective cure for dementia, comprehensive exploration of preventive strategies, including diet and lifestyle, is of utmost importance. Existing evidence, mostly from observational studies and less from clinical trials indicates a beneficial association between vegetables, fruits, fish/seafood, coffee/tea, olive oil, and moderate alcohol/wine consumption and cognitive outcomes in older adults. Evidence is more convincing for healthy dietary patterns than for individual nutrients or food groups, possibly due to the synergistic and/or cumulative effects of the dietary ingredients. The Mediterranean diet is the most extensively studied dietary pattern: higher adherence to this pattern is associated with a slower decline in cognitive performance and a reduced risk of dementia or Alzheimer's disease. It is characterized by the abundance of plant foods: fruits, mainly as the typical after-dinner dessert, vegetables, either as main or side dish, bread and other forms of cereals, legumes, nuts, and seeds. It also includes moderate amounts of dairy products (mainly the fermented ones), low to moderate amounts of fish and poultry, red meat in low amounts and wine, consumed modestly, with meals. Olive oil, the principal source of fat, is not just a culinary ingredient but an integral component of this dietary and cultural pattern. Interestingly, several reports and data from our and other research groups indicate that the Mediterranean lifestyle, as a whole entity including also physical activity, sleep and aspects of social life, can potentially be more important than diet per se or it may have a greater, more easily detectable effect in cognitive measures.

In conclusion, the effects of diet on cognition in older people are complex and the relevant research is challenging. Adoption of a Mediterranean-like diet, i.e. a plant-based diet with some fish and dairy products and olive oil as the main dietary fat, or a Mediterranean-like lifestyle appear as effective interventions and they could be endorsed in clinical practice or in public health strategies for brain health promotion, taking into account appropriate cultural adaptations. More research is warranted, mostly randomized controlled trials using as outcomes the cognitive measures or the biomarkers of the underlying neurobiological processes, focusing on the Mediterranean diet and aspects of diet that have been poorly addressed, such as temporal eating patterns.

Amal Kaddoumi
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OLIVE OIL AND DERIVED PHENOLICS AGAINST ALZHEIMER'S DISEASE AND RELATED DEMENTIAS: FROM BENCH TO BEDSIDE

Alzheimer's disease (AD) is a progressive neurodegenerative disorder that is characterized by several pathological hallmarks, including the deposition of amyloid-β (Aβ) plaques, neurofibrillary tangles, blood-brain barrier (BBB) dysfunction, increased oxidative stress, and neuroinflammation. Ongoing research in the AD field aims to identify novel targets and tools for AD prevention and modification. In this context, several studies showed the beneficial effect of the Mediterranean diet in preventing and treating AD. One integral component of the Mediterranean diet is extra-virgin olive oil (EVOO). EVOO and other olive-related phenolic compounds have been shown to reduce the risk of developing mild cognitive impairment (MCI) and AD. In this work, we will discuss the effect and mechanisms by which EVOO and its phenolic compounds exert neuroprotective effects, including modulation of AD pathologies and promotion of cognitive health. Our findings indicate that EVOO and its phenolic constituents influence key pathological processes of AD, such as Aβ aggregation, tau phosphorylation, and neuroinflammation while enhancing BBB integrity and reducing oxidative stress. In conclusion, our findings from preclinical and clinical studies support the significance of EVOO and its phenolic compounds against AD and related dementias.

Despite the evidence presented by my research group and others that have delineated the beneficial effect of EVOO, there remains a crucial need for future research to solidify these findings and guide clinical applications. Prospective studies should focus on large-scale, longitudinal, multicentric clinical trials to definitively establish the therapeutic efficacy and safety of EVOO and its phenolic compounds. However, to move forward with EVOO clinical studies, and as EVOO varies in its constituents in quality and quantity, standardized EVOO could be vital for such studies.

SESSION 3. OLIVE OIL, HEALTH AND NUTRITION

Miguel Delgado-Rodríguez
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MEDITERRANEAN DIET WITH ENERGY RESTRICTION, PHYSICAL ACTIVITY, AND NUTRITIONAL SUPPORT IN THE PREVENTION OF CARDIOVASCULAR DISEASES AND OTHER CHRONIC CONDITIONS. THE PREDIMED-PLUS TRIAL

The foundation of the trial is the increase in the prevalence of obesity all over the world. According to the WHO data, there are more obese people than undernourished: between 1975 and 2016, the prevalence of obesity in Spain in young women doubled. Similar figures were observed for other Western countries. The consequences of overweight obesity are obvious. Obesity depends mainly on two factors, caloric intake and physical activity. Previous results had observed that a low carbohydrate diet or a Mediterranean diet (MedDiet) were superior to a low-fat diet in the decrease of weight (DIRECT trial and Predimed trial).

The former facts launched that Prof. Martínez-González designed the PREDIMED-PLUS trial. In a population of 6,874 overweight or obese men and women aged 55-75 years who satisfy at least three criteria for the metabolic syndrome (MetSd), we intend to evaluate using a randomized trial design the effects of an intensive weight-loss-oriented lifestyle intervention program based on a traditional Mediterranean Diet (MedDiet) with energy restriction, increased physical activity and behavioral support, compared to a control group receiving usual care (including low-intensity advice on an ad libitum MedDiet) on the incidence of type 2 diabetes (T2D) at the completion of the 9-year intervention, the incidence of hard cardiovascular events (a composite endpoint of cardiovascular death, non-fatal myocardial infarction, and non-fatal stroke), and other chronic conditions, including cognition.

The sample size for the study was calculated to demonstrate the primary objective with a statistical power of 80% and assuming an alpha error of 5% and a ratio of the number of subjects 1: 1 between the experimental and the control groups. Computer-generated random allocation was centrally elaborated in blocks of six subjects and stratified by sex, age (<65, 65 -70, >70) and center. The randomization procedure was internet-based and blinded to all staff and to the principal investigators of each center (masked randomization).

Participants in the intervention group are encouraged to adhere to a MedDiet with reduced daily energy intake (approximately 500 to 1000 kcal/day) and with a macronutrient distribution of 40-45% carbohydrate, 35-40% fat and 20% protein. Dietary advice encourages the consumption of typical and seasonal minimally processed MedDiet foods and recommends refraining from foods characteristic of the Western dietary pattern. Along with the explanation of the dietary intervention, participants receive supporting materials, including general recommendations, a dietary plan, open menus, and seasonal recipes.

Participants in the control group attend group sessions every 6 months and receive routine healthcare from medical professionals, and abundant written recommendations to follow the MedDiet as in the PREDIMED trial. Control participants are specifically encouraged to adhere to the 14-item Mediterranean Diet Adherence Screener questionnaire used in PREDIMED. Participants from both study groups receive extra-virgin olive oil (EVOO; 1 liter/month.)

To monitor the MedDiet pattern we use a validated 17-points or 14-points test, respectively in the intervention and control groups. A broader evaluation of the dietary pattern is done using a validated 136-item food frequency questionnaire (FFQ). Progress in PA activity is monitored by means of the: Rapid Assessment of Physical activity (RAPA) tool, questionnaire for sedentary behaviors used in the Nurses' Health Study and previously validated in Spanish (PMID: 16277809), and the Minnesota-REGICOR Short Physical Activity questionnaire (PMID: 23223762, PMID: 10949009).

The International Advisory Committee does not allow to report results on the main outcome (cardiovascular diseases) until the end of follow up. We will report some interim results on weight loss and cognition.

Jayne Woodside
Director and Professor of Human Nutrition within the Centre for Public Health at Queen's University, Belfast, United Kingdom.

INCREASING OLIVE OIL INTAKE AND ADHERENCE TO THE MEDITERRANEAN DIET IN NON-MEDITERRANEAN POPULATIONS

Average diet quality is low in the UK and is socioeconomically patterned, contributing to the risk of non-communicable disease and poor health. Achieving meaningful dietary change in the long term is challenging, with intervention required on several different levels which reflect the multiple determinants of dietary choice. Dietary patterns have been identified which contribute positively to health outcomes; one of these is the Mediterranean diet (MD) which has been demonstrated to be associated with reduced non-communicable disease risk. Most research exploring the health benefits of the MD has been conducted in Mediterranean regions but, increasingly, research is also being conducted in non-Mediterranean regions. The MD is a dietary pattern that could have positive impacts on both health and environmental outcomes while being palatable, appetising and acceptable. Yet there will be particular foods, such as olive oil, that are not commonly consumed within regions outside of the Mediterranean. In this talk, studies that have explored transferability of the MD will be explored, including consideration of to what extent olive oil intake increased, and whether substitutions for olive oil, that may be more culturally acceptable, such as olive oil spread and rapeseed oil, may be nutritionally similar and included within the overall dietary pattern. To achieve long-term dietary change towards a MD, it is likely that the dietary pattern will have to be culturally adapted, yet preserving the core health-promoting elements and nutritional composition, whilst also considering the food system transition required to support changes at population level. Population-specific barriers need to be identified and ways sought to overcome these barriers, for example, key food availability and cost. Such an approach is likely to enhance the extent of adherence in the longer term, thus having an impact on population health.

SESSION 5. CLIMATE CHANGE, OLIVE IL PRODUCTION AND CONSUMPTION

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THE OLIVE TREE AS A KEY CROP IN THE FIGHT AGAINST CLIMATE CHANGE IN MEDITERRANEAN ENVIRONMENTS

Agriculture's strong dependence on climatic conditions makes it particularly vulnerable to climate change.

As we know, a considerable change in climatic conditions, associated with strong regional variability, is expected in the Mediterranean region. Most of the climate change scenes published by the Intergovernmental Panel on Climate Change (IPCC) predict a significant increase in temperatures, a decrease in rainfall and an increase in the frequency of extreme weather events.

Although the olive tree is reputed to be highly resistant to drought, several scientific studies and publications predict an increase in its net irrigation requirements, a reduction in yields and a variation in the

phenological phases of olive trees in the Mediterranean region, as a result of increased heat and greater water stress. The last two crop years have confirmed these forecasts.

While the agricultural sector does indeed produce greenhouse gas (GHG) emissions - due to certain practices, such as soil management, the application of nitrogen fertilisers, the use of fossil fuels, rice cultivation, the burning of residues, liming of soils, the use of urea, etc. - it can also play a key role in the fight against climate change. It can act as a CO2 sink thanks to the ability of certain agricultural ecosystems - mainly woody crops - to capture CO2 from the atmosphere and store it in permanent plant structures, ultimately storing it in the soil, increasing its organic matter content and transforming it into a permanent reservoir of CO2.

This is where the concept of the "carbon balance" comes in, which can be defined as the overall sum of GHG emissions and removals over the entire life cycle of a product, process or production system. This balance is considered within a specific unit of location and is expressed in units of mass of CO2-eq.

According to the International Olive Council's (IOC) 2017 Global Olive Oil Carbon Balance study, the world's olive groves could capture 47 million tonnes of CO2 per year. Given that the world's olive-growing area is 10.5 million hectares, one hectare of olive grove could therefore capture an average of 4.5 tonnes of CO2 per year.

Unfortunately, the unique capacity of olive groves to act as CO2 sinks is not taken into account by the methodologies currently in force (GHG Protocol, ISO 14067, ISO 14064, EU PEF, etc.). The incorporation of CO2 absorptions from olive groves is considered an additional data item but is not taken into account in official calculations, even though this would be essential to give an accurate overview of the real GHG emissions by the olive oil and table olive sector, both in terms of products and inventory approaches.

The current context provides an ideal scenario for the IOC to contribute to the development of methodological and policy frameworks aimed at strengthening the role of olive groves as an effective strategy for achieving the UN's climate objectives, in line with the adaptation measures recently described in the IPCC's Sixth Synthesis Report.

The sustainability of the olive sector is one of the IOC's strategic priorities. In this respect, the carbon balance of the olive grove is one of the main lines of action that the IOC intends to develop.

A number of initiatives have recently been launched to generate 'carbon credits' from agriculture, which could hypothetically be monetised on the voluntary emissions market. The European Union is currently working on a carbon certification framework.

We are therefore at a crucial time for olive groves to gain deserved recognition for their fundamental environmental role. This recognition could also have a positive effect on farmers, as their sustainable and positive agronomic practices would enable them to earn additional income.

As the only international and intergovernmental organisation in the world working in the field of olive oil, the IOC is set to become a leader in this sector, providing its member countries with technically contrasted tools, based on recognised and validated standards that are easy to use for the end user.

Juan de Dios Alché Ramírez
Researcher at Estación Experimental del Zaidín-CSIC, Granada, Spain.

EFFECTS OF CLIMATE CHANGE ON OLIVE REPRODUCTIVE BIOLOGY AND ITS IMPACT ON PRODUCTION AND QUALITY

There are two forms of reproduction that are of great importance in olive growing: vegetative reproduction (cuttings, seedling production, etc.) and sexual reproduction, which produces the gametes (pollen grains and embryo sacs) responsible for fertilisation and the subsequent formation of fruits and seeds, and therefore crucial for crop production. The processes of sexual reproduction have many critical aspects that can lead to production failure and are largely dependent on the environmental situation. For example, extreme temperatures coinciding with the progamic phase (the phase from pollination to fertilisation) are critical and cause phenomena such as loss of pollen viability (analysed as membrane integrity and/or limitation of enzymatic activities), absence or desynchronisation of stigmatic receptivity and various limitations in the growth of the pollen tube. In the case of the olive tree, both flowering and fertilisation also occur during periods of particularly variable weather and climatic drift.

The reproductive physiology of plants is governed by many factors, and in the case of the olive tree, we are beginning to understand them. We already know many of the molecules that enable the plant to cope with various key stresses during fertilisation (e.g. antioxidant enzymes, glutathione...) and the resilience mechanisms used by the plant, which in many cases differ between vegetative and reproductive tissues. To obtain this knowledge, we use new approaches (-omics) that help us to take a holistic view of plant physiology and its relationship with the environment. In this sense, it is worth highlighting the creation of databases such as OliveAtlas, where we are depositing a multitude of data that will soon allow us to generate predictive models that will undoubtedly help in the design of strategies to mitigate the effects we observe.

POSTERS

PT_SY01

Proteomic analysis in stroke patients suggests a beneficial long-term anti-inflammatory action of hydroxytyrosol

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ABSTRACT

Stroke is the second leading cause of death and one of the largest causes of disability worldwide. Most of the stroke-associated neuronal damage is due to the absence of oxygen and glucose during the interruption of blood flow and to the activation of inflammatory processes and increased oxidative stress during reperfusion. Hydroxytyrosol (HT) is an Extra Virgin Olive Oil (EVOO) phenol with antioxidant and anti-inflammatory properties. Our group has previously demonstrated, in an ischemic stroke animal model, that HT could serve as a beneficial therapeutic approach to attenuate ischemic-associated damage. This result prompted us to carry out a pilot study in humans administering a nutritional supplement containing 15 mg of HT/day or a placebo 24h after the onset of stroke, for 45 days. In order to have an overall picture of the molecular pathways modulated by HT, we performed a comparative proteomic analysis in serum samples at 0, 45 and 90 days after stroke. We observed that by the end of the treatment (45/0 days), HT modifies the expression of apoproteins and enzymes involved in lipoprotein metabolism (ApoB100, ApoE, ApoM, PCYOX1 and HSL). These changes lead to lower inflammation and atheroprotection suggesting that HT induces a better recovery. In fact, pathways linked with inflammation, coagulation, prothrombin activation and acute phase signaling were only found in control patients. The comparative analysis between 45 and 90 days revealed minor changes, indicating that the effect of HT is maintained over time. Although a larger trial is necessary, this study suggests that HT could be a beneficial nutritional complement with a long-term anti-inflammatory action and could help in the recovery after stroke.

PT_SY02

Antimicrobial activity of thymol and its application in the food industry of flavoured olive oils

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ABSTRACT

The aim of this research is the synthesis of thymol derivatives and the comparative study of their biological activity and of the starting molecule, with the aim of favouring their application in the food industry as ingredients in flavoured oils. Thymol is often the major component of thyme essential oil. This aromatic plant has a powerful antimicrobial effect and organoleptic properties that have allowed its use as an additive to olive oil in haute cuisine. In addition to being considered a gourmet product, it is also beneficial and has healthy properties, such as antimicrobial, anti-inflammatory and cardiovascular. The compounds tested show good antimicrobial activity, specifically on Gram-positive bacteria and also to a lesser extent on Gram-negative bacteria, which could also contribute to the control of pathogenic bacteria in the food industry.

PT_SY03

Bioactive compounds in pomace olive oil modulate the inflammatory response elicited by postprandial triglyceride-rich lipoproteins in BV-2 cells

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ABSTRACT

Alzheimer's Disease (AD) is the leading cause of dementia worldwide. It is a multifactorial disease, whose hallmarks are the acummulation of protein deposits enriched in beta amyloid (Aβ) and hyperphosphorylated protein Tau. More than 60% of Aβ is associated with triglyceride-rich lipoproteins (TRL), macromolecules involved in lipid metabolism, being higher in AD patients. An acummulation of TRL-Aβ produce a switch in the phenotype of microglia, termed as resident macrophages in the central nervous system (SNC), increasing the synthesis and secretion of proinflammatory mediators. Certain bioactive lipophilic compounds, such as oleanolic acid (OA), a triterpenoid highly present in the olive leaf and in pomace olive oil, could modulate oxidative stress and inflammatory response in microglia. Human TRLs generated during the postprandrial period after the ingestion of pomace olive oil (POO) will incorporate its fat-soluble bioactive components, retaining their protective capacities and potentially modulating microglia and the inflammatory response. Finally, the presence of bioactive compounds in POO has an atenuating activity on microglial activation after estimulation with TRL, which is not appreciated when HOSO is ingested. This way, consumption of POO could have a protective effect agains AD by inhibiting inflammatory processes associated with fat intake.

PT_SY04

Evaluation of antioxidant compounds content in virgin olive oils obtained during European 'ARTOLIO' project

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Keywords: Virgin olive oils; Phenolic compounds; Carotenoids; Chlorophylls; Oxidative stability

ABSTRACT

Given the challenges of globalization, the micro, small and medium (MSMEs) olive subsector is not profitable and many olive groves are abandoned or unattended. ARTOLIO Project, to face these challenges, established in each region a Native Olive Regional Knowledge Center in order to offer updated training on how an artisanal EVOO must be produced to remain competitive. The project resulted in higher olive oil yields, quality,

as well as higher profitability by connecting individual farmers in a global network of resilient MSMEs capable of creating medium- and long-term jobs and running businesses. Farmers have benefited from agronomic training to enhance the quality of virgin olive oils and olive tree cultivation throughout the project's development. They have also benefited from marketing training to help them sell their final products. In the case of Spain as a partner of this Project (PP7), the subgrantees have been six farmers and one olive mill. The locations of respective olive groves are in the province of Jaen, close to the oil mill, in order to reduce fruit transport time and improve the quality of olive oil obtained. In all cases, these olive groves are of the 'Picual' variety. ARTOLIO project spanned three harvest seasons, 2021/2023 to 2023/2024. At the beginning of the Project, a techno-agronomic evaluation of each of the olive groves was carried out, improvements to be implemented were determined. In each campaign, a characterization of the olive fruit was carried out to study lipogenesis evolution and determine the optimum harvesting moment. During the extraction process of olive oils an in-person control was carried out in the oil mill to ensure the quality of the product. The olive oils obtained were physicochemical characterized according to the following parameters: free acidity, peroxide value, and ultraviolet absorption (K_{270}, K_{232} and ΔK). Likewise, the minor components present in olive oils with antioxidant properties were determined, specifically, the content of total phenolic compounds, as well as the total concentrations of carotenoids and chlorophylls. In addition, the oxidative stability of the oils produced was determined (heating to 98°C and an airflow of 10 dm^3h^{-1}). This work aims to evaluate the results of the physicochemical characterization of olive oils of 'Picual' variety produced during ARTOLIO Project. It is focused in order to compare especially, in relation to the content of antioxidant compounds (phenolic compounds and pigments), and thus the oxidative stability of the oil. Referring quality parameters, all the oils obtained are within the normal ranges for Extra Virgin Olive Oils. Regarding the total content of phenolic compounds, it was reached a high concentration during 2023/2024 campaign, 953.84 ± 7.23 mg/(kg oil)$^{-1}$, corresponding as expected, to the olive grove located in the area of higher altitude and that supports colder temperatures. As for pigments content is concerned, during the 2022/2023 campaign, a maximum of both carotenoids content and chlorophyll compounds was reached, 21.74 ± 1.57 mg/(kg oil)$^{-1}$ and 46.36 ± 3.73 mg/(kg oil)$^{-1}$, respectively. Finally, 55.84 ± 6.53 h was the maximum value achieved in oxidative stability, corresponding to an olive oil from an olive groves with a high altitude location.

PT_SY05

What do think the andalusian young consumers about the olive oils traced by blockchain certification technology?

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Keywords: Blockchain; Traceability; Olive oil; Consumers; Agri-food

ABSTRACT

The traceability of olive oil food products, sustainability, and health value are of the greatest concern to consumers and organizations due repeated cases of fraud, alterations, and compliance misconduct. According to the literature, the adoption of a blockchain certification system in agri-food traceability area can contribute to solving the problems indicated. This technology is an additional voluntary traceability certification that guarantees, in a transparent way, the origin, variety, safety, and quality of olive oil, its health, and sustainability value, providing relevant information about cultivation, production, and distribution processes. Consumers scanning a QR code on the label can access all lifecycle details of olive oil from the "field to the bottle". Recently, this innovation has been applied in the olive oil sector. In Spain, the nine olive oil organizations that have adopted this innovation are exclusively Andalusian. Only a few studies have partially focused on blockchain traceability in the consumer olive oil field, revealing an asymmetry of information between supply and demand. This exploratory study aims to analyze the knowledge, perceived attributes, acceptance, and purchase intentions of the blockchain traceability certification system in olive oil for young consumers in Andalucia (Spain). Through a survey questionnaire distributed over the last four months, we validated 279 interviews, including the sample size, identifying consumer profiles, and corresponding constructs (Perceived

Usefulness and Ease of Use, Adoption Intention, Technology Acceptance Model and Data Privacy Security). Our results show that young Andalucian consumers trust in this innovative technology being familiar with mobile and web page digital tools (QR, photos, Applications) and are available to pay a high price for EVOO, ecological and premium (especially for those of Protect Origin Designation, early harvest and others rich of a high level of phenolic compounds) - traced by blockchain technology, showing a positive attitude toward buying these olive oils online in an e-commerce web page. These findings, filling a lack of literature, encourage the opening of a new line of research, and orient olive oil organizations in the adoption of blockchain traceability certification systems not only as a saving costs opportunity, but to develop a clear strategy for a new business model with these young consumer group targets reaching a competitive advantage.

PT_SY06

Impact of PET packaging on food safety and quality of olive oils

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ABSTRACT

The study focuses on addressing current challenges in the field of Food Safety, specifically by evaluating the interaction between plastic materials and olive oils. The degradation of these oils under certain thermal exposure conditions and storage periods was investigated by selecting samples for analysis of 0.4º and 1º olive oils packaged in polyethylene terephthalate (PET). Evaluations were carried out on the physicochemical properties of the oils, as well as on the deterioration of the plastic material. The results showed increases in the peroxide value and extinction coefficients of the oils, together with alterations in the structure of the plastic container with increasing carbonyl value and decreasing percent crystallinity (Wc), particularly after long periods of storage and thermal exposure. These findings determined the importance of assessing the degradation of olive oils packaged in PET to understand the possible migration of contaminants from plastic containers into food and their impact on food safety and final product quality.

PT_SY07

Consumer perception of olive oils in Europe: health and sustainability as key values

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ABSTRACT

One of the challenges facing the olive oil sector is the need for greater market orientation in order to align supply with the real needs of the consumer. In this sense, the design of competitive strategies based on differentiation is considered a fundamental way to provide greater added value to consumers and reduce their level of price sensitivity, something that is considered especially relevant at this time when the increase in olive oil prices has significantly affected demand. In this context, the general objective of this work focuses on exploring the perception that

consumers have of olive oils, as well as the factors that influence their purchase decisions. The aim is to identify the drivers that should guide the design of strategies to differentiate olive oils in the market. To this end, a qualitative study was carried out through focus groups in 7 European countries: Spain, Greece, Italy and Portugal, as the main European olive oil producing countries, and Germany, the United Kingdom and Denmark, as potential international markets for olive oil consumption. The results obtained highlight the importance of designing competitive strategies focused on health and sustainability, especially in their environmental and social dimensions. In addition, there are differences by country.

PT_SY08

Diffusion of sustainability on olive oil sector in online environment

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ABSTRACT

In recent decades we have witnessed a change in society's attitudes or values, which has been in line with economic growth and increase in per capita income. Society is increasingly critical of unethical business practices and their environmental and social impacts. According to the latest Eurobarometer (2023), concern for the environment and climate change is one of the top five concerns for Europeans (31%), along with public health (34%), hence more and more people are willing to change their habits to limit this impact. These same concerns were highlighted in 1987 with the so-called Brundtland Report which indicated that a new era of economic growth was possible: "growth that is both forceful and socially and environmentally sustainable". This study focuses on the olive sector. The aim is to analyse, on the one hand, what information on Sustainability or CSR is communicated on their websites, in the form of certifications and, on the other, what variables or factors explain a higher level of online dissemination of the same. Specifically, we analyse the extent to which the type of company (cooperative or non-cooperative) or greater interactivity with stakeholders, measured by having blogs, a forum, a complete online purchasing process and a presence on social networks or other platforms, contribute to disseminating their CSR. In conclusion, there is no culture of dissemination of information on sustainability or CSR in olive companies. Similarly, companies in the sector do not produce non-financial or sustainability reports. In general terms, the dissemination of information on CSR is favoured by the existence of a complete online purchasing process with the presence of organic products on offer and by interativity with stakeholders through blogs, forums, social media and Google reviews. However, it is not favoured by the legal form of the company as a cooperative society.

PT_SY09

Examining the relationship between reputation and performance in the olive oil sector: A long-term analysis emphasizing consistency

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Keywords: Reputation; Financial Performance; Olive Oil Companies; Rankings; Consistency

ABSTRACT

Corporate reputation is widely acknowledged as the most significant intangible asset with its most commonly cited advantage for firms being the improvement of financial performance. However, as noted by De la Fuente and De Quevedo (2003), defining the relationship between reputation and financial performance entails addressing two fundamental questions: i) determining the nature of the relationship sign (positive or negative) and ii) identifying the direction of causality. Previous literature has explored different combinations of signs and directions, yet a consensus remains elusive. Some authors even conclude that the relationship is positive but not linear, or simply assert that there is no direct relationship, proposing instead a virtuous circle connecting both performance measures through intangibles, as suggested by Surroca et al. (2010). Another limitation pertains to the specific industry chosen for analyzing the corporate reputation-performance relationship, which has not been introduced as a control variable. However, recent findings by Calvo-Iriarte et al. (2023) have highlighted the presence of an 'industrial halo' within Spanish companies in MERCO Business ranking.

Considering the above noted limitations, this study focuses on the analysis of the reputation-performance relationship in the olive oil sector. A more targeted, strategic and coherent approach in the olive oil sector is demanded by the European Union to ensure the transition to a greener and the future of a Common Agricultural Policy where sustainability, resilience and competitiveness are the aim looking for a Green Deal. For this reason, it is particularly important to deep into this industry since it could help these companies to apply a more effective reputational management bringing it into line with the European strategy. In addition, there are few studies on Spanish reputation for the olive oil such as García and Ruiz (2021) where the interest is to link it with the purchase decision of Spanish Olive Oil (SOO) in China or Castilla et al. (2018) where it tested the direct relationship between reputation and the double performance, social and financial, of olive oil cooperatives. The aim of this study is to test the relationship between reputation and financial performance into the most reputated Spanish olive oil companies -cooperatives and non-cooperatives companies- according the EVOO World Ranking. As our main contribution, we introduce the potential lag effect in our analysis since the intangible nature of reputation implies a long-term effect of the advantages associated. We have used Structural Equation Model (SEM) into a sample including the 354 most reputated olive oil companies in Spain during 2017-2021 period. To this end, we have developed an ad hoc database combining EVOO World Ranking and accounting measures from SABI INFORMA Database. Our findings show how reputation as antecedent impact on performance (consequent) within olive oil companies. Also, reputation feeds back because reputation in 2017 (the first year in study) impact on reputation in 2022 (last year analysed).

PT_SY10

Genotype-environment response of high-density cultivars to current climatic challenges

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ABSTRACT

Today's olive growing needs to respond to the climatological changes observed in recent years. In this context, the new high-density olive plantations require genotypes with a specific growth habit where the conditions of adaptation to the environment differ from the traditional ones. The aim of this work is to characterise the response of the genotypes: `Arbequina', `Arbosana', `Koroneki' and `Sikitita' grown in hedgerows in three different agro-climatic environments in Andalusia: Granada, Jaén (Canena) and Córdoba (Cabra). All the plantations are irrigated, except Cordoba, where it is also grown in rainfed conditions. For this purpose, physico-chemical characteristics of the fruit were analysed: weight, fat yield (expressed in dry and wet weight) and humidity; as well as components directly related to the sensory and nutritional quality and oxidative stability of the extracted oil: phenols, tocopherols and fatty acids. With regard to the physico-chemical characteristics of the fruit, significant differences were observed between genotypes, with 'Sikitita' standing out positively from the others in terms of fruit weight, humidity and fat yield in both wet and dry weight. About the environment, significant differences can be observed, Jaén (Canena) standing out with the highest dry and wet fat yields and Granada with the lowest. The composition of antioxidant compounds in the fruit, such as tocopherols and phenols, shows different behaviour. Tocopherols showed significant differences both for the field variable and genotype, with the 'Arbosana' content standing out positively, with an average of 213 mg/kg fruit. The genotype did not show major differences with respect to fruit and oil phenols; however, the environment variable showed higher concentrations of phenols in fruit and oil in Cordoba, in comparison with Jaen (Canena) and Granada. Finally, the fatty acid profile did not show a differential response with respect to genotype and environment. The results are of great importance for the selection of genotypes at high planting density that are best adapted to certain environments or geographical settings.

PT_SY11

Increase in the content of phenolic compounds and oxidative stability of olive oils produced in extraction processes using natural microtalc as a technological adjuvant

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Keywords: Virgin olive oils; Extraction process; Natural microtalc; Industrial yield; Phenolic compounds; Malaxation time

ABSTRACT

The main of this work has been to study the effect of the amount of adjuvant and the moment in which it is added during the malaxation on the yield of the oil extraction process, on the extractability index and on the characteristics of the oils obtained, fundamentaly pigment content, oxidative stability and phenolic compounds During the 2020/2021

campaign, the collection of olives of the 'Picual' variety was carried out in irrigated olive grove, located on a farm located in the municipality of Villardompardo (Jaen). The extraction process has been carried out in an Abencor system, and the study has focused on the malaxation stage with times of 60 min and a temperature of 25ºC. The percentages of natural microtalc (NMT) added with respect to the weight of paste of each sample were in the range 0.0 - 0.5%, and the addition was carried out at different malaxation times (0 - 40 min). The resulting data regarding industrial yield and extractability index show that the non-use of microtalc or a high dose (0.5%) at an addition time of 20 min give rise to low values in both parameters. Regarding the composition of the oils, the concentration of total phenolic compounds (TPC), stands out, with higher results being observed with a microtalc dose of 0.3% and an addition time of 20 min. On the other hand, regarding oxidative stability, OS, higher data are obtained at NMT doses of 0.1% and 0.3%. Finally, it can be concluded that the non-addition of NMT in the malaxation stage gives rise to lower values of TPC and OS. Considering all the values obtained for each of the samples, we tried to verify if there is a relationship between the TPC concentration and OS, detecting a certain linearity between both parameters.

PT_SY12

Influence of chemical treatments in olive groves on the physicochemical composition of the olive oils produced. Detection of heavy metals

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Keywords: Olive oils; Food safety; Heavy metals; Phenolic compounds; Olive oils quality

ABSTRACT

The presence of heavy metals with high levels can adversely impact human health leading to a wide range of adverse health effects. Additionally, heavy metals can affect food quality, such as catalyzing oxidation reactions, which can have harmful effects on oil flavor and storage. This study aims to enhance the food safety of olive oils by detecting critical points where contamination can be generated by heavy metals. Olive samples were collected from both trees (OT) and ground (OG) at an experimental olive grove of traditional production that belongs to the "University Institute of Research on Olive Groves and Olive Oils" (University of Jaen). This collection took place over 3 campaigns from 2021/2022 to 2023/2024. During the first two seasons 2021/22 and 2022/23, 5 olive samplings were carried out from OT and OG, and 6 sampling in season 2023/24. After heavy metals determination, it should be noted that copper is detected in all samples of this study, with concentrations above the regulation in two campaigns where copper treatments were carried out. The recorded values ranged from 0.06 to 0.43 mg/kg for OT and 0.05 to 0.39 mg/kg for OG. Fe concentrations have been between 0.15 and 0.42 mg/kg for OT and 0.12 to 0.32 mg/kg for OG. In the case of Zn, the maximum values were 0.1 mg/kg for both OG and OT. The lead ion has been detected in all samples with concentrations below the standard. However, As and Cd have not been detected in any of the samples of this study. Furthermore, in the context of food safety strategy, this study aims to improve also quality parameters by the enrichment of virgin olive oils in minor components like phenolic compounds. In this sense, an attempt was made to establish a correlation between the concentration of total phenolic compounds, chlorophylls, carotenoids and the oxidative stability determined at 120°C and a certain relationship was observed between these parameters. No correlation was observed between olive oils degradation and the presence of heavy metals, particulary when considering the parameters of peroxide values and UV absorption (K_{232}, K_{270}).

PT_SY13

Organic matter transformation during olive mill pomace composting in a full-scale facility: characterization by means of fluorescence spectroscopy

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ABSTRACT

Management of the olive mill pomace (OMP) generated during olive oil extraction is an important challenge for the olive oil industry. Its use as an organic amendment is a very interesting option for its recycling, requiring prior composting with other agricultural and livestock wastes to optimize its properties and avoid negative environmental impacts. This practice promotes the circular economy of the olive sector by directly using its by-products. In addition, the resulting material has proven to be potentially beneficial for agricultural lands, thus contributing to solving the degradation problems related to organic matter depletion and increasing their fertility.

To obtain a high-quality fertilizer, it is necessary to monitor the composting process and establish criteria to assess the maturity of the final product. Although many parameters are used for this purpose, a deep knowledge of the humification process is needed to understand the structural changes that occur in the organic matter. In this work, the potential of fluorescence spectroscopic methods, in particular of three-dimensional excitation-emission matrix (EEM) fluorescence spectroscopy to assess compost maturity, will be studied. For this purpose, 47 composted samples at different maturity stages were obtained from an industrial compost pile built from the beginning of the olive harvest and oil production season (Nov-20), using OMP (68 %) and other agricultural and livestock wastes. Once the pile was completed (March-21), aeration was performed by turning it monthly until Nov-21. For sampling, the pile was arbitrarily divided into four 20 m sectors, so that its progressive formation is also considered.

To analyze the EEMs' multivariate data obtained from fluorometry, parallel factor analysis (PARAFAC) was used, thus obtaining an appropriate 3-component model. This model allowed us to deepen the organic matter composition of the compost, revealing that the fulvic (C1) and humic (C2) components were more enriched with composting, which suggests an improvement in the stabilization process with time. Also, a decrease in C3 could be appreciated along with composting, associated with simple aromatic compounds derived from proteins and soluble materials similar to microbial by-products (SMP). Furthermore, the relative abundance of these components was related to several physical-chemical maturation parameters. Thus, the C/N ratio and H percentage correlated negatively with C1 and C2 ($p < 0.01$), revealing the degradation of organic matter and an increase in the aromaticity of fluorophores with time. In addition, using principal component analysis (PCA), differences between sampling sectors were revealed. In this way, considering the PC2 axis (17.32 % explained variance), the increase in C1 and C2 seems to take longer in sampling sector S1, meaning a higher resistance of the organic matter to biodegradation in the first sector concerning the last one, which could be due to differences in the climatic conditions as well as to insufficient oxygenation.

PT_SY14

Spanish chefs' knowledge of olive oils

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ABSTRACT

In recent years, chefs have become opinion leaders and media stars. Their influence on food is key to consumers' food purchasing and consumption behaviour. Based on the assumption that their communication depends on their general level of knowledge and the specific aspects or pieces of information they hold in their minds, this paper analyses the level of

knowledge/beliefs of chefs in Spain in relation to olive oils. In general, there is a panorama of lack of knowledge and above all confusion about basic aspects of the world of olive oils; especially (i) in relation to the difference between an olive oil and a virgin oil; (ii) the quality parameters of olive oils, (iii) the excessive importance and true meaning of acidity, (iv) the role of the bitter and spicy attributes; (v) confusion about aspects such as colour, unfiltered oil, the terms intense and mild or olive variety (vi) false beliefs about whether one or the other is more fattening or (vii) false beliefs about healthiness. In short, the results show the need to inform and educate this group, given their influence on other consumers.

PT_SY15

Sustainability in the olive grove: transformation of waste into biofilm

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ABSTRACT

The intensive production of olive oil in Spain generates as a by-product a volume of around 3000 kg/ha of olive pruning biomass (OTP) annually. Traditionally, this residue is used on site as a soil repairer or, in most cases, incinerated, so that the carbon footprint of the olive oil industry increases considerably. Due to its lignocellulosic nature, the cellulosic fraction (30-40% by weight) can be isolated for further conversion into different products or derivatives that can be used in different industrial sectors. Today, cellulose derivatives are presented as an alternative to conventional polymers from non-renewable resources such as petroleum. Among them, some cellulose-derived polymers stand out for being compostable, biodegradable and with high potential to be used in the manufacture of packaging for the food industry, reducing the use of fossil fuels. In this work, the process of obtaining cellulose acetate from cellulose previously isolated from olive pruning has been optimised, with the aim of revalorising this waste and developing biofilms to be used in the manufacture of packaging for the agri-food industry.

Different plastic films have been developed with different concentrations of plasticising agent to achieve packaging with properties similar to petroleum-based plastics in terms of mechanical, thermal and barrier properties.

These plastics are proposed as an alternative to petroleum-based plastics for good environmental management, as conventional plastics generate a great deal of environmental pollution, causing environmental problems as they remain in the environment for hundreds of years before decomposing. Thus, plastics can be produced from bio-based polymers, reducing the environmental effects they generate because they are biodegradable.


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