21st European

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Keynote Forum

Day 1

Maria Luz Fernandez, J Nutr Food Sci 2018, Volume 8
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Maria Luz Fernandez

University of Connecticut, USA

Benefits of egg intake in diverse populations

Statement of the Problem: Recently the 2015 US Dietary guidelines removed the upper limits for dietary cholesterol. However, due to its cholesterol content, there is still uncertainty regarding egg consumption and risk of heart disease. Further, recent information about the potential role of plasma trimethyl amine-N-oxide (TMAO) in increasing cardiovascular risk, has brought further concerns regarding intake of eggs. In previous studies, we demonstrated that egg consumption does not increase the biomarkers for heart disease in children, young and older populations, subjects with metabolic syndrome or patients with type-2 diabetes. In contrast, eggs have been demonstrated to have protective effects by increasing plasma antioxidants, plasma choline and decreasing the number of atherogenic lipoproteins.

Objective: The objective of this study was to demonstrate that eggs exert protection against chronic disease without increasing the biomarkers for cardiovascular disease

Methods: We conducted a study in which 40 healthy participants following a 2 week washout in which 0 eggs were consumed, they ate 1, 2 and 3 eggs per week for 4 weeks each (see diagram). Following each dietary period, blood was taken and plasma lipids, lipoprotein number and size, plasma carotenoids and other antioxidants in addition to plasma concentrations, a marker of cardiovascular risk were measured.

Results: Compared to 0 egg intake, consuming 1-3 eggs per day resulted in higher concentrations of HDL cholesterol, apolipoprotein A-I, lecithin cholesterol acyl transferase and large HDL, all parameters associated with reverse cholesterol transport. Furthermore, no changes in plasma LDL cholesterol were observed when compared to 0 eggs while large LDL, the less atherogenic particle was increased. There was a significant increase ($p<0.01$) of plasma lutein and zeaxanthin after the consumption of 2 eggs per day as well as on paraoxanase-1 activity and plasma choline. Intake of 1 egg per day was sufficient to increase HDL cholesterol; however more than 2 eggs resulted in higher benefits as seen by the higher concentrations of plasma carotenoids and plasma choline.

Conclusions: These results indicate that egg intake does not increase the biomarkers for heart disease but results in additional anti-oxidant and anti-atherogenic benefits.

Biography

Maria Luz Fernandez is a Professor in the Department of Nutritional Sciences at the University of Connecticut. She is a leading authority on the effects of dietary interventions on dyslipidemias, oxidative stress and inflammation as it relates to cardiovascular disease, metabolic syndrome and type-2 diabetes. She uses the guinea pig model to elucidate the mechanisms by which different types of fat, dietary fiber, carbohydrate restricted diets and antioxidants reduce the risk for hepatic steatosis, systemic inflammation and atherosclerosis. Her research has been supported by the Federal Government, Industry and Food Commodities. She has co-authored 235 peer-reviewed papers, 13 book chapters plus over 240 scientific abstracts. She has been invited to present her research in Argentina, Brazil, Canada, Colombia, Egypt, Ecuador, Korea, Mexico, Panama, Peru, Portugal, Spain, Saudi Arabia and United Arab Emirates.

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Lonnie Lowery, J Nutr Food Sci 2018, Volume 8
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Lonnie Lowery

University of Mount Union, USA

Effects of instant coffee on pitch speed, pitch accuracy and the consistency of throws

Little is known what effects caffeine from instant coffee has on pitching performance in baseball. We tested a highly-caffeinated coffee product, Via® instant coffee (VIA) vs. its decaffeinated version (DCF) on college students (18–25 years) with overhand throwing experience. We hypothesized that VIA would enhance pitch speed, pitch accuracy, and the consistency of throws ($p<0.05$). 14 college aged men and women (18–25) participated in this randomized, double-blind crossover study. Subjects were experienced throwers and consisted of athletes ranging from baseball, softball, and volleyball. Subjects reported to the testing facility in a fasted state and ingested either VIA or DCF 60 minutes prior to testing. Each participant completed a standardized 15 minute warm up. Subjects then threw 10 maximal throws at a 61 square cm target, placed 18.3 m away, using a standard collegiate baseball. Data were analyzed using a commercial radar gun and video recordings (Dartfish 6.0, Fribourg, Switzerland). Subjects returned a week later and completed the alternate intervention. Dependent t-tests were used to compare the speed and accuracy between VIA and DCF groups (Statistica 12, StatSoft, Inc., Tulsa, OK). Pitch consistency was analyzed by comparing coefficient of variation between interventions. These data only partly support our hypothesis that, caffeine enhances pitch speed, pitch consistency and the accuracy of a throw. That is, pitch speed was enhanced while accuracy tended to decrease and consistency was unaffected.

Biography

Lonnie Lowery is an exercise physiologist, Registered Dietitian, and Associate Professor at the University of Mount Union, He has 20 years experience in teaching and he has published nearly 20 papers in different types of Journals.

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Jong Dae Park, J Nutr Food Sci 2018, Volume 8
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Jong Dae Park

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A standardized extract, KGR-BG1, from Korean black ginseng (*Panax ginseng*) and its protective effects against a suppressed immunomodulatory disorder induced by environmental heat stress

The root of *Panax ginseng* is one of the traditional and folk medicines to be used for many therapeutic purposes in the oriental countries such as Korea, China and Japan for thousands of years. In the present study, a standardized extract, KGR-BG1, showing the higher contents of ginsenosides Rg5, Rk1 and Rg3, was prepared from Korean black ginseng (five times-steamed and dried ginseng), depending upon the extracting and processing methods. The protective effects of KGR-BG1 were investigated against heat stress in a rat model. Following acclimatization for one week, rats were housed at room temperature for two weeks and then exposed to heat stress (40°C/2h/day) for four weeks. Heat stress dramatically increased secretion of inflammatory factors and this was significantly reduced in the KGR-BG1 treated groups. Levels of inflammatory factors such as heat shock protein 70(HSP 70), IL (interleukin)-6, i-NOS (inducible nitric oxide synthase) and TNF-α (tumor necrosis factor-α) increased in the spleen and muscle on heat stress. KGR-BG1 has been found to inhibit the increase by down-regulation of HSP 70 and the associated NF (nuclear factor)-κB, MAP (mitogen-activated protein) kinase signaling pathways, indicating it to suppress activation of T-cells and B-cells. As a result, it is considered that KGR-BG1 suppresses the immune response by heat stress and decreases the production of inflammatory cytokines in muscle and spleen, suggesting it to protect a suppressed immunomodulatory disorder by inhibiting inflammation and maintaining immune homeostasis.

Biography

Jong Dae Park received his BS and PhD at the School of Pharmacy, Sungkyunkwan University, South Korea in 1980. Following his PhD in 1987, he took a Post-doctoral course at the Faculty of Pharmaceutical Sciences, Osaka University, Japan in 1990. He has worked as a Project Leader at the Division of Ginseng Efficacy, Korea Ginseng & Tobacco Research Institute. His main research interest is in the field of discovery of new drugs and nutraceuticals from natural sources, which covers isolation and characterization of immunomodulatory acidic polysaccharide from red ginseng and development of anti-rheumatoid arthritis and anti-hypolipidemic agents from ginseng and crude drugs. He is now the Project Investigator for the National Research Project related to development of new materials relieving heat shock stress from Korean ginseng.

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Day 2

Marianne O'Shea, J Nutr Food Sci 2018, Volume 8
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Marianne O'Shea

PepsiCo, USA

PepsiCo nutrition criteria

Statement of the Problem: Consumers are looking for products with healthier nutrition profiles. To meet this need PepsiCo has developed internal nutrition profiling schemes to meet dietary intake guidelines aiming to reduce added sugars, saturated fats, and sodium in the diet and offer more positive nutrition.

Methodology & Theoretical Orientation: PepsiCo Nutrition Criteria (PNC) is PepsiCo's nutrition profiling system used to guide new product development and reformulation of existing products. While the criteria are used internally, they are based on food and nutrient recommendations from the leading external global nutrition and public health authorities including World Health Organization (WHO), Food & Agricultural Organization (FAO), US National Academy of Sciences (NAS), European Food Safety Authority (EFSA), USDA Evidence Analysis Library (EAL), and Euro diet; along with certain country-specific dietary guidelines. Based on published external recommendations, global consumption patterns, the role of given products within the diet, and the specific cohort a product is intended for rigorous criteria were developed for product categories representing PepsiCo's entire portfolio.

Findings: The PNC define maximum thresholds for nutrients to limit (sodium, saturated fat, trans fats, and added sugars); minimum levels for nutrients to encourage, nutrients that are defined as being at risk of suboptimal intake with regional population groups and minimum levels for food groups to encourage (fruits, vegetables, whole grains, low-fat dairy, nuts, seeds, legumes and pulses). Several steps were identified to ensure a stealth approach to product reformulation. Case studies regarding product development and consumer acceptance challenges will be presented.

Conclusions & Significance: PepsiCo's Performance with Purpose agenda commits us to developing a healthier portfolio through both reformulation and new product innovation. At PepsiCo these goals are guided by the robust PepsiCo Nutrition Criteria. The PNC are permitting implementation of our commitment to overall development of healthier products.

Biography

Marianne O'Shea is the Vice President of Global Nutrition Sciences for PepsiCo leading a dynamic nutrition team to develop and drive a nutrition strategy that fuels PepsiCo's innovation and portfolio transformation through nutrition science. She and her team collaborate with internal Research & Development cross functional teams and business units worldwide to implement nutrition and health science programs that capitalize on our strengths and address gaps in PepsiCo's diverse product portfolio of foods and beverages. She joined PepsiCo in 2010, prior to that she held various R&D roles within several sectors of the industry including nutritional ingredient suppliers to both food and supplement industry and originally started her career in CPG with Unilever in the Netherlands. She holds a degree in Biochemistry and a PhD in Biochemistry and Nutrition from University College Dublin and Dublin City University, respectfully.

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Aisling Aherne, J Nutr Food Sci 2018, Volume 8
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Aisling Aherne
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Sugar taxes – do they influence consumption and incidence of obesity?

Several studies have associated excessive sugar consumption with weight gain and obesity. Across Europe, daily consumption of total sugars ranges between 15% and 21% of total energy intake among adults and from 16% to 26% in children. Added sugar intakes range from 7% to 11% in adults and 11% to 17% among children. The major dietary sources of these added sugars are Sugar-Sweetened Beverages (SSBs) and sweet products. Hence, many countries and/or states implemented or are in the process of introducing taxes on SSBs. The logic of a sugar tax is that product prices would increase which in turn, would deter purchases and hence lower consumption. This reduced intake of calories is believed to positively impact on the incidence of obesity. However, assessing the impact of food taxes on public health is very complex. The economic rationale of sugar taxes is that illnesses associated with obesity add unnecessary costs to a government's budget for national health systems. But, do the sugar taxes work? Sugar taxes have altered patterns in both the food industry as well as consumer behaviours – not always in a positive direction. Consumers have resisted price increases, crossed borders for purchases, and/or consumed non-taxed high sugar-containing products. On the other hand, there are a limited number of papers documenting decreased purchases of SSBs after a tax was imposed. However, this reduction in sales is not being reflected in the rising obesity epidemic. There is very little evidence, if any, that SSB taxes have a positive impact on weight management in overweight and obese individuals. Public health policies, consumer education, reformulation and portion size adjustments are all key actions to promote healthier eating patterns.

Biography

Aisling Aherne graduated with both a BSc in Nutrition and PhD in Nutritional Biochemistry from University College Cork (UCC). Her career has involved working in nutrition research, science communication, and clinical nutrition support. In April 2016, Aisling joined Kerry Group as Nutrition Science Manager for Europe & Russia. Her role involves working collaboratively with Kerry RD&A, Marketing, Regulatory, and Commercial teams on projects and opportunities. Aisling is also involved in nutrition research projects internally and also externally with various third level research institutes. In February 2018, Aisling presented on a Kerry Health and Nutrition Institute webinar entitled "*Sugar Reduction: formulating for Success*".

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Francisco J Señoráns, J Nutr Food Sci 2018, Volume 8
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Structured lipids vs natural TAG enriched in Omega-3 outcome of lipids with different PUFA: ALA, Stearidonic, EPA and DHA

Omega-3 fatty acids have different nutritional effects and health benefits depending on their length, being very different for α-linolenic acid (ALA) and stearidonic acid (18:4) than for EPA and DHA but at the same time, present different properties if the fatty acid is in form of natural triacylglycerol or in form of ethyl ester or structured lipid. Polyunsaturated Fatty Acids (PUFA) Omega-3 are well known for reducing the risk of cardiovascular diseases and prevention of nervous system and inflammatory diseases. Health authorities along the world have promoted the intake of foods that contain higher amounts of Omega-3 fatty long chain acids. For instance, ALA has been recognized by European authorities (EFSA) to reduce blood cholesterol concentration, while EPA and DHA play a vital role in health and correct nutrition, especially during fetal and infant growth. Subsequently, in recent years, there has been a growing interest in alternative sources of Omega-3 oils rich in ALA, like new oilseeds (chia (*Salvia hispanica L.*), camelina (*Camelina sativa L.*), etc.) and also in microalgae lipids with EPA and DHA, like Nannochloropsis, Isochrysis and others. Modern extraction and fractionation techniques such as Pressurized Liquids Extraction (PLE) with green solvents were used to produce healthy lipids concentrated in omega-3 in natural triglyceride form and characterized. Furthermore, natural lipids were enzymatically modified to Fatty Acid Ethyl Esters (FAEE) and to structured Triacylglycerols (sTAG) combining EPA and ALA, with improved content of Omega-3 to compare their health and nutritional properties and comprise desired lipid characteristics to improve the nutritional profile of final food products.

Biography

Francisco J Señorans has developed his research and teaching career in Food Science and Nutrition in different Spanish and international Institutions during the last 25 years at Madrid University (CSIC and UAM) and at Uppsala University (Sweden) as Researcher and Lecturer for two years. He is Chemical Sciences PhD and since 2002, he is Profesor Titular (Associate Professor) at Autonomous University of Madrid (Spain), where he has been responsible of numerous research projects and contracts with industry. He was in charge of the management as a Co-director and creation of the Joint Institute in Food Science Research (CIAL). He is co-author of more than 110 publications of international impact (SCI) with h index of 33 (Web of Science) and of several international patents transferred to industry. In 2001 he received the Prize "Archer Daniels" granted by the AOCS. At present he directs a research team with a sound record of research contract with food and pharma industry, in projects related with healthy lipids, including omega-3 fractionation and enrichment of fish and marine oils, microalgae components extraction with compressed fluids and supercritical technology and enzymatic technologies for structured lipids, hipocaloric oils and polar lipids.

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Teruyoshi Amagai

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Paradigm shift of novel linguistics for clinical nutrition

Aim: To examine the hypothesis that a novel linguistics for clinical nutrition could be feasible and applicable to clinical practice.

Methods: It would be examined whether Nutrition Care Process (NCP) as a novel linguistics (language 1), developed by the association of dietetics and nutrition in 2003, US, is able to be applied in clinical practice in nutrition compared with non-NCP language (language 2) broadly available in clinical nutrition settings or not. Method 1: Compare language 1 and 2 in their structures to be available to clinical settings, including hospitals and nursing homes. Method 2: Compare outcomes in clinical cases, including human, time and financial resources using two languages, respectively.

Prospective Results: Result 1: compared to language 2, language 1 (NCP) might be well acceptable and feasible in clinical settings. Result 2: we compared two languages in clinical cases, although language 1 might be time-consuming before stake holders become used to, it might save human and financial resources.

Future Works: NCP might be spread to extended areas in clinical nutrition using participatory education styles, evidenced its effectiveness by National Training Laboratories

Biography

Teruyoshi Amagai is an MD, PhD from the Medical School, University of Tsukuba, Japan, in 1982 and has trained and worked at the Department of Paediatric Surgery in Japan and Birmingham Children's Hospital, Birmingham, UK. Thereafter, he moved from being a Clinical Practitioner to Educator and then to a Dietitian; now he is a Professor at the Department of Clinical Nutrition of the Mukogawa Women's University in Japan.

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Day 3

Wolfgang Herrmann, J Nutr Food Sci 2018, Volume 8
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Wolfgang Herrmann
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One carbon metabolites and telomere length in cross-sectional, prospective and randomized one year B-/D-Vitamin supplementation trials

Background: Telomeres are essential for the maintenance of genomic integrity. Telomere length declines with age and telomere dysfunction has been proposed as a biomarker for age-related diseases. Vitamin B_{12}, B_6 and folic acid are essential cofactors for numerous cellular processes including the synthesis of purines and nucleotides, DNA and protein methylation. B vitamin deficiencies and hyperhomocysteinemia are risk factors for the development of age-related diseases. The aim of this study is to evaluate the effects of B vitamins on telomere biology.

Methods: We analyzed the LURIC study (3316 cardiovascular patients), the South-Tyrolean study (STVS, 350 healthy subjects) and the KNOVIB study (60 elderly subjects were supplemented for one year with vitamin B_{12}, B_6, folate, vitamin D and calcium (group A n=31) or only with vitamin D and calcium (group B n=29)). Relative Telomere Length (RTL), LINE-1 methylation, vitamin B6, B9, B12, Homocysteine (HCY), 5-methyltetrahydrofolate (5-methylTHF), 5,10-methenylTHF, S-adenosylhomocysteine, S-adenosylmethionine (SAM), cystathionine, dimethyl-glycine, metylmalonic acid, choline, IL-6, C-Reactive Protein (CRP) and advanced glycation end-products (AGEs) were quantified.

Results: Median HCY was 9.8 µmol/L in the STVS and 12.4 µmol/L in the LURIC study. Age-corrected RTL correlated negatively with HCY (r=-0.151; p=0.007). RTL was shorter in the presence of hyperhomocysteinemia. HCY was also lower in the highest (4th) quartile of age-corrected RTL. In the LURIC study, age-corrected RTL correlated positively with vitamin B6 (r=0.04; p=0.031), and the 4th quartile of age-corrected RTL was characterized by higher levels of vitamins B6 and folic acid and by lower levels of IL-6 and hsCRP. Age-corrected RTL correlated negatively with IL-6 (r=-0.043; p=0.019). IL-6 and hsCRP correlated negatively with vitamin B6, folic acid, and positively with HCY. In the STVS age-corrected RTL correlated negatively with AGEs (r=-0.146, p=0.01). AGEs correlated positively with HCY and negatively with vitamin B12. In fact, AGEs were higher in subjects with vitamin B12 below the median. In the interventional study, at baseline HCY and 5-methylTHF were significant predictors of RTL. Vitamins supplementation decreased HCY in group A but not in group B. Vitamins supplementation in group A increased LINE-1-methylation but reduced it in group B. After supplementation in group B but not in group A LINE-1-methylation correlated inversely with RTL, and LINE-1-methylation variation was an independent predictor of RTL variations. In group B an increase in RTL was correlated with lower LINE-1-methylation. Subjects with 5-methylTHF >10nmol/L had compared with <10nmol/L at baseline lower LINE-1-methylation, due to a to a lower SAM formation. Subjects with HCY >12µmol/L had compared <12µmol/L at baseline and after supplementation longer telomeres. In group B subjects with HCY >12µmol/L had lower mean LINE-1-methylation. Multiple backward regression analysis showed, 5-methylTHF in group A and HCY in group B were significant predictors for LINE-1-methylation.

Conclusions: The results from these studies provide evidence for an association between vitamin B_6, B_{12}, folic acid, HCY and telomere length. Hyperhomocysteinemia is able to negatively affect telomere length in healthy, in cardiovascular patients and in elderly. On one hand hyperhomocysteinemia is able to induce an inflammatory and oxidant status that in turn induces telomere attrition. On the other hand hyperhomocysteinemia induces DNA hypomethylation that in turn induces telomere dysfunction. In fact, literature data indicates that DNA hypomethylation is associated with elongated and dysfunctional telomeres. Further analyses are needed to confirm these results.

Biography

Wolfgang Herrmann is completed his Graduatation and Postgraduation from Saarland University and now he is working as Professor, He is also the president of the Technical University of Munich.

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Dietary nitrate: Novel, innovative roles in common, diverse cardiometabolic disorders

Statement of the Problem: Despite medical advance, cardiometabolic pathologies, including cardiac and respiratory diseases are major causes of premature morbidity and mortality worldwide. Cost effective, safe and sustainable therapies are urgently required. Nitric oxide (NO) is a potent vasodilator. NO synthesis can be facilitated in vivo by reduction of dietary nitrate (NO^{3-}) to NO independent of NO synthase, possibly providing therapeutic effect. Multiple cardiometabolic pathologies are associated with perturbations in NO, including hypertension (HTN) and obstructive sleep apnoea syndrome (OSAS). To extend findings from our preliminary studies (1,2), we hypothesized that dietary NO^{3-} may have utility in HTN and OSAS. We conducted 2 separate double-blind, randomized, placebo-controlled, crossover trials of daily NO3- supplementation (concentrated beetroot juice) compared to placebo (PL; matching nitrate-depleted beetroot juice) for 14d among a group of well-characterized, treated yet uncontrolled hypertensives(3) and subjects with newly diagnosed OSAS(4). We recruited 20 uncontrolled hypertensives (mean age=63y, mean BMI=31kg/m2, mean no. of antihypertensives=2) as well as 12 adults with severe OSAS (mean apnoea-hypnoea index=74, mean age=52y, mean BMI=31kg/m^2). Assessments were conducted on three occasions, baseline (day 1), midpoint, (day 15) and endpoint (day 29) - before and after each intervention period and included plasma nitrate as well as 24h ambulatory blood pressure. Daily dietary nitrate was well-tolerated, safe, led to increased plasma NO metabolites and decreased BP profiles in uncontrolled hypertensives and OSAS. Dietary nitrate has potential as a novel therapeutic, adjunct strategy in difficult to treat BP.. In a review review, we wrote that 'increased green vegetables consumption may provide similar/ superior benefits to nitrate supplementation in a cheaper, safer, and potentially tastier context' (5). Considering the low cost and safety profile of foods containing dietary nitrate, this concept appears promising as an adjunct therapeutic strategy for elevated blood pressure.

Biography

Conor P Kerley has his expertise in chronic disease prevention and treatment. He received his Bachelor's degree in Human Nutrition and Dietetics from Trinity College Dublin and his PhD from University College Dublin. He has presented his award winning findings at multiple national and international nutrition and medical conferences. His research has been published in international peer-reviewed medical journals and has attracted over €210,000 in research funding to date In addition to his clinical research, He served as chairperson of the Scientific and Research Steering Group of the Irish Nutrition and Dietetics Institute and is an active member of several professional societies including the Irish Nutrition and Dietetics Institute, Nutrition Society, The National Blood Pressure Council and The True Health Initiative. The current work is based on his design and implementation of a novel, innovative nutrition education intervention in addition to an exercise focused rehabilitation program.

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