

# ONLINE SUMMIT ON **FOOD SCIENCE, NUTRITION & PUBLIC HEALTH (FNPH- 2021)**

**March 18, 2021**



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# Online Summit on Food Science, Nutrition & Public Health

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## Quantitative Risk Assessment using Challenge Testing and Predictive Modelling: *L. monocytogenes* in a Ready-to-eat Food

Rita Bernardo, António Salvador Barreto, Telmo Nunes and Ana Rita Henriques

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### Abstract

#### 1. Background

Effective control of *Listeria monocytogenes* in ready-to-eat foods requires knowledge on its ability to develop in these foods. For that, routine microbiological monitoring and challenge test studies are required.

In this work, a challenge test using *L. monocytogenes* and a ready-to-eat salad was conducted and results were used to perform a quantitative microbial risk analysis to estimate listeriosis cases/year linked to its consumption.

#### 2. Methods

Different strains may differ in their ability to survive diverse stressful conditions, so a subset of three representative strains (serogroup IIa, IIb and IVb) was used to inoculate salad samples. Salad's pH and aw together with *L. monocytogenes* detection and quantification were performed along its commercial shelf-life. Three independent replicates were considered. DMFit and GraphPadPrism5 were used for predictive modelling and statistical analyses. Monte Carlo quantitative microbiological risk assessment was used.

#### 3. Expected Results/ Conclusion/ Contribution

The obtained results showed that the salad was able to support *L. monocytogenes* growth, as pH measurements were consistently between 4.2 and 9.5, and aw between 0.93 and 0.99, throughout the challenge test. Predictive modelling revealed that *L. monocytogenes*  $\mu_{max}$  significantly increased ( $p < 0.05$ ) with storage temperature, from  $0.02 \pm 0.01$  log cfu/g/h at 4°C to  $0.066 \pm 0.009$  at 16°C. The resulting data were subsequently used to develop a quantitative microbial risk assessment, estimating a median number of  $8.7 \times 10^{-5}$  listeriosis cases per year linked to the consumption of these ready-to-eat salads. Sensitivity analysis considering

### Keywords

Challenge test; Predictive Model; Risk Assessment; *L. monocytogenes*

### Biography

Ana Rita de Sá Henriques as a PhD from the Faculty of Veterinary Medicine, University of Lisbon. She is a DVM with a Master in Veterinary Public Health. She has worked for the last eighteen years as a food safety and quality consultant, auditor and trainer in several national and international food companies. She is currently an invited lecturer in food safety at her alma mater. Her research focuses on food microbiology and food safety systems. She has published several papers in peer-reviewed journals and international meetings.

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# Online Summit on Food Science, Nutrition & Public Health

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## Perception of Advertisements for Healthy Food on Social Media: Effect of Attitude on Consumers' Response

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### Abstract

#### 1. Background

The growing concern for health is currently a global trend, so promoting healthy products is an opportunity that companies can exploit to differentiate their products in highly competitive markets. The main objective of this research is to ascertain which variables influence the consumer's response through intention motivated by his/her attitude to the value of healthy food (which is motivated by the utilitarian value of eating and the hedonic value of eating), and by external stimuli through social media advertising value.

#### 2. Methods

The theory of Ducoffe's advertising value model was used as a conceptual framework for the antecedents of attitudes. Ducoffe proposed informativeness, entertainment, credibility and irritation as antecedents of advertising value. The Social Media Advertising Value (SMAV) of healthy food refers to the individual subjective value of the potential consumer that, through online advertising, incorporates users' interactions and any content they share. SMAV variable is used to determine its relationship with attitudes and utilitarian and hedonic eating values precede this variable. Also, A range of social science research supports the role of attitudes in predicting behavioral intentions. Additionally, the link between attitudes and adoption intentions is well-established in food research. Intention has an indirect partial mediating effect on consumer response. To achieve this objective, a descriptive cross-sectional study was carried out based on primary data from a survey of a representative sample of the Spanish population with 2023 valid questionnaires. The Partial Least Square (PLS) method was applied to test the hypothesized relationships and predictive variables.

#### 3. Expected Results/ Conclusion/ Contribution

The current research contributes to the existing literature in that it provides empirical evidence of the capabilities of an extended model of the antecedents of SMAV, and the consequences for consumer response through attitude and intention. A conceptual model was proposed and empirically tested in the context of healthy food advertising on social networks.

### Keywords

Healthy Food; Social Media Advertising; Attitude; Intention; Consumer Response; Social Networks

### Biography

**Pedro Cuesta-Valiño** holds a PhD in Economic and Business Sciences and is a Professor of Marketing at University of Alcalá (Spain). His research lines are marketing strategies, creation of value through marketing, corporate social responsibility, service management and economics of happiness. His research has been published in several academic journals specialized in business (Corporate Social Responsibility and Environmental Management, Journal Retailing and Consumer Services, Economic Research, International Journal of Environmental Research and Public Health, Sustainability) and a large number of chapters published in the most relevant international editorials in economics (Springer, Peter Lang, Tirant lo Blanch).

**Pablo Gutiérrez-Rodríguez** holds a PhD in Marketing and is a Professor of Marketing and Market Research at University of León (Spain). His research lines are non-profit and public marketing, service marketing and international marketing. His research has been published in several business academic journals (Nonprofit and Voluntary Sector Quarterly, Corporate Social Responsibility and Environmental Management, Journal Retailing and Consumer Services, Economic Research or International Journal of Environmental Research and Public Health) and in a large number of chapters published in the relevant international and national editorials in economics (Springer or ESIC).

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# Online Summit on Food Science, Nutrition & Public Health

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## Characterization of Prickly Pear Peel Flour as a Bioactive and Functional Ingredient in Bread Preparation

Lucia Parafati

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### Abstract

#### Background

The aim of the present research was to evaluate the addition of prickly pear peel flour (PPPF) to bread dough as a source of nutrient and bioactive compounds. The PPPF's physical, chemical and nutritional composition was evaluated, as well as its content of bioactive compounds betalains, and flavonoids. The characterization evidenced high fiber and carbohydrate contents and an elevated amount of polyphenols and betalain compounds. The PPPF was then added at different concentrations to bread formulations as a potential functional ingredient. Among the different formulations, those containing PPPF at 10% showed the highest values in terms of the leavening dough capacity and bread specific volume and received the best sensory evaluation score

#### 2. Methods

The flour obtained from "Agostani" fruits was characterized for its physical, chemical, nutritional and antioxidant properties. Therefore, dough formulations were performed by replacing the wheat flour with different amount of PPPF (5, 10, 15, 20, 50%, w/w). The experimental doughs were then evaluated for physical, chemical properties and for technological parameters. All concentrations, except 50% PPPF, evidenced good leavening dough properties and were then tested for baking. Bread added with PPPF, was evaluated for bio-chemical parameters, texture and sensory profile and compared to the traditional bread.

#### 3. Expected Results/ Conclusion/ Contribution

From the prickly pear peel, which is considered to be a by-product, is possible to obtain vegetable flour rich in bioactive compounds and with a high antioxidant activity. The PPPF also revealed to be a good source of dietary fiber that improves the nutritional characteristics of bread, allowing for a functional product. Furthermore, the recovery of bioactive compounds also revealed a high amount of total polyphenols and betalains after the baking process. Among the different formulations, the replacement of the wheat flour with 10% PPPF leads to obtain the highest dough increase and the best results in terms of the specific volume. Moreover, the sensory characteristics of bread formulated with the 10% PPPF registered the highest total sensory evaluation scores.

#### Keywords

Food Byproducts; Opuntia Ficus Indica; Functional Ingredient; Phenolic Compounds; Antioxidant activity; Bread

#### Biography

Lucia Parafati has completed her PhD at the age of 29 years at the University of Catania. She current works in food science and technology field, focusing her researches on the antimicrobial and functional characteristics of agricultural and food by-products and their re-use for the formulation of new functional foods.

During the doctoral period, she investigated the action mechanisms of new yeast biocontrol agents (BCAs) against the main post-harvest fungal pathogens and carried out research at the USDA, Appalachian Fruit Research, United States Department of Agriculture, Kearneysville, WV (US), in order to evaluate the gene expression *Wickerhamomyces anomalus* BS91 strain, producer of glucanase enzymes.

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## Shrinkage Phenomenon in Cherries During Osmotic Dehydration

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### Abstract

During the process of cherry osmotic dehydration, it is produced the output of water from the cells and the input of soluble solids, modifying the shape, volume and the surface of cherries in different ways, producing the phenomenon of shrinking. Three formulations were made: witness: 100% sucrose, T1 treatment with 75% sucrose lactitol 25% and T2 and 50% sucrose, 50% with lactitol, in order to study the loss of moisture, and shrinking phenomenon. To the obtained data, a polynomial equation of third degree was adjusted. There are few but important works of osmotic dehydration that include the shrinkage phenomenon. The aim of this work it is to analyze the shrinking phenomenon in cherries by osmotic dehydration. The experimental model was compared with the Lozano, Ochoa y Ratti's Models for drying cherries in convective conditions with hot air. The models validated the behavior of osmotic dehydration in the trial conditions

### Biography

Dra. Maldonado studied Biological Sciences. She receive her doctoral thesis with honors in 2004 at the Universidad Nacional de Cuyo. Mendoza. Argentina, She is Specialist in Quality Engineering. She received a lot of awards: GOLD PLATE AND HONOR DIPLOMA for National University of Cuyo, Honorary mention, Federation of University Women Argentina Merit for the Best graduate and Honorary member the Centro de Bromatólogos Mendoza. And She won 3rd MENTION in VI Food Congress XXI Conference Food, Nutrition and Health XXXIX for this work : "Use of low digestibility carbohydrates as sucrose substitutes in the production of preserved cherries" She has wrote a lot of papers in international magazines and Congress.

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## Anti-inflammatory Diet and Endothelial Dysfunction in Stage 1 Hypertension. Results from HINTreat Study

Anastasios Vamvakis

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### Abstract

#### 1. Background/ Objectives and Goals

Non-pharmacological treatment is important for controlling blood pressure (BP) and could improve endothelial and vascular dysfunction, which are present in patients with stage 1 essential hypertension (EH). The Hypertension Intensive Nutrition Treatment (HINTreat) study examines the effect of a 6-month intensive lifestyle treatment (ILT) on the BP levels and the endothelial and vascular function, compared with the usual care.

#### 2. Methods

A total of 76 adults (38 in each group), newly diagnosed with stage 1 EH, were randomized. Primary outcomes were and blood pressure (BP) (office and ambulatory/ABPM), asymmetric dimethylarginine (ADMA), central hemodynamics (cBP, PP),  $\beta$ -stiffness index, carotid intima media-thickness, biochemical and 24h urine profile. Secondary outcomes included anthropometry, dietary analysis and physical activity and dietary Na intake. The dietary inflammatory index (DII) was selected for dietary analysis, based on the median of 3 repeated diet recalls, and was calculated from the intake of 29 nutrients/food components.

#### 3. Expected Results/ Conclusion/ Contribution

At the end of the trial, participants in the ILT group reduced their daytime and 24h BP ( $p < 0.01$ ), 24h urinary Na excretion ( $p < 0.001$ ), mean carotid  $\beta$ -stiffness index ( $p < 0.01$ ) and IMT ( $p < 0.05$ ) and ameliorated their lipidemic profile compared to the standard care. DII levels improved in both groups, but the comparison between the groups showed significant difference at the end of the trial ( $p < 0.001$ ), even after adjustment for energy intake of the patients ( $p < 0.001$ ). Univariate analysis for the total sample showed a strong association between DII and ADMA levels ( $\beta = 0.089$ ,  $p < 0.01$ ). ILT can enhance dietary anti-inflammatory profile of the diet, reduce BP levels and improve endothelial and vascular function in newly diagnosed patients with stage 1 EH.

### Keywords

Hypertension; Asymmetric Dimethylarginine; Dietary Inflammatory Index; Endothelial Dysfunction; Inflammation; Medical Nutrition Therapy

### Biography

Dr Anastasios (Tasos) Vamvakis is Clinical - Sports Nutritionist - Dietician. After his first postgraduate studies in Sports Nutrition in Aberdeen University in Scotland and the second postgraduate studies in Clinical Research Methodology in the Medical School of Aristotle University in Thessaloniki he has completed his PhD in the field of Hypertension, Nutrition and Physical Activity from Aristotle University in Thessaloniki, Greece. He is a level 2 ISAK certified Anthropometrist and a research fellowship with the 3<sup>rd</sup> Department of Internal Medicine and the 3<sup>rd</sup> Department of Pediatrics (Endocrinology Unit) in the Medical School of Aristotle University of Thessaloniki. In parallel he works as private dietician and cooperates with a private pregnancy clinic and a variety of athletic clubs and sports teams.

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## Ensuring Improved Food Security through Control of Immune Response and ADPribosylation for Healthier Plants

**Palmiro Poltronieri**

GreenGreener Ltd, Italy

### Abstract

#### Background

Plants and crops are affected by abiotic stresses as well as by pathogens attack. To cope with stresses, there are several defense mechanisms relying on phyto-hormones, Nucleotide binding (NB) Leucine repeat region (LRR) receptor kinases or receptor like proteins (RLK, RLPs). These plasma membrane receptors sense the presence of molecular patterns, and activate downstream signaling that leads to Pattern Triggered Immunity (PTI) and Effector Triggered Immunity (ETI), which cooperate to protect surrounding cells from damage and pathogen spread. In the past years great advances have been made on the role of NLRs domains and helper proteins in the immune response without negative effects on plant growth or trade-off between plant safety and crop security.

#### Methods

Our recent work described the role of effectors Cf-9 peptide, flagellin peptide and EF-Tu peptide on various chimeric NLRs, and the requirement for BAK and SOBIR kinase activity. In addition, we are exploiting the advancement on the role of NAD (either extracellular as well as intracellular) on the production of secondary signals such as ADP-ribosylated proteins, cyclic ADP-ribose and Nicotinic acid adenine diphosphate (NaADP) by TIR domains of NLRs with NADase activity.

#### Expected Results/ Conclusion/ Contribution

We discuss the relevance of PARP-domain proteins in spreading the immune signals and in activation of hormones, ROS, and transcription of defense genes. Similar requirement of hormones has been shown important in abiotic stress response. Today, a new challenge is the increase in greenhouse gas, with high CO<sub>2</sub> endangering the photosynthesis and plant health.

Therefore, by acting on plant signaling, we may ensure and provide crops without being affected by losses or diseases, adapted to the present environmental conditions.

#### Keywords

ADP-ribosylation; NAD; Nicotinamide; Cyclic ADP-ribose; Calcium Waves; Immunity; Abiotic Stress Response; Crop Security

#### Biography

Palmiro Poltronieri has completed his Bachelor degree in 1987 and in 1995 his PhD from University of Verona, Faculty of Medicine (Italy). He is a biochemist, and worked for 21 years with National Research Council of Italy, Department of Agrofood, Institute of Sciences of Food Productions (CNR-ISPAA), now retired, at 67 years old. He has published more than 70 papers in reputed journals, and serving as an editorial board member for Biochem. Pharmacology. He is in the scientific committee of a new company, GreenGreener Ltd.

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## An Application of a Thickening Agent to Introduce a Novel Scotch Bonnet “Githeyo Mirus” Sauce in the Maldives

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### Abstract

Maldives export most of the food products that we daily use from other countries. These food products are made by using different chemical substances to stabilize, increase its shelf life, improve texture and quality. The food thickener is one of the substance that is commonly used in processed food products. A food thickener is a substance which can increase the viscosity of a liquid without substantially changing its other properties. The increase in demand for long lasting food has driven a market expansion for food thickeners, which are used to thicken food products to improve consumer experience and durability. The process of thickening occurs due to nonspecific entanglement of polymer chains which require correct temperature, pH, concentration and molecular weight of the thickening agent to have perfect thickening effect in the production of the food product. Hydrocolloids like thickeners are widely used in many food formulations to improve quality and shelf-life. Food ingredients like flour is a combination of a protein and polysaccharide making it a stronger thickener. In the process of making sauce, cooking the flour isolates the protein molecules first and makes the starch more widely available for liquid absorption. The addition of raw flour to liquid results in lumps that are hard to get out, and it will only have marginal thickening strength, it will only be added after separately mixing with liquid. Therefore, the main aim of this study is to introduce corn-starch flour which is easily available in Maldives as a thickening agent for locally made scotch bonnet sauce to increase its viscosity and stability without changing its original flavour. The addition of thickening agents to sauces helps to achieve their acidic characteristics and to preserve the product for a longer time. Besides, the viscosity of the sauce plays a major role in handling and quality of sauces which will increase people's interest towards the product.

### Keywords

Corn Flour; Thickener; 'Githeyo mirus'; Scotch Bonnet; Maldives

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## Characterization of Tamanu Oil: Fatty Acid Content, Level of Heavy Metal and Microbial Contamination

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Research Development Office, The Maldives National University, Male', Maldives

### Abstract

*Calophyllum inophyllum* is an important woody oil plant found in Maldives on a large scale. Its seed oil is enriched with and a high content various fatty acids, which are beneficial to human health. The main purpose of conducting this research is to characterize Tamanu oil produced in Maldives in terms of chemistry and microbiology. Duplicate samples of the Tamanu oil is tested from two different bottles (D-CIO1 and D-CIO2) respectively of the same oil, and the chemical profile of Tamanu oil is investigated through various analytical techniques such as Gas chromatography. Results delivered that there were saturated as well as unsaturated fatty acids in Tamanu oil. Total of 14 different fatty acid components were identified and quantified. Linoleic acid was found in highest concentration (37.11g/100g in D-CIO1 and 36.61g/100g in D-CIO2) among the identified analytes of interest. In addition Oleic acid (31.46g/100g in D-CIO1 and 31.13g/100g in D-CIO2), palmitic acid (16.59g/100g in D-CIO1 and 16.59g/100g in D-CIO2), stearic acid (12.67g/100g in D-CIO1 and 12.52g/100g in D-CIO2), lauric acid (0.17g/100g in D-CIO1 and 0.80g/100g in D-CIO2), myristic acid (0.11g/100g in D-CIO1 and 0.39g/100g in D-CIO2), palmitoleic acid (0.23g/100g in D-CIO1 and 0.23g/100g in D-CIO2), heptadecanoic acid (0.11g/100g in D-CIO1 and 0.11g/100g in D-CIO2), arachidic acid (0.70g/100g in D-CIO1 and 0.68g/100g in D-CIO2), cis-11-eicosenoic acid (0.13g/100g in D-CIO1 and 0.12g/100g in D-CIO2), linolenic acid (0.22g/100g in D-CIO1 and 0.24g/100g in D-CIO2), behenic acid (0.21g/100g in D-CIO1 and 0.20g/100g in D-CIO2) and arachidonic acid (0.19g/100g in D-CIO1 and 0.18g/100g in D-CIO2) were found. Some fatty acids were present in D-CIO1 but not in DCIO2 and vice-versa. For instance, cis-10-heptadecanoic acid was present (0.3g/100g) in D-CIO1, but not in D-CIO2. Likewise, caprylic acid (0.12g/100g) and capric acid (0.09g/100g) were present in DCIO2, but not in DCIO1. Concentrations of rest of the detected fatty acids were less than 0.01g/100g and hence not detected. In the results obtained for the heavy-metal profile, the oil was tested for the presence of Arsenic, Cadmium, Manganese, Chromium, Mercury, Lead, Thallium and copper, of which only the presence of copper was detected (2.7mg/kg D-CIO1 and 2.8mg/kg D-CIO2) in the oil. The concentration of rest of the heavy metals were lower than the limit of quantification of 0.5mg/kg. Lastly, the results of the microbial activity of the oil suggested the absence of both *salmonella* and coliforms. Additionally, the aerobic plate count also had a result of <10 colony forming unit/g which is considered an acceptably low value. The water activity of the oil was found to be 0.62 aw with a neutral pH of 7. Thus, this study findings could be used to promote the production of Tamanu oil in Maldives as marketable, authentic local product.

### Keywords

Microbes; Heavy Metals; Fatty Acids; Tamanu Oil; Maldives

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## Functional Components and Potential Health Benefits of Honey Vinegar

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<sup>b</sup> Yalova Beekeepers Association, Turkey

### Abstract

#### Background

Honey vinegar has been well known for many years and has also used in traditional medicine. However, there are only a few scientific publications on honey vinegar production, components, properties and beneficial effects. The purpose of this study is to collect these few studies and to present them in a way that is easily understood by consumers and producers

#### Methods

Honey vinegar has been well known for many years and has also used in traditional medicine. However, there are only a few scientific publications on honey vinegar production, components, properties and beneficial effects. The purpose of this study is to collect these few studies and to present them in a way that is easily understood by consumers and producers

#### Expected Results/ Conclusion/ Contribution

Honey vinegar production methods, components (total acids, organic acids, alcohols, microbial metabolites, volatile compounds, nectar, phenolics, aromatics, free amino acids) potential health benefits (hyperlipidemia, hypercholesterolemia, insulin level, blood pressure, antimicrobial effects). Multiple vitamins, phenolic compounds, riboflavin, thiamine, and mineral salts derivatives were reported as important components which affective factors on distinct flavor of honey vinegar. Final quality and volatile/aromatic compounds of honey vinegar can be influenced by both the honey (type, climate and origin) and the process (starter cultures, fermentation conditions, ageing etc).

When all of the collected articles were evaluated, health beneficial effects of honey vinegar should be studied more comprehensively in future to determine its health promoting effects on consumers. Also honey characteristic also should be well defined before studying of beneficial effects and components of honey vinegar. Potential beneficial results were seen on antimicrobial and cholesterol lowering effects. On the other hand, no significant effect on anthropometric indices, blood pressure and LDL cholesterol.

#### Keywords

Fermentation; Bee product; Cholesterol; Volatile compounds

#### Biography

Yasin OZDEMIR has completed his PhD at the age of 29 years from University of Namik Kemal (Turkey). He is has leader national and international research project. His studies focused on fruit and vegetable processing and medicinal plant root culture production. He has published more than 100 papers in reputed journals and serving as an editorial board member of repute.

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# Online Summit on Food Science, Nutrition & Public Health

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## Garlic: Nutritional Content, Production Techniques, and Postharvest Strategies on Quality Maintenance in Food Sector

Selen Akan

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### Abstract

Garlic and its functional products have gained popularity in food industry due to their nutrition and health effects for many years. Garlic is a great source of unique bioactive sulfur components (e.g. *alliin*, *allicin*, *S-allyl-L-cysteine*) and rich in polyphenols, antioxidants, vitamins, flavonoids, minerals and ascorbic acids. It has diverse therapeutic effects associated with biochemical content. However, maintaining health benefits is problematic due to its some sulfur component's instability. In addition, the most important issue here is provide high quality-garlic and stability of bioactive ingredients in it. At this point, quality maintaining is now popular target for using garlic in food industry. It is essential to know main indicators for affecting food quality of garlic for ensuring the target product in the food industry. Quality and nutritional properties of garlic greatly depends on the production techniques and handling procedures at post-harvest. Therefore, the aim of this study is review the results of some studies on garlic and provide a comprehensive knowledge on nutritional content, production techniques, postharvest strategies, and quality maintaining for food industry. Moreover, health benefits, potential uses and future outlook were also summarized.

### Keywords

Garlic; Nutrition; Human Health; Antioxidant; Food Quality

### Biography

Selen AKAN has completed his PhD at the age of 32 years from University of Ankara, Graduate School of Natural and Applied Sciences, Department of Horticulture, Ankara (Turkey). She is an agriculture engineer, research assistant, and a part of a research team focusing on food quality, postharvest physiology and shelf life of horticultural crops. She has published more than 20 papers in reputed journals and serving as an reviewer and editorial board member of reputed.

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## Effect of Using *Moringa Oleifera* and *Spirulina Platensis* as Feed Additives on Performance, Meat Composition and Oxidative Stability and Fatty Acid Profiles in Broiler Chicken

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### Abstract

A study was conducted to determine mainly the n 3 fatty acids enrichment and decreased oxidation of broiler meat using the plant *Moringa oleifera* and a blue green algae *Spirulina platensis*. The effects of the dietary treatments were evaluated in terms of growth performance, carcass and meat yields, oxidative stability and fatty acids modulation. Two hundred and forty (240) one day old Cobb 500 broiler chicks were assigned to 5 dietary treatments for 5 weeks, with 4 replications having 12 chicks per replication. The diets of the treatments were formulated from the basal feed as follows: control (T<sub>1</sub>), including 2 different levels of *M. oleifera* leaf meal 1% (T<sub>2</sub>) and *M. oleifera* leaf meal 1.5% (T<sub>3</sub>) and 2 different levels of *S. platensis* 1% (T<sub>4</sub>) and *S. platensis* 1.5% (T<sub>5</sub>). The birds were randomly distributed in each pen, and the data were analyzed using the SPSS statistical package. The final body weight (BW) gain was significantly higher in the T<sub>2</sub> and T<sub>5</sub> groups, and the feed conversion ratio improved in the T<sub>2</sub> group (1.68). The lowest ( $p \leq 0.05$ ) thiobarbituric acid-reactive substances values (TBARS) of breast and thigh were obtained in T<sub>2</sub> groups compared to T<sub>3</sub>-T<sub>5</sub> group after the second week of preservation. Regarding fatty acid profile of breast and thigh meat, the omega-3 fatty acid levels, such as those of linolenic and docosahexaenoic acid (DHA), were increased in the additive's groups. The results of the present study elucidated that dietary inclusion of the 2 medicinal plants in the T<sub>2</sub> and T<sub>5</sub> groups could be promising functional ingredients to produce value-added broiler meat in terms of oxidative stability and omega-3 fatty acids enhancement.

**Key words:** Broiler Chicken; *Moringa oleifera*; *Spirulina platensis*; Oxidation; Fatty Acid

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# Online Summit on Food Science, Nutrition & Public Health

MAR 18, 2021

## Tailoring Feed Chemistry to Synchronize Healthier Egg Profile - A Value Added Tool to Enhance Desired Nutrient Index

Muhammad Aasif Shahzad

MinHillandale Gettysburg Lp, USA

### Abstract

#### 1. Background

Egg nutrient composition has strong correlation with the flow of nutrients the hen is getting from feed and it has been the talk of the town among multidisciplinary researchers in the last couple of decades. Influence of transfer of some trace minerals, some healthy fatty acids, some bioactive compounds or functional nutrients, water soluble and fat-soluble vitamins have projected it a promising domain of applied nutrition science to bring positive change in community through encouraging consumption of healthier modified eggs. This domain of science has given birth to certain nutraceutical aspects of pharmacology. Scientific findings of some functional properties of certain nutrients as if being an effective antioxidant have revealed numerous human health benefits by acting as anti-aging, better eye health, skin care and vision. Antioxidants are substances that may protect your cells against free radicals, which may play a pragmatic role in reducing heart, cancer and other diseases. Antioxidants, such as vitamins C and E and carotenoids, may help protect cells from damage caused by free radicals. Likewise, to an extent, decrease in egg saturated fats through feed modification is also helpful to address the consumer saturated fatty acid concerns. Similarly, lipids are key macronutrients in the human diet, its type and proportion influence whole body physiology. Scientific studies reveal that saturated fatty acids are detrimental to health, while monounsaturated and polyunsaturated fatty acids offer health benefits. Improving omega 3 fatty acid profile can help to address the multiple human concerns due to numerous health benefits of omega 3 associated with it. This presentation highlights the potential of modifying egg nutrient profile through altering hen feed composition in order to provide eggs with healthier nutrients to the community.

#### 2. Methods

Hen feed nutrient profile can be altered aimed to improve the certain nutrient contents in the egg nutrients i.e. certain vitamins, trace minerals, fatty acids and some bioactive or nutraceutical compounds. Use of modified fatty acid profile feed ingredients like those that flaxseed meal has been reported to enhance omega 3 fatty acid profile. Likewise, improving certain water soluble and fat-soluble vitamins and certain trace minerals boost up the egg composition in favor of human health. Scientists are using different plant or herbal extracts in hen feed to incorporate some nutraceutical/functional effects to egg composition aimed better healthy food.

#### 3. Expected Results/ Conclusion/ Contribution

Positive impact of healthier egg nutrient profile has been reported to enhance human health under different circumstances with varying degree of success. However, it has opened a new avenue that altering flow of nutrients to hen egg composition may be used as a promising and effective tool to address different human health issues of our day-to-day life. This presentation reviews and presents that how altering nutrient supply chain (feed formulation) to egg composition has enhanced the healthier egg contents to serve the community.

### Keywords

Egg Nutrition; Altering Feed Composition; Modifying Egg Nutrient Profile; Human Health

### Biography

Dr. M. A. Shahzad completed his Post Doctorate in Animal Nutrition /Welfare from the University of Queensland Gatton Campus Australia after completing Ph.D and MS in animal nutrition (with distinction – did top in faculty) from University of Agriculture Faisalabad, Pakistan. Dr Shahzad has 36 peer-reviewed publications in more than 14 impact factor international journals and 33 Proceedings/Abstracts in Foreign Conferences/Seminars in addition to two books on his credit. He also wrote 30 scientific articles in new media. He has delivered more than 20 oral presentations on his research work in international conference and is a reviewer of more than 15 international journals.

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# Online Summit on Food Science, Nutrition & Public Health

MAR 18, 2021

## How to Treat Rheumatoid Arthritis Using Foods as the Main Tools?

Huang Wei Ling

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### Abstract

**Statement of the Problem:** Rheumatoid arthritis (RA) is a chronic autoimmune inflammatory disease, which affects approximately 1% of the world's adult population. It is characterized by the inflammation of synovial tissue from multiple articulations, leading to tissue destruction, pain, deformities and reduced quality of life. RA etiology is complex and largely unknown, although studies support the influence of genetic and environmental factors on its pathogenesis. According to traditional Chinese medicine (TCM) theory, RA is categorized under the "Bi" or impediment disease, which means a group of diseases caused by the invasion of wind, cold, dampness, or heat pathogen on the meridians involving muscles, sinews, bones, and joints, manifested by local pain, soreness, heaviness, or hotness, and even articular swelling, stiffness, and deformities, also referring to arthralgia. According to Chinese nutritional therapy, all patients with pain in the joints should avoid the consumption of dairy products.

### Purpose

To demonstrate that patient with rheumatoid arthritis need to avoid the ingestion of dairy products.

### Methods

Through an extensive literature review by PubMed and NCBI on rheumatoid arthritis in Western medicine and traditional Chinese medicine and the report of a clinical case demonstrating the importance of dietary counselling avoiding the ingestion of dairy products in the treatment of rheumatoid arthritis patients. This patient is a 26-year-old male, with diagnosis of rheumatoid arthritis since 5 years ago, and was using immunosuppressive medications and corticosteroids to control the pains in all joints. He began to treat his pains with a Chinese medicine doctor who advise him to avoid all dairy products, cold water, raw food and sweets. The second group of foods that was orientated to avoid was fried foods, chocolate, honey, melted cheese, coconut, alcoholic beverages and the third group of foods to avoid was coffee, soda and matte tea. The patient also was submitted to auricular acupuncture with apex ear bloodletting and *radiesthesia* procedure. All his seven chakra's were in the lowest level of energy (rated 1 out of 8) and he was medicated with high diluted medications for a period of one year or more.

### Results

The patient improved from his symptoms after the oriental medicine tools and avoiding all dairy products and after less one month of treatment he was able to withdraw his high concentrated medications (corticosteroids and immune suppressant medications) and never need to use them anymore.

### Conclusion

Rheumatoid arthritis patients should be advised to avoid the consumption of dairy products because all the patients' symptoms were normally attributed to the disease but, thought this case report, the author is demonstrating the necessity of take out all dairy products from the patients' diet to improve all the symptoms related to pain in rheumatoid arthritis.

### Biography

Huang Wei Ling, born in Taiwan, raised and graduated in medicine in Brazil, specialist in infectious and parasitic diseases, General Practitioner and Parenteral and Enteral Medical Nutrition Therapist. Once in charge of the Hospital Infection Control Service of the City of Franca's General Hospital, she was responsible for the control of all prescribed antimicrobial medication and received an award for the best paper presented at the Brazilian Hospital Infection Control Congress (1998). Since 1997, she works with the approach and treatment of all chronic diseases in a holistic way, with treatment guided through teachings of traditional Chinese medicine and Hippocrates.

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## Mitigating Colon Inflammation using Soluble Polymer-curcumin Complexes as Nutraceutical Therapy

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<sup>a</sup>Department of Pharmaceutical Sciences, College of Pharmacy and Allied Health Professions, South Dakota State University, USA

### Abstract

Poor colon health with prolonged inflammation is a major risk factor for ulcerative colitis and colorectal cancer. As a dietary approach to managing colon inflammation, curcumin a safe anti-inflammatory component of turmeric root provides an excellent option. However, curcumin is not soluble or stable in water, which restricts its clinical application. In this study, we have delivered water-soluble and -stable curcumin locally to the lumen of the colon without detectable systemic absorption using novel polymeric complexes of curcumin (Ora-curcumin or OC-S). OC-S was prepared by coprecipitating curcumin and EUDRAGIT<sup>®</sup>-S100 polymer and characterized by FTIR and HPLC. The anti-inflammatory activity of OC-S was tested using dendritic cells activated by *E. coli* ( $5 \times 10^5$ /ml). The levels of TNF- $\alpha$  were determined by sandwich ELISA. For studying pharmacokinetics, curcumin or OC-S was administered orally (15mg/kg) and the levels of curcumin in both blood and fecal matter were determined by HPLC. Inflammation-specific binding of OC-S was quantified by imaging ( $\lambda$ -470/535nm) the colon pieces from healthy and Dextran Sulfate Sodium (DSS)-treated (2.5% in drinking water) mice after incubation with OC-S for one-hour. OC-S contains 10 % curcumin and is highly water-soluble (>2000 times) and stable. One-hour after OC-S administration, there was no detectable curcumin in the mouse blood; however, >90% of curcumin present in fecal matter collected 16-hours after OC-S administration was water-soluble ( $\sim 2 \mu\text{g/g}$ ). In contrast, 100% of the fecal curcumin was water-insoluble in the unformulated curcumin group. OC-S showed significantly higher binding to the inflamed colon tissues (DSS-colitis) vs. healthy colon tissues. OC-S was more potent than curcumin in inhibiting TNF- $\alpha$  secretion by dendritic cells activated by *E. coli* ( $p < 0.001$ ). OC-S was compatible and stable with commercial dietary products over 12-months at room temperature. OC-S is a unique inflammation-targeted local colon delivery technology that enables curcumin as a dietary option to manage colon inflammation.

### Biography

Chaitanya Valiveti, M.S., has completed his bachelor's degree in pharmaceutical science from Annamalai University, India, and a master's degree in pharmaceutical chemistry from Fairleigh Dickinson University, NJ, U.S.A. He worked as a senior scientist for 5 years in the Pharmaceutical industry (NJ, U.S.A). Currently, he is pursuing Ph.D. degree (final year) in Pharmaceutical Sciences from the South Dakota State University and Allied Health Sciences, Brookings, SD. His research was published in high-impact journals, Journal of Controlled Release, Cancers etc. He has broad area of expertise includes nutraceutical therapy, Pharmaceutical Chemistry, Cancer, and Vaccines.

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# Online Summit on Food Science, Nutrition & Public Health

MAR 18, 2021

## Food Safety Management System Approach of an African Aviation Company Food Supplier (Poster Presentation)

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### Abstract

#### 1. Background

In aviation catering, food production and service are regarded with rigor in all procedures, as any food-related event can entail incalculable consequences. The Hazard Analysis and Critical Control Points (HACCP) system is a proactive food safety system that certainly ensures the production of safe food along the food chain. However application of this system in catering can be challenging, especially in low income countries. This study aimed to design and propose a food safety management system approach based on HACCP program for an African aviation catering.

#### 2. Methods

The project considered a two-step approach. In the first phase, an internal audit was performed regarding the existing food safety management system procedures and documentation. After analyzing the first phase results, the implementation of a revised food safety management system, based HACCP following Codex Alimentarius standards took place. Considering the wide variety of prepared food products in the assessed catering company, the project approach focused on production processes, rather than on individual final food products. Validation of the system was performed through microbiological assessment of ready-to-eat meals. Potential food pathogens were detected and quantified

#### 3. Expected Results/ Conclusion/ Contribution

The obtained internal audit results revealed major and minor nonconformities linked to hygiene procedures. Three main production processes were outlined to categorize all of the final food products (n>100) produced in the assessed food unit: cold meals, cooked meals and cooked meals served warm. Unexpected results were obtained for coagulase-positive staphylococci and E. coli with no direct relation with production process. The main challenges for the HACCP system implementation in the assessed catering were those related to suppliers control, layout and to personnel training. This approach confirmed that verification and validation of the food safety management system are of utmost importance to reinforce the remaining HACCP principles.

#### Keywords

Food Management System; Catering; HACCP; Audit; Ready-to-eat Foods

#### Biography

Ana Rita de Sá Henriques has a PhD from the Faculty of Veterinary Medicine, University of Lisbon. She is a DVM with a Master in Veterinary Public Health. She has worked for the last eighteen years as a food safety and quality consultant, auditor and trainer in several national and international food companies. She is currently an invited lecturer in food safety at her alma mater. Her research focuses on food microbiology and food safety systems. She has published several papers in peer-reviewed journals and international meetings.

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# Online Summit on Food Science, Nutrition & Public Health

MAR 18, 2021

## Are We Vaccinating Immunocompetent or Immunocompromised People for COVID-19?

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### Abstract

#### Introduction

Since January 2020, Chinese scientists shared the SARS-CoV-2 genomic sequence and approximately, 321 research groups begin the search for vaccine since then. The CDC notes that immunocompromised patients may receive the vaccines so long as they have no contraindications to vaccination, but that they should be counseled about the unknown safety profiles of the vaccines in immunocompromised populations.

#### Purpose

The purpose of this study is to demonstrate that the majority of the patients that the author is attending nowadays is in the category of immune compromised patients.

#### Methods

The author did radiesthesia procedure to measure the energy of the seven chakra of 1000 patients during 2015 to 2020. Doing this measurement, the author was measuring the energy of the five massive organs in traditional Chinese medicine, responsible for the production of energy Yin, Yang, Qi and Blood, important to maintenance of health in the human body and the production of Zheng-Qi, that is responsible for the protection of the body against the invasion of external pathogenic factor, in this case SARS-CoV-2.

#### Results

The result of this study is that more than 90 percent of the patients analyzed were in the lowest level of energy, meaning that their immune system are compromised because energy in TCM means immune system.

#### Conclusion

To vaccinate people from COVID 19 nowadays, it is important to analyze the energy of each person before doing the vaccination because, according to the research made by the author, more than 90 percent of her population were in the lowest level of energy, meaning that they all have immune system very compromised.

#### Biography

Huang Wei Ling, born in Taiwan, raised and graduated in medicine in Brazil, specialist in infectious and parasitic diseases, General Practitioner and Parenteral and Enteral Medical Nutrition Therapist. Once in charge of the Hospital Infection Control Service of the City of Franca's General Hospital, she was responsible for the control of all prescribed antimicrobial medication and received an award for the best paper presented at the Brazilian Hospital Infection Control Congress (1998). Since 1997, she works with the approach and treatment of all chronic diseases in a holistic way, with treatment guided through teachings of traditional Chinese medicine and Hippocrates.

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## Optimization of the Bovine Plasma Hydrolysis to Obtain Iron-Binding Peptides and Evaluation of In Vitro Iron Bioavailability

Gómez NA<sup>a</sup>, Gómez LJ<sup>a</sup>, López G<sup>b</sup>, Alegría A<sup>b</sup>, Cilla A<sup>b</sup>, Zapata Je<sup>a</sup>

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### Abstract

#### 1. Background

#### Background/ Objectives and Goals

Iron deficiency anemia is highly prevalent worldwide. According to the WHO, it is women and children of school age who suffer the most from this pathology. Many factors contribute to iron deficiency ( $Fe^{2+}$ ) and the main reason is the diet with low natural availability of this micronutrient. Strategies to fortify foods with  $Fe^{2+}$  have been analyzed, especially in regions with malnutrition in their population. However, the fortification of foods with iron causes sensory changes not pleasant to human taste, for which a strategy has been proposed to develop new molecules that increase the solubility and bioavailability of iron at the gastrointestinal level. Some studies show that iron interacts with different dietary compounds during digestion and forms complexes that can increase its absorption. The objective of this study was to determine the potential of peptides to increase the bioavailability of  $Fe^{2+}$  in differentiated colon cells. The absorption of iron at the intestinal level was evaluated by in vitro culture of Caco-2 cells. This work presents a study of the ability of peptides (BPH) produced by the enzymatic hydrolysis of bovine plasma to chelate  $Fe^{2+}$  ions and determine the ability to increase the bioavailability of  $Fe^{2+}$  in Caco-2 cells. It was determined that HPB has a capacity to chelate  $Fe^{2+}$  ions of 38.57% and that it increases the absorption of this nutrient by 80.98% at the intestinal level with respect to normal absorption.

### Keywords

Iron Bioavailability; Caco-2 cells; Iron Chelating Capacity; *in-vitro* Cellular Model; Bovine Plasma Hydrolysate; Enzymatic Hydrolysis

### Biography

Nathalia Gómez is a chemical engineer with a master's degree in biotechnology and a candidate for a doctorate in biotechnology. She has training in Metrology from the Superintendency of Industry and Commerce, the National Institute of Metrology in Colombia and the PTB of Germany. She is the internal auditor of standard 17025: 2017. She currently works as a researcher, professor at the University of Antioquia and she is the first president of the National CTS (Sectorial Technical Committee in Metrology) with the INM (National Metrology Institute). She has published around 8 articles in renowned magazines.

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## Acylated Ghrelin, Obesity and Insulin Resistance are Associated with Depression Severity in Postmenopausal Women

Maria Fernanda Naufel<sup>1</sup>, Amanda Paula Pedroso<sup>1</sup>, Lila Missae Oyama<sup>1</sup>, Mônica Marques Telles<sup>1</sup>, Helena Hachul<sup>2,3</sup>, Eliane Beraldi Ribeiro<sup>1\*</sup>

Departments of <sup>1</sup>Physiology; <sup>2</sup>Psychobiology; <sup>3</sup>Gynecology  
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### Abstract

The postmenopause-associated symptoms impact negatively women's quality of life. We have previously found clinical and experimental evidence of a connection between the lack of ovarian hormones and increased rates of obesity, anxiety and depression. Additionally, a bidirectional association between obesity and depression has been suggested. The factors involved in the association of these disturbances in postmenopausal women have not been fully explored. Although an involvement of ghrelin in mood modulation has been suggested, its role is still ambiguous and has not been established in postmenopause. We were not able to find any studies investigating ghrelin's association with mood disorders in postmenopausal women. A better comprehension of the postmenopause-associated changes and the factors influencing them will certainly improve the management of the symptoms affecting the quality of life of middle-aged women. In the present study, we hypothesized that ghrelin influences the depression and anxiety symptoms in postmenopausal women.

Fifty-five postmenopausal women with depression symptoms (age 50-65), who were not in use of hormonal or antidepressant treatments, were included. Depression and anxiety scores (Beck's Depression (BDI) and Anxiety (BAI) Inventories, Patient Health Questionnaire-9 (PHQ-9)), bioimpedance anthropometry, blood biochemical and hormonal levels, were determined. Postmenopausal women were then allocated into three groups according to the BDI classification: mild (n=26), moderate (n=22) or severe (n=7) depression. Data were analyzed by either Anova (and Tukey post-hoc) or Kruskal-Wallis, for p<0.05. Pearson's correlation and linear regression models were applied. Severe depression group had higher total and acylated ghrelin levels than those of mild depression. BDI scores correlated positively with both total and acylated ghrelin levels and with waist-hip ratio (WHR), and presented a tendency to a positive correlation with body mass index (BMI). BAI scores correlated positively with skeletal muscle mass, WHR, fat free mass, and basal metabolic rate. PHQ-9 scores correlated positively with total and acylated ghrelin and with WHR, insulin, glucose, and homeostasis model assessment of insulin resistance (HOMA-IR). Multivariate regressions showed that acylated ghrelin and BMI were positively associated with BDI, while acylated ghrelin and HOMA-IR were positively associated with PHQ-9. BAI was positively associated with WHR. The results shows that the higher the acylated ghrelin levels, the BMI and the insulin resistance, the more severe are the depression symptoms in postmenopausal women. Moreover, we demonstrate an important connection between obesity and mental disorders in postmenopausal women, as WHR associated positively with BAI scores and BMI associated positively with BDI scores. Also, PHQ-9 scores associated with HOMA-IR. These findings indicate that obesity has a relevant influence on psychological symptoms in postmenopausal women. This is the first study showing an important association between acylated ghrelin levels and the severity of the depression symptoms in postmenopausal women. Further investigations are warranted to assess if the acylated ghrelin levels may be used as a criterion describing depression prognosis as well as treatment effectiveness in postmenopause.

### Keywords

Ghrelin; Postmenopause; Mental Disorders; Obesity; Insulin Resistance

### Biography

Maria Fernanda Soares Naufel. Postdoctoral researcher / Departamento de Fisiologia, Programa de Pós-Graduação em Nutrição – Universidade Federal de São Paulo – UNIFESP/EPM

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