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Ryoko Wada et al., J Nutr Food Sci 2018, Volume 8
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Dysphagia diet for elderly prepared by Espuma method

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Background & Aim: Recently, nursing care level of residents in nursing home has worsened, consequently pasted foods ratio among serving meals at care facilities in Tokyo increased from 0% to 37% in these 10 years. Similarly, we found that 60% (43 of 71) of group homes for elderly with dementia in Tokyo have residents who have swallowing/eating difficulty. Moreover, pneumonia including the aspiration pneumonia is the third leading cause of death of elderly in Japan. Decreased swallowing/eating ability causes malnutrition as well as aggravation of health as a result QOL (Quality of life) of elderly will get worse. In this study, we examined the foamy food produced by "Espuma" aiming to provide tasty, safe and nutritive foods as a new style of prepared foods.

Methodology: We prepared 4 kinds of sample bread porridge and processed it by Espuma dispenser to foam. Foamed porridge textures were examined at 10 min and 30 min after produced.

Findings: Texture of foam porridge was maintained for 30 minutes after processed. To take 100 kcal by bread porridge, eating amount was about 40 g. Regarding the softness of porridge foam, sample S and sample SC were significantly softer than reference sample. The bread porridge became soft with the soy milk. It suggested that some kinds of cream effect to maintain the texture of foam foods.

Conclusion & Significance: Espuma-processed bread porridge has 250 kcal per about 100 g, it means foamed porridge potentially improve a nutrient condition. Moreover, it maintained foam shape 30 min after produced and indicated equivalent texture level to criteria of dysphagia diet that suggested Espuma-produced foam foods can be introduced to the food service at nursing facilities for elderly with swallowing/eating difficulty. Furthermore, we are examining the porridge using rice which is the Japanese staple food.

Biography

Ryoko Wada is currently a Professor in the Department of Food and Nutrition at the Tokyo Kasei University, Japan. She is a qualified Registered Dietitian. She has years of experience in managing the food service at nursing care facility as registered dietitian as well as management of facility. She specializes in nutritional management for elderly, nutritional education and diet education. Currently she is tackling research studies of nutritional management of nursing care facilities for elderly and improvement in nutrition of elderly.

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Minako Kudo et al., J Nutr Food Sci 2018, Volume 8
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Preparation of cabbage vichyssoise soup utilizing unused resources

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In Japan, the consumer demand for convenience food is increasing. The demand for cut vegetables is increasing because they can be readily consumed without cooking. However, when cut vegetables are increasingly consumed, the amount of unused core and peel of vegetables also increases. Cabbages are the most consumed cut vegetables, which have a yield rate of approximately 70%. Therefore, we investigated the characteristics of the cabbage cores and focused on methods to effectively use the cores. We investigated the characteristics of the core of cabbage and analyzed nutrient composition. The cabbage core was divided into three parts, namely core center, vascular bundle, and peripheral leaf of the core. We performed a sensory evaluation of the odor strength of the cabbage core parts with 12 women (age, 23±4 years). The result revealed that the vascular bundles had a significant odor ($p<0.01$). We assessed the odor by a smell distinction assay. The center and peripheral leaf of the core had similar odor quality, sulfur, amine, aldehyde were high. The vascular bundles were high in aromatic and ester. To effectively use the cores, we prepared vichyssoise soup only using cores that were cutoff at 2 cm from the bottom. The specific gravity of the soup was 1.02±0.00, the viscosity was 390.6±78.7 mPa•s and the hardness were 49.87±1.84Pa. The soup could be eaten without being affected by the odor of the core. This recipe used approximately 70% of the cabbage core, thereby reducing food loss.

Recent Publications

1. Author Name, MD (Home Economics), Dietician graduated. She worked as a Dietician at a hospital and nursing home for more than 15 years. Currently, she is a second-grade Doctoral student and studying at the graduate school.

Biography

Minako Kudo , MD (Home Economics), Dietician graduated. She worked as a Dietician at a hospital and nursing home for more than 15 years. Currently, she is a second-grade Doctoral student and studying at the graduate school.

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Akiko Koizumi et al., J Nutr Food Sci 2018, Volume 8
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Taste and flavor characteristics of dried tuna stock: Comparisons and synergistic effects with other stocks

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Aim: In Japan, people generally make Japanese stock using dried bonito shavings. However, high-class Japanese-restaurants sometimes use stock that is a mixture of dried tuna and dried bonito. In Japan, dried bonito stock has been studied until now, and there are no scientific data or a recipe concerning dried tuna. The aim of this study is to investigate the taste and flavor characteristics of dried tuna stock compared with dried bonito stock, as well as the synergistic effect of dried tuna stock and kelp stock.

Materials & Methodology: Dried bonito stock was used as standard sample. The samples were 3 stock types, which were made from 2% dried tuna shavings and were boiled for different times (for 0 min, 1 min, 2 min) and left to stand for 3 min. Moreover, these 3 type samples were mixed with 1% kelp stock. The sample properties were characterized by the amount of inosine 5'-monophosphate (IMP), the taste characteristics and the odor strength. Moreover, the sensory (analysis and preference) evaluation and Temporal Dominance of Sensations (TDS) were carried out.

Results: In the sensory evaluation analysis, the flavor intensity of dried tuna stock boiled for 0 min was significantly higher than that boiled for 2 min. Moreover, the flavor intensity of mixed dried bonito stock boiled for 2 min with kelp stock was significantly higher than those boiled for 0 min and 1 min. In the preference sensory evaluation, mixed stock boiled for 0 min was significantly preferred over that boiled for 2 min.

Conclusions: Depending on the mixture of dried tuna stock with kelp stock, the students preferred it to dried tuna stock. Moreover, from multiple regression analysis results, the palatability for Japanese stock had a taste effect greater than a flavor effect.

Recent Publications

1. A Shimamura et al. (2017) Change of sensory evaluation characteristics of cooked rice over time. Journal of Home Economics of Japan 68(9):478-485.

Biography

Akiko Koizumi is currently studying animal food products in terms of cookery science and food science at Graduate School of Tokyo Kasei University in Japan. She will obtain her master's Degree in Home Economics from the same university in 2018. She received license as a Japanese Registered Dietitian in 2016.

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Characterization of diversity and probiotic efficiency of the autochthonous lactic acid bacteria in the fermentation of selected raw fruit and vegetable juices

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The diversity of indigenous lactic acid bacteria (LAB) in fermented broccoli, cherry, ginger, white radish and white fleshed pitaya juices were analyzed using culture independent and dependent approaches. The major properties of selected probiotic strains using broccoli as the fermented substrate, including dynamic variations in pH, viability counts, antibiotic resistance, bacterial adhesion to hydrocarbons and survivability during simulated gastrointestinal transit were investigated. Within broccoli and ginger juices, *Lactobacillus* occupied the dominant position (abundances of 79.0% and 30.3% respectively); within cherry and radish, *Weissella* occupied the dominant position (78.3% and 83.2% respectively); and within pitaya, *Streptococcus* and *Lactococcus* occupied the dominant position (52.2% and 37.0% respectively) *Leuconostoc mesenteroides, Weissella. cibaria/soli/confusa, Enterococcus gallinarum/durans/hirae, Pediococcus pentosaceus, Bacillus coagulans and Lactococcus garvieae/lactis* sub sp., *cremoris* were identified by partial 16S rRNA gene sequencing. Overall, the selected autochthonous LAB isolates showed no significant differences compared to commercial strains with regards to growth rates or acidification in fermented broccoli juice; meanwhile, among all isolates of *L. mesenteroides* B4-25 showed the highest antibiotic resistant profile equal to that of L. plantarum CICC20265 and suitable adhesion properties, demonstrating binding of 13.4±5.2%~36.4±3.2% and 21.6±1.4%~69.6±2.3% to ethyl acetate and xylene, respectively. Furthermore, *P. pentosaceus* Ca-4 and *L. mesenteroides* B-25 featured the highest survival rates after simulated gastro intestinal transit of 22.4±2.6% and 21.2±1.4% respectively. These results indicated a high level of diversity in the autochthonous bacterial community in fermented fruit and vegetable juices (FVJs) and demonstrated the potential of these probiotic candidates for applications in fermentation.

Recent Publications

1. Haiyan Gao and Xinxing Xu (2016) Isolation, identification and characterization of bacillus subtilis CF-3, a bacterium from fermented bean curd for controlling the postharvest diseases of peach fruit. Food Science and Technology Research. 22(3):377-385. Doi:10.3136/fstr.22.377.
2. Haiyan Gao and Xinxing Xu (2017) Optimization of headspace solid-phase microextraction for GC-MS analysis of volatile compounds produced by biocontrol strain Bacillus subtilis CF-3 using response surface methodology. Food Science and Technology Research. 23(4):583-593. Doi:10.3136/fstr.23.583.
3. Haiyan Gao, Peizhong Li and Xinxing Xu (2018) Research on volatile organic compounds from Bacillus subtilis CF-3: biocontrol effects on effects on fruit fungal pathogens and dynamic changes during fermentation. Frontiers in Microbiology 9:456. Doi:10.3389/fmicb.2018.00456
4. Dongsheng Luo, Xueli Pang and Xinxing Xu (2018) Identification of cooked off-flavor components and analysis of their formation mechanisms in melon juice during thermal processing. Journal of Agricultural and Food Chemistry. 66(22):5612-5620. Doi: 10.1021/acs.jafc.8b01019.
5. Xinxing Xu (2018) Comparative study of high hydrostatic pressure and high temperature short time on quality of clear and cloudy se-enriched kiwifruit juices. Innovative Food Science and Emerging Technologies. Doi: 10.1016/j.ifset.2018.07.010.

Biography

Xinxing Xu is currently a PhD candidate at China Agricultural University, P R China. She has her expertise in processing and storage of agriculture products, especially on food flavor, fruit and vegetable processing and preservation technology and theory, fruit and vegetable resources comprehensive utilization.

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Shiliang Jia, J Nutr Food Sci 2018, Volume 8
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Effects of chitosan oligosaccharides on microbiota composition of silver carp (*Hypophthalmichthys molitrix*) determined by culture-dependent and independent methods during chilled storage

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Background: Silver carp is an important species for commercial production due to its high nutritional value, rapid growth rate, high yield, low feed demand. However, aquatic products are highly perishable because of microbial growth, which is due to high moisture content, abundant nutrients and higher pH. Previous studies demonstrated that composition of fish microbiota could affect the generation of TVB-N (total volatile basic nitrogen), the degradation of ATP related compounds and the production of biogenic amines during storage. Therefore, characterizing the composition of microbiota and evaluating the relationship between changes in quality and composition of microbiota during fish storage are important for quality control. This study evaluated the effects of chitosan oligosaccharides (COS) on the changes in quality and microbiota of silver carp fillets stored at 4°C.

Methodology: Sensory scores, ATP-related compounds (inosine monophosphate, hypoxanthine ribonucleotide, hypoxanthine), total volatile basic nitrogen (TVB-N), biogenic amines were evaluated and presence of spoilage microbiota was detected by culture dependent and culture independent 16S rRNA gene sequencing methods.

Results: During storage, COS treated samples maintained good quality as evidenced by retarding sensory deterioration, inhibiting microbial growth, attenuating the production of TVB-N, putrescine, cadaverine and hypoxanthine, and delaying degradation of inosine monophosphate and hypoxanthine ribonucleotide. Variability in the predominant microbiota in different samples during chilled storage was observed. As storage time increased, the control and 1% (w/v) COS treated samples were rejected by sensory panelists at day six and eight, respectively. At the time of sensory rejection, *Pseudomonas*, followed by *Aeromonas, Acinetobacter* and *Shewanella* became the main spoilers in the control samples. However, COS inhibited the growth of *Pseudomonas, Aeromonas* and *Shewanella* significantly. Consequently, *Acinetobacter* followed by *Pseudomonas* became the predominant microbiota in 1% (w/v) COS treated samples.

Conclusions: Therefore, COS improved the quality of fillets during chilled storage, which was mainly due to their modulating effects on microbiota.

Recent Publications

1. Shiliang Jia et al. (2018) Application of Illumina-MiSeq high throughput sequencing and culture-dependent techniques for the identification of microbiota of silver carp (Hypophthalmichthys molitrix) treated by tea polyphenols. Food Microbiology. 76:52-61.
2. Xiaochang Liu et al. (2018) The roles of bacteria in the biochemical changes of chill-stored bighead carp (Aristichthys nobilis): proteins degradation, biogenic amines accumulation, volatiles production, and nucleotides catabolism. Food Chemistry. 255:174-181.
3. Shiliang Jia et al. (2016) Chitosan oligosaccharides alleviate cognitive deficits in an amyloid-β1–42-induced rat model of Alzheimer's disease. International Journal of Biological Macromolecules. 83:416-425.
4. Shiliang Jia et al. (2016) Neuroprotective effects of liquiritin on cognitive deficits induced by soluble amyloid-β1–42

oligomers injected into the hippocampus. Journal of Asian Natural Products Research. 18(12):1186-1199.

5. Dapeng Li et al. (2017) Effect of using a high voltage electrostatic field on microbial communities, degradation of adenosine triphosphate, and water loss when thawing lightly-salted, frozen common carp (*Cyprinus carpio*). Journal of Food Engineering. 212:226-233..

Biography

Shiliang Jia has his expertise in the processing and storage of aquatic products and has characterized the microbial community in silver carp fillets stored at 4°C and evaluated the spoilage potential of bacteria isolated from silver carp fillets. Recently, his research mainly focuses on interactions of the specific spoilage organisms especially, the quorum sensing system in specific spoilage organisms.

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Notes:

Sun Shin Yi et al., J Nutr Food Sci 2018, Volume 8
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The effect of anti-appetite agent is dependent on various habituated foods

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Supported by National Research Foundation of Korea
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Over the several decades, increasing attention has been paid to the roles and regulatory mechanisms of pharmacological agents in the treatment of obesity. Many anorectic agents such as dl-fenfluramine can lead to substantial reduction in body weight. However, the effects of these anorectic and body weight-reducing agents are not uncommon and/or rebound weight gain may be observed following drug withdrawal. Moreover, dl-fenfluramine intake has showed anorectic property and weight-reducing effects are faded away in both human and experimental animals chronically medicated. In the present study, we performed several experiments that normal diet food and western diet, respectively habituated rats for a month each, and gave free options for food choices—both foods at the same time with dl-fenfluramine administration chronically—to investigate whether the reasons of pharmacologic tolerance problems of chronic systemic dl-fenfluramine administrations originate from long habituated food and/or specific food preference for taste and nutrient. In summary, dl-fenfluramine has known its pharmacologic effect disappeared by chronic treatments, however, its anti-appetite effect can be different by habituated foods. Therefore, we'd like to insist that the habituation or preference for specific nutrition and ingredient ratios of various foods in the obese patients can be very important to anticipate anti-obesity drugs' pharmacological success or failure before showing their tolerance according to the dl-fenfluramine results.

Biography

Sun Shin Yi has completed his PhD from Seoul National University, South Korea and Post-doctorate from Marquette University, WI, USA. Now, he is a Professor in the Department of Biomedical Laboratory Science, and an Associate Dean of Special Affairs for Planning and Chair of IACUC in the Soonchunhyang University. He has published more than 60 papers in reputed journals and a Board Member of Korea Mouse Phenotyping Center (KMPC).

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Notes:

Gonca Yildirim et al., J Nutr Food Sci 2018, Volume 8
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Assessment of relationship between eating attitudes and body image in adolescent athletes

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Eating disorders are pathological disorders in eating behaviors involving distorted perceptions of body shape and weight. One of the strongest predictors of eating disorder is dissatisfaction of the body image. The main purpose of this study is to determine the occurrence of eating disorders in adolescent athletes and whether adolescent athletes are at risk for body image concerns or not. The study included adolescent atheletes (n:219) and non-athletes (n:219). Social Physique Anxiety Scale (SPAS) was used to assess body image Eating Attitude Test-26 (EAT-26) and Eating Disorders Examination Questionnaire (EDE-Q) were used to assess eating behavior. For SPAS, non-athletes had higher scores than athletes, sedentery females had higher scores than female athletes and sedantary males and these findings were statistically significant ($p<0.05$). There was no significant difference in SPAS scores between sedentary males and male athletes ($p>0.05$). There was no significant difference in EAT-26 and EDE-Q scores between atheletes and nonathletes ($p>0.05$). However, sedentary females had higher EAT-26 and EDE-Q scores than sedentary males ($p<0.05$). There was positive but weak correlation between EAT-26 and SPAS scores and there was positive and moderate correlation between EDE-Q and SPAS scores in athletes group. Additionally, positive and weak correlation between EAT-26 and SPAS scores and strong correlation between EDE-Q and SPAS scores was observed in non-athlethes group. Results show that participation in sports may have beneficial effects on body image, which may also protect adolescents from eating disorders. Sedantary females seem to be the most risky group for eating disorder and body image.

Biography

Gonca Yildirim is pursuing her Post-graduate education at Acibadem University and completed her Bachelor's Degree at Başkent University. She works at Atilim University as a Research Asistant. And also International Medical Center Hosiptal- Dietitian Başkent University Nutrition and Dietetic student colloquium. She is participant of 9-10 May 2015 ANKARA and also GülhaneHospital Symposium on Current Nutritional Approaches in Diseases 13-14 October 2017.

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Notes:

Spirulina maxima inhibits adipogenesis in 3T3-L1 cells and high fat diet induced obese mice

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Obesity is a major health problem across the world that causes the risk of type 2 diabetes and obesity-related pathologies. Obesity occurs by an imbalance between energy intake and energy expenditure. *Spirulina maxima* is a microalga rich in other essential nutrients and contains phenolic acids. Recently, many studies have been demonstrated that *Spirulina maxima* has anti-oxidant and anti-cancer properties. However, it has not been shown whether *Spirulina maxima* has anti-obesity effects. The aim of this study is to evaluate the anti-obesity effect of *Spirulina maxima* 70% ethanol extract (SM70EE) *in vitro* and *in vivo*. Our results showed that SM70EE repressed the lipid accumulation compared with MDI-induced differentiation, using Oil Red O staining. SM70EE decreased expression of adipogenic genes such as C/EBPα, PPARγ, and aP2 in 3T3-L1 adipocytes. Additionally, treatment of SM70EE reduced lipogenesis related genes such as LPAATβ, LPAATθ, and Lipin1 by using Western Blot analysis. Moreover, SM70EE induced brown adipocyte marker proteins such as PRDM16, PGC1α, and UCP1 in 3T3-L1 cells. In HFD-induced obese mice, SM70EE treatment significantly depressed weight gain as well as the weight of the white adipose tissue (WAT). These results indicated that the intake of SM70EE suppressed expression of adipogenesis related genes such as C/EBPα, PPARγ, and aP2 in mouse WAT. Our study revealed that SM70EE improved obesity through inhibition of adipogenesis and induction of thermogenesis in 3T3-L1 cells and high fat diet induced obese mice.

Recent Publications

1. Choi J et al. (2016) Gelidium elegans extract ameliorates type 2 diabetes mellitus through negative regulation of MAPK signaling pathway by PI3K/AKT activation. Journal of the Korean Society of Food Science and Nutrition. 10(1).pii:E51.
2. Seo Y J (2017) Anti-adipogenesis mechanism of pterostilbene through the activation of heme oxygenase-1 in 3T3-L1 cells. Phytomedicine. 33:7-13.
3. Koh E J et al. (2017) Modulation of HO-1 by ferulic acid attenuates adipocyte differentiation in 3t3-l1 cells. Molecules. 22(5).pii:E745.
4. Choi J et al. (2017) Gelidium elegans regulates the AMPK-PRDM16-UCP-1 pathway and has a synergistic effect with orlistat on obesity-associated features in mice fed a high-fat diet. Nutrients. 9(4).pii:E342.
5. Koh E J et al. (2017) Ginsenoside Rg1 suppresses early stage of adipocyte development via activation of C/EBP homologous protein-10 in 3T3-L1 and attenuates fat accumulation in high fat diet-induced obese zebrafish. Journal of Ginseng Research. 41(1):23-30.

Biography

Boo Yong Lee is currently a Faculty Member in the Department of Food Science and Biotechnology, College of Life Science of CHA University, Republic of South Korea. He has his expertise in evaluation and passion in improving the health and wellbeing. His open and contextual evaluation model based on responsive constructivists creates new pathways for improving food and nutrigenomics. He has built this model after years of experience in research, evaluation, teaching and administrating in education institutions.

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Andrey A Tyuftin et al., J Nutr Food Sci 2018, Volume 8
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Sugar and fat reduction strategies in Irish confectionery products: Sensory evaluation and physical properties

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University College Cork – NUI, Republic of Ireland

One of the main causes for obesity in society today is the consumption of free and refined sugar. In Ireland the Irish Universities Nutrition Alliance (IUNA, 2011) reported that free sugars account for 14.6% of the total energy intake of Irish adults who participated in the study. According to the healthy Ireland survey (2015) 37% of adults that participated were overweight and a further 23% were obese (a strong risk factor for type 2 diabetes). The highest sugar content in day to day diet products in Ireland is in bakery products. The aim of the work is to reduce sugar and fat content in brownies, cakes and biscuits. Methods for the sugar reduction contained sugar particle manipulation (grinding and fractioning), addition of sugar and fat organic replacing ingredients. Physical and sensory perception properties of sugar reduced sweet products were evaluated. Sugar particle manipulation strategy was used in brownies containing black beans as a fat replacer. Brownie samples containing the smallest sugar particles size (SPS) with 25% butter replacement were most significantly associated with liking of appearance, texture, colour and overall acceptability ($p<0.01$). In formulation of sponge cakes there was no significant difference between the control sample and the 25% sugar replaced with SPS sample and sucrose and stevia extract as a sugar replacer. In the formulation of biscuits, a sample with SPS was more acceptable in sweetness perception. In conclusion, sugar particle manipulation has a significant impact on properties of bakery products along with sugar and fat organic replacers and can be utilized by bakery companies for sugar reduction, economy and customers' health impact.

Recent Publications

1. MacGregor G A and Hashem K M (2014) Action on sugar-lessons from UK salt reduction programme. Lancet 383(9921):929-931.
2. Irish Universities Nutrition Alliance (2011) National Adult Nutrition Survey. Pages:1-36.
3. Richardson A M et al. (2018) The impact of sugar particle size manipulation on the physical and sensory properties of chocolate brownies. LWT - Food Science and Technology. 95:51-57.

Biography

Andrey A Tyuftin pursued Degree in Organic (Supramolecular) Chemistry in 2009. He is currently a Postdoctoral Researcher at University College Cork, Republic of Ireland. He has his expertise in high barrier coatings for flexible packaging, development of biodegradable edible active antimicrobial films and coatings based on food ingredients, supramolecular systems for sensors application in smart packaging and particular in new food products formulation. He is a participant in voucher funded R&D projects of funding contributions from individual food companies primarily for short term client commissioned research projects at UCC for testing and development of new food products. For example; he developed and validated super food smart beverage with sugar substitution. Before joining UCC he worked four years as R&D manager in flexible packaging industry on projects for famous brands and local companies. He has collaborations with several universities and small to large SME.

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Rafah Oday Al-Zubaidi et al., J Nutr Food Sci 2018, Volume 8
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A high fat diet induced obesity modulates melanoma tumour microenvironment in Low density lipoprotein receptor deficient *LDLR*-/- mouse model

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Inflammation and altered immune response are the main features of obesity and contribute greatly to the promotion of obesity-related metabolic complications, especially cancer development and progression. Adipose tissue expansion is associated with increased tumour infiltration by regulatory T cells (T-regs) which are critical regulators of the adaptive immune response. Adipocytes and infiltrating immune cells secrete pro-inflammatory adipokines and cytokines providing a microenvironment favourable for tumour growth. LDLR-/- mice fed on high fat diet and control diet were subcutaneously injected with 5×105 syngeneic melanoma cells (B16F10). After two weeks, tumours and spleens were dissected. Tumours and bodies were weighed at endpoint and then the percentage of CD4+CD25+FOXP3+T-regs population among splenocytes was determined by flow cytometry (FACS). High Fat Diet (HFD) feeding increases solid tumour growth combined with increases in adipose tissues of *LDLR*-/- tumour bearing mice. The percentage of T-regs among spleen lymphocytes was significantly higher in tumour bearing mice fed on high fat diet compared with those fed on control diet. Obesity may promote tumour progression by favouring an immune suppressive tumour microenvironment.

Recent Publications

1. Jung J I, Cho H J, Jung Y J, Kwon S H, Her S, et al. (2015) High-fat diet-induced obesity increases lymphangiogenesis and lymph node metastasis in the B16F10 melanoma allograft model: roles of adipocytes and M2-macrophages. Int J Cancer 136(2):258–70.
2. Balistreri C R, Caruso C and Candore G (2010) The role of adipose tissue and adipokines in obesity-related inflammatory diseases. Mediators Inflamm. 2010:802078.
3. Calle E E, Rodriguez C, Walker-Thurmond K and Thun M J (2003) Overweight, obesity, and mortality from cancer in a prospectively studied cohort of U.S. adults. N Engl J Med. 348(17):1625–38.

Biography

Rafah Al-Zubaidi is a PhD student at the University of Leicester, UK, studying the role of high fat diet in melanoma cancer. She has 10 years' experience in immune system and medical investigations. She built this experience from teaching and administrative work in both hospital and education institutions. She is interested in cancer immunology research and the role of consuming high fat diet in the development of cancer and the disease progression. She has passion for exploring, developing and improving methods to decrease the incidence of different cancers diseases.

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Kyungmi Hwang, J Nutr Food Sci 2018, Volume 8
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Determination of vitamin B1 in infant and follow-on formula by high performance liquid chromatography

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The purpose of this research is to establish an analysis method for the contents of vitamin B1 in infant and follow-on formula products. In this method, the sample preparation method required prior enzyme digestion with taka-diastase. A HPLC method was performed on Shiseido LC system (SP3213) coupled to fluorescence detector (FLD), with a UG120 (C18, 4.6 × 150 mm, 3 µm) column. Validation was performed using certified reference material (NIST SRM 1849a). Method performance parameters were estimated for linearity, limits of detection (LOD), quantification (LOQ), accuracy, repeatability and reproducibility. The proposed method was successfully applied for the determination of vitamin B1 in infant and follow-on formula and was found to be suitable for routine quality control monitoring.

Recent Publications

1. Kang Y J et al. (2016) Associations of obesity and dyslipidemia with intake of sodium, fat, and sugar among Koreans: a qualitative systematic review. Clinical Nutrition Research. 5(4):290-304.
2. Hwang K M et al. (2012) Survey of polycyclic aromatic hydrocarbons in marine products in Korea using GC/MS. Food Additives & Contaminants: Part B. 5(1):1-7.

Biography

Kyungmi Hwang is currently a Scientific Officer of Nutrition and Functional Food Research team at the National Institute of Food and Drug Safety Evaluation, Republic of South Korea. Her research and development interests cover the areas of functional food and food chemistry. She has published more than 15 papers in reputed journals.

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Aguirre Mandujano E et al., J Nutr Food Sci 2018, Volume 8
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Physicochemical characterization and functionality of acetylated amaranth starch *(Amaranthus hypochondriacus)*

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In recent years there is a growing interest of consumers living with celiac diseases by gluten free foods. However, the elimination of this component causes adverse changes in the properties of the dough, poor texture and quality defects. The incorporation of starches of different botanical origin, native or chemically modified, such as amaranth (*Amaranthus hypochondriacus*) may be an option to imitate the rheological properties of gluten. Therefore, in the present work starch was obtained from amaranth grain (*Amaranthus hypochondriacus*) var. Revenge, with a yield of 23% (w/w) with respect to the amount of grain used. The starches had a composition (w/w) of 5.7% moisture, 7.2% protein, 0.54% ethereal extract, 0.18% crude fiber and 1.52% ash. An acetylation modification was carried out and starches were obtained with 0.64% acetyl groups and a degree of substitution of 0.024%. The hydrated grain had an area volume mean diameter of D=3.38 μm and 5.5% (w/w) amylose. The maximum viscosity was reached after cooling of the gel, reaching values of 1650 Cp for native starch and 1300 Cp for acetylated starch. The functional properties (water retention capacity, swelling power) of the modified starch were lower than those of the native starch, while its solubility index showed higher values.

Recent Publications

1. Jekle M, Mühlberger K and Becker T (2016) Starch gluten interactions during gelatinization and its functionality in dough like model systems. Food Hydrocolloids. 54(Part A):196-201.
2. Copeland L et al. (2009) Forms and functionality of starch. Food Hydrocolloids. 23(6):1527-1534.
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Biography

Aguirre Mandujano E obtained his PhD in Biotechnology from Metropolitan Autonomous University, México in 2009. He is a Professor of Agro Food and Technology and Chemistry at Autonomous University Chapingo, México, for 37 years. He has more than 10 years of experience in Food Science and is an author of 12 scientific publications.

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Notes:

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Improved stability of food oil-in-water emulsions using cacao pods husk pectin-whey protein hydrolysate complexes

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Nowadays, the production of commercial pectin is limited to a few sources, usually lemon peels and apple pomace, thus, there is an ongoing search for new sources of pectin from regional botanical sources and agroindustrial wastes, like cacao pods husk. Pectin is gradually gaining acceptance as an effective emulsifier in numerous industrial applications, and the emulsifying and emulsion-stabilizing properties of this hydrocolloid are increasingly being assessed. It has been informed that biopolymer soluble complexes formed by oppositely charged protein and polysaccharides exhibit improved emulsifying properties than the individual biopolymers. In this work, the dynamic interfacial adsorption and emulsifying properties of cacao pod husks pectin (CP) were investigated and compared with those of a soluble complex formed between CP and Whey Protein Hydrolysate (WPH). Pectin was extracted from cacao pod husks wastes, and the diffusion (K_{diff}), penetration (K_{pen}) and rearrangement (Krea) rate constants were determined at the canola oil-water interface. Canola oil-in-water emulsions stabilized with CP (ECP) exhibited oil droplets having an initial area-volume mean diameter (d3,2) of 113.60 nm, which significantly increased to 162.0 nm during 28 days of storage at 4°C. The soluble complex (SCWPH-CP) formed by electrostatic interaction between CP and WPH in a weight ratio of 1:5 at pH 3.25, decreased the interfacial tension faster and displayed higher Kdiff and Kpen constants than CP. SCWPH-CP yielded canola oil-in water emulsions with oil droplets presenting a d3,2 of 90 nm, which did not suffer significant changes during storage. It was concluded that the greater stability of EWPH-CPHP was due mainly to steric repulsion originated by the soluble complex adsorption layers around the oil droplets.

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Biography

Lobato Calleros C pursued her PhD in Biological Sciences from Autonomous Metropolitana University, México in 1997. She is currently a Professor of Agro-Food Science and Technology and Chemistry at Chapingo Autonomous University, for more than 20 years. She has more than 15 years of experience in Food Science and Technology research and is author of more than 50 scientific publications. One of her main areas of research is the development and evaluation of colloidal systems for the protection and release of bioactives.

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Effects of high levels of deoxynivalenol and zearalenone contaminated feeds on urine metabolites of piglets

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Deoxynivalenol (DON) and zearalenone (ZEN) are common food contaminants produced by Fusarium sp. Mycotoxins are a potential health hazard because of their toxicological effects on both humans and livestock. The aim of this study is to investigate, in pigs, the effect of higher concentration of DON and ZEN exposure on urine metabolites. In the present study, 15 eight-week-old piglets were randomly assigned to the following three different dietary treatments for 4 weeks: a control group (fed a standard diet), and the DON and ZEN groups, fed a diet containing 8 mg/kg DON and 0.8 mg/kg ZEN respectively. After 4 weeks of treatment, all the pigs were euthanized and urine samples were collected directly from the urinary bladder using syringe. The metabolites of urine were analyzed using UPLC-Q-TOF MS. Total of 5 metabolites were significantly different ($P<0.05$) in DON and ZEN dietary treatments when compared with the control group. The metabolites of N,N-Dimethylarginine, Prolyl-4-hydroxyproline, 6-methyladenosine, Dihyroxy-1H-indole glucuronide, and Tert-butyl (2Z)-(5-cyano-4,4,5-trimethyl-2-pyrrolidinylidene) ethanoate were significantly increased in DON exposed group than control group. Contrarily, three metabolites such as Tert-butyl (2Z)-(5-cyano-4,4,5-trimethyl-2-pyrrolidinylidene), prolyl-4-hydroxyproline, and N,N-Dimethylarginine, were significantly decreased in ZEN dietary group, but Dihyroxy-1H-indole glucuronide and 6-methyladenosine were increased in ZEN dietary group. We speculate that because of the acute toxicity of DON and ZEN (particularly DON), we found metabolites in the urine of the treatment groups. Additional studies are needed to investigate the potential relationships between DON- and ZEN toxicity and higher levels of metabolites excretion from the urine.

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Biography

Kondreddy Eswar Reddy obtained his Doctoral Degree from Sri Krishnadevaraya University, Anantapur, India. He currently holds a Research Associate position at National Institute of Animal Science of Rural Development Administration, Jeonju, Republic of South Korea. His current work focuses on (i) developing ways to improve quantity and quality of native Hanwoo cattle by using high nutritional diet and (ii) developing toxicity testing methods and screening of animal biomarkers for potential hazards in feeds. He has total seven and half years of Postdoctoral and Research Professor experience at different reputed institutions in Republic of South Korea. He has been trained and gained expertise in animal and plant genomics by visiting various laboratories in India and Republic of South Korea. He has published his research findings in esteemed international journals with high impact factor. He has constantly received several national and international awards and prestigious fellowships from India and Republic of South Korea.

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Olive waste derived nutraceuticals: Sustainable formulation and biological characterization

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Statement of the Problem: Olive pomace, remaining in large amounts after the production of olive oil represents serious ecological problem in olive-oil producing countries. At the same time, it is a valuable source of bioactive polyphenolic substances, also present in olive oil, with proven health benefits. Due to the lack of efficient and sustainable methods of formulation and data on its biological activity and particular possible areas of application, the use of olive pomace extract as nutraceutical/functional food ingredient is still limited. Therefore, the aim of our research was to develop sustainable formulation process and evaluate biological activity (*in vitro* bioavailability and antioxidant activity) of dry polyphenol rich olive pomace extracts.

Methodology: Green extraction methods (ultrasound- and microwave- assisted extraction with food grade solvents) were optimized for the extraction of polyphenols from olive pomace. Spray-drying was combined with cyclodextrin encapsulation (different types) for the formulation of stabile dry products with acceptable technological properties. *In vitro* bioavailability of polyphenols from obtained formulations was evaluated in Caco-2 cell model. Antioxidant activity was evaluated in different chemical-, food- and biological model systems.

Findings: Microwave-assisted extraction with 60% ethanol resulted with the highest yields of bioactive polyphenols in obtained extracts. Cyclodextrin encapsulation was combined with spray-drying to obtain dry extracts that were organoleptically acceptable and it significantly affected biological activity of obtained formulations. Hydroxypropyl-β-cyclodextrin and randomly methylated β-cyclodextrin encapsulated extracts showed excellent antioxidant activity in food- and biological models. Gastrointestinal stability of polyphenols in obtained extracts was good, with significant conversion of different polyphenols into hydroxytyrosol. Cyclodextrins significantly increased the content of bioactive polyphenols in obtained formulations and reduced transepithelial transfer of polyphenols across Caco-2 cell monolayer, but to a lesser extent.

Conclusion & Significance: Olive pomace extracts obtained by novel sustainable process possess significant biological activity and can be used as nutraceuticals/functional food ingredients.

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Biography

Kristina Radić currently works at the Department of Food Chemistry at the Faculty of Pharmacy and Biochemistry, University of Zagreb. Kristina does research in Phytochemistry, Biochemistry, and Cell Biology. She is a collaborator at the project named 'Valorization of olive waste in sustainable food innovation (NutriOliWa).

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Chemical and elemental analysis of the edible fruit of five *Carpobrotus* species from South Africa: Assessment of nutritional value and potential metal toxicity

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The nutritional value of the edible fruits of five Carpobrotus species was determined for the first time. The fruits were low in lipids, high in moisture and may contribute adequately towards the Recommended Dietary Allowance (RDA) for proteins, carbohydrates and essential elements. Concentrations of essential elements were generally in decreasing order of Ca > Mg > Fe > Mn > Zn, Cu > Cr > Se ~ Ni ~ Co. C. dimidiatus and C. acinaciformis were rich in Cr contributing between 82 - 143% and 62 - 109%, respectively towards its RDA whilst C. delicious was rich in Mn contributing between 122 – 156% towards its RDA. The fruits did not exhibit metal toxicity except for C. dimidiatus which had Cd and Pb concentrations exceeding maximum permissible limits. The results show the fruits of Carpobrotus species to be nutritionally rich hence; they may contribute positively to the diet of all who consume them.

Biography

Neal K. Broomhead was awarded his MSc. Degree in Analytical Chemistry from Birkbeck College, University of London at the age 33. He is currently undertaking his PhD studies in Chemistry at the University of KwaZulu-Natal School of Chemistry and Physics, South Africa as a member of the Natural Products Research Group. To date he has published 1 paper in a reputed journal.

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Notes:

JOINT EVENT

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Accepted Abstracts

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Truly coherent policies of microalgae with food technologies

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Currently, fruits and vegetables contain small amounts of key nutrients. As a result, the need of people and animals to use high quality food and feed additives to compensate for a lack of physiologically active components has increased. Microalgae contain, among other elements, high quantities of proteins, enzymes, amino acids, pigments, lipids, and a fairly high concentration of vitamins, compared with other plants or animals. Microalgae food and feed additives is optimal way for increasing of human and animal well-being, resistance to illnesses and improvements of food quality as well as removal of the use of antibiotics in animal feed (microalgae contain acids with high antibacterial action). Based on these challenges, the use of microalgae Chlorella as a food and feed additive could become the best solution. The food waste of 1.3 billion tones is critical problem to our society like environmental pollution (GHG emissions of 3.3 billion tons of CO_2 per year), health risk, and scarcity of dumping. Incineration and anaerobic digestion of food waste reduce the economic value of the substrate. Termohydrolyzation of food waste with the use of effluent gases can be used for producing of microalgae as our high value added answer on global challenges. In concrete pools of 26.85 ha the cost of dry Chlorella biomass will be lower than $1/kg which is competitive compared with costs of used feed additives. In case manufacturing on an area of 121,976 ha, produced volumes of dry Chlorella powder will be equal to 417,659 t (investment of $607 million) can absorb up to 0.764 $MtCO_2$ (in addition, reduction of NOx and VOCs) and produce 0.559 MtO_2. This quantity can be used as feed additive (1%) and will meet the total demand of Canada on 213%, USA on 25%, or Europe on 20% per year.

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Free sugars and non-starch polysaccharides–phenolic acid complexes from bran, spent grain and sorghum seeds

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The processing of sorghum seeds to flour used in a wide variety of foods and in traditional African beers known as "Bil-Bil", leads to Sorghum Bran (SB) and sorghum spent grain (SSG), respectively. Part of these by-products (SB and SSG) is used for animal feed and the rest which is underexploited is thrown as waste in the environment. However, SB and SSG can be value-added sources of dietary fiber (DF). The aim of this study is to characterize free sugars and non-starch polysaccharide-phenolic acid complexes isolated from bran, spent grain and sorghum seeds. Free sugars and non-starch polysaccharide–phenolic acid complexes were isolated from bran, spent grain and sorghum seeds. To perform this, GLC and HPLC methods were used. Total and reducing sugar contents in free sugars were highest in spent grain: 12.56 and 10.47% respectively. The major and minor soluble sugars identified in the samples were significantly different according to the material used. Hemicelluloses B had highest yield while the calcium hydroxide extractable polysaccharides (CHEP) were almost completely soluble. The major sugars identified in the non-starch polysaccharides (NSP) fractions were arabinose, xylose, galactose and glucose. The pentose to hexose ratio was highest in CHEP fractions, the one of spent grain being fourteen-fold than that of bran. Ferulic, coumaric and p-hydroxybenzoic acids were present in all the NSP and absent in the alkaline-insoluble residues. Ferulic acid was the major bound phenolic acid present. Ferulic, coumaric and vanillic acids were identified as the major phenolic acids in CHEP fractions. NSP from sorghum by-products especially CHEP could exhibit high functional properties when added to foods.

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Effects of dietary phytochemicals on healthy ageing in a hormetic stress response manner

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Hormesis is defined as any circumstance in which chemical and environmental factors give beneficial effect to the cells in an organism at low doses while causing harm for them at high doses. The stress responses observed in mammalian cells can be classified as heat shock response, unfolded protein response, autophagic response, DNA damage response, antioxidant response and sirtuin response at the intracellular and molecular levels. Factors which strengthen the hemodynamic structure causing low level molecular damage and activating one or several stress response pathways are called hormetins. Hormetins can be categorized as: physical hormetins, physiological hormesis, biological and nutritional hormetins. Nutritional hormetins are an interesting, comprehensive research topic because of their effects on health and life span. Dietary phytochemicals are potential nutritional hormetins with their low-level stress inducing effects. Resveratrol, curcumin, capsaicin, epicatechin, isothiocyanates, ferulic acid and certain vitamin minerals can form heat shock response, unfolded protein response, auto phagic response, DNA damage response, antioxidant response and sirtuin response causing the stimulation of kinases and transcription factors. Studies generally have shown that these phytochemicals are related to nuclear factor erythroid 2 (Nrf-2) and sirtuin pathway, heat shock response activation and nuclear factor kappa-B (NF-κB) down regulation. This study aims to explain stress response effect mechanisms of the dietary phytochemicals, which show the property of nutritional hormetin as important components that affect the delay of age related diseases, healthy aging and life span.

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Optimization of gas chromatography and high-performance liquid chromatography to set the official analytical method for stearoyl lactylates in foods

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Stearoyl lactylates (SLs, E481/E482) are emulsifiers generally used in baking to improve the texture, crumb structure, gas retention and to strengthen dough. Many countries have controlled the levels of SLs in food according to their maximum permitted levels as food additive in foods. This study was performed to optimize the analytical method of SLs using Gas Chromatography (GC) and High-Performance Liquid Chromatography (HPLC) to set the guidelines of SLs in Korea. Seven previous analytical methods using GC and HPLC were examined and modified to establish new methods. A new GC method using DB-1 column with He as carrier gas and one modified HPLC method using C18 column with water and methanol as a solvent were selected and compared. The selected GC method exhibited and showed r2 in standard curve as 0.999 and LOD and LOQ of this method were 16.54 and 50.12 μg/kg respectively. The new HPLC method showed regression coefficient (r2) of 0.999 in standard curve and its limit of detection (LOD) and limit of quantification (LOQ) were 0.26 and 0.78 μg/kg respectively. The GC and HPLC methods showed precision data ranged from 0.3 to 2.0 and from 0 to 0.2% and accuracy results ranged from 98.7 to 108.5 and 92.7 to 102.5% respectively. These analytical methods showed improved results in linearity, LOD (Limit of detection), LOQ (Limit of Quantification), precision and accuracy compared with other previous reported methods. Newly optimized both GC and HPLC methods can be considered as suitable methods to determine the level of SLs in foods.

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Metabolomic approaches to analyze principal components in pomegranate juice by HPLC and LC-MS/MS to evaluate adulteration in the commercial juice

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Pomegranate is one of the expensive fruit due to its short harvest season. Therefore, adulterated pomegranate juice, mixed with other chief fruit juice, can lead economic benefit to Food Company. In order to distinguish pure pomegranate juice with its adulterated juice, the major components of pomegranate juice were analyzed together with grape and peach juices mainly used for manufacturing the adulterated pomegranate juice. Organic acids, polyphenols and flavonoids were analyzed using HPLC and LC-MS/MS. Malic acid and citric acid were selected as major organic compounds to evaluate purity of pomegranate juice and tartaric acid was chosen for grape juice. Commercial pomegranate and peach juice products were collected in domestic markets and polyphenol and flavonoids were compared after LC-MS/MS metabolomic research. The difference in major metabolites between pure pomegranate juice groups and other juice groups were clearly found through principal component analysis (PCA). The OPLS-DA (S-plot and VIP-plot) was used to identify metabolites exhibiting significant differences between pomegranate and peach and 47 metabolites were identified in this study. Among them, five flavonoids can be selected as indicators to compare pure pomegranate juice with adulterated pomegranate juice. This study offers analytical method to evaluate the adulteration of pomegranate juice with other fruit juices.

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JOINT EVENT
17th World Congress on **Nutrition and Food Chemistry**
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September 13-15, 2018 | London, UK

Expression profile of adiponectin in young obese Pakistani subjects

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Obesity in adolescents and young adults has increased significantly in recent years resulting in the development of chronic diseases. Obesity induces adipocyte dysfunction, secretion of adipokines and activation of macrophages leading to inflammatory cytokine production. The aim of the present study was to investigate the adiponectin gene expression in young subjects of different BMI groups. Study subjects included 300 overweight, obese males and females with an age ranging from 17–30 years. 100 comparable control subjects with normal BMI were included. The data was stratified into normal-weight, overweight, obese I and obese II groups. Anthropometric parameters including age, BMI, waist circumference, WHR, systolic and diastolic blood pressure were assessed. The metabolic and inflammatory parameters including glucose, insulin, lipid profile, leptin, adiponectin, resistin, C-reactive protein and interleukin-6 in serum were measured by chemistry analyzer and ELISA. RNA extraction was done by TRIZOL method and cDNA synthesis was done by using cDNA synthesis kit. The expression of target gene was compared with GAPDH on real time PCR using gene specific primers. Serum levels of insulin, leptin, resistin, CRP, IL-6 were significantly higher in overweight and obese subjects as compared to control subjects ($p<0.01$). Adiponectin was significantly low in obese groups ($p<0.01$). In correlation analysis, adiponectin showed a significant inverse relationship with BMI, WC ($r =-.262$, $p<.008$), ($r=-.310$, $p<.002$) $p<0.01$ and with WHR ($r=-.199$, $p=.046$) $p<0.05$, respectively. Adiponectin was significantly correlated with fasting insulin ($r=-.282$, $p=.004$) $p<0.01$ in obese group. The expression of adiponectin gene was significantly influenced by obesity.

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Attitudes and practices of overweight and obese women towards weight reduction in World Bank area of Owerri West Local Government area, Imo State, Nigeria

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Obesity is fast becoming a public health issue not only in developed countries but in developing countries like Nigeria because of the associated health problems. While affluent countries are fighting hard to reduce the incidence, developing countries are being crippled by false beliefs and ignorance of majority of the affected. A randomized survey was carried out in the World Bank area of Owerri West Local Government area, Imo State, Nigeria to determine the attitudes and practices of overweight and obese women of child bearing age with different marital status and academic background towards weight reduction, between November and December 2017. Body mass index (BMI) was utilized to categorize 60 (8.6%) of the total 700 women who gave their consent for the study as either overweight or obese. Of the selected 60 women, 12 (20%) were obese while the rest 58 (80%) were overweight, eight (13.3%) were single, while 52 (86.7%) were married and all 60 (100%) had either secondary or tertiary education. Data collected further revealed that only 10 (166.6%) would want weight reduction and the desire for weight reduction was significantly ($P<0.05$) dependent on marital status, as seven (70%) of those who wanted weight reduction were single ladies, while two (20%) who were married had no issues and only one (10%) wanted to reduce her weight because she saw obesity as a health risk. On the other hand, 10 (17.2%) of the overweight claimed they love their weight, five (0.9%), said they need the weight as long as child bearing lasts, while the rest did not see anything wrong with their weight. Of all, only six (10%) did some physical exercises to reduce weight, and four (0.7%) reduced consumption of energy dense food. Other 50(88.3%), claimed that they had no time for exercises and do not need them, while a few said that they already have much stress in their jobs. Educational level was found to have no significant ($P>0.05$) influence on either the attitude or practice towards weight reduction of overweight and obese women in this study. The need for more public enlightenment and health education in the area is highlighted.

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Notes:

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Effect of a moderate-intensity continuous training program and cognitive behavioral psychotherapy over the endothelial dysfunction genes expressions in overweight and obesity children

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Background: The worldwide obesity epidemic has stimulated interest to find early interventions that could be implemented in childhood and adolescence, with consideration of biomarkers that are potentially predictive of cardiometabolic complications present at later ages. Interventions such as moderate-intensity continue training program (MCIT) and cognitive behavioral therapy (CBT) are the mainstay of treatment for this condition. Such interventions may lead to changes at the molecular level in the expression of genes involved in endothelial dysfunction such as PRMT1, DDAH1 and ADMA.

Objective: This study evaluated the effect of moderate-intensity continues training program and cognitive-behavioral program over gene expression associated with endothelial dysfunction in children aged 6-12 years who were overweight or obese.

Methods: We recruited 26 patients with overweight and obesity diagnosed according to the CDC tables between 6-12 years, of which peripheral blood was obtained. One group had the MCIT intervention (n = 13), and the other group with MCIT + CBT intervention (13), both groups were treated for 12 weeks. Anthropometric and biochemical variables were measured, gene expression was quantified by the real-time PCR technique.

Results: Both groups had a decrease in the anthropometric parameters such as BMI, waist, WHtR ($p < 0.05$), the group of MCIT + CBT also decreased the WHR and triglycerides ($p < 0.05$). Regarding gene expression, mRNA levels of PRMT1, DDAH1 behaved differently in each group since the group of MCIT + CBT had an overexpression of DDAH1 and ADMA in contrast to the group of CBT that lowered their expression significantly ($p = 0.001$, $p = 0.039$ respectively).

Conclusions: The intervention of MCIT represents an effective intervention to decrease endothelial damage and cardiometabolic complications, by increasing the levels of expression of DDAH1 and having a downward trend of the PRMT1 gene both are ADMA regulators, that is a potentially marker of cardiovascular risk.

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Nutritional value and sensory attributes of Ventricina del Vastese, an Italian traditional meat-product

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Rural development is one of the major objectives of EU policies, mainly focused on the development of traditional food products. The Italian diet is characterized by the consumption of a variety of traditional foods often based on ancient recipes. An example of traditional meat-product is a dry-fermented sausage, Ventricina del Vastese, produced in Abruzzo region (central Italy). Only natural ingredients and salt are added as microbial growth inhibitors. Moisture, protein, lipid, fatty acids, minerals, trace elements, vitamins were analyzed according to AOAC official methods. Twenty-three sensory attributes were selected and evaluated by nine professional judges. Ventricina, from six manufacturers, were collected after 6 months of ripening. Differences in proximate composition among manufacturers well describes the non-standardized recipe formulation and manufacture process. Moisture content ranged from 35 to 37.9%, protein from 22 to 34%, lipid from 23 to 35%, cholesterol from 85 to 108 mg/100g. The unsaturated fatty acid fraction accounted for 67% of total lipids. Among fatty acids, oleic acid was the most represented (50% of total lipids), followed by palmitic (23%) and linoleic acid (10.9%). Ventricina represented a very rich source of all trace elements, especially zinc and iron; differences in mineral content among manufacturers were observed especially for calcium and sodium (added as preservative). B group vitamins were well represented showing a high content of niacin (7.6 mg/100g) and thiamin (0.83 mg/100g). The mean sensory profile of the dataset showed a high variability for most of descriptors. Principal component analysis specifically allowed to discriminate the sensory profile of the industrial sample from most of artisan ones, as well as to identify the Ventricina sample which most corresponded to the mean sample of the dataset. This picture offers an example of how the manufacturing experiences, handed down locally, allows the production of high quality meat-products by safer preserving methods.

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Nutritional value of edible insects

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Statement of the Problem: In the recent years, insects are very often reported to be an alternative protein source. Since January 2018 insects have been recognized as a novel food in the EU. Chemical composition of edible insects is known to be influenced by many factors, so it significantly varies among different species as well as within the same insect species. Nutritional value of insects depends on their feed, the rearing conditions and many other factors.

Purpose: The purpose of this study is to evaluate the nutritional value of insects recommended by EFSA as possible species for human consumption and the effect of sex and developmental stage on the nutritional value.

Methodology: Nutritional value of selected insects: *Tenebrio molitor*, *Acheta domestica, Zophobas morio* and Blattodea species was evaluated by analyzing their basic nutrients such as fat and protein content as well as their fatty acid and amino acid profiles. Dry matter, ash and chitin content were also determined. Essential amino acid index as well as atherogenic and thrombogenic indexes were calculated.

Conclusion & Significance: Edible insects could be a good source of protein as well as lipids and their nutritional value is more or less comparable with the conventional protein sources. Their basic nutrients composition depends on sex; males of Acheta domesticus contained significantly higher protein and lower lipid content than females; as well as on the developmental stage adults of Blattodea species contained more crude protein and ash, but less fat sub adults. On the other hand, the quality of nutrients expressed by amino and fatty acids profile and indexes calculated from them were similar. These findings may contribute to better evaluation of nutritional value of insects as novel food.

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Trace contamination of Algerian virgin olive oil by migration from PET packaging

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In Algeria, PET is nowadays the packaging material of choice for virgin olive oil. Reasons for this are its resistance to breaking as well as the clarity of the PET material. Admittedly, food contact plastic materials are covered by the European regulation N°10/2011, which established the list of authorized compounds for use in plastic formulation, but in my country we import the raw material in the form a mixture whose exact composition is unknown, however, it has been demonstrated that plastic packaging contains various substances such as additives and monomers but also non-intentionally added substances coming mainly from three sources: interaction between constituents of the packaging material, degradation processes and impurities of the raw materials. Thus, the objective of our work is to evaluate the contamination levels of olive oil during storage. We have used a high chemical quality of extra virgin olive oil and three different commercial bottles. The bottles were stored at room temperature for one year. The polymer tested can absorb water at 0.51±0.11% to 0.65±0.09% and can lose at 105°C after evaporation 0.33 to 0.53%. The rate of ash of the plastic is established and analyzed, so, some metals are identified in oil by the comparison between the results obtained by the spectroscopy of atomic absorption and the microanalysis. The global migration was calculated by determination the weight of specimens before and after 10 days of contact with the oil at 40°C and the amount of absorbed oil. The absorbed oil was determined by gas chromatographic analysis. The results of these determinations guided us to follow the migration of monomer terephthalic acid during storage. The lowest migration is recorded in oil while no significant difference ($p \leq 0.05$) was found for three samples of containers, and the amounts of specific migration conform to European Union legislation that identifies specific migration limits, whereas the rate of the total migration is relatively high. Further investigation will be needed to better explain this contamination and these results of interaction.

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Association between abdominal obesity and osteoporotic fractures among elderly Israeli women

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Obesity has been traditionally viewed as a protective factor for fractures. Recent studies have challenged this, particularly regarding abdominal obesity. We studied the associations between abdominal obesity and body mass index (BMI) with osteoporotic fractures prevalent in community dwelling elderly Israeli women. The data in this cross-sectional study was based on '*Mabat Zahav*', with a nationally representative sample of elderly Israelis. The study population included 669 women. Information on osteoporotic fractures site and circumstances was self-reported, and height, weight, waist and calf circumferences were measured. Waist circumference variable was divided into tertiles: <88 cm, 88–99 cm and >99 cm. Sixty five women reported osteoporotic fractures. The fracture group was less educated than the non-fracture group. While BMI was not associated with osteoporotic fractures in any of the models, abdominal obesity (waist circumference >88 cm) was positively associated with the prevalence of osteoporotic fractures, independently of age, smoking, physical activity and BMI (middle and high waist circumference tertiles [3.147 (95% CI, 1.411–7.020), 2.776 (95% CI, 1.054–7.307), respectively]. The middle tertile remained positively associated with osteoporotic fractures in all the models, while in the high tertile, the association was no longer significant after controlling for low calf circumference, functional status, cardiovascular or metabolic disease (presence of hypertension, coronary heart disease, or diabetes), education years and income. BMI was not associated with osteoporotic fractures. We conclude that among this sample of elderly women, abdominal obesity was positively associated with osteoporotic fractures. Waist circumference may be a useful indicator for assessing osteoporotic fractures risk.

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Association of adipocytokines with cardio metabolic risk factors in normal weight obesity: A cross-sectional study

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Background: Subjects with excessive body fat and normal body mass index (BMI) are characterized as normal weight obese subjects (NWO), who are at increased risk of developing cardio metabolic dysregulation. The purpose of this study was to determine the prevalence of cardio metabolic risk factors in association with adipocytokines including leptin, vaspin and irisin in patients with NWO compared to the controls.

Material & Methods: We recruited 64 women with mean age of 28.95±4.63 in a cross-sectional study. A case group including 34 normal weight obese women (BMI <25 kg/m2, BF >30%) were compared with a control group including 30 women with BMI <25 kg/m2 and BF <30%. Body fat mass was measured by bio-impedance method and serum levels of insulin, irisin, leptin and vaspin were measured using ELISA method. Systolic and diastolic blood pressure, waist and hip circumference, lipid and glycemic profiles were measured. Serum levels adipocytokines were compared using non-parametric Mann-Whitney test between two groups and the correlation between the adipocytokines and measured parameters were investigated using the Spearman's correlation coefficient.

Results: Median leptin (39.78 vs. 21.87 ng/ml, P<0.001) and irisin (36.67 vs. 25.96 ng/ml, P<0.01) were significantly higher among NWO compared to controls. There was no difference in vaspin level between two groups. The mean (SD) values of waist circumference (WC) (74.77±4.74 vs. 70.84±3.03 cm, P<0.001) and hip circumference (HC) (98.90±4.29 vs. 93.44±2.99 cm, P<0.001) were higher in NOW than control, but not waist to hip ratio (WHR). Cases had higher concentration of fasting insulin (9.02±4.75 μIU/ml) and HOMA-IR (36.92) compared to controls (6.31±2.49 μIU/ml, P=0.01 and 25.42, P=0.01), respectively. Systolic and diastolic blood pressure, fasting blood level of triglycerides, total cholesterol, HDL-c, LDL-c and fating blood glucose were non-statistically significantly higher in NWO than controls. Serum level of leptin, vaspin and irisin showed statistically significant positive relationship with fasting insulin level (r=0.50, P<0.001, r=0.28, P=0.02 and r=0.30, P=0.01, respectively) and with HOMA-IR (r=0.51, P<0.001, r=0.27, P=0.03 and r=0.29, P=0.01, respectively). In addition, serum level of leptin had a positive relationship with WC (r=0.45, P=0.004), HC (r=0.51, P=0.01) and body fat mass (r=0.40, P=0.01) in NWO. We observed that irisin correlated directly with DBP (r=0.33, P=0.04) and indirectly with HC (r=-0.38, P=0.01) and fat mass (r=-0.40, P=0.03).

Conclusion: Despite having normal BMI, patients with normal weight obesity have impaired glycemic profile than controls with normal fat mass and BMI. According to the relationship between adipocytokines and glycemic profiles, it can be concluded that the levels of adipocytokines might be important mediators of impaired glycemic profile in NWO.

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Prevalence of obesity and its association with Type 2 diabetes mellitus and hypertension among urban geriatric population in South India

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Statement of the Problem: World has witnessed demographic transition in 20th century, where the proportion of elderly population increased globally especially in underdeveloped and developing countries. As per the 2011 census, the elderly population in India constitute more than 100 million. This increased life expectancy is associated with age related chronic non-communicable diseases (NCDs) including overweight and obesity.

Objectives: The objective of this communication is to assess the prevalence of obesity and its association with NCDs among elderly.

Methodology& Theoretical Orientation: A community based cross-sectional study was carried out among 400 urban elderly (60 years and over) subjects residing in Khammam town of Telangana State. Weight, height and waist circumference (WC) were measured using standard equipment. WHO recommended Asian standards were used for calculation of body mass index (BMI) and abdominal obesity. Blood pressure was recorded using mercury sphygmomanometer and history of diabetes mellitus (DM) was obtained from all subjects. Finger prick fasting blood sample was collected from sub-sample (202). The overall prevalence of overweight/obesity and abdominal obesity among urban geriatric population was 72.7% and 66%, respectively. While the prevalence of Type 2 diabetes mellitus and hypertension was 25.3% and 66.5%, respectively. In general, the prevalence of overweight and obesity was relatively higher among elderly women as compared to their male counterparts. The prevalence of diabetes and hypertension was significantly ($p<0.01$) higher among the elderly with abdominal obesity and higher BMI.

Conclusion and Significance: The prevalence of obesity and its association with NCDs is a serious public health concern among urban geriatric population. Therefore, the community should be sensitised adverse health effects of NCDs through health and nutrition education and behavioural change communication (BCC) for adaptation of healthy lifestyles during adolescence and early adult life for the prevention and control of non-communicable diseases during the period of ageing.

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Effect of the inclusion of bambara nut (*Vigna subterranea* L.) and plantain (*Musa paradisiaca*) flours on the nutrient compositions and functional properties of cassava fufu (*Manihot esculenta*)

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Cassava Fufu, one of the foods that are swallowed mostly without chewing, in the process of eating it is tasteless and high in carbohydrate. The nutritional value is dependent on the nutrient quality of the soups it is eaten with. Unfortunately, most of the low-income earners; the locals in the suburban and rural areas, where fufu is the main staple cannot readily afford the high costs of adequate animal proteins to enrich their meals. Consequently, this results to the high prevalence of protein energy malnutrition, diabetes and other nutrition related diseases among the elderly and children. Hence, the utmost importance to enrich cassava fufu products, with cheap plant proteins from legumes is to alleviate these conditions. Bambara nut and plantain are abundant all year, rich in protein, vitamins and minerals. Bambara nut, though underutilized has great potentials to influence the nutritional profile of the fufu. The rich nutrients in plantain will further boost the legume in the product. The fufu flour was obtained after peeling, fermentation for 4 days, sieving, dewatering and drying at 80°C, 3 h. The bambara nut was boiled for 40 min, dehulled, dried at 105°C, 2 h, milled and sieved. The green plantain was peeled, sliced, blanched at 60oC, 15 min, dried, milled and sieved. The formulations were blended at different ratios of cassava, bambara nut and plantain flours. The effects of the inclusions were determined on three different samples respectively through the analysis of their proximate compositions and functional properties; using appropriate, standard methods. The protein contents ranged from 4.86-6.88%, fibre: 3.85-5.58%, ash: 1.85-4.59%, moisture content: 12.74-6.82%, carbohydrate: 60.49-79.54%. The functional properties were: water absorption capacity: 4.83-7.65 g/g, oil absorption capacity: 3.25–4.45 g/g, swelling index: 6.56-11.83 gcm-3 and bulk density: 0.46-0.85gcm-3. The blend with equal ratios of cassava, bambara and plantain flours had the highest protein, water absorption capacity, ash, swelling index and lowest bulk density. The physical attributes: colour, texture and moldability were highly acceptable; the cooking time was the shortest for 4 min, varying the ratios of the bambara and plantain, yielded fufu blends of better nutrient and functional status, necessary to check the protein, energy malnutrition prevalent in the developing nations. Higher inclusions of bambara nut flour will yield fufu flour of higher protein values.

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Omega-3 fatty acids and malignant ventricular arrhythmias in patients with implantable cardioverter defibrillator

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Background & Aim: Studies that evaluated the effects of omega-3 polyunsaturated fatty acids (n-3) on cardiovascular diseases have yielded conflicting results. We aimed at examining the association between plant/marine n-3 and malignant ventricular arrhythmias (MVA) among patients benefiting from the best preventive strategy including Implantable Cardioverter Defibrillator(ICD).

Methods & Results: Consecutive patients in whom an ICD was implanted for primary or secondary prevention of MVA were eligible. All patients had blood fatty acid analysis. The method of Kaplan-Meier was used to estimate the survival curves in each quartile of the main plant (ALA) and marine (EPA and DHA) n-3. Among the 238 enrolled patients, 100 had a relevant end point recorded by the ICD or died from a cardiac cause during a mean follow up of 30±12 months. No significant difference in MVA was observed between quartiles of ALA (log-rank test p=0.88), EPA (log-rank test p=0.58) and DHA (log-rank test p=0.97). In a multivariate Cox proportional hazard model including age, sex, ischemic heart disease, diabetes, smoking, hypertension and high cholesterol as covariates, we found no association between MVA and n-3: hazard ratio was 1.12 (95% CI 0.62-2.02) for ALA and 1.44 (95% CI 0.81-2.58) for the sum of main marine n-3.

Conclusions: Plant and marine n-3 do not seem to either increase or decrease the risk of MVA in patients who are not n-3 deficient and benefit from the most effective preventive treatment. Further studies are required to test whether n-3 deficient patients would still benefit from n-3 supplements. Finally, these data raise major questions regarding interactions between dietary n-3 and certain medications.

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Evaluation of effect of vitamin D supplementation on serum AMH in vitamin D deficient PCOS women

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Context: PCOS is characterized by oligo or anovulation, clinical or biochemical hyperandrogenemia, and/or polycystic ovaries on ultrasonography. Vitamin D plays a role in ovulation in PCOS.

Objective: To correlate vitamin D levels with serum AMH after vitamin D supplementation in vitamin D deficient PCOS women.

Materials & Methods: The study design used was observational, comparative and interventional. All consenting females diagnosed with PCOS according to Rotterdam criteria in the age group of 16–40 years were recruited. A total of 630 incident cases of PCOS were enrolled after considering inclusion and exclusion criteria. Out of this, 30 patients each without (Group 1) and with vitamin D deficiency (Group 2) were selected using purposive sampling design to study the impact of vitamin D deficiency on serum AMH levels. In the intervention group, 60,000 IU, once weekly vitamin D supplementation, was done for eight weeks. After eight weeks, vitamin D and serum AMH levels were reassessed. Data was analyzed using Statistical Package for Social Sciences Version 21.0. PCOS women having vitamin D (25OHD) levels (<20 ng/ml) were given oral vitamin D3: 60,000 IU once weekly for eight weeks. The main outcome measures were change in AMH concentration after vitamin D3 supplementation. The targeted AMH concentration was <4 ng/ml.

Results: In Group 1, 23.3% women had AMH levels <4 ng/ml, whereas it was 20.0% in Group 2. The correlation between vitamin D and AMH levels was weak and not significant statistically (=0.090; p=0.495). On evaluating this correlation separately in Groups 1 and 2, it was found to be weak but statistically not significant (=0.129; p=0.497) in Group 1; whereas, in Group 2 it was found to be mildly positively correlated yet statistically not significant (=0.344; p=0.063). Following intervention, mean vitamin D levels changed from 12.53±4.32 ng/ml to 33.59±8.75 ng/ml, thus showing a significant change. Vitamin D levels were normalized (>20 ng/ml) in all the women. A statistically significant change in AMH levels was observed with mean values changing from 4.88±2.06 ng/ml to 3.79±2.00 ng/ml. The proportion of women with normalized AMH levels (<4 ng/ml) increased from 20% to 80% following intervention. In the vitamin D deficient group, following intervention, the correlation between vitamin D and AMH levels was weak and not significant statistically.

Conclusion: Vitamin D levels have a regularizing effect on ovarian reserves among PCOS patients with vitamin D deficiency.

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Time dependent degradation of polyphenols from thermal processed berries and their *in vitro* antiproliferative effects against melanoma

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Berries are an important source of bioactive compounds, known to have positive health benefits. Those compounds are namely phytochemicals and among them, anthocyanins contribute in high amount to the nutritional and potential health value. Because of berry seasonal availability and also due to their rapid degradation, people found multiple ways to preserve them. The most common options are: freezing, jellies or jams. The last one is also the most popular way of conservation in Romanian household. The most common fruits used as primary ingredient in jams are: berries, plums, cherries. Starting from this we thought what has all this common? The answer was: that they share a large amount of bioactive compound-polyphenols such as anthocyanins, flavonoids or phenolic acids. Their stability is a continuous challenge for food industry. There are also multiple published data providing that they are sensitive to light, pH or high temperature. All those vectors are present during jam preparation. In this context we started a study regarding phytochemical composition and bioactive compounds degradation after jam preparation. We also monitored their degradation during storage time and their in vitro antiproliferative potential. However, to the best of our knowledge, no report exists on the effect of processing on the phenolic compounds content of homemade jams from chokeberry, elderberry, blackcurrant or blackthorn. The obtained results revealed that processed and stored in time, the bioactive compounds from berries jam are degraded, they still exert antioxidant and antiproliferative potential. Prior to LC-MS analysis, polyphenolic compounds were identified as: flavonoids (anthocyanins, flavonols) and non-flavonoid (hydroxycinnamic acids (HCA) and hydroxybenzoic acids (HBA)). The most significant decrease was observed for HCA compared to other classes of the quantified compounds. This variation is expected due to variations in constituents and phenolic types among different analyzed berries.

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