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**Traditional Foods and
Sustainable Food Systems**
Symposium

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TOROS UNIVERSITY
FACULTY OF FINE ARTS, DESIGN AND ARCHITECTURE
DEPARTMENT OF GASTRONOMY AND CULINARY ARTS

**1st INTERNATIONAL TRADITIONAL FOODS AND
SUSTAINABLE FOOD SYSTEMS SYMPOSIUM**

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PROCEEDING BOOK

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BRAIN FOODS

Meliha ÇAVDAR¹, Hilal TOKLU²

ABSTRACT

All over the world, healthy aging and protecting brain health have been the primary goals of societies. Despite all kinds of environmental effects that threaten human health, the scientific world's search for health protection and treatment continues. There are many factors related to nutrition that are known to have an effect on cognitive development. Recently, it is believed that the most important reason for the decrease in cognitive functions with age is the increase in oxidative stress and the decrease in antioxidant levels. Oxidation damage caused by the increase of free radicals produced as a result of physiological events in the body and the insufficiency of their clearance by antioxidant systems is also involved in the etiology of diseases that threaten brain health. Oxidative stress increases with age and facilitates the development of neurodegenerative diseases such as Alzheimer's and Parkinson's.

The relationship between diet and mental health is more well known today and nutrition has become part of the treatment of psychiatric disorders. Foods that can help optimize mental performance have formed the basis of the concept of "brain foods". The foods we consume affect the chemical composition of our brain and change our mood. The brain needs twice as much energy as other cells in our body, and glucose is the only fuel that can be used directly by the brain. While glucose controls motivation in some areas of the brain, fructose does not affect these factors. Therefore, it is important to control the amount and type of carbohydrates in the diet. Deficiency of omega-3 fatty acids leads to an increased risk of various mental disorders, including attention deficit disorder, dyslexia, dementia, depression, bipolar disorder, and schizophrenia.

Tryptophan, one of the amino acids, is a precursor to serotonin, and dietary intake of tryptophan may affect the level of serotonin in the brain. Since chocolate contains the amino acid tryptophan, it increases the feeling of happiness when consumed. At the same time, cocoa beans contain tannin, catechin and alkaloid theobromine and caffeine, which have different effects on our brain and emotions. Various micronutrients with antioxidant capacity associated with mitochondrial activity are also said to affect cognitive function. Folate supplementation alone or in combination with other B group vitamins has been shown to be effective in preventing cognitive decline and dementia during aging, as well as enhancing the effects of antidepressants. Alpha lipoic acid, found in a variety of foods, is a coenzyme important for maintaining energy homeostasis in the mitochondria. Vitamin E deficiency has also been negatively associated with memory performance in elderly individuals. In addition, consumption of caffeinated coffee has been found to reduce the incidence of dementia, particularly Parkinson's disease.

As a result, proper nutrition is of great importance to improve our mental abilities, concentration and memory. However, foods and nutrients must be consumed together in order to regulate brain and cognitive functions.

Keywords: *Brain, foods, neurodegenerative diseases*

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INVESTIGATION OF THE ENERGY AND NUTRIENT CONTENT OF THE GEOGRAPHICALLY MARKED ZİLE CHURCHKHELA (KÖME)

Kübra ESİN¹

ABSTRACT

Zile Churchkhela (Köme) is a sweet food containing walnuts threaded on a string and coated with hasuda prepared with unfermented narinçe grape juice, wheat starch and flour. The unique qualities of Tokat walnut and narinçe grape, the two primary components of Zile Churchkhela, which received a geographical indication in 2017, make it distinct from similar products produced in other regions and provide its unusual taste and aroma. No food additives are used in the production of Zile Churchkhela, including sugar, sweetener, flavouring or components that give flavour. This local dessert, prepared primarily with unfermented grape juice, walnut and starch and not containing refined sugar, attracts attention with its nutritiousness besides deliciousness. Yet, there is not any study in the literature examining the energy and nutrient values of Zile Churchkhela. Hence, the current study aimed to analyse the energy and nutrient values of Zile Churchkhela. The content of the Zile Churchkhela was taken from the official website of the Turkish Patent and Trademark Office, and the content of its 100 grams was calculated based on the given amounts. Zile Churchkhela's energy and nutrients were analysed in the Nutrition Information System (BeBiS in Turkish) 9 computer program. 100 grams of Zile Churchkhela contains 352.1 calories and 1.2 g of fibre. According to the macronutrient distribution, 57% is carbohydrates, 37% is fat, and 4% is protein. Zile Churchkhela is rich in vitamins and minerals and has high vitamin E, niacin, biotin, copper, manganese, linoleic acid and alpha-linolenic acid content. In conclusion, Zile Churchkhela is a nourishing local dessert with a rich nutrient content that does not contain refined sugar. Conducting similar studies will be worthwhile in understanding the taste factor of local dishes as well as their relationship with nutrients and health.

Keywords: *Zile Churchkhela (Köme), geographical indication, local food, energy, nutrient.*

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OLEUROPEIN AND INFLAMMATORY PROCESSES

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ABSTRACT

For centuries, the olive has been the symbol of healthy nutrition with its fruit and the oil obtained from its fruit. Inflammatory processes, on the other hand, are pathways that are shown to be at the center of various pathologies, although they are not a common term in the field of food. The aim of our study is to evaluate oleuropein, which is abundant in olive leaves, which cannot be consumed directly as food, as a food supplement, and to evaluate its positive effects on inflammatory processes and its regulatory potential within the scope of information obtained from scientific studies. The method of our study is the review of scientific articles. For this purpose, 25 domestic and foreign scientific articles and studies, whose dates are between 2010 and 2022, were selected and evaluated among more than a hundred scientific studies searched in PubMed, Google Scholar and DergiPark databases. Oleuropein is the main phenolic component extracted from the olive tree, *Olea europea*. Although oleuropein is detected in all parts of the olive fruit, it is found in the highest amount in the leaves of the olive tree. This amount reaches a concentration of 60-90 mg/g in the dry matter of the leaves. Oleuropein in the fruit parts decreases with the maturation of the fruit and the bitterness of the fruit is reduced. Experimental studies have been done on oleuropein and it has been shown to have hypotensive, antiarrhythmic and spasmolytic effects on intestinal smooth muscle. On the other hand, discussions on the mechanisms of action continue. Inflammation is the body's response to tissue damage from physical injury, ischemic damage (insufficient blood supply to an organ), infection, exposure to toxins, or other types of trauma. Inflammatory responses cause cellular changes and immune responses that result in repair of damaged tissue and cellular proliferation (growth) at the site of injured tissue. Inflammation occurs in two forms, acute or chronic. acute inflammation; Conditions that start suddenly and heal in a short time are called chronic inflammation, and conditions that progress slowly and continue for a long time. There are various immune mediators involved in these processes. In particular, cytokines are cellular regulatory proteins that are secreted against various stimuli and affect the behavior of targeted cells. Although various triggering events and the increase in cytokines and the development of inflammation are life-saving, inflammation that lasts longer than necessary also damages healthy peripheral tissues. As a result of some genetic disorders, immune system elements initiate an inflammatory process against healthy tissue, leading to the emergence of autoimmune diseases. The importance of regulating inflammatory processes and suppressing excessive inflammation emerges. The preventive effect of oleuropein on free radicals formed as a result of inflammatory processes occurring in lung epithelial cells has been determined. In addition, in experimental studies, it was determined that oleuropein application did not cause any genetic differentiations or damage, and no adverse effects were observed. Oleuropein has strong antioxidant activity, especially as a free radical scavenger. Studies have shown that oleuropein inhibits various inflammatory enzymes such as lipoxygenases and prevents free radical formation with its ability to chelate metal ions such as Cu^{+2} and Fe^{+2} , which catalyze free radical generation reactions. In another experimental study, it was presented that the osteoblast levels of the subjects treated with oleuropein increased significantly, and oleuropein successfully reduced inflammation and apoptosis with osteoclasts. As a result of the evaluations, it has been determined that the scientific studies examined contain results that support the purpose of our

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research. These studies, which are pioneers for a scientific study we will carry out, show that inflammation can be suppressed and regulated by the use of oleuropein. Finally, the olive tree is an important natural heritage that grows in our country and its fruit is used as food either directly or after various processes. Olive leaves, which is a food by-product of the olive tree, has the potential to be considered as a food supplement due to its high oleuropein content. At the point reached by modern medicine, it is known that inflammatory processes are responsible for various pathologies from tissue damage to functional disorders, from Alzheimer's to Parkinson's disease. For this reason, it is thought that in the near future, the olive leaf and the oleuropein it contains will act as a bridge between the fields of food and health.

Keywords: *Anti-inflammatory, inflammation, oleuropein, olive leaf.*

A REVIEW: IMPORTANCE OF SUSTAINABILITY AND SUSTAINABLE NUTRITION FROM PAST TO PRESENT

Kübra KAYNAR¹, Şüheda Hilal GÜVEN², Ezgi ŞENOL³

ABSTRACT

Sustainability is to develop the nature and existence of the planet earth. Sustainable nutrition is also a diet model to access to the safe and adequate food supply. The sustainability was introduced by Germany in the 17th century. The sustainable diet was invented by Gussow and Clancy in 1986. In 1987, the World Commission on Environment and Development defined the sustainability in its report as "Our Common Future". The food system effect takes the lion pie. Especially animal-based foods have more negative effects than other products. Today, more than 2 billion people suffer from micronutrient deficiencies originated from inadequate global sustainability and approximately 860 million people suffer from hunger. Agriculture covers 48% of global soil usage and food processing is responsible for about 30% of global greenhouse gas emissions and 70% of clean water usage. In 2010, the International Symposium held by FAO and Biodiversity International Foundation redefined a sustainable diet. In 2019, the Commission on Healthy Diets of the Anthropocene Foods suggested the Eat-Lancet sustainable food system as a reference diet for human and planet health. In Turkey, sustainability studies have become widespread in recent years. With the Stockholm Conference, Turkey added environmental issues to its development plans. To sum up, sustainability and sustainable nutrition are considered as an integral part of carbon footprint, biodiversity, clean water, environment, and human health. That's why, plant-based nutrition such as the Mediterranean Diet, the Traditional Japanese Diet, the Nordic Diet, and the Vegetarian Diet should be given importance to provide sustainable planet.

Keywords: *Sustainability, sustainable diet, planet earth, health.*

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DETERMINING THE RELATIONSHIP BETWEEN SUSTAINABLE NUTRITION AND TENDENCIES OF ORTHOREXIA NERVOSA IN UNIVERSITY STUDENTS

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ABSTRACT

Sustainable nutrition has attracted more attention today as a result of the increase in the world population and the increasing interest in climate change issues, especially in the last 10 years. Unhealthy and unsustainable food production poses a global risk for human health and the world. Sustainable nutrition; In addition to ensuring the continuation of natural resources, it is a safe and healthy nutritional behavior that is respectful and protective of biodiversity and ecosystem, accessible, economically appropriate, sufficient in terms of nutrition. However, the tendency to consume healthy foods can become an obsession and negatively affect health and quality of life. As a result of this situation, one of the eating behavior disorders may occur, called "orthorexia nervosa". This pilot study was planned as cross-sectional and was conducted online with 175 volunteer university students to determine the relationship between sustainable nutrition and orthorexia nervosa tendency. The online questionnaire contains questions about demographic information and health information. The 'Sustainable Nutrition Behavior Scale' and 'Ortho-15' were applied to the students. The increase in the score in the sustainable eating behavior scale indicates that the sustainable eating behavior is more adopted, while the decrease in the score in the Ortho-15 scale indicates that the tendency towards orthorexic behavior increases. Body weight and height were taken based on the declaration and body mass index (BMI) was calculated. A total of 148 female (84.6%) and 27 male (15.4%) university students participated in the study. The mean age and BMI of the participants were calculated as 21.5 ± 3.0 years and 22.2 ± 3.4 kg/m², respectively. It was found that 76.9% of the students received education in the field of health and 30.9% were in the 4th grade. According to the BMI classification of the students, 69.7% were normal, 19.5% were overweight-obese, and 10.9% were underweight. When the sustainable eating behaviors and orthorexia nervosa tendencies of the participants were examined, it was observed that 52.5% of them adopted the sustainable eating behavior more and 77.1% of them were orthorexic. In addition, it was determined that 46.6% of orthorexic individuals adopted the sustainable eating behavior less ($p > 0.05$). While the mean sustainable nutrition score of women (18.2 ± 5.1) was statistically significantly higher than men (14.1 ± 4.7) ($p < 0.05$), there was no difference between the mean scores of Ortho-15 according to gender ($p > 0.05$). A significant negative correlation was found between the sustainable nutrition scale score and the Ortho-15 scale score ($r = -0.171$; $p = 0.023$). In this pilot study, although it is seen as a positive situation that approximately one out of every two students exhibited sustainable eating behaviors, it is a remarkable result that the tendency for orthorexia nervosa is also at a high level. It was found that the tendency of orthorexia nervosa increased as the sustainable eating behavior of the students increased. Further studies are needed to determine whether this increase is associated with orthorexic behaviors.

Keywords: *Sustainability, sustainability, orthorexia, eating habits.*

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EFFECT OF COFFEE ON TENDON INJURIES

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ABSTRACT

Coffee is one of the most consumed beverages in the modern world after being processed with various techniques, which is stated to have been discovered in Ethiopia by a goat herder in the 3rd century. Coffee has a highly complex bioactive content. Studies conducted on coffee beans; shows that there are many bioactive compounds such as chlorogenic acids, polyphenols, diterpenes, caffeine and caffeine metabolites. The aim of our study is to evaluate the effects of coffee consumption on tendon injuries within the scope of information obtained from scientific studies. The method of our study is scientific article compilation; For this purpose, 32 domestic and foreign scientific articles and studies, whose dates are between 2010 and 2022, were selected and evaluated among more than two hundred scientific studies scanned in PubMed, Google Scholar and DergiPark databases. The medical and physiological effects of coffee; It is associated with the presence of various bioactive compounds such as caffeine, chlorogenic acid and cafestol. Caffeine is a very powerful ergogenic aid. It is also very useful for increasing endurance against physical conditions. Caffeine is very similar in structure to adenosine and can bind to cell membrane receptors for adenosine, thereby inhibiting their action. Adenosine receptors are found in most tissues, including the brain, heart, smooth muscle, adipocytes, and skeletal muscle. Its ubiquitous nature and diverse types of adenosine receptors make caffeine easy to affect a variety of tissues simultaneously, resulting in a wide variety of interacting responses. Tendons are connective tissues that connect muscle to bone and carry mechanical force, allowing joint and whole body movement. Its primary function is to transmit the forces generated from the muscle to the hard bone that will produce joint motion. Tendon and ligament injuries account for 30% of all musculoskeletal consultations, with 4 million new cases worldwide each year, thus placing a significant burden on society and the economy. Damaged tendon and ligament can seriously affect normal body movement and lead to many complications if not treated timely and adequately. Tendon rupture is characterized by disruption of blood vessels and the extracellular matrix (ECM). ECM is composed of a mixture of proteins and polysaccharides found in all tissues and organs, primarily collagen, elastin, hyaluronic acid, proteoglycans and glycosaminoglycans. Injuries to tendons are called strains. It is divided into acute and chronic. Due to the decrease in flexibility, strength and endurance, 3 types of strain occur in the tendon during load transfer as mild, moderate and severe. In mild strain, there is no obvious defect in the muscle tendon unit, only swelling and pain. In moderate strain, significant deformity occurs in the muscle tendon unit. Complete disconnection occurred in severe strain. This condition in the muscle tendon unit is visible and palpable. Tendon healing is a slow process that takes several months and eventually restores tendon fiber continuity and mechanical strength. Healing is accomplished by both internal healing from the tendon itself and external peripheral fibroblasts. Tendon healing; The patient's hormonal status, age, presence of systemic disease, gender, chronic drug use (quinolones, steroids, etc.), the size of the injured area and the type of injury, and the treatment method applied may affect it. In our study, we examined scientific studies, assuming that coffee, as an external factor, could also support the healing process. Studies demonstrating that caffeine increases maximal strength suggest that caffeine may increase muscle strength weakness resulting from injury through this pathway. Caffeine is rapidly absorbed in the human body through the gastrointestinal tract, and high

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levels may occur in the bloodstream within 15-45 minutes after consumption, with the highest concentrations evident one hour after a meal. Since it is known that long-term use of caffeine increases muscle endurance and regeneration through molecular pathways, the relationship between caffeine intake and muscle endurance can be revealed. This is an important result in terms of accelerating the tendon healing process and reducing the risk of re-injury. Caffeine is widely used in over-the-counter medications for its pain-relieving effect by blocking adenosine receptors. It is widely used clinically to help reduce headaches. In addition, the analgesic effects of caffeine have been shown to reduce experimental muscle soreness. This is very important for patients with a low pain threshold during the healing process. Tendon injuries plague a wide variety of patients, from strong athletes to non-athletes. Different sports and occupations expose patients to increased risk for certain tendinopathies. Studies have shown that caffeine intake affects the amount of epinephrine. Therefore, it is known that caffeine causes an increase in cardiovascular load. Optimal sports performance and cardiovascular fitness can be achieved with caffeine taken in appropriate doses. Potential effects of caffeine during short-duration high-intensity exercise include a direct effect on skeletal muscle, an effect on excitation-contraction coupling affecting neuromuscular transmission, and increased mobilization of intracellular calcium from the sarcoplasmic reticulum. Caffeine intake has also been shown to significantly increase plasma epinephrine concentration at rest and during exercise. In addition to its significant effects on various physical performance parameters, caffeine also provides acute cognitive benefits when consumed, especially in sleep-deprived individuals. At the beginning of these cognitive benefits are increased focus, shortening of problem solving time and decision-making time. This is very important for pre-injury. As a result of the evaluations, it has been determined that the scientific studies examined contain results that support the purpose of our report. These studies have shown that coffee consumption may indirectly affect the prevention of risks before tendon injury, contribute to treatment during injury, and recovery after injury. Caffeine (1,3,7 trimethylxanthine), the main active ingredient in coffee beans and the most studied, is often found in over-the-counter medicines, coffee, tea, cola, chocolate, and various other products. When it comes to caffeine, the main thing that comes to mind is coffee. People have a very long history of consuming caffeine; It is one of the most consumed food additives in the world and the health risks it creates are minimal for appropriate amounts. As a result, it can be said that coffee and the caffeine it contains have positive effects on the tendon healing process along with various physiological effects. However, it should be noted that these healing processes depend on many factors, coffee is only an external factor among them, and it can be helpful if consumed in an appropriate amount, not dominant for treatment.

Keywords: *Healing, coffee, caffeine, tendon injuries.*

MONOSODIUM GLUTAMATE: AS A FIFTH TASTE “UMAMI” IS IT SAFE OR HARMFUL?

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ABSTRACT

Monosodium glutamate, abbreviated MSG or code E621, is the sodium salt of amino acid glutamate. Also, it is a flavor enhancer frequently used in prepared foods. MSG strengthens the flavor properties of the food and makes it want to eat more often and faster by increasing saliva secretion. MSG was first discovered in 1865, and its commercial production began in 1909. It is widely used in ready-to-eat foods in many countries including Turkey, especially in Chinese and Japanese cuisines. MSG is included in all types of chips, some fats, broths, instant soups, sauces, processed meat, fish and chicken products, mayonnaise, spice mixes, colored yogurts, baby foods, and many other consumer products with different names (glutamic acid, glutamine, etc.). There are opposing views in studies on the safety of MSG, which is especially used in ready-made foods for its flavor-enhancing feature. It is known to cause chest pain, headache, facial flushing, shortness of breath, edema, and sweating when used as a flavoring called Chinese Restaurant Syndrome. In addition to the data reporting its harmful effects on the nervous system, retina, and kidneys, it is suggested that excessive use causes disorders in learning and memory mechanisms, and causes neurodegenerative diseases such as obesity, infertility, growth disorder, Alzheimer's, Parkinson's and epilepsy in advanced ages. Today, studies evaluating the possible effects of MSG on human health are still ongoing. Although there are different opinions on this subject, there is not enough scientific evidence to prohibit the use of MSG. However, for many people, the fact that it is discussed that MSG may have harmful effects and that it is not fully proven to be harmless is enough to cause reservations about its use.

Keywords: *Chinese salt, Chinese restaurant syndrome, diet, monosodium glutamate, nutrition, umami taste.*

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BETANIN, AS A NATURAL FOOD ADDITIVES: PROTECTIVE EFFECTS ON CARDIOVASCULAR DISEASE PATHOGENESIS

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ABSTRACT

Cardiovascular diseases (CVD) are a group of conditions that include peripheral arterial disease, coronary heart disease, and cerebrovascular disease. These conditions block the blood flow to the brain and cardiac muscle as a result of aggregates form of oxidized lipids, platelets, immune and inflammatory cells, smooth muscle cells, and platelets that occurs as the result of vascular endothelial injury. Clinical trials and epidemiological evidence have demonstrated the protective effect of the intake of vegetables enriched in antioxidants on oxidative stress and CVD. Because of their ability to scavenge reactive oxygen species (ROS) and reactive nitrogen species (RNS), many of these bioactive phytochemicals may be involved in maintaining a redox state in the organism, while others may modulate the expression of genes encoding proteins involved in intracellular defense against oxidative damage, compete for active sites in enzymes, or bind to receptor sites as antagonists in various subcellular structures. The major phytochemical representative of betalains is betanin (betanidin 5-O-b-D-glucoside), a water-soluble nitrogenated heterocyclic molecule that gives beetroot its red-violet hue. Furthermore, betanin is defined as a bioactive substance capable of suppressing lipid membrane and LDL peroxidation, regulating ROS synthesis and gene expression to decrease inflammatory cytokine release, and increasing antioxidant enzyme activities. Thus, betanin has the potential to be used as a supportive treatment to alleviate the pathophysiological consequences of oxidative stress and inflammatory processes that contribute to CVD disorders. The purpose of this study to review the results of studies in the literature on the possible effect of betanin on the pathogenesis of cardiovascular diseases.

Keywords: *Betanin, cardiovascular disease, protective effect, beetroot.*

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BAUHINIA AS A BIOACTIVE SOURCE AND HEALTH POTENTIAL

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ABSTRACT

Bauhinia variegata also known as Kachnar is a medicinal tree, native to tropical and temperate regions of India. Kachnar is well practiced in Indian indigenous health sciences; Ayurveda. Various parts of plants i.e. flowers, buds, stems, roots, barks, seeds, and leaves have been used since ancient times for the treatment of diseases. Kachnar bark is used in disorders such as lymphadenopathy, goiter, tumor disorders, while flowers have pittaghna cures dysfunctional uterine bleeding, curing cough, and antitubercular properties. Kachnar leaves are beneficial in managing diabetes by reducing blood glucose levels and improving the lipid profile due to the presence of antioxidants. It have fat 12%, protein 2.53%, fiber 11.2% and carbohydrate as 3.45%.

Purpose: The present study is to evaluate the bioactive constituents and health potentials of Kachnar in the previous studies done. The plants contribute a variety of bioactive compounds such as tannins, phenolic compounds, phytosterols, flavonoids, lysine, oleic acid, glycosides, linoleic acid, saponins, etc. Besides this, the plant and its parts are used for many conventional activities, such as mosquito control, dying industry, and agricultural operations.

Methodology: Different review and research papers are collected for the present study evaluation to know about bioactive and health status of the crop. Findings done on Kachnar crop was identified and the present study highlights the nutritional, bioactive and health benefits of crop among consumers.

Findings: Kachnar has bundle of bioactive compounds which highlight the health status of crop. Kachnar helps in wound healing by inducing the formation of new skin cells due to its anti-inflammatory and antioxidant properties. In Ayurveda, applying Kachnar powder mixed with honey helps manage skin problems such as acne, and pimples due to its Sita (cold) and Kashaya (astringent) properties. Kachnar improves the digestive fire which corrects the metabolism and also helps to balance tridosha due to its appetizer and Tridosha balancing property.

Keywords: *Bauhinia, kachnar, bioactive constituents, saponins, tannins, health benefits.*

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COROSOLIC ACID: A NATURAL AND PROMISING ANTI-DIABETIC MEDICATION

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ABSTRACT

Diabetes is a long-term metabolic condition marked by hyperglycemia (high blood sugar levels), which in due time can seriously lead to micro and macrovascular complications. Type 2 diabetes has been considerably increasing during the last three decades in nations of all income levels. The bulk of the 422 million people with diabetes worldwide live in low and middle income countries and diabetes is directly responsible for 1.5 million fatalities annually. Corosolic acid, a pentacyclic triterpene acid found in leaves of plants like *Lagerstroemia speciosa* and *Costus igneus* has been used as a traditional herbal medicine for diabetes. There are two potential ways that corosolic acid works. The first is that it improves the sensitivity of the insulin receptor by inhibiting a protein in the body called tyrosine phosphates, which reduces insulin receptor site activity. Secondly it has capacity to create a brand-new channel for insulin to enter cells. The GLUT4 glucose transporter is responsible for allowing glucose to be taken up by the body's muscles, which has a positive impact on blood glucose regulation. In addition to these pathways, research have shown that corosolic acid can prevent our bodies from producing glucose, a process known as gluconeogenesis. This may significantly impact the body's ability to reduce blood glucose levels. Besides these mechanisms, there are also studies that show corosolic acid can inhibit our own body's manufacture of glucose in a process called gluconeogenesis. This can have an important effect on lowering of blood glucose levels in the body.

Keywords: *Corosolic acid, diabetes mellitus, insulin receptors, GLUT4, gluconeogenesis.*

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TOPICS TRADITIONAL FOOD CULTURES

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ABSTRACT

Hippocrates, around c. 415 BC proclaimed, ‘let food be thy medicine, and let medicine be thy food.’. A report published in Elsevier by Archeological Survey of India (ASI), New Delhi, that ‘seven similar big-size brown ‘laddoos’ high protein, multigrain ‘laddoos’ (food balls)’ was found at the Harrapan site in Rajasthan India. This is surprisingly shocking to the world as many civilizations, sects & religions were not born then. But unfortunately, in the 2021 Global Hunger Index, India ranked 101st out of the 116 countries in 2021 GHI scores and fell under the serious category with a score of 27.5. This finding was compared with 4 Agro-climatic zones of Bihar, eastern India. The present study was conducted given 2 objectives viz., 1. To evaluate the nutritional security of historical India, and 2. To compare the nutritional security of past & present India. The alternative research hypothesis framed for the present study was that the present era is more nutritionally secure than the past. The materials and methods used were Observation and immersion, Content analysis of visual and textual materials, Open-ended surveys, Focus groups, Sullivan et al. (2006) for normalization, Oral history & ranking by Alfares (2009). Food security in Bihar was 0.674, which was Most secure (>0.6) due to social safety net & intervention of Bihar Krishi Road Map project. Nutritional security in Bihar was just 0.269, which was alarming at Least secure (<0.3) level. Poshan Abhiyaan's convergence mission to address malnutrition must be implemented through ensured community mobilization and participation. The research concludes that India in the past may be more food secure than eastern India taking the case of 4 agro-climatic zones of Bihar as Nutritional security was just 0.269, which was Least secure (<0.3) comprising the range from 0-1. Hence, ayurvedic foods are recommended for different health disorders as diet plays the most critical role in maintaining health parameters.

Keywords: *Ayurvedic healthily foods, finger millet, global hunger index, harrapan laddoos, nutritional security, traditional Indian food.*

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THE RELATIONSHIP BETWEEN NUTRITIONAL HABITS AND SKIN TYPES OF GENERATION Z: A STUDY ON UNIVERSITY STUDENTS

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ABSTRACT

Nutrition is one of the important factors that have an impact on human health. Today, research on nutrition and health is aimed at protecting and improving health status, and aims to prevent or slow the emergence of diseases. It is considered that the Z generation is in a structure that tends to instant consumption in terms of nutritional habits, attaches importance to creativity, innovation and quality, and puts different cultures at the forefront.

This study aims to reveal the relationship between the nutritional habits of the Z generation and their skin types. In addition, this paper contains the pilot results of an ongoing study. Necessary permissions were obtained from Gümüşhane University Ethics Committee to conduct surveys. Data were collected from 100 university students in the study. Data were analyzed via SPSS. Confidence interval for the interpretation of the findings was $p \leq 0,05$. In case of not knowing the skin types of the students, a short awareness test was added within the framework of the criteria determined by the International Itch Research Form (IFSI).

The analyzes carried out revealed important findings. 63,3% of the participating stated that they smoke and 43,3% stated that they have acne (pimples) on their skin. In total, 76,6% are more or less interested in people's appearance. 46,7% like to wear loose clothes, 53,3% like to wear tight. 63,3% are dissatisfied with their skin. 73,3% of them stay in a rented house or dormitory/pension apart from their families. 60% of them prefer to eat out, usually as a ready meal. On the skin types of the participants; normal (26,7%), dry (23,3%), mixed (20,7%), oily (16,7%) and sensitive (13,3%). More than half of the participants did not know their skin type. According to the findings, the most used methods for skin cleaning are washing with water (100%) or cleaning using water and soap (100%). The participants prioritize satiety, the effect of advertisements, cheapness, nutritiousness, ease of transportation, practicality and deliciousness, respectively, in their food preferences. People who state that they usually eat out are those with oily and combination skin types. People who pay attention to facial care (water, water and soap, skin care, facial cleanser) are people with dry and normal skin. People with high consumption of fatty foods (chips, other oils, fries) and sugar are people with low skin satisfaction.

Keywords: *Z generation, nutritional habits, skin type, university students*

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GEOGRAPHICALLY INDICATED TOKAT BEZ SUCUK AS A GASTRONOMIC VALUE, ITS CHARACTERISTIC FEATURES AND PRODUCTION METHOD

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ABSTRACT

Gastronomy tourism is one of the most important factors that determine the attractiveness of a place. In this regard, ensuring the protection, marketing and sustainability of local gastronomic products and gaining them to a commercial dimension is of great importance in terms of destination promotion. The fact that there are many traditional and local values in our country and that these values have their own characteristics has brought the phenomenon of appropriation of these values to the agenda in the developing world trade. For this reason, it is important to collect and protect information about local and traditional values in a certain order. At this point, geographical indication is a quality mark that shows and guarantees the source of the product, its characteristics and the connection between the said characteristic features of the product and the geographical area for consumers. Tokat cloth sausage, which is a gastronomic product with a geographical indication of Tokat province which has a rich cuisine, is a product that has been produced and consumed for years. The addition of added value by evaluating meat, which is a very perishable product, both supports the development of the economic activities of the factories that import and export on an industrial scale and contributes to rural and regional development thanks to the gastronomic tourism to be made in to the region. Tokat Cloth Sausage; It is a fermented sausage produced by mixing the meat and fat extracted from a meat grinder with salt, garlic and spices, then filling them in cloth covers, maturing by hanging them on a hanger and flattening them by rolling. The distinctive features of Tokat Cloth Sausage are the application of a natural fermentation method, filling of cloths called Marmersahi, taking air with rollers and giving it a flat shape and not applying heat treatment. One of the most important features of this sausage is its taste, which it leaves on the palate, but it is prepared as a winter food by almost everyone in Tokat houses. Cloth Sausage is a product that is also marketed outside of Tokat and has increased its awareness, which is taken away as a gift by the guests who come to Tokat. This study was prepared in order to evaluate the product description, distinctive features and production method of Tokat cloth sausage, one of the Tokat geographical indication products, in the Geographical Indication Registry Document, what its registered characteristics are and what distinctive features it has from other sausages in a scientific framework.

Keywords: *Gastronomy, fermentation, meat, geographical indication.*

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NANOPHTOSOMES: GENERAL PROPERTIES AND USAGE IN FOOD

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ABSTRACT

Phytosomes are molecular complexes that resemble plant cells and are formed by incorporating plant extracts, flavonoids and different phenolics into phospholipids. Phytosomes have higher bioavailabilities and their absorption in the body are higher than plant extracts. During phytosome production, the components in the plant extract bind with phospholipid and a phyto-phospholipid complex is formed. As a result of this interaction, a complex that is both water-soluble and lipid-soluble is formed, which is the greatest advantage of phytosomes, because some of the flavonoids are highly lipophilic and therefore difficult to add to aqueous foods. Thanks to these structures, which generally find application in the pharmaceutical, herbal product and cosmetic industries, the absorption and bioavailability of nutraceuticals and health-promoting supplements are increased; in addition, the taste and aroma of food products, as well as color and textural properties can be improved. Nanophytosomes, on the other hand, are structures created by reducing these lipid-based carrier systems, which are used for the encapsulation and transport of bioactive components, to nano size.

Phenolic compounds in the foods have critical importance in many respects such as their positive effects on human health; their antimicrobial and antioxidative properties; effects on taste, odor and color formation; causing enzyme inhibition and being a purity criterion. Since phenolic compounds have low stability both in food systems and in the gastrointestinal system due to their chemical structures, encapsulation of phenolic substances with suitable carriers can overcome stability and absorption problems in order to preserve their structural integrity and bioavailability. In this study, information about the general properties, production methods and use of nanophytosomes in foods is given.

Sustainable food systems are systems that ensure food security and nutrition for all without compromising economic, social and environmental fundamentals. The development of these systems is possible with the development of innovative, sustainable and new foods. With nanoparticles used in the transport of bioactive components, superior bioavailability can be achieved and sustainable functional foods can be developed. Nanophytosomes stand out as innovative nanoparticles with a high potential to contribute to the superior bioavailability they provide, the functional properties of the food in which they are contained, and increasing the shelf life, which is of great importance in terms of sustainability. The current study focuses on the importance of nanophytosomes for the development of sustainable food systems.

Keywords: *Phenolic compounds, phytosome, nanophytosome, nanotechnology, stability.*

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A SUSTAINABLE FOOD SOURCE: ALGAE

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ABSTRACT

Algae are photosynthetic microorganisms consisting of heterogeneous groups of organisms that live in salt or fresh water environments that convert sunlight, water and carbon dioxide into biomass. Among the algae, especially phytoplankton, which are commonly classified as microalgae (phytoplankton) and macroalgae (seaweed) according to their size, show high productivity and can grow rapidly. Acting like higher plants, they store lipids in the form of triacylglycerol. They may contain lipids up to 20-80% of their dry mass. These rates are much higher than the amount of vegetable oil obtained with the highest efficiency. In addition, the composition of algae contains protein, dietary fiber and high amounts of bioactive compounds. They are considered as an additional food source due to the carotenoids, carbohydrates, sterols, vitamins, pigments, polyunsaturated fatty acids especially ω -3 in their structure. Algae have been part of the human diet for many years. In addition to macroalgae, some microalgae are also known to be grown for foods and food additives. While China and Indonesia meet 95% of algae production, the consumption of algae as a food is mostly seen in Japan.

Algal oils are used in the production of functional foods, due to their ω -3 fatty acid contents. In addition to the food industry, it is preferred as a raw material in the cosmetics and pharmaceutical industries, during the production of bioenergy and biofuels. At the same time, it is used in order to reduce the CO₂ concentration in nature and in biological improvement applications, as well as algae are used as nitrogen-fixing biofertilizers. Since our country is suitable for solar energy, algae culture can be easily grown in open ponds or photobioreactors. Within the scope of this study, information was given about the composition and properties of algae, their classification, production and harvesting of algae cultures, oil extraction from collected biomass, as well as the properties and usage areas of algal oil. The aim of the present study is to introduce algae as an alternative source of ω -3 and to provide information on the inclusion of algae-enriched foods as supplements in the human diet (especially for vegetarians and vegans). The subject of the study aims to draw attention to an alternative food source that has the potential to be used better in today's world where sustainability is gaining more importance.

Keywords: *Algae, algal oil, functional food, ω -3 fatty acid.*

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USE OF WATER KEFIR BACTERIA AS CULTURE IN WHITE CHEESE PRODUCTION

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ABSTRACT

Cheese is a valuable dairy product that has been produced all over the world since ancient times, according to the raw materials used in production and the differences in the production method. In addition to its nutritive effect, many functional properties can be added to cheese. In recent years, the use of probiotics in cheese from dairy products is very common. Water kefir is produced using a polysaccharide biomass structure (grain). Water kefir grain, like milk kefir grain, contains a wide variety of probiotic microorganisms.

The aim of this project is to produce white cheese using water kefir culture as a culture with two different enzymes (animal rennet and microbial rennet) and compare it with some quality parameters. In our research, chemical (pH, titration acidity, total dry matter), microbiological (lactic acid bacteria, yeast and coliform), color and sensory evaluation (scoring test) were performed.

It was observed that the pH values of the samples using water kefir culture were not significant compared to the uncultured productions. It was determined that the % dry matter values of the white cheese samples produced using water kefir culture decreased significantly compared to the samples without culture. % salt values were determined to be in the range of 1.18-1.65. According to the color analysis results, it was determined that there was no significant difference between the samples. Microbial and animal liquid rennet and water kefir culture added white cheese on the first day *Lactobacillus* spp. content was determined as 6.47 and 7.06 log cfu/g, respectively. In the production of white cheese produced with both liquid rennet and water kefir cultures, *Lactobacillus* spp. Its content is in the range of 7.26-7.75 log cfu/g.

As a result; With the use of water kefir as a culture in cheese production, the presence of rich lactic acid bacteria in cheese was determined for 30 days and the culture used did not have a negative effect on the chemical properties and structure of the cheese. Its rich bacterial content shows its usability in production. With a different research, the source of the positive contribution to the taste evaluation can be determined by determining the aroma components.

Keywords: *Cheese, probiotic, water kefir, functional.*

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GENETIC HERITAGE AND TRADITIONAL CHEESES

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ABSTRACT

Traditional foods reflect the cultures, geographical characteristics and dietary habits of societies. Among the traditional dairy products, the greatest variety is seen in cheeses. Cheese is a valuable dairy product in that it is durable and has varieties that can satisfy consumer expectations. In generally, it is a dairy product obtained by separating whey, shaping the curd and salting it after of whole milk, cream, partially or completely skimmed milk, buttermilk or a mixture of several or all of these coagulation with rennet or organic acids, and consumed fresh or after ripening. Although there are many reasons for this diversity, it is due to the geographical region, the use of different animal milks as raw materials, the technological processes applied, the ripening or non-ripening of cheeses, and even the nutritional habits in different regions of the same country. Traditional cheeses come forward with their unique physical, chemical, textural and sensory properties. With the age of technology, the interest in traditional cheeses in Türkiye produced in different regions, especially in many years, has brought many studies. The most produced and consumed traditional cheeses in Türkiye are White Cheese, Kaşar, Tulum, Mihaliç, Dil, Otlu, Örgü, Çerkez, Halloumi, Lor and Civil. Defining the structures of traditional cheeses and elucidating their microbiota are important for the continuity of production. In the research of artisanal cheeses, are preferred produced by traditional methods, especially in order to maintain the genetic heritage of cheeses, which play an important role in the creation of their textural and sensory characteristics.

The microbiota of traditional cheeses includes the most important step in transferring production to industry and ensuring that it remains active for generations. Lactic acid bacteria (LAB) are recognised as the predominant microbiota of artisanal cheeses. LAB metabolites vary according to the cheese type, production processes and ripening conditions. Characterization of the lactic acid bacteria in traditional cheeses may provide valuable markers of identity. Methods based on genetic structures are used in the identification of microorganisms (PFGE, PCR, 16s rDNA and MALDI-TOF etc.) Depending on the technique used in these molecular methods, identification can be made at the level of genus, species, subspecies and strain. In addition, these genotypic methods can be used to distinguish genetically similar species.

Keywords: *Traditional, cheese, microbiota, heritage.*

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NOVEL NOMENCLATURE FOR BUTTER CULTURE

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ABSTRACT

Butter is a dairy product made by churning out fresh or fermented cream or milk. It constitutes a large part of the nutritive value of milk. Converting milk fat to butter is one of the oldest ways to preserve milk fat. Butter production is generally classified as unsalted sweet cream, salted sweet cream, unsalted/salted cultured butter or traditional sour cream butter. In the production of butter, the cream can be fermented to manufacture "cultured cream butter", unlike "sweet cream" butter made from uncultured cream with the addition of lactic acid and aroma-forming microorganisms. This process defined as biological ripening can be applied to the formation of unique taste-aroma compounds in butter. Currently, starter cultures containing *Lactococcus lactis* ssp. *lactis*, *Lactococcus lactis* ssp. *cremoris*, *Lactococcus lactis* ssp. *lactis* biovar. *diacetylactis* and *Leuconostoc mesenteroides* ssp. *cremoris* strains are used in butter production. Among these bacteria, *Lactococcus lactis* ssp. *lactis* and *Lactococcus lactis* ssp. *cremoris* are acid producers; *Lactococcus lactis* ssp. *lactis* biovar. *diacetylactis* and *Leuconostoc mesenteroides* ssp. *cremoris* are the aroma producers. In recent years, comparison of DNA sequences of lactic acid bacteria isolated from butter and used as starter culture has enabled the reclassification of known species and the identification of new species. The method of DNA sequencing is used by taxonomists to infer the relevance of an organism's DNA base composition. This is usually expressed as a percentage of guanine plus cytosine (G+C) in the base composition. The base composition of a single species is theoretically a fixed property; therefore, a comparison of G+C content in different species can reveal the degree of species-related. This study has aimed to give information about the reclassification and nomenclatural of bacteria used as starter cultures in butter production.

Keywords: *Nomenclature, starter culture, butter.*

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MICROBIAL AND SENSORY EVALUATION OF HOMEMADE WINE PRODUCED FROM WATERMELON AND PINEAPPLE FRUITS BLEND

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ABSTRACT

This study focused on the sensory and microbial evaluation of homemade wines produced from watermelon and pineapple fruit blend. The wines were produced using standard the standard procedures with three different mixing proportions (50:50, 80:20 & 20:80) of fruit blends under the same conditions and procedures. The microbial evaluation was conducted on the wine samples to determine the consumption safety using standard methods. The samples were presented to a 100 member panelists to rate them on the hedonic scale where 9 was maximum and 1 was minimum. The result showed that WP1 (50:50) had the lowest value of Total Heterotrophic Bacterial Count and Fungi Count of 1.0×10^2 Cfu/ml and 0.00Cfu/ml respectively. Also, results showed that there are significant difference at ($p < 0.05$) in the results for sensory evaluation between WP1 (50:50), WP2 (80:20), and WP3 (20:80), as WP3 had the highest in all the sensory qualities of appearance, aroma, taste, consistency and general acceptability respectively. It was concluded that wine produced from 20% watermelon, and 80% pineapple (WP3) was most preferable by the panelists, while wine produced from 50% watermelon, and 50% pineapple (WP1) was the safest. However, all samples are safe for consumption because their values met the safe levels of both the heterotrophic and fungi counts. The study therefore recommends that WP1 sweetness should be improved upon because of the mild bitterness taste.

Keywords: *Perishable product, homemade, microbial load, sensory, wine, safety.*

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QUALITY CHARACTERISTICS AND ACCEPTABILITY OF STEAM BEAN PUDDING (*MOIMOI*) ENRICHED WITH FLUTED PUMPKIN (*UGU*) LEAF SLURRY

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ABSTRACT

The need to diversify the utilization of abundant leafy vegetable in our environment coupled with the efforts to enrich the traditional culinary formed the basis of this study. Steamed bean pudding was enriched with fluted pumpkin leaf slurry at 5, 10 and 15 % levels of inclusion. The enriched pudding was subjected to proximate analysis, antioxidant properties, phenolic content, mineral composition and sensory evaluation. The results showed that the ash content of the samples ranged between 3.80 to 6.64 % and the protein content ranged between 24.52 and 26.27 %. The results of the antioxidant also showed that the radical scavenging ability of the enriched bean pudding samples (11.87 to 20.60 %) was greater when compared with the control pudding (10.87 %), the ferric reducing antioxidant power of the enriched samples (1.36 and 1.80 mgAAE/g) was lower compared with 1.98 mgAAE/g for the pudding without leafy vegetable pudding. Enriched bean pudding with fluted pumpkin leafy vegetable contained higher phenolic content (0.79 and 0.89 mg GAE/g) than the 0.72 mg GAE/g bean pudding without leafy vegetable slurry. The results of the mineral content showed that Magnesium was dominant in the enriched pudding than the other mineral elements evaluated. The results of the sensory evaluation revealed that the preference for the samples decreased as the level of inclusion of the vegetable leaf slurry increased. Findings from the results showed that though the enriched steamed pudding samples nutritional great nutritional benefits, the green colour of the samples affected the acceptability. Therefore, more sensitization of the products is needed to gain wide acceptance.

Keywords: *Bean pudding, nutritional benefits, antioxidant properties, functional foods, consumer awareness.*

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REVEALING THE BACTERIAL POPULATION IN BRINE BELONGING TO EZINE PDO CHEESE FROM A METAGENOMIC PERSPECTIVE

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ABSTRACT

Brined cheeses are among the most produced cheeses in the Mediterranean and Balkan countries. These are also called white cheeses, and Feta cheese in Greece and Ezine cheese in Turkey, which have received PDO certification, can be given as their examples. These cheeses are in the group of ripened cheese produced using raw milk. Revealing the microbiota of PDO cheeses is important in terms of determining the characteristics of the product. In this context, metagenomic approaches using the next-generation sequencing, which provide faster and more detailed results rather than the culture-dependent methods, have become prominent. With the metagenomic methodology, in addition to the studies examining the microbiota of cheese, determining the microbiome of the brine will provide more detailed information about the properties of the product. This study was designed for revealing the bacterial population in the brines of Ezine cheeses by next-generation sequencing. Brine samples were collected from Bayramiç and Ezine districts of Çanakkale (Turkey). Following the isolation of total DNA from the brine samples, PCR amplification of 16S rRNA genes was performed and a 16S library was prepared. The resulting library was sequenced on an Illumina NovaSeq platform according to the Illumina 16S metagenomic sequencing library protocol. To denote the taxonomy of each sample, similar sequences were clustered and defined into the Operational Taxonomic Units (OTUs) they represent. Species richness and distribution uniformity of bacterial communities were determined by alpha diversity indices (Shannon, Simpson). It was determined that *Proteobacteria* (40.74-68.43%) and *Firmicutes* (28.83-48.04%) were dominant phyla in brine samples, followed by *Bacteroidetes* phylum (2.51-9.90%), and *Actinobacteria* phylum constituted the least portion (0.07-1.12%). At the genus level, a total of 33 genera were identified with over 0.20% relative abundance, and the most dominant genera were found to be *Lactococcus* (13.60-42.23%) and *Pseudomonas* (53.81%). Also, genera of *Streptococcus* (2.15-7.06%) and *Acinetobacter* (2.86-5.45%) were prevalent. As for the species level, *Pseudomonas parvalactis* (53.09%), *Lactococcus lactis* (2.39-12.29%), and *Lactococcus raffinolactis* (1.13-38.88%) species were dominant. Surprisingly, the next-generation probiotics *Prevotella copri* (0.29-0.57%), *Faecalibacterium prausnitzii* (0.29-0.35%), *Bacteroides coprocola* (0.31-0.50%), *Bacteroides plebeius* (0.39%), and *Bacteroides vulgatus* (0.27-0.32%) were detected, but at low proportions. While 162 OTU-species were determined in the samples from the Ezine district, 106 OTU-species in the samples from the Bayramiç district. Shannon index was found to be higher (4.03-4.43) in the samples collected from the Ezine district, where species diversity was the highest. On the other hand, Simpson index, which indicates the evenness distribution of abundances of the species, was found to be lower (0.68-0.70) in samples taken from the Bayramiç district, where a specific species was more dominant. This study is the first to examine the bacterial population in the brine of Ezine cheese. This study provided important data about the bacterial composition in the brine of Ezine cheese through a metagenomic approach. Generally, it can be said that psychrophiles and lactic acid bacteria species dominated the brine microbiota. Cheese brines also included the next-generation probiotics. This study may be the pioneer of studies that will examine the effects of cheese brines containing the next-generation probiotics on human health *in vitro*

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and *in vivo*. In subsequent studies, Ezine cheese production can be tried with the back-slopping method using cheese brine. Besides them, cheese brine can be a source to isolate various bacteria and the next-generation probiotics by culture-based methods.

Keywords: *Cheese brine, bacteriome, species diversity, next-generation probiotics, traditional cheese.*

COMPARATIVE STUDY OF PHYSICO-CHEMICAL PROPERTIES OF TOMATO PRODUCTS

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ABSTRACT

The objective of this study was to investigate of the chemical and physical properties of tomato paste and ketchup, which are the main tomato products produced in Kyrgyzstan, and comparison of the properties of samples of ketchup produced in our country with imported ketchup. The dry matter, moisture, ash, dietary fiber, lycopene, vitamin C content, water activity, color, pH, titratable acidity and rheological properties of the samples were analyzed. The studied samples of tomato paste and ketchup differed from each other in physical and chemical properties. The content of lycopene was found to be higher in tomato paste samples than in ketchup. Ketchups produced in our country are not inferior to imported ketchup samples in terms of chemical and physical properties. It was determined that the viscoelastic characteristics of these products is mainly related to dry matter content. Tomato paste is used as a main ingredient for the manufacture of ketchup products. The obtained results can be used as an initial source of information in the production of ketchup from tomato paste.

Keywords: *Tomato paste, ketchup, viscoelasticity, ycopene.*

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TRENDS AND DEVELOPMENT WORK FOR PACKAGED NON-ALCOHOLIC BEVERAGES FUTURE FUNCTIONAL PRODUCT DEVELOPMENT OPPORTUNITIES

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ABSTRACT

Packaged soft drinks are grouped as carbonated/still beverages, fruit juices and bottled waters. This sector has a significant impact on the world economy with an average volume of 109.5 L per capita in 2020. It is expected that the volume of this market will increase further in the coming years. Despite the pressure of global trends, such as reducing sugar in this work, drinks will remain on the market because they give people hydration and pleasure; however, In product development, it has begun to move from standard sugary formulations to functional formulations in which undesirable ingredients are reduced with additional functional ingredients and satisfactory flavors. Additions or reductions not easy tasks due to losses in formulations in desirable sensory properties, especially taste and mouthfeel, possible quality and stability problems during storage and difficulties in maintaining them to the end of shelf life. To solve these problems and succeed in this consumer-important industry, it is important to know the technical fundamentals of beverages to create opportunities in this space shaped by global consumer and product trends. Packaged soft drinks are one of the preferred products because they are pleasurable and useful in end use. We see it much earlier in these product categories in analyzing and developing new product entry into the market. In this review, important points in the production and emulsion technology for the inclusion of functional ingredients are included in order to indicate the points that both academic and industry professionals should pay attention to due to the lack of studies on the classification, production, ingredients, trends, future ingredients and product development areas of soft drinks.

Keywords: *Soft drinks, functional ingredients, emulsion technology.*

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LISTERIA MONOCYTOGENES- CONSUMER FOOD SAFETY CONCERNS

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ABSTRACT

Listeria is one of the most intensely studied genera of bacteria during the past 30 years. This reflects its importance as a public health concern, as a tool for studying virulence and immune response, and as a challenge to traditional means of controlling foodborne pathogens. Important foodborne pathogen *Listeria monocytogenes* is linked to high hospitalization and case-fatality rates. Because people choose how to handle food when they shop, store, and prepare it at home, consumers can help reduce the risk of contracting *L. monocytogenes*. Observational study contradicts self-reported habits when it comes to food safety when it comes to food preparation and handling, despite the fact that the majority of consumers claim to be knowledgeable about these topics. Undercooking food and failing to use correct refrigerator storage settings are two of the most prevalent consumer food safety practices that raise *L. monocytogenes* hazards. The number of customers who are vulnerable is growing and could make up as much as 30% of the total population. Pregnant women, newborns, and those whose immune systems have been impaired by cancer, renal illness, diabetes, HIV/AIDS, or advanced age (>65 years old) are at risk for contracting listeriosis. The ability of *L. monocytogenes* to adapt to and defy typical measures used to restrict its presence makes the control of *L. monocytogenes* contamination in food processing facilities hard. *L. monocytogenes* continues to be the main obstacle for the food industry despite numerous successes in industrialized nations, particularly in the areas of public health, food safety, program administration for promoting health, and advancements in laboratory diagnostics techniques.

Keywords: *Listeria*, food safety, foodborne pathogen, risk assessment.

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SENSORY PROFILE AND PHYSICOCHEMICAL COMPOSITION OF PREMIXED AND POSTMIXED FRUIT WINE FROM BLENDS OF PINEAPPLE AND WATERMELON JUICE

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ABSTRACT

Wines are mostly produced from grapes which are not grown in Nigeria, hence the need for alternative use of fruits for wine production. Tropical fruits have high perishability, thus, the production of wine from common fruits could help reduce the level of post-harvest losses and increase variety of wine. The wine samples were produced from juices that were blended before and after fermentation known as premixed; coded as PWp and post mixed; coded as PWs at the ratio of pineapple to watermelon as follows 90:10, 80:20, 70:30, 60:40, and 50:50, and fermented for 7 days at 28 ±2°C and aged for two weeks, bottled and corked. Physicochemical analysis and sensory evaluation were carried and experimental design used was a split plot in Completely Randomized Design and data obtained were statistically analyzed. pH of both premixed and post mixed wine decreased as total acidity increased which may be due to yeast metabolism. Total soluble solid decreased in premixed wine due to the level of water melon added to pineapple wine increased; while increase in post mixed wine increased as level of watermelon added to the pineapple wine increased. Moisture content of the wines reduced. There was increase in alcohol content of premixed and post mixed wine. Post mixed wines were preferred and had higher scores in terms of taste, mouth feel and overall acceptability. Blending of pineapple and watermelon after fermentation in the ratio of 80:20 was the best in physicochemical examination.

Keywords: *Tropical fruits, variety, split plot, total acidity, total soluble solid, alcohol content.*

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EFFECT OF BLANCHING AND DRYING ON NUTRITIONAL, ANTIOXIDANTS, FUNCTIONAL AND SENSORY ATTRIBUTES OF DRIED *EWEDU* (*CORCHORUS OLITORIUS*) LEAVES

Tolulope ADEJUMO¹, Oluwatoyin OLADEJI², Kehinde Adekumbi TAIWO³

ABSTRACT

Corchorus olitorius (*Ewedu*) is a traditional leafy vegetable in Africa and highly appreciated for its mucilaginous (drawability) property in various traditional food preparations. Effect of different type of blanching and drying methods of *ewedu* leaves on nutrients, antioxidants, functional and sensory attributes were examined. *Ewedu* leaves were destalked; steam and water blanched; dried in sun and in oven at 50 and 70°C. The resulting dried products were reconstituted and cooked into soup to determine drawability and sensory attributes using standard procedures. Protein, ash, and fibre contents of dried *ewedu* leaves ranged from 12.06 % to 14.83%, 6.50 to 11.75%, 4.23 to 5.48% respectively. Steam blanched sample oven dried at 50°C yield higher mineral content than other samples. Flavonoid, total phenols and vitamin C ranged from 0.45 to 2.64 mg RE/g, 0.29 to 4.47 mg GAE/g, 4.88 to 14.80 mg/100g respectively. Control samples had the highest value (0.018 m/s) for drawability, and the value was significantly different ($p < 0.05$) from those of blanched samples (0.008 – 0.010 m/s). Steam blanching and drying in oven preserved most of the nutrients with acceptable drawability better and more acceptable to the consumer than water blanching and sun drying.

Keywords: *Ewedu* soup, drawability, reconstitution, antioxidant, proximate.

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CHARACTERIZATION AND EVALUATION OF END-USE QUALITIES OF *ORYZA SATIVA L-ORYZA GLABERRIMA* HYBRID AND *ORYZA GLABERRIMA* SPECIE CULTIVATED IN IBAJI LGA OF KOGI STATE, NIGERIA

Chinenye. E. AZUKA¹, Felix U. ASOIRO², Adaora. N. NWOSU³, Kingsley. O. OMEJE⁴

ABSTRACT

Oryza glaberrima (*Oje-Igbale*) and *Oryza sativa L-Oryza glaberrima* hybrid (*Adede-agidi*) are two rice varieties cultivated in Ibaji LGA of Kogi State, Nigeria, and each of them is used for only a singular purpose. Studies were carried out to find out the characteristics of these grains and further processes it could be subjected to in order to contribute in the strive for food security. Three (3) samples each, of the two different rice varieties' paddy, were procured, cleaned, a portion parboiled, milled and thereafter analyzed for their physical and cooking, attributes. Un-parboiled paddy of the two rice varieties were dehusked, milled into flour and samples used to determine their physicochemical properties. For the physicochemical properties, the starch content of *Oje-Igbales*' were of hard gel consistency (29.32- 38.11 mm) and intermediate-amylose content (20.78- 24.68 %) depicting it will be a good variety for high temperature treatment processes. The starch content of the *Adede-agidis*' were of soft gel consistency (66.43– 72.52 mm), low- and intermediate-amylose content (18.47- 20.23 %) depicting it will be suitable for breakfast cereals, fermented rice cakes and baby foods. This research provides knowledge on the characteristics and other end use qualities of *Oje-Igbale* and *Adede-agidi* for value addition.

Keywords: *Rice, quality characteristics, oje-igbale, adede-agidi, oryza glaberrima, oryza sativa.*

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DISTINCT FOOD ITEMS OF SINGPHO COMMUNITY AND ITS IMPORTANCE FROM THE NUTRITIONAL POINT OF VIEW

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ABSTRACT

The food we eat can affect our health and our risk for certain diseases. Eating healthy food is important for health. Different cultures have different dining habits.. The Singpho are a tribe who inhabit parts of India, China and Myanmar. In India these people reside in the state of Arunachal Pradesh in the district of Lohit and Changlang and in Assam inhabits in the district of Tinsukia and scattered in some other district like Sivasagar, Jorhat and Golaghat. In this paper an attempt has been made to study about the food items of the Singpho Community and it's nutritional value were also studied. Different food items of the Singpho Community are steamed 'Maytong' rice, Pungkhong Sat, Passa, Kumusi, Wuhkaung, Sat Sapung or Khawlam etc. No oil is used in the dishes and ginger, garlic, onion, coriander and bamboo shoot are the main spices along with traditional herbs and chillies. Through analysis of the food items it was found that the food items of the Singpho Community contains different nutrients such as carbohydrates, protiens, vitamins and minerals. But low in fat as they use no oil. Their diet is found to be protein rich.

Keywords: *Singpho community, food, nutritional.*

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ROASTED FISH RECIPE IN INDIAN FOOD WITH SPECIAL REFERENCE TO NORTH-EASTERN INDIA

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ABSTRACT

Fish is considered as the healthiest food in the planet due to its nutritional quality and delicacy. The annual per capita consumption of fish for the entire Indian population is estimated at 5-6 kg whereas for the fish eating population it is found to be 8-9 kg. Fish is included in daily diet in North-Eastern India and people enjoy the typical flavour of traditional cuisine like grilled, roasted, smoked and fermented fishes since years. Roasting of Garai, *Channa punctatus* is one of the most popular roasted fish recipes in this region. To prepare this food, generally woods are burned in the fireplace on which a wired mesh grill cot is placed, then live fishes, without dressing and salting, are spread for drying as well as grilling/roasting and partially cooking on moderate heat. Fishes get turned over frequently for uniform heating and process may be continued till the fishes dried up to moisture content below 10% and fishes turned into black. Then stored fishes are packed in a wooden box for storage and transportation. Roasted fishes may be consumed directly or cooking them in gravy or dal preparations for additional flavor as well as nutrition. This is a traditional fish processing and conventionally used by the North-Eastern people.

Keywords: Fisheries resource, nutrition, traditional fish products, roasted fish.

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ALIMENTARY SYSTEMS, GIAHS AND BLUE ZONES

María Patricia SÁNCHEZ¹

ABSTRACT

The integration of several strategies that preserve and protect alimentary systems like the agriculture, the diversity and sustainable use of ancestral local products, the culture and identity, prioritizing healthy food and life styles, it becomes a solution for the objectives of sustainable development, achieving food security and the rural territorial development. These ancestral systems protected by the network GIAHS (Global Important Agriculture Heritage systems) or SIPAM in Spanish (FAO, UNESCO, UNWTO, RIMISP and others); All this jointly with the program of blue Zones, it will allow to know more about the key local products and the gastronomy of the five zones considered the most long-lived ones in the world.

In Costa Rica, one of these five zones is located at Nicoya, Guanacaste, where his alimentation base is the indigenous trilogy, the Middle American and ancestral gastronomy, based in corn, the bean and cucurbitaceous (the pumpkin, chayote and other ones). Gastronomy, the genetics of the population, the way of life and their culture, they favor their longevity

Keywords: *Alimentary systems; GIAHS, blue zones.*

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THE EFFECT OF DIFFERENT PREPARATION PROCESSES ON THE ANTIOXIDANT ACTIVITY AND TOTAL PHENOLIC CONTENT OF MATE TEA AND GREEN TEA

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ABSTRACT

The positive effects of medicinal and aromatic plants on health increase their use. The use and effects of teas in the world and in our country have been proven with studies. Mate tea is used in mental and physical fatigue, gastrointestinal problems, arthritis, liver diseases, obesity and depression widely. Caffeine which one of the compounds in its structure shows that diuretic and antirheumatic effects. Also it helps to lose weight by increasing the breakdown of fat and sugar. Similarly, green tea has different pharmacological effects such as antioxidative, anti-inflammatory, antimutagenic, anticarcinogenic, antiangiogenic, apoptotic, antiobesity, hypocholesterolemic, antiatherosclerotic, antidiabetic, antibacterial, antiviral, anti-aging. In this study, total phenolic contents (TPC) and DPPH radical scavenging activities of mate and green tea were compared.

In addition, the effects of two different preparation processes such as brewing and boiling and different durations on the total phenolic component and DPPH radical scavenging activities were observed. For this purpose, various brewing and boiling times were used for the preparation of mate and green tea samples, and the results were also compared in terms of total phenolic content and antioxidant activity. The brewing and boiling of teas processes were performed at different times (5 min., 10 min.). In the samples prepared by brewing, 100 mL of hot water was added to 10 g mate tea and green tea and they were brewed for 5,10 minutes. Then the prepared samples were filtered through filter paper. In the samples prepared by boiling, 100mL of hot water was added to 10 grams of mate and green tea and boiling was applied for 5,10 minutes after it started to boil. Afterwards, the filtering process was applied. In total of 8 samples were obtained and total phenolic and DPPH radical scavenging activity tests were performed. The lowest total phenolic content was determined as 520.97 mg GAE/mL in mate teas obtained by brewing for 5 minutes while the highest amount of phenolic substance was determined as 2148.30mg GAE/mL in green tea obtained by brewing for 10 minutes. The total phenolic content increased as the preparation time increased in mate and green teas prepared both by brewing and boiling.

The highest DPPH radical scavenging activity was calculated as 82.83% in green tea obtained by boiling for 10 minutes while the lowest DPPH radical scavenging activity was calculated as 60.81% in mate tea obtained with boiling for 10 minutes. The boiling process in mate tea and the brewing process in green tea resulted in higher amount of phenolic substances. DPPH radical scavenging activity is similar in the all samples. DPPH activity value was increased to applying the boiling process in green tea. Thanks to this study; we conclude that the applied processes and durations are quite effective of value DPPH scavenging activity and total phenolic content.

Keywords: *Mate tea, green tea, antioxidant, phenolic.*

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BEE PRODUCTS AND USAGE IN FOOD

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ABSTRACT

Bee products, which are rich in bioactive components, have been used in many sectors, especially medicine, cosmetics and food industry from past to present. Honey, which is one of the bee products used for the treatment of diseases, for the enrichment and preservation of foods, is the most widely used bee product. Although propolis, royal jelly, bee pollen, bee venom, beeswax, apilarnil and bee bread are less known and consumed bee products, they are at least as effective as honey in preserving and enriching foods due to the ingredients in their composition. The interest in bee products with high commercial value is increasing. Recent studies show that a rapidly increasing number of studies have been conducted on the use of these little-known products in foods, and their effect on increasing the quality of food products and extending their shelf life has been examined. Studies show that bee products are very rich in terms of protein, carbohydrates, vitamins, minerals and phenolic substances. It has been determined that when added to foods such as meat, milk, cereal products, it improves the nutritional composition of foods, prevents oxidation and microbial growth, and ensures longer preservation. Propolis and royal jelly are not as widely used as honey due to their sharp taste, smell and expensiveness.

The chemical composition of bee products varies depending on factors such as season, geographical feature, plant origin. While honey is a carbohydrate-rich product, bee pollen is rich in protein. Royal jelly has a high water content. Royal jelly, which is rich in protein, lipid, oil and mineral substances, has an acidic taste. Although bee bread is mostly mixed with pollen, it is richer than pollen in terms of bioactive components and should be kept in a cool environment and consumed quickly. As the bee bread waits, it loses its biological activity. Apilarnil, which is used abroad, contains all of the essential amino acids.

In this study, literature studies on bee products and their use in food were reviewed.

Keywords: *Bee products, food, antimicrobial activity.*

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ENCAPSULATION OF BIO-ACTIVE COMPOUNDS FROM GRAPEFRUIT WASTE: A BY-PRODUCT VALORIZATION APPROACH

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ABSTRACT

Fruit and vegetable by-products represent one of the world's most common environmental pollution problems. However, these wastes are now being recognized for their functional value. Grapefruit is a wonderful fruit belong to *Rutaceae* family, popularly recognized for color varieties, and loaded with phenolic acids, flavonoids, ascorbic acid, and dietary fiber. However, grapefruit processing accounts for more than 50% waste yield which only adds to wastage and consequently discarding problems. Grapefruit by-products offer bioactive compounds from *viz.* peel, pomace, and seeds, which holds health benefitting properties and hence can be proficiently used. But concern associated with the instability under normal conditions (pH alterations, temperature, light, O₂) restricts their use. Opportunely, encapsulation technique is viable to decrease sensitivity to environmental conditions while improving the stability. Apart, encapsulation offers wide food industry application with various purposes, including enrichment, fortification, and coloring. Fostering the concept, advance technologies for extraction such as non-thermal technologies and encapsulation such as physical and chemical methods are in trend to actualize the strategy. Application can be improved by employing appropriate encapsulation techniques and wall materials which also offers futuristic scenario. Extraction of valuable compounds from grapefruit by-products for practicable utilization as encapsulation also connotes roadmap towards sustainability.

Keywords: *Grapefruit, encapsulation, bioactive components, essential oil, core and wall material.*

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NUTRITIONAL AND PHYTOCHEMICAL COMPOSITIONS OF EDIBLE WILD MUSHROOMS FROM ENUGU, NIGERIA AS INFLUENCED BY SUBSTRATES

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ABSTRACT

Edible wild mushrooms help low-income families maintain their food security and nutrition. Estimating the natural substrate's contribution to the composition of wild mushrooms will help consumers and the pharmaceutical industry to understand the nutritional and therapeutic benefits of these mushrooms. The goal of this experiment was to see how natural substrates affected the proximate, mineral, vitamin, and phytochemical compositions of edible wild mushrooms. In Enugu State, Nigeria, seven wild mushrooms species collected from three different substrates were identified and analysed for their physical and chemical composition. The data was subjected to analysis of variance, principal component analysis, and hierarchical cluster analysis. The results revealed that protein concentrations ranged from 3% to 19.48%. The ranges for fibre, ash, and carbohydrate were 0.83-5.25%, 1.77–12.25%, and 1.42–9.08%, respectively. K, Na, and P were the most abundant minerals in this study, followed by Mg and Ca. Vitamin A was the most abundant vitamin in the wild mushrooms studied, followed by vitamin C and vitamin E. Phenols, alkaloids, flavonoids, tannins, and saponins were also found in the wild mushrooms. The first four principal component axes had a total Eigen value of 20.44 (PC1 = 9.65, PC2 = 4.26, PC3 = 3.7, and PC4 = 2.84), which explained 75.7% of the variations in the mushrooms. The natural growth substrate of the mushrooms had a greater influence on their composition than the town of collection. The findings of this study could aid low-income families in identifying mushrooms with high nutritional value while foraging in the wild, thereby reducing hidden hunger.

Keywords: *Edible non-wood forest products, food security, fungus, minerals, termitaria, and vitamins.*

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FEEDING NIGERIA TODAY AND TOMORROW: ADOPTION OF UPGRADED TRADITIONAL FOOD TECHNOLOGY IN KWARA STATE

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ABSTRACT

It is apparent that Nigeria is struggling to ensure enough food to feed her teeming population due to the inherent factors associated with food processing technology. Reports indicate that the use of traditional technologies is majorly practiced by food processors while the products are characterized with loss of valuable nutrients, low yield, inconsistent product quality and quantity, poor packaging, and many other attributes. Various approaches have been introduced for traditional food processing technologies in order to transform these characteristics. The study was designed to examine the existing technologies for production of some major foods in Nigeria using Kwara State in correlation with the five main approaches obtained for upgrading the traditional food technologies. The use of improved raw materials; improved post-harvest handling, mechanization of some processing units; fortification or enrichment and packaging of products were the five approaches. The results indicated that traditional food technologies accounted for production of 96.5% of the staple foods. Varied levels of adoption of the five approaches for different food products were obtained. Chief among them were use of improved raw materials at 10.5%, fortification or enrichment at 5.1% and packaging of product at 9.5% while adoption of upgraded traditional technologies varied significantly. Significant relationships existed between the use of improved technologies for processing and age ($X^2 = 7.15$, $p = 0.05$), educational status ($X^2 = 6.18$, $p = 0.05$), sex ($X^2 = 11.20$, $p = 0.05$) and type of technology utilized. The need for reinvigorating of the traditional food technologies to feed the nation today and tomorrow is established.

Keywords: *Traditional food, food security, food processing, food enrichment, Nigerian foods.*

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ASSESSMENT OF QUALITY CHARACTERISTICS OF TABLE WINE FROM TAMARIND (*TAMARINDUS INDICA*) AND PASSION FRUIT (*PASSIFLORA EDULIS*)

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ABSTRACT

Background and Objectives: Table wine is produced from red grapes. However, there are some tropical indigenous fruits such as tamarind and passion fruits that are cheap, available and underutilized. This work was to assess the quality characteristics of table wine from tamarind (*Tamarindus indica*) and passion fruit (*Passiflora edulis*). Materials and Methods: Table wine was formulated from the blends of tamarind (*Tamarindus indica*) and passion fruit (*Passiflora edulis*) juice. The fruit must was fermented with *Sacchromyces cerevisiae* isolated from fresh palm wine and commercial brewer's yeast. The blended ratios were divided into two groups, the first six was fermented with isolate from palm wine while the remaining fermented with commercial brewer's yeast. After 14 days' fermentation, the wine was subjected to sensory evaluation for colour, flavour, taste, aftertaste, tartness, astringency, mouthfeel, clarity and overall acceptability using 20- man semi trained panelist. The formulated table wine was assessed for chemical composition, minerals, micro-nutrient, physiochemical parameters. Results: It show that the protein 0.88 to 4.88 (PTFA) and fat ranged from 0.2 (PFAA and GRFW) to 0.8 (TPFE). Carbohydrate ranged from 1.25 (TFAA) to 10.59 (PFAA) while moisture content ranged from 88.22 (PTFE) to 96.59 (TFAA), and ash ranged from 0.006 (TPFA) to 0.017 % (PTFD). The potassium and phosphorus ranged from 5.76 (sample TFAA) to 17.17mg/100 (TPFC) and 49.22 (TFAA) to 56.73mg/100 (PTFE), respectively. Vitamin A and C ranged from 1.07 (GRFW) to 3.02mg/100ml (PTFE) and 1.33 (TFAA) to 2.03mg/100ml (PTFE). The pH (before fermentation) recorded 2.60 for sample TPFA and 3.10 (PFAA). After fermentation, it tended to be more acidic to the range of 2.40 (TPFA, TPFB, PTFA and PTFB) to 2.90 (PFAA). The total soluble solids in degree Brix before fermentation was from 9.20 (PTFA) to 11.900 (PTFB) and after fermentation from 6.70 (TPFC) to 8.80 (° Brix) (PTFB and PTFC), while titrable acidity ranged from 2.40 (sample TPFA) to 3.24 % (TPFE), specific gravity before fermentation ranged from 1.00 (GRFW) to 1.075 kg/m³ (TPFA) and after fermentation 1.002 (GRFW) to 1.010 kg/m³ (TPFB). Alcohol value of the formulated table wine ranged from 5.94 (PTFA) to 9.05 (%) ABV (PFAA). The methanol and pectin content ranged from 0.031 (sample TPDF) to 0.041 mg/L (TPFA and PTFE) and 0.12 (TPFC) to 2.30 (%) (TPFE). Conclusion: Formulating wine from the blends of tamarind and passion fruit fermented with *Saccharomyces cerevisiae* from two different sources (isolate from palm wine and commercial brewer's yeast) had a high acceptability.

Keywords: Fermentation, passion fruit, *sacchromyces cerevisiae*, table wine, tamarind fruit.

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EFFECT OF DRYING ON THE QUALITY PROPERTIES OF 'POBOLO' A SOUTH- WESTERN TRADITIONAL SOUP FROM *STERCULIA TRAGACANTHA LINDL*

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ABSTRACT

Vegetables, especially the leafy types, are organically suitable choices for healthy foods with functional, nutraceutical and medicinal benefits. They play important roles in complementing staple foods, boosting health, sustaining well-being as well as inhibiting and preventing specific diseases by moderating the immunity of the body.

Sterculia tragacantha Lindl, that is sometimes described as a deciduous shrub, is a medium sized tree that grows to about 5-12 m tall and is usually known as African tragacantha. It is commonly used in some South-South, South-East and South-West regions of Nigeria for the treatment of cold, edema, diabetes, diarrhea and other infectious diseases. It has also been reported to have shown pharmacological potentials due to its antioxidant, antimicrobial, anti-inflammatory, anti-diabetic and several other activities.

There is dearth of information on its utilization as food even though in South-Western Nigeria, some towns (Imesi-Ile, Otan-Ile and Esa-Oke) cook the apical shoots of the tree as vegetable soup. Preliminary investigations have revealed an encouraging proximate, minerals and vitamins compositions as well as the secondary metabolites contents of the apical shoots. In furtherance to the promising proximate, mineral and vitamins contents of the plant as established in its use as vegetables, this study sought to establish the effect of drying on the quality parameters of this local cuisine. The findings shall be revealed in the full manuscript.

Keywords: *Sterculia*, traditional cuisine, vegetable, drying.

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EFFECT OF COMBINED PRESERVATION TECHNIQUES ON THE DETERMINATION OF THE DLC OF AN ARTISANAL FRESH CHEESE

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ABSTRACT

The objective of this work was to study a hurdle technique, namely the effect of the incorporation of essential oil of thyme encapsulated at different concentrations (0.5, 1 and 1.5 ml /kg) with LPS, on the quality of fresh cheese, through the evaluation of microbiological quality, physico-chemical parameters (titratable acidity, pH, total dry extract, fat, defatted dry extract, moisture and firmness) and organoleptic properties, during its storage at + 4±1°C for 18 days and to determine the shelf life of the products.

This combination had a significant impact on all physicochemical parameters throughout the shelf life of the cheese. On the other hand, the incorporation of essential oil encapsulated with LPS had no significant effect on the texture.

The combination of essential oil of thyme encapsulated with LPS showed that at the first day, the different concentrations had a significant effect on the microbiological quality compared to the control and LPS cheeses, but after nine days it was noted that only the concentrations of OEt of 1.5 and 1 ml /kg had a significant impact on the microbiological quality of the cheese compared to other samples. On the other hand, the activation of LPS alone had no significant impact on the evolution of these germs (mesophilic aerobic germs, yeasts and molds and total coliforms).

Regarding sensory analysis, no descriptor (color, odor, texture and overall acceptability) had a significant effect detected by the panel throughout the shelf life.

These preservation combinations allowed an extension of the shelf life. In fact, the control cheese had an expiration date of 3.63 days and the one preserved by LPS only of 3.09 days. On the other hand, the combination of essential oil of thyme encapsulated with LPS allowed to increase the shelf life of fresh cheese by 4.19, 8.01 and 10.40 days respectively for OEt concentrations of 0.5, 1 and 1.5 ml/kg with LPS activation.

Keywords: Cheese, preservation techniques, food.

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INFLUENCE OF PASTEURIZATION, SULPHITING AND ADDITION OF YEAST ISOLATE TO MUST ON THE MICROBIOLOGICAL AND BIOCHEMICAL PRODUCTION OF WINE FROM OVER RIPE PLANTAIN

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ABSTRACT

Wine is essential in every celebration but it is very expensive in countries where grape is not grown. *Agadagidi*, an effervescent wine analogue with sweet-sour taste is locally produced from overripe plantain which is abundant in the Tropics. This research produced *agadagidi* by sulphiting the must with or without inoculating with *Saccharomyces cerevisiae* isolated from spontaneous fermentation. Some of the samples were also pasteurized with a view to producing *agadagidi* with consistent quality. Microorganisms were enumerated, isolated and identified during storage, sugars, pH, TTA and sensory properties were also assessed using standard methods. The result showed that the range of TVC, LAB, and fungi count were 5.571 – 9.076 log cfu/ml, 2.717- 9.253 log cfu/ml and 4.079 - 9.418 log cfu/ml respectively. Microorganisms isolated were *Saccharomyces cerevisiae*, *Saccharomyces bayanus*, *Pichia kluyveri*, *Candida albicans*, *Bacillus pumilus*, *Lactobacillus plantarum*, *Bacillus subtilis* and *Leuconostoc oenos*. The reducing sugar was higher in unpasteurized samples than pasteurized sample at the beginning of storage. Total sugar generally decreased while the TTA increased during storage. The sensory score showed that all unpasteurized samples and pasteurized sample without isolate and sulphite were accepted by the panelists. This study therefore suggests the use of sulphite with or without starter culture in the production of *agadagidi* with consistent quality.

Keywords: *Microorganisms, sulphiting, pasteurization, agadagidi, sugar, sensory properties.*

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PERSPECTIVE ON UTILIZATION OF LEAF MEAL AS FISH FEED INGREDIENT FOR FISH IN FUTURE AQUACULTURE

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ABSTRACT

Fish feed accounts for around 60% of the operational cost of fish production, it makes sense for farmers to employ plant-based aquatic feed ingredients instead of expensive animal protein diets. The researchers have focused their efforts on developing alternatives to DORB, fish meal, soyabean meal etc. Plant based diet can partially or completely replace the high cost fish meal or stressful DORB. Leaf meal is currently the most cost-effective source of protein and energy for use as a supplement in fish feed. The leaf meals are prepared from both the terrestrial and aquatic plants depending on crude protein content and the level of inclusion as well. The disadvantage of incorporation into the fish diet lies in the anti-nutritional factors that need to be eradicated. Various processes are excavated to get rid of it. It involves using exogenous enzymes and cooking, fermentation, soaking, milling, roasting and other techniques. The effects of programming documented in fishes are based on survival, growth, brain development and nutrient metabolism. This could be brought into play as a strategy in aquaculture. In a nutshell, this paper discusses the current status of nutrition regarding feed formulation in aquaculture, their possible effective supplementation in fish diets in a sector-specific fashion with a note on some suggestive measure, if implemented, which can boost their participation in fisheries in days to come.

Keywords: *Plant-based diet, cost-effective, leaf meal, anti-nutritional factors, exogenous enzymes, fish nutrition, feed formulation.*

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PARBOILING AND PUFFING OF RICE

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ABSTRACT

Parboiling and puffing of rice are one of the most traditional food cultures in India. The puffing of rice can be done only after parboiling, traditionally. Parboiling is a hydrothermal process, which consists of soaking, heating, and drying which leads to the changes in the qualitative and processing behavior of rice, soaking is a hydration process in which the diffusion-controlled water uptake migration occurs in the rice kernel and continuous heating leads to nonreversible swelling and fusion of starch granules. Due to the reason that starch granules are gelatinized, followed by relevant reassociation, different changes occurring rice that plays an important role in various postharvest handling and processing operations, such as storage, milling, cooking, and eating qualities. Puffing is one of the process where evaporation of water occurs in the grain when they are subjected to heat and the grain expansion occurs, puffing of rice can be done by both traditional and modern methods, but the oldest and the common method of puffing is sand roasting, where the grains are roasted in hot sand at high temperature, frying in oil is also one of the traditional method. As technology is increasing day by day different modern methods are developed for puffing of rice, like microwave puffing, fluidized mechanized puffing etc. puffed rice are gluten free and ha less calories, they can be suggested for people suffering with celiac disease.

Keywords: *Traditional foods, rice processing, celiac disease*

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STANDARIZATION OF OSMODEHYDRATED FRUIT INCORPORATED BARNYARD MILLET PAYASA MIX

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ABSTRACT

Barnyard millet is nature's gift to the modern diet because it has a low glycemic index, low in calories, is rich in fibre, and is a good source of iron and gluten-free food. Payasam is an Indian sweet prepared from grains, sweeteners, dry fruits and milk/ghee optional addition. Payasam mix was optimized using osmodehydrated pomegranate, pineapple, and papaya with 5 %, 10 %, 15 % and 20 % incorporation into the developed barnyard millet payasam mix. The physicochemical parameters and cooking quality of the accepted payasam mix were estimated using standard protocols. Sensory evaluation results reported that 15% osmodehydrated pineapple scored highest for overall acceptability (8.4 ± 0.69), followed by 10% osmodehydrated pomegranate (8 ± 0.94) and 10% osmodehydrated papaya (7.9 ± 0.31). Per cent moisture, fat, and total ash content of the standardized mix were 3.29 ± 0.003 , 5.13 ± 0.001 and 2.37 ± 0.01 respectively. The process parameters for payasam preparation were optimized *i.e.*, 1:5::payasam mix: water and 15 minutes cooking time. The study concluded that incorporation of more than 20% of natural fruit flavour chunks into the payasam mix results in curdling of the payasam.

Keywords: *Barnyard Millet, osmodehydrated fruits, payasam mix, cooking quality.*

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MULTIPLEX PCR FOR GM MAIZE ALLERGEN DETECTION IN FOOD

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ABSTRACT

Genetically modified (GM) plants and foods derived from them are globally widespread however potential allergenicity of GM food is especially noteworthy for sustainable diets of vulnerable allergic groups. The international and local legislations require monitoring and mandatory labeling of genetically modified organisms (GMOs) and their allergens, which needs effective methods of allergen analysis. Maize (corn, *Zea mays L.*) is one of the most important grain crops used for traditional foods all over the world. Due to the widespread corn derived products, it is becoming more and more difficult to prevent corn allergies. In addition, corn belongs to the most common transgenic crops. Detection of GM corn allergens is important for food safety assessment and proper labeling, health protection and consumer information. The aim of our study was to develop a new efficient detection method for GM maize allergens. To this purpose DNA-based multiplex polymerase chain reaction (PCR) approach was applied. The insect resistant GM maize variety MON810 and corn derived processed products such as canned corn kernels, corn flakes, corn flour were selected as research objects. The set of certified reference materials consisting of 0-5% MON810 were used for the optimization of the PCR systems. New oligonucleotide primers were designed for the genes of important food allergens, such as maize Zea m 8 (chitinase), Zea m 14 (phospholipid transfer protein) and zein as well as GMO-specific Cry1Ab delta-endotoxin expressed in the insect resistant GMOs. The agarose gel electrophoresis of PCR products revealed that new PCR methods enable reliable analysis of maize allergens Zea m 8 Zea m 14 and zein, whereas PCR method with primers Cry98f/Cry98r allows accurate detection of GMO allergen Cry1Ab delta-endotoxin. Moreover, this method may be applied for screening of insect-resistant GMOs with sensitivity of 0.5%. The analysis of processed products demonstrated that newly developed uniplex and multiplex PCR methods allow reliable, fast and efficient detection of the abovementioned GM maize allergens in most foodstuffs. It is noteworthy that, Zea m 14 gene was not detected by PCR method in case of canned corn kernels. The obtained results indicate that an appropriate method is needed for the accurate detection of each allergen in each foodstuff.

Keywords: *Food safety, GMO, maize, allergens, multiplex PCR.*

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CURRENT AND POSSIBLE EFFECTS OF CLIMATE CHANGE ON OLIVE AND OLIVE OIL PRODUCTION: THE CASE OF TURKIYE

Fulya HARP ÇELİK¹, Pelin ALIYEV²

ABSTRACT

Climate change is global or regional changes in the earth's climate. It was only in the second half of the 20th century that it began to be understood that climate change, which emerged as a result of the deterioration of the natural greenhouse effect, which is one of the most important factors that ensure the continuity of human life in the atmosphere, is an issue that needs to be tackled. At the point reached today, climate change is one of the most important security issues facing the world. Since climate change is perceived as a threat to security by many states, climate change is seen as an issue that needs to be tackled, and they develop policies to combat this issue. Moreover, since climate change is not only a national but a global issue, it is one of the main agenda topics of international politics and requires multi-actor governance for its solution. On the other hand, climate change should not be seen as a mere temperature change, but as the starting point of multidimensional problems and even crises. The temperature change on the earth causes many interrelated events to occur. Especially in recent years, many studies have suggested that there is a close relationship between climate change and food security, and it is revealed that climate change may be the source of a global food crisis. Extreme drought and water scarcity as a result of climate change are among the factors that significantly affect the efficiency of agricultural production. Olive and olive oil are among the agricultural products with a high potential to be affected by climate change. Olive, which is mostly grown in the Mediterranean and Aegean regions in Turkey, makes a significant contribution to the country's economy. In addition, olive and olive oil are among the main livelihoods of the local people. However, extreme temperatures and water scarcity due to climate change pose a great risk for olive and olive oil production, as it is for other agricultural products. In particular, it has the potential to adversely affect fruit quantity and quality. Despite the development of irrigation practices to increase productivity within the scope of the changes in olive production systems, the creation of high productivity orchards remained very limited. In this context, the aim of this study is to determine the current and possible effects of global climate change on olive and olive oil production in Türkiye.

Keywords: *Global climate change, food security, olive, olive oil, Türkiye.*

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DEVELOPMENT AND QUALITY EVALUATION OF PEARL MILLET BASED TRADITIONAL PRODUCT - *PAPAD*

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ABSTRACT

Papad is a traditional product which is relished with meals after roasting or oil frying. Traditionally it is prepared by using rice. Nutritionally pearl millet is better than rice, which is rich in dietary fiber, micronutrients, good quality proteins and also phytochemicals with nutraceutical properties as compared to rice. The present study was undertaken to develop nutritious *papad* by replacing rice flour for pearl millet flour. The preparation was carried out with different level of incorporation of rice flour: pearl millet flour (100:0, 90:10, 80:20; 70:30, 60:40, 50:50, 40:60, 30:70, 20:80, 10:90, 0:100 respectively). Prepared *papad* were fried and were subjected for sensory evaluation by using 9-point hedonic scale by semi trained judges. The nutrient content of raw materials rice and pearl millet and also highly acceptable *papad* were assessed for proximate composition, and minerals like calcium, zinc and iron by using standard AOAC methods. Sensory evaluation of pearl millet *papads* at different incorporation level showed *papad* prepared from 20 per cent rice and 80 per cent pearl millet flour proportion was highly acceptable. The nutrient composition of developed *papad* from control (100% rice flour) and pearl millet *papad* (20:80 %) showed moisture 10.2 & 9.8%, fat 3.9 & 4.0%, protein 6.9 & 10.9%, crude fibre 0.67 & 1.9%, ash 0.91 & 2.1%, calcium 16.7 & 41.7mg/100g, iron 1.19 & 10.1mg/100g and zinc 1.14 & 4.8mg/100g respectively. Overall, it can be concluded that development of *papad* from pearl millet enhanced the nutritional quality of *papad* as compared to rice.

Keywords: *Papad*, traditional product, traditional food.

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ROLE OF SUSTAINABLE PACKAGING IN CONSERVING THE ENVIRONMENT AND FOOD CONTAMINATION

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ABSTRACT

Packaging plays an important role in preserving the food quality where it is an important aspect in controlling the food borne diseases and chemical contamination through food. Packaging material is said to be sustainable if it is recyclable, compostable or bio-based form which is safe for consumers and environmental friendly. Food packaging is a representative of multifaceted nature of sustainability, FP has multiple pro-social functions where it determines how supply chain performer and consumers can distribute and handle food products. FP is a major social impact which enhances food security, where all people, all time have the access to sufficient nutritious food to lead a healthy life. The micro biodegradable polymers from agro-food waste residues is the bright route for the packaging industry where it helps to reduce the wastage, food loss and nutrients can be retained by the soil which helps to restore the environment. Biodegradable packaging development is hampered its technical, social, and environmental benefit. Modified atmospheric packaging (MAP) in which active MAP where active compounds are emitted for instance from packaging material towards headspace where modified atmosphere is created that limits microbial spoilage which is an eco-packaging solution.

Keywords: *Food packaging, biodegradable packaging, modified atmospheric packaging, food quality.*

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CARAMBOLA A VALUABLE SOURCE OF ANTIOXIDANT NUTRACEUTICALS

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ABSTRACT

Starfruit or carambola is the fruit of the *Averrhoa carambola* tree in the family of Oxalidaceae native to Southeast Asian countries, mainly the Philippines, Indonesia, Malaysia, Vietnam, Nepal, Bangladesh, and India and widely distributed around the world. In Manipur, it is called Heinoujom. The fruit has a star-like segment of five, giving it a star shape. The entire fruit is edible and consumed raw and frequently used in fruit salad and fruit platters, as a garnish in cocktail drinks and beverages, or squeezed into juice and served as a beverage. It is a crunchy, juicy fruit with a light flavour. The skin is waxy yellow or green and edible and the fruit has a tiny dark seed in the centre. The odour of the fruits resembles oxalic acid and their taste varies from very sour to mildly sourish or sweetish.

Traditionally, it is used for treating diabetes, diabetic nephropathy, arthralgia, vomiting, lithangiuria, coughing, hangovers and chronic paroxysmal headache for thousands of years. Fresh star fruit (per 100g) showed: an energy of 31 Kcal, carbohydrates 6.73g, protein 1.04g, and total fat 0.33g. The nutritional value of Starfruit includes; that they are low in calories and a great source of vitamins and other nutrients as well as antioxidants including fibre, protein, vitamin C, vitamin B5, calcium, sodium, folate, copper, potassium, and magnesium. The star fruit is known to have high antioxidant properties that efficiently scavenge free radicals as well as help in hypoglycaemic and hypoglycaemic treatments. Due to the presence of the above nutritional values, the fruit had different health benefits that include anticancer potential, anti-inflammatory ability, weight loss promotion, and immunity boosting ability, improved heart health, and improved digestion. Phytochemical analysis of Starfruit showed the presence of saponins, alkaloids, flavonoids and tannins. Starfruit contains caramboxin and oxalic acid which is harmful to individuals suffering from kidney failure, kidney stones and it also contains toxic substances called neurotoxins that can affect and the brain and causes neurological disorders. Starfruit is as delicious low calorie food except with kidney problems and who take prescription drugs but for most people starfruit is a healthy and tasty addition to diet

Keywords: *Averrhoa carambola*, *benefits*, *antioxidant*, *nutrition*, *medical properties*.

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COMPARATIVE EVALUATION OF LOCAL PAKISTANI JUJUBE (BER) VARIETIES AND THEIR SUITABILITY FOR DEVELOPMENT OF JAM PRODUCT

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ABSTRACT

Ber (*Z. mauritiana Lam*) is known as one of nutritionally rich fruits from long times, But despite having great nutritional potential it is neglected in Pakistan with research point of view. Number of local Pakistani ber varieties still need to profile on the basis of their Physico-chemical properties as well as their suitability to introduce new commercial scale products in the market. The present work was designed to identify physicochemical and nutritional characteristics of three local ber varieties of Punjab Province on fresh basis followed by making jam product. 4 different jams Control (T₀), Delhi White (T₁), Mehmood Wali (T₂), Anokhi (T₃), Mixed Ber jam (T₄) were made by using 45% pulp concentration. Jams were kept in air tight jars and subject to evaluate Moisture, ash, fiber, protein, Vitamin C and polyphenols (TPC, TFC) along with sensorial study throughout the storage period of 0, 14 and 28 days. Amongst the tested varieties, highest moisture (83.09±0.05), protein (1.10±0.22) and Vitamin C 40.52±0.032.67±0.05 mg/100g was found in Anokhi. Highest fat content (0.10±0.02) was noticed in Delhi White. Antioxidant potential of fresh ber fruits and jam samples was determined by spectrophotometer at 515nm. Concentration of phenolic compounds was higher in T₃ for before and after storage period 45.55 ±0.30 mg GAE/g, 5.44±0.03 mg GAE/g. Overall ascorbic acid loss was 53.13% after jam production and continued during storage. Antioxidant capacity was highly correlated with total anthocyanin and total phenolics content (R₂ = 0.77 and 0.72, respectively), whereas total antioxidant capacity and ascorbic acid showed linear correlation. 9 point hedonic scale used to check the sensory parameters of jams and Anokhi showed highest values followed by Mehmood Wali, Delhi White and least was in control.

Keywords: *Jujube, jam, local varieties, phenolic, storage study*

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ETHNOBOTANY AND NUTRITIONAL VALUE OF WILD EDIBLE PLANTS EATEN BY THE AGRO-PASTORAL COMMUNITIES IN NORTH EASTERN UGANDA

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ABSTRACT

The reliance on a handful of food crops to feed the global population is increasing vulnerability to climate change effects and simplification of human diets. As such, the study sought to: (i) establish an inventory and document the traditional knowledge of wild edible plants (WEPs) consumed in north eastern Uganda, and (ii) examine the nutritional value of five WEPs. Data was collected using a semi-structured questionnaire administered to 240 respondents, focus group discussions and guided field excursions. The nutritional analysis of *Vigna kirkii*, *Maerua angolensis*, *Leptadenia hastata*, *Senna obtusifolia* and *Dioscorea* sp. was done in triplicate at the Makerere University Food Science and Technology laboratory. The ethnobotanical survey data was analyzed using relative frequency of citation (RFC) and informant consensus factor (FIC). The study recorded 100 plant species in 47 families with fruit being the most consumed part (63%), followed by leafy vegetables (29%), seeds (9%), tubers (5%) and gum (1%). Some of the highest nutritional values include 19.04 ± 370.65 Kcal gross energy in *M. angolensis*, 65.43 ± 2.91 g/100g carbohydrate in *Dioscorea* sp. and 36.37 ± 0.42 %/100g crude protein in *M. Angolensis*, 14.71 ± 3.56 mg/100g Ascorbic acid in *M. angolensis* and 1082.12 ± 0.08 μ g/100g Beta-carotene in *S. obtusifolia*. *Diospyros scabra* and *Balanites aegyptiaca* are reported to cause negative effects like diarrhoea and drunkenness. The five WEPs are only inferior to *Manihot esculenta* (cassava) and *Brassica oleracea* var. *capitata* (Cabbage) in gross energy and ascorbic acid. Thus, there is need to examine the causative agents of the negative effects, establish the mineral element composition and undertake propagation tests for selected WEPs.

Keywords: *Wild edible plants, traditional knowledge, ethnobotany, nutritional value, Uganda*

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NUTRITIONAL AND FUNCTIONAL CHARACTERISTICS OF INGREDIENTS USED IN BROWNTOP MILLET (*BRACHIARIA RAMOSA*) COOKIES

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ABSTRACT

The present research work on nutritional and functional characteristics of ingredients used in browntop millet (*Brachiaria ramosa*) cookies was undertaken to explore the utilization of neglected but highly nutrient-rich browntop millet in bakery products. The protein and crude fiber content of browntop millet (12.56 ± 0.25) and (3.99 ± 0.02) were higher than maida (9.84 ± 0.93) and (1.25 ± 0.21) this is essential in reducing the risk of chronic disease such as diabetes, obesity, cardiovascular disease and diverticulitis. Browntop millet contain 67.95(%), maida contain 74.71(%) carbohydrate, browntop millet may contain complex carbohydrates which may have impact on non-communicable disease. Functional properties i.e., bulk density was 0.74 g/ml, water absorption capacity was 65.4 ml/g and oil absorption capacity was 74.80 ml/g of browntop millet flour were lesser than maida bulk density (0.95 g/ml), water absorption capacity (120.45 ml/g) and oil absorption capacity (139.6 ml/g). Because of high water and oil absorption capacity, maida absorbed high fat and water during preparation of cookies, which had an effect on the textural and nutritional properties of cookies. The chemical compositional analysis of jaggery indicated moisture content 3.45 ± 0.05 percent and reducing sugar 11.24 ± 0.19 g. The analysis of functional properties of fat, showed saturation point 56.86 °C, melting point 34.84 °C and saponification value 0.4 %. The study concluded that the incorporation of browntop millet flour for the development of cookies could result in an excellent nutritional profile with desirable sensory attributes. Organic jaggery powder could replace sugar, which makes cookies acceptable and more nutritious. It seems to be a viable option to utilize browntop millet to raise farmer's income, apart from providing the population with many health benefits.

Keywords: *Browntop millet, cookies, jaggery, margarine, functional properties.*

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BER FRUIT AS A BIOACTIVE SOURCE AND HEALTH POTENTIAL

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ABSTRACT

Ber is also known as Indian jujube and scientifically known as *Zizyphus mauritiana*. It belongs to the family Rhamnaceae. *Zizyphus jujuba* and *Zizyphus mauritiana* are the most important cultivated species of the ber. It is normally consumed in fresh, dehydrated form and is highly nutritious rich in ascorbic acid, and carbohydrates, and contains vitamins and B complex also minerals like calcium, phosphorous, and iron. The nutritional composition of Ber is protein as 2.80%, carbohydrate as 17.6%, calcium 25.6 mg, phosphorous 26.8%, sugars 5-10%.

Purpose: The present study is to evaluate the bioactive constituents and health potentials of Ber in the previous studies done. The plants contribute a variety of bioactive compounds such as tannins, phenolic compounds, phytosterols, flavonoids, lysine, glycosides, linoleic acid, saponins, etc.

Methodology: Different review and research papers are collected for the present study evaluation to know about bioactive and health status of the crop. Findings done on Ber crop was identified and the present study highlights the nutritional, bioactive and health benefits of crop among consumers.

Findings: Ber has bundle of bioactive compounds which highlight the health status of crop and processed into various products like ber fruit powder, candy, jelly, jams, etc. Jujube has a high nutritional value due to the presence of a large number of nutrients and phytochemicals, such as fibers, proteins, fat, carbohydrates, vitamins (ascorbic acid, thiamine, and riboflavin), phenolics, and minerals. Predominant phenolics found in Ber relate to its major antioxidant activity, reducing power activity and scavenging of free radical activity. Ber has great medicinal value, is considered to purify blood and aid digestion, provides glowing skin, is good for bones, helps us sleep better, prevents cancer, augments heart health, and reduces inflammation, and fights stress and anxiety.

Keywords: *Ber, nutritive value, bioactive constituents, medicinal value, health benefits.*

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STONE APPLE FRUIT AS A BIOACTIVE SOURCE AND HEALTH BENEFITS

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ABSTRACT

Stone apple scientifically known as *Aegle marmelos* belongs to the family *Rutaceae*. The bael is the large fruit and the color is pale yellow to golden orange when ripe. Its leaves are offered in prayers of lord shiv. It is one of the most important medicinal plants in India. Bael has been used in the Ayurveda as a part of various formulations since ancient times to help with many diseases like dysentery, earaches, and discharge from the ears, fever, and cold. The nutritional benefits of Bael fruit are composed of fat 0.8%, protein as 1.8%, fiber 2.9%, carbohydrate 31.6%, calcium 0.09% and phosphorus as 0.05%.

Purpose: The present study is to evaluate the bioactive constituents and health potentials of Bael fruit in the previous studies done. The plants contribute a variety of bioactive compounds in fruit, bark, leaves, seeds, and roots such as coumarin, xanthotoxol, imperatorin, aegeline, and marmeline. These compounds can provide antidiabetic, anticancerous, antifertility, antimicrobial, immunogenic, and insecticidal activities.

Methodology: Different review and research papers are collected for the present study evaluation to know about bioactive and health status of the plant. Findings done on Bael plant was identified and the present study highlights the nutritional, bioactive and health benefits of plant among consumers.

Findings: Bael has bundle of bioactive compounds which highlight the health status of the plant. Utilization of bael fruit in day-to-day life has a great nutritional, environmental as well as commercial importance and all the parts of tree including stem, leaves, seed, bark, flower and fruit are utilized for various purposes. The presence of bioactive compounds helps to reduce the swelling and help in the treatment various diseases like asthma and diarrhoea, provide various benefits to the body like it boost the immunity, provide good digestion, reduce the cholesterol level, prevent the skin infections and also act as a blood purifier.

Keywords: *Bael, bioactive constituents, health benefits, nutritional profile, food products.*

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THE INTRODUCTION OF QUINOA IN THE REGION OF GHARB MOROCCO

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ABSTRACT

Quinoa (*Chenopodium quinoa*) is an annual herbaceous plant of the Amaranthaceae family. Native to the Andean region of South America, it was domesticated by indigenous peoples several thousand years ago. Cultivated from sea level to nearly 4000 m of altitude on the high plateaus of the Andes, the plant has gradually adapted to the poor soil and extreme ecological conditions. It provides as much energy as foods used in a similar way, such as beans, rice or wheat. Quinoa is also an important source of quality protein, dietary fiber, polyunsaturated fatty acids and mineral salts of phosphorus, magnesium, potassium, iron and gluten free. However, although it provides many nutrients in significant quantities, it should be integrated into a balanced meal with many other types of food to feed properly. The object of our work is the introduction of the quinoa in Gharb Morocco what opens big perspectives of development because of this vegetable species associated to the cereals to different climates. To reach our objective we will proceed to the study and the highlighting of the life cycle of this plant, to improve their production in order to be available to the Moroccan population by an important quantity to make alternative to the cereals. Although the trial is honorable for the sandy soil, a new plot implanted in the region in June and the other will be implanted in September 2022 in order to continue acquiring knowledge on the development of this new crop in the region.

Keywords: *Quinoa, protein, gluten.*

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STUDIES ON NUTRIENT BUDGETING IN *SALICORNIA BRACHIATA* ROXB PRODUCTION USING AQUACULTURE EFFLUENT IRRIGATION AND LEVELS OF FERTILIZER DOS

Ampee TASUNG¹, Sonal TRIPATHI², Pathik Baldev PATEL³, J. M. PATEL⁴

ABSTRACT

An experiment was carried out to study nutrient budgeting using source of irrigation (sea water-S₁ and aquaculture effluent-S₂) and levels of fertilizer (F₁-No fertilizer, F₂- 125:37.5:25 kg/ha NPK, F₃- 250:75:50 kg/ha NPK) for production of *Salicornia brachiata* Roxb. at Coastal Soil Salinity Research Station, Dhanti-Umbharat, Navsari, Gujarat, during 2015. The results showed positive N balance in source of irrigation (seawater-110 kg/ha and aquaculture effluent-230 kg/ha). Among levels of fertilizer, highest gain of N was in F₃ (250 kg/ha) followed by F₂ and F₁. The interactions between source of irrigation and levels of fertilizer (S×F) showed positive N balance where S₂×F₃ had the highest gain (310 kg/ha). In P budget, negative P balance and positive P balance was observed in seawater (-0.64 kg/ha) and aquaculture effluent (2.62 kg/ha) irrigation. Among the fertilizer, net P loss was observed in F₁ (1.02 kg/ha) and net P gain in F₂ and F₃ (1.02 and 2.98 kg/ha). All interactions except S₁×F₁ and S₁×F₂ observed net P gain. There was positive K balance in sources of irrigation (seawater irrigation-956 and aquaculture effluent-1938 kg/ha). Net K gain was observed in the levels of fertilizer where F₃ (1843 kg/ha) had highest gain followed by F₂ and F₁. All interactions showed net K gain. The rice equivalent yield was higher in aquaculture effluent (6.32 kg/ha) and F₃ (7.18 kg/ha). At completion of experiment highest benefit:cost ratio recorded in aquaculture effluent (4.3), F₃ (4.3) and S₂×F₃ (5.45).

Keywords: *Salicornia brachiata roxb.*, aquaculture effluent, RDF, nutrient budgeting, benefit:cost.

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DEVELOPMENT OF NUTRITIONALLY ENRICHED TRADITIONAL PEARL MILLET PRODUCT

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ABSTRACT

Pearl millet (*Pennisetum glaucum*) is considered as “Nutri Cereal”, which contains good quality protein, adequate fat, micronutrients, vitamins, insoluble dietary fiber and phytonutrients which are beneficial against non communicable diseases like cancer, diabetes and heart problems. Forms staple diet among farm households, poorest people in rural and urban poor, while small share in the basket of high income consumers. Consumption is restricted, because considered as inferior grain due to typical grey color, poor shelf life quality and presence of antinutritional factors. Traditionally pearl millet is used for preparation of *roti* and *mudde* (cooked *balls*). Hence study was undertaken to develop nutritionally enriched traditional whole grain products. Effect of processing on nutrient and non-nutrient content showed that, soaking, blanching, reduced polyphenol and tannin content, whereas germination reduced polyphenol, but increased tannin, vitamin C and crude fibre content. Developed value added products from pearl millet were subjected to organoleptic evaluation on nine point Hedonic scale by 20 semi trained judges and all products were liked moderately (Score >7). Acceptability index ranking showed, all prepared products were acceptable. Among all products pearl millet *ladoo* (sugar) ranked first (91.09%), followed by *kichadi* (84.78%), *paddu* (84.22%), *jaggery ladoo* (83.11%) *spicy popps* (82%), and *dosa* (80.50%) .

Keywords: *Nutritional, pearl millet, nutri cereal.*

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MILLETS FOR SUSTAINABILITY AND NUTRITIONAL SECURITY

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ABSTRACT

Millets are short duration, small seeded, highly nutritive crop grown mainly in rain fed and dryland areas. It is being cultivated in the India as well as around the world since ancient times. The historical evidence for the millet cultivation in India has been reported around 4500 BC in the bronze era. India is the largest producer with the annual production of 11000 thousand million tonnes followed by Niger and China. Maximum contribution of global millet market is 40% is contributed by India while, 41 % of the globally produced millets is consumed by Africa alone. Earlier, millets were majorly consumed as staple food but nowadays more than 50% millets are consumed as alternative food. Millet's area has been shrunked around the world since 1994 (38.5 MH) to 2018 (33.5 MH), while the production of millets has been increased from 28 MT to 31 MT (<http://www.fao.org/faostat>) unlike rice and wheat. Modern crops have taken over the area of the millets especially, after the green revolution with the availability of high yielding varieties of rice and wheat. The advancement in the agricultural technologies such as fertilizers, insecticides and pesticides, availability of irrigation, development of different farm mechanisation tools etc. has increased the production and productivity of modern crops such as rice, wheat, maize *etc.* Millets are the crop with nutraceutical properties and are rich in minerals, vitamins, protein and fibres. It is hardy crop which require minimum input and can sustain at higher temperature under drought conditions but it is not much popular as rice and wheat. It may be due to lower yield, less palatability, difficult in cultivation due to lack of availability of crop-based farm machineries *etc.* With growing emphasis on nutritional security after the food sufficiency era, efforts are being made with biotechnological intervention and breeding tools for increasing the production and productivity of millets in order to increase the area under millet crops around the world. Government policies and industrial activities are also supporting the popularisation of millets which will cater the need of nutritional need of the population suffering from malnutrition around the world.

Keywords: *Millet, Nutrition, sustainability, nutraceutical.*

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DEHYDRATION OF DRUMSTICK LEAVES

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ABSTRACT

The research entitled “Dehydration of drumstick leaves” was conducted. This research included three factors: a) Pre-treatments like, untreated, blanched with 0.5 % sodium metabisulphate for 2 minutes and chemical treatment of fresh leaves with 0.1 % magnesium chloride + 0.1 % sodium bicarbonate + 2 % potassium metabisulphite dip for 15 minutes. b) Drying methods viz., sun drying, shade drying, microwave oven drying, cabinet drying, tray drying and vacuum drying. In dehydration of drumstick leaves, untreated leaves had maximum drying rate (4.58 g/min), minimum moisture content (2.68 %) and water activity (0.56). Chemical treated leaves had highest per cent of protein (23.21 %), fat (2.68 %), crude fibre (9.62 %), total chlorophyll (25.19 mg/100 g), total carotenoids (27.19 mg/100 g) and ascorbic acid (97.14 mg/100 g). This was more brighter (52.10) with more greenness (-3.17) and blueness (4.19) with extremely liked appearance, taste, flavour and acceptability. Among drying methods, microwave oven drying had minimum moisture content (3.25 %), water activity (0.57), maximum drying rate (9.88 g/min), rehydration ratio (5.23), ash (11.48 %), protein (21.54 %), total chlorophyll (25.08 %), total carotenoids (26.57 %), ascorbic acid (96.23 %), L* (50.09), a* (-1.56) and least yellowness b* (3.45) with extremely liked appearance, taste, flavour and acceptability over other drying methods. Drumstick leaves treated with 0.1 % magnesium chloride + 0.1 % sodium bicarbonate + 2 % potassium meta bisulphite solution for 15 minutes and microwave oven dried leaves found to be the best for physical, chemical properties and sensory quality.

Keywords: *Drumstick leaves, dehydration, drying methods.*

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QUALITY EVALUATION OF FORMULATED INSTANT NOODLES FROM WHEAT, RICE (*Oryza sativa*) AND MUSHROOM (*Agaricus bisporus*) FLOUR BLENDS

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ABSTRACT

This study evaluated the quality of instant noodles from wheat, rice and mushroom flour blends. A composite flour of wheat and rice flours (90:10) was obtained as the best blends after a preliminary sensory evaluation and substituted with 10, 20, 30, 40 and 50 % mushroom flour coded as WRM1 (90:10), WRM2 (80:20), WRM3 (70:30), WRM4 (60:40), WRM5 (50:50) and commercial noodles (Indomie) served as the control. The formulated blends were used to produce instant noodles. The instant noodles were analysed for proximate composition, micronutrients (vitamin B₁, B₂ and B₃, iron, potassium, and phosphorus) microbial quality, cooking characteristics, sensory qualities and functional properties of the flour blends using standard procedures. Results showed that mushroom flour increased the crude protein (9.49-15.39 %), ash (1.39-5.31 %), crude fiber (1.50-5.40 %), moisture content (7.92-14.48 %). It, however, decreased the fat (0.5-1.50 %) and carbohydrate content (58.42-77.45 %). Potassium and Vitamin B₃ were identified as the predominant micronutrients in the instant noodles samples and increased with level of mushroom addition. Sample WRM1 (90:10) with 10% mushroom flour had the highest mean for all sensory attributes (taste, colour, appearance, texture, and overall acceptability) compared to other samples. The total viable count ranged from 4.3 x 10² (control) to 1.78 x 10³ cfu/g in sample WRM4 (60:40). Thus, mushroom flour could be incorporated into instant noodles to obtain an acceptable product rich in dietary fiber, protein, ash, vitamin B₃ and potassium but low in fat and carbohydrate.

Keywords: *Noodles, rice flours, wheat flour, mushroom flour, composite flour blends.*

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BIOPLASTICS FOR SUSTAINABLE FOOD PACKAGING

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ABSTRACT

Approximately 40% of the plastics produced in the world are used as packaging materials. The food packaging industry is the number one end user of such packaging materials. However, the food packaging industry is constantly looking for new alternatives for such materials based on the content of plastic packaging, the structure of the food in it, be migration due to contact time with food and contact temperature, irreversible damage to the environment during the processing of fossil fuels to produce plastics, in addition the negative effects of plastic waste, which takes many years to dissolve in nature, as soil and water pollutants. Nowadays; a new generation of plastic materials termed “bioplastics” have been developed to replace petroleum-based plastics and formulate a sustainable solution. Bioplastic is often used to identify plastics that can be either bio-based, biodegradable, or both. The current review explores, the basic function of sustainable food packaging, various types of bioplastics utilized in food packaging, their constituent biopolymers and their properties, bioplastic processing techniques, degradation routes of bioplastics, highlighting their distinctive properties and functionalities in relation to their packaging applications. In this study has been found; scientific researches are progressing fast in order to meet the world’s need for environmentally friendly and sustainable packaging materials and these scientific researches are focused on the following subjects;

- Improving the performance of biodegradable natural polymers using physical, chemical and enzymatic processes,
- Synthesis of new biodegradable polymers and improvement of polymer properties,
- Improving the production of bio-based conventional polymers and
- Search for new renewable resources

Keywords: *Bioplastic, food packaging, biodegradable, packaging material.*

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PROXIMATE ANALYSIS AND BIOASSAY OF BREAKFAST CEREALS PRODUCED FROM BLENDS OF ACHA (*Digitaria exilis*), MUNGBEAN (*Vigna radiata*) AND CASHEW NUT (*Anarcadium occidentale* Linn) FLOURS

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ABSTRACT

Breakfast is the first meal of the day. It is considered the most vital meal of the day. Breakfast cereals were formulated from blends of acha, fermented mungbean and cashew nut (undefatted and defatted) flours. The undefatted and defatted cashew nut flours were used at different levels of substitution (10, 20, 30, 40 and 50 %) with the best blend of acha and mungbean (80:20) flour which was determined by sensory evaluation. Breakfast cereals were produced by toasting (170 °C) a dry heat treatment process to gelatinize and semi-dextrinize the starch in order to generate dry ready to eat products. The samples were subjected to proximate and bioassay analyses. The breakfast cereal was used for four weeks bioassay study using eighty four (84) healthy male albino rats weighing 60 - 90 g. The rats were divided into twelve groups (seven per group) including a control group. The proximate composition showed: crude protein 10.24-20.10 %, moisture content 6.01-8.07 %, crude fat 3.60-24.51 %, crude fibre 4.02-7.07 %, ash 3.39-4.80 %, carbohydrate 46.4-68.08 % and energy 361.16-459.70 KCal. Feed intake was measured daily while weight gain was measured weekly. Results after the study showed; feed intake 234.22 – 344.55 g, weight gain 34.14 – 80.25 g, feed efficiency 0.14-0.25 and protein efficiency 0.99-1.89. Feeding trial showed positive increase in weight when the rats were fed the formulated breakfast products, this implies that the products could support growth. No adverse growth rate was observed. Feed intake was also acceptable and compared well with the stable diet for rats. Feed efficiency of the samples compared well with the control diet.

Keywords: *Undefatted, defatted, semi-dextrinize, heat treatment, feed intake, feed efficiency, feeding trial.*

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THE PERSPECTIVE OF GEOGRAPHICALLY INDICATED DAIRY PRODUCTS

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ABSTRACT

Geographically indicated foods are products that are manufactured and registered in that country according to the traditions, history, knowledge, and skills of that region, country, and society, which differ from their counterparts with one or more characteristic features. Turkey has great potential in terms of geographical indications with its geographical features and long history. Today, the registration of geographical indication is done in two ways: The designation of origin is given to the products that have to take place in the geographical area whose borders are determined. A geographical indication is defined as the name given to the products whose production, processing and at least one of the other processes must take place in the geographical area whose borders are determined. Various local dairy products are produced in Turkey with the usual production techniques, depending on the geographical conditions, cultural habits, and differences in animal species and breeds. While most of these are produced/consumed in quantities to meet the demand in the region where they are produced, some of them are known throughout the country and provide added value by being transformed into commercial products. In this study, information about dairy products with geographical indications belonging to Turkey is aimed.

Keywords: *Geographical indication, designations of origin, dairy products, cheese, Turkey.*

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DIFFERENT WHEAT SPECIES AND THEIR LOCAL VARIETIES; AND THE QUALITY AND NUTRITIONAL FEATURES OF THE FINAL PRODUCT

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ABSTRACT

Wheat, as a crucial substance of the human diet, has a strategic importance in terms of economic, social, historical and cultural aspects. According to recent studies, wheat based agriculture has started originally in so called 'Fertile Crescent', which involves the south eastern region of Turkey. Our country, which has rich genetic resources including wild and local wheat varieties, has an important place as the geography where wheat spreads to the world. In recent years, the search for traditional nutrition has come to the fore due to the understanding of the importance of functional food and the increasing interest in the quality of foods and organic products. For these reasons, improvements in a more suitable way for human health are researched and efforts are made to obtain products that create high added value. It is understood more and more every day that wild and local wheat, which stands out with its richness of vitamins, minerals and fibrous structure, which is important in terms of nutritional physiology, will make a serious contribution to human health and nutrition, and it is supported by researches. The use of local wheat varieties plays an important role in plant breeding as a source of beneficial genes. In addition, it is thought that the use of local wheat can increase agro-food biodiversity and contribute to the provision of new raw materials for the production and development of foods that have a positive effect on health. In studies, foods with high nutritional quality attract the attention of consumers and researchers, because their consumption plays an important role in the prevention of various diseases. High protein content, low allergy and high antioxidant features has increased the interest towards local wheat. Some components such as antioxidants (flavonoids, phenolic acid, phytic acid, tocopherols and carotenoids) and dietary fibers contained in cereals are effective in improving the functional properties of wheat species and local varieties products and preventing chronic diseases. In this study, researches on final product quality and nutritional properties of different wheat species and local varieties were examined.

Keywords: *Wheat species, landraces, end-use quality, nutritional quality.*

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THE EFFECTS OF DIFFERENT COOKING METHODS AND PARAMETERS ON THE FORMATION OF POLYCYCLIC AROMATIC HYDROCARBON (PAH) COMPOUNDS IN MEAT AND MEAT PRODUCTS

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ABSTRACT

Polycyclic Aromatic Hydrocarbon (PAH) compounds are toxic, mutagenic and carcinogenic compounds formed as a result of pyrolysis or incomplete combustion of various fossil fuels, carbon-containing substances and other organic compounds such as food. PAH compounds constitute a significant part of environmental pollutants. PAH compounds may contaminate foods with contaminated soil, air and water, besides that smoking and heat treatments can lead to PAH formation in foods. Meat and meat products, which are protein-rich foods, are accepted as effective carriers for PAH intake into the human body because they are widely included in diets and require heat treatment to be consumed. Many studies have reported that the level of formation of PAH compounds changed in meat and meat products that were applied to different cooking methods (boiling, grilling, barbecue, oven, frying, roasting, ohmic cooking, etc.) and parameters. In addition, it was reported that these carcinogenic and mutagenic compounds were formed in different amounts in the doner samples cooked in gas and wood fire. Limited studies revealed that the limit values for PAH compounds determined by the Turkish Food Codex Contaminants Regulation (TGK, 2011-28157) and the European Union Legislation (EC No: 1881/2006) can be exceeded depending on doner cooking methods and parameters. In recent years as a result of the studies carried out has been reported that the difference in the type of wood used in the cooking process also affects the amount of PAH compounds. The amount of PAH in meat products with ohmic cooking was found to be lower than those of other cooking methods. The proximate composition of the food, especially the fat content, plays an important role in the formation of these compounds. For this reason, examining and considering all these factors in studies will provide a healthier evaluation. In this study, the importance of Polycyclic Aromatic Hydrocarbon compounds and the effects of different cooking methods and parameters on their formation in meat and meat products were investigated.

Keywords: *Polycyclic aromatic hydrocarbon, PAH, meat, meat products, cooking parameters, Benzo (a) pyrene.*

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ORANGE PRODUCTS AND BY-PRODUCTS IN TURKEY

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ABSTRACT

Among citrus fruits, orange is the most preferred fruit worldwide in terms of fresh consumption, beverage and aroma industry. The ecological conditions of our country allow citrus cultivation to be carried out successfully in the Mediterranean and Aegean regions. Among the reasons why this fruit group, which has a very wide usage area, is preferred, is its high nutritional value, unique flavor and aroma, as well as its longevity on the tree. In Turkey, which differs a lot in terms of citrus varieties, enough attention is not given to domestic orange varieties, and industrial orange production is mostly carried out with foreign varieties. In recent years, as in all other agricultural products, there have been great difficulties in the production and evaluation of citrus fruits, which have an important place for the country's economy. In this context, citrus products produced in our country are sold below their cost, in many citrus gardens the products are left at on trees and cannot find buyers. One of the main reasons for this is the weak relationship between citrus producers and the processing industry. The studies and activities carried out for the evaluation of wastes in our country are not sufficient and efficient. Every year in Turkey, 40 thousand tons of orange peel goes to waste as industrial waste. However, there is a potential to produce many products from oranges. Orange can be processed into many products such as fresh consumption, fruit juice and concentrate production, as well as orange wine, dried orange slices, jam-marmalade and confectionery, while it can also be evaluated with its by-products such as orange peel oil-flavor and orange peel powder. Orange can be processed into many products other than fresh consumption, fruit juice and concentrate production, like orange wine, dried orange slices, jam-marmalade and confectionery, while it can also be evaluated with its by-products such as orange peel oil-flavor and orange peel powder. In this study, economically important orange products and their potential to produce new products are explained.

Keywords: *Orange, orange products, marmalade, jam, orange peel powder.*

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CHEESES OF TURKIYE: SAMPLE OF ÇUKUROVA REGION

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ABSTRACT

Çukurova region, which starts from Anamur in the west, extends along the Mediterranean to the east, expands to Tufanbeyli in the north, surrounds the Iskenderun Bay, turns to Erzin in the south, and finally ends at Yayladağı on the Syrian border, is a geographical, economic and cultural region in Southern Anatolia. However, most of this region, which includes the provinces of Adana, Mersin, Hatay and Osmaniye, is a large, flat and fertile area that is among the most suitable for agriculture in the world. The place of traditional products is very important in the cuisine of this region, which has very different cultural values. Among these traditional products, milk and dairy products, which are indispensable foodstuffs in world cuisine, have an important place. Cheese, which is a part of the cultural richness of a country or region, has a very important place in terms of human health. When we look at the cheese variety in the world, there are approximately 4000 kinds of cheese, while it is known that there are more than 200 kinds of cheese in Turkey, each with a different flavor. The traditional cheeses produced in the Çukurova region can be summarized as follows; Adana Yoruk cheese, Adana tuluk cottage cheese, Çimi Tulum, Dolaz (Tort) cheese, Divle Tulum cheese, Goat Tulum cheese, Plastic Jar Tulum cheese, Hard Goat Feta cheese, Yoghurt cheese, Fresh Kunefe cheese, Salted Kunefe cheese, Tubular Kunefe cheese, Culture added Kunefe cheese, Melted cheese, Carra cheese, Cere cheese, Jug cheese, Sürk, Kavsara cheese, Basma cheese, basket cheese, Katremis cheese, Teleme cheese, Fresh Kaşar cheese, Örgü cheese, Dil cheese, Tulum cheese, Sünme cheese, Lor, Çökelek etc. As it is known, the importance of traditional foods in gastronomic tourism is increasing day by day all over the world. It is considered that creating a gastronomic identity will contribute to gastronomic tourism with these local-traditional products by researching many cheeses in Turkey, especially cheeses that are about to be forgotten, standardizing their production methods, obtaining geographical indications and evaluating them within the scope of the Slow Food movement, which carries the slogan of good-clean-fair foods. In this context, it was aimed to investigate the traditional cheeses of Adana, Mersin, Hatay and Osmaniye provinces, which are in the Çukurova Region of Turkey, and the production methods and some properties of these cheese varieties produced in the region are given in this study.

Keywords: *Cheese, traditional products, Çukurova region, Slow food.*

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TRADITIONAL FOODS: KAYSERI CUISINE

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ABSTRACT

Culinary culture, types of food and beverages that provide nutrition, their preparation, cooking, storage, consumption; it includes space, equipment, food tradition and the historical and cultural process shaped according to the socio-cultural and economic situation of the society, its historical development, eating and drinking habits and agricultural production. Since the Turks are a nomadic society, they have been influenced by many different cuisine cultures. It was seen as a symbol of meat, flour and oil consumption habits during the Seljuk period. "Mantı" made with yogurt and meat is among the most popular pastry dishes. Mantı are mostly made at home and are usually eaten before dark. One of the most important dishes of Kayseri cuisine is mantı. The importance of mantı in Kayseri used to be understood by how much mantı can fit into a spoon. Pastrami making is an important source of income in the economy of Kayseri province. Pastrami is famous product in Kayseri and is indispensable for breakfast tables. Sausage, which is one of the meat products that Turks have consumed since Central Asia, together with pastrami and roasting, is one of the gastronomic products identified with the province of Kayseri. One of the local dishes of Kayseri is "Develi Cıvıklısı". Meat of sheep bred in the highlands of Mount Erciyes and classified as fat-tailed sheep is preferred in the preparation of cıvıklı. Homemade noodles made from wheat flour are also frequently consumed in Kayseri. Wheat flour, which is the basic ingredient of foods such as pastry, katmer, yağlama, pancake is the main component of Kayseri dishes. There are Güllü Baklava, Nevzine and Aside desserts that are unique to Kayseri. All three of them are desserts that are frequently made and consumed at guests and family tables or on special occasions in Kayseri. As a result, when Kayseri local dishes are examined, it is seen that meat and meat products and pastries are widely used. Kayseri; It has created a rich and local cuisine that requires effort and has a different place in Anatolia with its settled culture.

Keywords: *Traditional foods, Kayseri, food culture.*

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THE EFFECT OF USING SOUS VIDE COOKING TECHNIQUE ON SENSORY QUALITY IN COOKING MEATS

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ABSTRACT

Different preservation and cooking methods have been applied to foods since ancient times. Thermal treatment is critical importance in order for meat and meat products to have an acceptable sensory quality due to their processes, to improve the digestibility of foods and to ensure that the product is microbiologically safe. For this purpose, traditional cooking methods such as smoking, roasting, frying, grilling, oven, steaming are mostly used. Among the cooking methods, the sous vide technique is defined as putting raw or half-cooked foods in heat-resistant packaging with or without adding flavor enhancing materials, cooking or pasteurizing them in tanks that can be temperature controlled after vacuuming, according to the appropriate temperature-time parameter. With this method, meat can be cooked at lower temperatures for a long time. Sous vide, a popular thermal treatment process, is used in foods on the purpose of extending the shelf life and increasing the nutritional, sensory and microbiological quality. During the cooking of meat and meat products with traditional cooking methods, the water in their structures causes losses in sensory quality due to losses in water soluble nutritional components and aroma components, etc. Studies have shown that sous vide cooking has a positive effect on the level of sensory taste such as firmness, color, juiciness and flavor criteria by preventing moisture loss in the product. With this technique, meat and meat products are pasteurized at low temperatures and, on the other hand, due to long-term cooking, nutrient losses are reduced, providing a more homogen color and a better level of sensory taste. In this paper, it is aimed to provide an overview of the existing studies examining the effect of sous vide cooking method on the quality characteristics of meat, especially texture, color, odor-flavor and taste.

Keywords: *Sous vide, meat and meat products, cooking methods, sensory quality.*

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GEOGRAPHICAL INDICATION, TRADEMARK REGISTRATION AND PATENT IN GASTRONOMY

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ABSTRACT

Ensuring sustainability in gastronomy is possible by accurately recording every stage from production to consumption, increasing the recognition of local products and protecting cultural heritage. The principle of sustainability, which states that natural resources should be protected and developed, is important in terms of increasing the consumption and awareness of existing products and making applications such as branding, registration or patenting of products. In this way, it is possible to contribute to tourism both with local products and with the introduction of new products. When old recipes that are about to be forgotten come to light, the existence of dishes that can be made with endemic species belonging to the region, the registration of products grown specific to the climate, when evaluated within the scope of gastronomic tourism, provide an economic contribution to the region and country they belong to. The foods, cooking techniques or tools obtained from the products of the region can also be used within the scope of gastronomic tourism by obtaining patents. With the geographical indication registration, it is ensured that the products that have gained a certain reputation depending on their traditionality, local raw materials and local characteristics are protected. If all or the essential qualities of a product originate from natural and human elements belonging to a certain geographical area, it is called the "name of origin", and the geographical indications that are the subject of products whose production, processing or other processes must take place within the specified geographical area are called "origin marks". Names that are not covered by the name of origin or the indication of origin and that have been proven to have been used traditionally for at least thirty years to describe the product can be defined as the traditional product name. These practices, which will ensure sustainability in terms of gastronomy, can be made personally to the Turkish Patent and Trademark Office, or support can be obtained from the technology transfer offices of the regional universities and the provincial culture and tourism directorates. It is important to examine the issue as it will be beneficial in the development of promotion and marketing strategies, as well as increasing the market share of local products with the data announced by the Turkish Patent and Trademark Office. This study was carried out in order to support the importance given to the geographical indication and the studies on the products with geographical indications, which are known to be beneficial in the formation of gastronomic identity of the regions.

Keywords: *Gastronomy, sustainability, geographical indication.*

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BATUK - A TRADITIONAL FUNCTIONAL FOOD PRACTICED BY ETHNIC GROUP OF DHIKURA, BHUMIKASTHAN MUNICIPALITY

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ABSTRACT

Functional Food is a traditionally, spiritually and culturally, accepted special kind of food prepared and use in special occasion or festival by different ethnic group in different ways. In fact, this kind of food are grown locally and traditionally prepared by specific tribe /ethnic group in particular region. Batuk - a functional food prepared locally by traditional cooking system by mountain ethnic group -Palunge, Raskoti/ Rana Magar in Dhikura, Arghakhanchi Lumbini Province, Nepal. Batuk is small ring-shape, deep fried. It is prepared from Rice bean (*Vigna umbellate*) locally named Masayang, Siltung or Jhilangi. It is a climber plant and belongs to leguminous Family. It is planted by showingseed on fellow land as well as at the margin land of terrace of rice field during july and harvested on October/November in hilly region. Batuk is used specially during rituals like Maghesakrant (in January 15th /16th,) Dipawali (festival of lights in October), Marriage as a Sagun (a Nepalese ceremony which involves ritualized presentation of auspicious food to a person to invoke good fortune and show respect in Magar society). Batuk made by rice beans is an integral part of marriage ceremonies so it has cultural and religious significance. It is also served during homage to ancestor by son and daughter in- law of Rana Mager society. Rice bean has higher nutritive value and nutritionally richer than other beans and also has medicinal value. The Batuk dish is fully described even in the Sanskrit Scripture Dharma Sutras. Even though this is a sustainable functional food with cultural, traditional value along with its good nutritive value, it is loosing its place and significance in the society due to overgrowing fast foods hence needs to be promoted.

Keywords: *Batuk, ethinc group, functional food, sustainable.*

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KASTAMONU EINKORN BULGUR

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ABSTRACT

Einkorn wheat, which is accepted as the ancestor of today's wheat, is the first wheat cultivated in history. Although it has been grown in Anatolia for more than 10000 years, cultivation areas are rapidly decreasing in the face of high-yielding modern wheats. However, with its high nutritional content, low glycemic index value and gluten ratio, it has become a sought-after product in recent years. Academic studies have shown that it has many advantages in terms of health. Einkorn wheat, which has been grown for centuries in Kastamonu, is processed as einkorn bulgur due to its flavor and has inspired many local dishes. In this study, the production stages of Kastamonu einkorn bulgur with geographical indication and local dishes were examined.

Keywords: *Einkorn, wheat, bulgur, Kastamonu.*

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TRADITIONAL FOOD OF THE KAZAKH'S “BESHBARMAK”

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ABSTRACT

Kazakhstan, the ninth largest country in the world, draws attention with its rich history, culture and natural beauties, as well as its richness in traditional cuisine from past to present. “Kazakh traditional cuisine”, which is an integral part of the national culture, clearly reflects the inner world, history, traditions and faith of the people. Today, although there are some changes in traditional ceremonies such as various religious holidays, weddings, celebrations compared to the past, "Kazakh food culture" and "Kazakh hospitality" have not lost their old form, on the contrary, they have been developed and preserved until today. Although people of various nationalities and religions such as Russians, Tatars, Ukrainians, Uzbeks, Germans, Uyghurs, Dungans and Koreans live in Kazakhstan, this diversity has not affected the culinary traditions, lives and culture of the Kazakh people. In fact, "Traditional Kazakh Cuisine" has been adopted and loved by all generations of these people. Traditional Kazakh dishes such as beshbarmak, bauyrsak, irimshik, kurt, goose, shuzhik, kumiss, shubat, sirne, kuyrdak, katama, katik, zhent, talkan are cultural symbols worth exploring with their unique flavors. In this study; It is aimed to introduce and give information about the preparation technology of "Beshbarmak", which is one of these traditional dishes of the Kazakhs, which takes its name from being eaten by hand (with five fingers) when there is no spoon and has survived from the oldest history of Central Asia. The main ingredients of “Beshbarmak” are meat, dough and onions. Although it is very easy to make, the preparation time is quite long. Because the softening of the meat and giving its taste to the soup is one of the important points. Preferably, beef, sheep, horse or goose meat is used in the production of “Beshbarmak”. “Beshbarmak”, which is called the king of dishes, differs from other traditional products in the way its dough is used and the way it is cut. In addition, this type of food provides the Kazakh table with a unique flavor and original variety not found in other peoples' kitchens.

Keywords: *Beshbarmak, Kazakhstan, tradition, Kazakh cuisine, culture.*

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THE ROLE OF TRADITIONAL PRODUCTS IN PRESERVING THE GASTRONOMIC HERITAGE OF UKRAINE

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ABSTRACT

Preservation of gastronomic cultural heritage of Ukraine in the conditions of military aggression of Russia and genocide against Ukrainian people requires comprehensive support of local communities - bearers of traditions of production and ritual and everyday consumption of local food. Therefore, special attention is paid to the analysis of existing and new risks, the study of the best practices of European countries, the identification and implementation in the Ukrainian realities of effective tools for the protection of gastronomic heritage.

The main challenges to the protection and valorization of traditional products are identified:

1) Since 2017 the traditional product is defined by the legislation of Ukraine, but there are no regulations regarding the procedures for their identification and research, also there are no registers of traditional products both regional and national. As a result, there are no state programs to protect and support traditional products. Consequently, the legislative regulatory framework of Ukraine is at the stage of formation in relation to the protection of traditional products.

2) a small number of traditions of production and consumption of local products are included in the local, regional and national list of elements of intangible cultural heritage.

The author has developed a model of valorization of the local food product by the following tools: traditional product, an element of the “Ark of Taste”, an element of intangible cultural heritage, a protected geographical indication, an object of tourist attraction. As a result of desk and applied research we created an algorithm for the systematic work with this set of tools and examined pilot practices of implementing the proposed algorithm in different regions of Ukraine - Transcarpathia, Ukrainian Bessarabia, Kiev region. The high potential of traditional products in the self-identification of ethnic communities of Ukraine and the formation of their food security and sustainable food system of Ukraine as a whole was determined. The implementation of the European experience will help to effectively implement strategies for the protection of gastronomic heritage, increase the diversification of food products on the market, will promote the development of rural areas and small towns as competitive gastronomic tourist destinations.

Keywords: *Traditional product, gastronomic intangible cultural heritage, food system of Ukraine.*

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