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Доклади и Постери

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Секция I. "Състав на храните"

Пленарен Доклад

FOOD LABELLING

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The European legislation establishes requirements to labelling of foodstuffs to enable consumers to get comprehensive information on the contents and the composition of food products. Labelling helps consumers to make an informed choice while purchasing their foodstuffs. For certain foods it is considered particularly important that the products should also be of a specific quality. In such cases legislation has been established defining specific rules on, for example, composition.

Доклад

STUDY OF THE RADIOCEASIIUM'S CONTENT IN BULGARIAN WILD MUSHROOMS FOR THE YEAR 2005

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The wild mushrooms enter more and more actively in the contemporary food regimen of the Bulgarian individual. Because of the specificity in the physiology of this plant kind, related to the ability of accumulating heavy metals, the mushrooms are of a great interest from radiological point of view. With the purpose of minimizing the risk of an additional dose loading of the population during its consumption the precise radiometric control of the content of radioactive elements in them is necessary to be carried out.

In the present work results of the carried out analyses of the content of ^{137}Cs and ^{134}Cs in mushrooms from different regions of Bulgaria are presented. A summary, by kinds of mushrooms and in relation with the existing in EC standards for the content of the radioactive elements in food and food products, is performed. The results for dry and fresh mushrooms are commented.

Key words: radioactivity, Ceasium – 137, wild mushrooms, contamination

Доклад

DETERMINATION OF FATTY ACIDS IN FOOD ADDITIVES

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The rate of death related to haemostatic impairments such as arterial and venous thrombosis, heart attacks, strokes, and peripheral vascular diseases has reached the rates of death caused by cancer formations in the last decade. Fish oils are very rich of ω -3 fatty acids and they are a promising alternative for prevention and treatment of such kind of illness. Recently a lot of scientific groups in all over the world focused on investigation of composition and physiological properties of fish oils. Presently, this kind of food additives are not yet classified as medical drugs and they are not subject of strict control. But the dynamics of the European Union and its legal system could rapidly redefine this kind of supplements to medicinal drugs and to impose their strict and binding control.

Herein, we report our investigation on analyzing and defining the content of ω -3 fatty acids in dietary supplements containing extracts of fish oils commercially available in Europe. Additionally, we will discuss the methods used for sample preparation and methodology used for GC-MS determination.

Постер

LIPID COMPOSITION OF WALNUTS AND HAZELNUTS GROWN IN BULGARIA

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Since ancient times, walnuts and hazelnuts have been a part of the human diet and an important source of energy. Due to their excellent taste and increasingly demonstrated health benefits, nuts are currently considered fundamental to several dietary guidelines worldwide. They contain high amounts of protein and fat, mostly unsaturated fatty acids, thus being an excellent source of the so-called essential fatty acids, which are indispensable for life and good health. The benefit of nuts consumption is already well recognized in Europe and, logically, research is focused on chemical characterization of their local varieties. Knowledge on the lipid composition of Bulgarian nuts will provide a tool for classification and identification of local and introduced walnut and hazelnut cultivars. In addition, the results will be very useful for proving the authenticity of nut oils that are currently popular as salad or cooking oils as well.

In this investigation, the lipid composition of five walnut and three hazelnut cultivars grown in Bulgaria was determined by various chromatographic methods (TLC, GC-FID, GC-MS, HPLC). The nuts characteristics analyzed in all samples were the fat content, total fatty acid composition and triacylglycerols. The neutral lipid classes and their individual fatty acid composition, as well as the sterols, were analyzed in single nuts cultivars. Chemometric approaches were applied for differentiation and classification of the nuts cultivars.

Key words: lipid composition, walnuts, hazelnuts, chromatography

Постер

CHROMATOGRAPHIC METHODS FOR EVALUATION OF AUTHENTICITY AND QUALITY OF LIPID BASED FOODS AND FOOD SUPPLEMENTS

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With the continuously expanding market of lipid based foods and food supplements, their authenticity and quality become important subjects from both commercial and health perspectives, while food adulteration becomes a growing concern for the food industry, regulatory authorities and the consumer. Monitoring the authenticity and quality of edible oils and fats has been carried out using instrumental techniques that provide data about their qualitative and quantitative composition. Several procedures can be used for authentication of edible oils and fats. Most often these include analysis of fatty acids, triacylglycerols and sterols. The methods and procedures for control of composition, quality and authenticity of foods and lipid-containing food supplements developed and used during the last 15 years in the Laboratory of Lipid Chemistry at the Institute of Organic Chemistry with Centre of Phytochemistry – Bulgarian Academy of Sciences, are presented here. These include determination of neutral lipid classes by TLC; analysis of triacylglycerols (including regioisomers) by Ag-HPLC and RP-HPLC; fatty acid configurational (cis/trans) and positional isomers as various esters by Ag-TLC, Ag-HPLC, GC, GC-MS on 4,4-dimethyloxazoline derivatives; sterols by GC and GC-MS.

Examples for analysis of natural and modified edible oils, food supplements, lipid extracts from mushrooms, as well as detection of vegetable oils in milk fat and derived products (cheese, yoghurt), trans-fatty acids content of butter, margarines etc., are presented on the poster.

Key words: lipid analysis, fatty acids, triacylglycerols, sterols, adulteration

Постер

QUALITATIVE DETERMINATION OF AMINO ACID COMPOSITION OF HONEY SAMPLES

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Honey is a sweet juice collected by bees from plants. They process it, enrich it with enzymes and store it in honeycombs. The composition of honey generally includes invert sugar, water, dextrin, nitrogenous substances, acids and minerals. Moreover, there are different quantities of amino acids, vitamins - B1, B2, B3, B6, K, C, E and hormones in a honey. Honey has various healing and dietary characteristics and therefore it is used largely in a folk and scientific medicine. In the literature there are different data on the amino acid composition of different honey types varying in different boundaries. All this provokes us to make a qualitative amino acid analysis of several types of honey from some geographic regions of Bulgaria. It was found that the studied samples contain proline, serine, alanine and glutamic acid.

Секция II. „Замърсители в храните”

Пленарен Доклад

ENVIRONMENTAL POLLUTION AND CONTAMINANTS IN FOOD

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Recently a great attention has been focused in Europe on the importance of food safety and the relation among environmental pollution, contaminants in food and human health. In this context, specific classes of environmental contaminants (e.g, pesticides, metals, dioxins) are discussed in terms of their transition into the food chain and human health. The attention is focused on two main questions - Whether the quantity and bioavailability of one chemical in food provides a real risk to human health? Whether the chemical is not present or it is undetected by instruments we have used.

Food quality control, dietary exposure to contaminants, some traditional and innovative detection methods are considered.

Key words: pesticides, metals, dioxins, detection methods

Доклад

LABORATORY ACTIVITIES IN BULGARIAN FOOD SAFETY AGENCY

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The presentation includes the organization of Laboratory control which is performed by Bulgarian Food Safety Agency - Laboratory Network - Scheme of Labs on Central level and Regional level as well as the activities of the "Laboratory Activities" Directorate. The presentation presents the National Reference Laboratories according to Regulation (EC) No 882/2004 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on official controls performed to ensure the verification of compliance with feed and food law, animal health and animal welfare rules. The presentation also presents the most important microbiology methods which are in accordance with Regulation 2073/2005 on on microbiology criteria on foodstuffs.

Доклад

OFFICIAL CONTROLS TO CONTAMINANTS IN FOOD

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Bulgarian Food Safety Agency (BFSA) carry out official controls to contaminants in food. Contaminants are substances that have not been intentionally added to food. These substances may be present in food as a result of the various stages of its production, packaging, transport or holding. They also might result from environmental contamination. Since contamination generally has a negative impact on the quality of food and may imply a risk to human health, the BFSA has taken measures to minimise in foodstuffs the following contaminants: mycotoxins (aflatoxins, ochratoxin A, patulin), metals (cadmium, lead, inorganic tin) and nitrates.

Key words: official controls, contaminants in food, results.

Постер

A COMPARAISON OF Ni-LEVELS IN PLANTS ON SERPENTINE SOILS GROWING IN-SITU AND EX-SITU ON THE TERRITORY OF THE BOTANICAL GARDEN, BULGARIAN ACADEMY OF SCIENCES

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An *ex-situ* collection of serpentine plants was made in the Botanical Garden at the Bulgarian Academy of Sciences in Sofia. Fifty-three taxa of higher plants of the Bulgarian serpentine flora, collected from the Eastern Rhodopi Mts, are grown on a rocky place of 25 m² and 2 m in height. The total number of individuals collected for transplantation is 103, belonging to 26 plant families distributed in the following categories: 1) endemics narrowly restricted to serpentine; 2) local indicator species showing high fidelity but not restricted to serpentine; 3) wide-ranging species that occur in a variety of habitats underlain by both normal (zonal) and ultrabasic soils, 4) medicinal plants.

The plants growing on serpentine soils accumulate heavy metals in different levels. The group of the hyperaccumulators as well as some medicinal plants were of special interest. The objectives of the study were to widen understanding of the distribution of the nickel hyperaccumulators and their uptake behaviour in relation to the characteristics of their soil environments. Collection and chemical analysis of both plant and soil samples has allowed evaluation of phenotypic efficacy in hyperaccumulating nickel. In total, 10 taxa were studied.

The Ni-content in plants growing *ex-situ* were lower which can be result of the changed ecological conditions. The highest Ni concentrations in leaves were found in *Alyssum murale* and *Thlaspi kovatsii* in *ex-situ* collection. Medicinal plants do not show hyperaccumulation of Ni both in *ex-situ* and *in-situ*. Also Ni-content in their leaves in *ex-situ* collected material was quite lower. This result give reason to consider medicinal plants growing on serpentines suitable for pharmaceutical uses after *ex-situ* cultivation.

Key words: serpentine, medicinal plants, Ni-hyperaccumulators, *ex-situ*

Секция III. „Микробиология на храните”

YERSINIA КАТО ХРАНИТЕЛЕН ПАТОГЕН – ЗНАЧЕНИЕ И МИКРОБИОЛОГИЧЕН КОНТРОЛ

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Два от трите патогенни за човека видове от род *Yersinia* са ентеропатогенните *Yersinia pseudotuberculosis* и *Yersinia enterocolitica*, които предизвикват все още третата докладвана по честота зооноза в Европейския съюз. Те са обичайно разпространени в околната среда – вода, почва, зеленчуци и др. и при поглъщане от хора и животни причиняват инфекции, които варират по своята тежест и характер на протичане. За основен резервоар на инфекцията се считат свинете и добитото от тях месо и продукти. Освен при малки деца, често се описват и случаи при разнообразни домашни и диви бозайници – крави, кози, овце, елени и др. Впоследствие, тези животни (включително и полученото от тях мляко) също могат да бъдат източник на инфекция и потенциален риск за на консуматора.

Разработваните понастоящем класически молекулярни методи за доказване и количествено определяне на тези патогени в различни храни, в т.ч. QPCR са все още недостатъчно бързи и включват редица критични стъпки от методично естество. Ще бъде докладван оптимизиран QPCR с използване на TaqMan сонда за бърза детекция и количествено определяне на *Y. enterocolitica* в изкуствено и естествено контаминирано сурово прясно краве мляко. Праймерите и сондата включват последователности от хромозомно кодирания ген на вирулентността *ail*. Методът е приложен успешно и за характеристика на растежния потенциал на различни био/серотипове йерсинии в проби от сурово мляко, съхранявано при най-често използваните температури. Методът е чувствителен и специфичен, директен (без набогатяване) и може да бъде използван за определяне степента на риска за здравето на потребителите, след консумация на мляко.

Доклад

QUANTITATIVE ANALYSIS OF *LACTOBACILLUS BULGARICUS* IN COMMERCIALY AVAILABLE YOGURTS “VEREYA”, “NA BABA” AND “ELENA”

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Lactobacillus delbrueckii subsp. *bulgaricus* together with *Streptococcus thermophilus* is responsible for the fermentation of the bulgarian yogurt. The cells are rod-shaped, often arranged in chains containing metachromatic granules. It synthesizes beta-galactosidase in highest amount among the other lactobacilli. The aim of our experiments was to study the number of lactobacilli in three 3.6 % cow yogurt samples – “Vereya”, “Na baba” and “Elena”, commercially available in Bulgaria. The experiments were conducted with 1 g yogurt *via* the Koch’s method - tenfold serial dilutions spread on MRS agar. Incubation was performed at 45° C for 24 h. The experimental data showed the following count of *L. bulgaricus* per 1 gram yogurt – “Vereia” – 2.6×10^6 , “Na baba” - 3.4×10^6 and “Elena” - 0.7×10^6 . According to the Bulgarian State Standard (BDS) the count of *L. bulgaricus* per gram yogurt is necessary to be 1×10^6 to 1×10^7 . Our results revealed that both yogurt products “Na baba” and “Vereya” cover BDS. Elena yogurt is close to the standard. Based on these results we conclude that the examined yogurt products are appropriate for consumption and could express their healthful effect on customers.

Key words: *Lactobacillus bulgaricus*, commercially available yogurt, count, MRS

ANTIBACTERIAL ACTIVITY OF PARSLEY

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Parsley (*Petroselinum crispum*) is one of the best-known natural diuretic and possesses antioxidant and cancer chemopreventive effects. Even though parsley displays biological activity, data according its antibacterial action is still scarce. The aim of our research was to examine the antibacterial activity of parsley leafs and stems against test bacteria *Bacillus subtilis* N°8751 and *Escherichia coli* N°8752 (deposited in the National Bank for Microorganisms and Cell Cultures). Leafs and stems were homogenized using a mortar and pestle. 0.1 ml of test bacteria (1×10^9 CFU/ml) were spread on Nutrient agar. The homogenised samples were placed in aseptically perforated Nutrient agar wells. The petri dishes were cultivated at 37°C for 24 hours. Our results showed that parsley leafs inhibit the growth of *B. subtilis* (0.5cm. inhibition zone) and are not active against *E. coli* (0 cm.). Similar results were obtained also for parsley stems: against *B. subtilis* the inhibition zone length was 0.6 cm. in contrast to *E. coli* where no inhibition zone was noted. Our investigation revealed that parsley leafs and stems inhibit only the growth of Gram (+) bacteria.

Key words: parsley, leafs and stems, antibacterial activity, Gram (+) bacteria, Gram (-) bacteria

LACTOBACILLUS BULGARICUS CONTENT IN HOME MADE BULGARIAN YOGURT

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Lactobacillus delbruekii, subsp. *bulgaricus* display broad biological activity due to its probiotic properties. The aim of our investigation was to count *Lactobacillus bulgaricus* CFU in bulgarian home made yogurt. Three samples of home made sheep and cow yogurt were analyzed. Two samples (S7 and S8) originated from area of Velingrad, Rodopa mountains and one sample (S9) was supplied from Montana, a valley region in Northwestern Bulgaria. S7 and S9 yogurt were produced from cow milk while S8 was prepared from a sheep milk. The fermentations were performed with home cultivated unidentified bacterial cultures. Analyzes were conducted on solid MRS media by Koch's method. The experimental data revealed that sheep yogurt possess the highest count of *Lactobacillus bulgaricus* – 4.4×10^7 CFU per g. Both cow yogurt samples showed less amount of lactobacteria compared to sheep yogurt - 3.3×10^7 per g in sample S7 and 0.7×10^7 CFU per g in sample S9. Obtained results demonstrated that number of lactobacilli in mountain originating yogurts exceed significantly the standart count demanded by the Bulgarian State Standard BDS 12:2010 "Bulgarian yogurt". We found that sample S9 match BDS 12:2010. Our results proved the excellent biological properties of home made Bulgarian yogurt.

Key words: home made yogurt, *Lactobacillus bulgaricus*, sheep milk, cow milk

ASSESSMENT OF LACTOBACILLI IN LB, PARSHEVITZA AND RODOPEIA YOGURT

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Lactobacillus bulgaricus, firstly discovered in 1905 by the Bulgarian physician Stamen Grigorov, cause lactic acid fermentation. *L. bulgaricus* possess antitoxic effects and in this relation the amount of lactobacteria in yogurt is crucial for the health effect. The aim of our study was to assess the number of lactobacilli in some of the often bought trade mark yougurts - LB, Parshevitsa and Rodopeia. Yougurts were purchased from large supermarkets. Analyzes were performed using the selective MRS media. The number of lactobacilli was evaluated by Koch's method on agar media. The recorded experimental data showed that LB yogurt contain 7.1×10^7 , Parshevitza yogurt - 2.8×10^7 and Rodopeia yogurt – 0.4×10^7 lactobacilli. Our results demonstrated the highest count of lactobacilli in LB, followed by Parshevitza and Rodopeia yogurt. Several lactobacterial cultures were isolated and will be further indentified using API test.

Key words: lactobacteria; fabricated yougurt, MRS media

Секция IV. „Контрол качеството на храните”

Пленарен доклад

FOODS IN THE CONTEXT OF THE COMPANY ENVIRONMENTAL ACTIVITIES

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Several aspects of the control and management of the foods in the connection of overall company activity from the food industry have been discussed in this report. Accents have been put on the systems of **TQM** /Total Quality Management/ as external and internal evaluation of the quality of the products – foods, quality of the resources, included in the food production, quality of the systems of management and quality of the human resources.

The essential element of the report is the connection of the food production with the introduction and functioning of the systems of **environmental management /EMS, EMAS and ISO-14000/** in the food producing companies. The environmental company policy, ecological features of the food products have been discussed step by step. The necessary significance has been given of **Life Cycle Assessment, Environmental Labeling, and Environmental Aspects of the Food Standards**.

In the context of good ecological practices and overall environmental company policy the attention is paid on reusing and treatment of wastes in food production. The innovative technologies and approaches waste treatment and water treatment technologies have been shown in order to increase the company effectiveness and to reduce the food prices on the base of application of closed water cycles and full package of **environmental principles and approaches**– minimizing of resources and energy, biomass treatment with gas production etc.

Доклад

CURRENT FOOD STANDARDS

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Bulgarian Food Safety Agency (BFSA) implement policy for the development of Approved Food Standards for traditional Bulgarian products. In 2010 in a response of public willingness to raise the quality of marketed foods, with the initiative of the Minister of Agriculture and Food established standards for certain meat products and meat preparations under brand “Stara planina” were drawn up and along with that Bulgarian State Standards for yogurt and cheese were patented. With the launch activities of BFSA one of the main priorities was the establishment of approved standards for bread and flour. The last standard that has been developed is the Sectoral Standard for “Lutenica”. For manufacturers the implementation of standards is voluntary, but on the other hand it is guarantee that only products with guaranteed quality are placed on the market, which enhances consumer demand and confidence.

Key words: Bulgarian Food Safety Agency (BFSA), Approved Food Standards, quality, consumers

Доклад

FOOD SAFETY IN FAMILY HOTEL BUSINESS

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Предстои депозиране

Секция V. Доклади с кореспондираща тематика

Пленарен доклад

STRATEGY FOR IMPROVING SPECIALISTS' QUALIFICATION BY 2020 IN THE SECTOR FOR WHICH THE BULGARIAN FOOD SAFETY AGENCY IS RESPONSIBLE.

(Current status, problems and perspectives)

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The report contains information on the strategic objectives and the tasks that the Bulgarian Food Safety Agency (BFSA) will support for further development of vocational education and training and the provision of conditions for personal, social and professional development of specialists in the field of plant protection, animal health, food and feed safety.

The implementation of the EU Strategy for enhanced cooperation in vocational education and training (EVET) on adopted on 29-30 November 2002 in Copenhagen, known as "Copenhagen process", started on 12 May 2009. The Council decided to establish a strategic framework for European cooperation in the field of education and training until 2020 ("ET 2020"). The main objective is to support further development of education and training in the Member States, aimed at providing personal, social and professional fulfillment of all citizens, and sustainable economic prosperity and employability, whilst promoting democratic values, social cohesion, creativity and innovation, active citizenship and intercultural dialogue.

Directive 2005/36/EC lays out the principles of recognition of professional qualifications among member states. It is essential to allow professionals to create new business or find a job in another Member State which requires specific skills for a particular job.

It is envisaged a uniformed European Professional Card (EPC) to be introduced. The introduction of this card (EPC) aims to accelerate and facilitate the procedure of recognition of professional qualifications.

Taking into consideration the above we formulated the strategic objectives of BFSA by 2020 and they are: To establish and improve the conditions for the acquisition, expansion and development of the professional skills of the workforce in order to improve employability, career.

The vision for the future is the development of a BFSA as an active institution of European type, which by coordinating the actions of all stakeholders contributes to the modernization of the national system of vocational education, training and guidance in the context of lifelong learning and continuing vocational training and thus to ensure an effective integration and reintegration of the specialists in the labor market.

Key words: EVET, ECVET, professional qualifications, European professional card (EPC).

EFFECT OF DIETARY TRACE ELEMENT ZINC ON MALE FERTILITY

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Zinc is an essential trace element necessary for the proper development and physiological balance of living organisms, particularly human. It is found in nearly 200 enzymes in the human body and is relevant to both male and female fertility. Up to one-fifth of the world's people may lack sufficient zinc in their diet. Zinc deficiency is a recognized health problem. In the U.S., the Recommended Dietary Allowance (RDA) is 8mg/day for women and 12 mg/day for men. Oysters, lobster and red meats, especially [beef](#), [lamb](#) and [liver](#) have some of the highest concentrations of zinc in food. Zinc is less concentrated in eggs and cheese. The food plants that contain the most zinc are wheat and [sesame](#). Zinc is also found in [beans](#) and [nuts](#), [almonds](#), [pumpkin seeds](#), [sunflower seeds](#).

Zinc deficiency in men leads to reduced sperm concentration, poor motility and morphology of male germ cells. The earliest sign of zinc deficiency is an arrest at spermiogenesis with lack of elongated spermatozoa. Zinc is incorporated into the sperm nucleus and is important for compact DNA packing. The exchange of somatic histones into basic protamines helps this compaction and protects the DNA by reducing the access of a potential source of free radicals. Antioxidant enzymes are located primarily in the cytoplasm but in sperm lack of cytoplasm results in decreased antioxidant defense. Therefore sperm are very sensitive to oxidative stress and need enough zinc to protect their chromatin. If there is not enough zinc the sulfhydryl (thiol) groups (SH) in protamines interact with iron which is a prerequisite for the formation of free radicals. Therefore insufficient intake of dietary zinc can have a negative effect on male fertility.

Keywords: zinc, food, spermatozoa, fertility

Доклад

THE BEGINNING OF MODERN REGULATION OF PURITY OF FOOD: THE PROGRESSIVE ERA LEGISLATION IN THE UNITED STATES

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The legislative regulation of quality of foods and beverages has long history (for instance, the Reinheitsgebot - the "Bavarian Purity Law" of 1516, setting a standard for brewing of beer). There were many precedents, provisions, and legal experiments in individual states of the United States in the 1800s, but national regulation of consumer products, food and drugs first of all, started in earnest as part of the broad social and economic reforms during the "Progressive era" (1900-1918). The public opinion in the United States was roused by exposure of many abuses by investigative journalists (so called Muckrakers), like the unsanitary methods of meat processing at the slaughter houses, using of preservatives like borax, benzoate, formaldehyde, sulfites, and salicylates, medicines with high alcoholic and opium derivatives content intended for infants, etc.

The result was the enactment by the United States Congress of the Federal Meat Inspection Act and the Pure Food and Drug Act of 1906. The former authorized the Secretary of Agriculture to inspect and condemn any meat product found unfit for human consumption and to ensure that meat and meat products are slaughtered and processed under sanitary conditions; the latter was principally a "truth in labeling" law designed to raise standards in the food and drug. The enforcement of the Pure Food and Drug Act was assigned to the Bureau of Chemistry in the U.S. Department of Agriculture, since 1930 renamed the U.S. Food and Drug Administration (FDA). The law also establishes a corpus of federal food inspectors, and besides monetary penalties, goods that are found to be in violation of the law are subject to seizure and destruction at the manufacturer's expense.

The legislation was due to the education of the public and the exposures made by the "muckraking" journalists, like Upton Sinclair and Samuel Hopkins Adams, as well as to the determination of the "Progressive" President Theodore Roosevelt, who was deeply concerned with social reforms and ecology (which was termed at that time "conservationism"). Though the early federal legislation had certain gaps and deficiencies, and numerous amendments were made, or were replaced by new acts (Federal Food, Drug, and Cosmetic Act, 1938, Poultry Products Inspection Act, 1957), it remained statutory basis for federal regulation of foods and other consumer products, and marked the beginning of modern regulation of purity of food with the respective positive social effect.

Key words: quality of foods, foods and drugs control, "Progressive era" social legislation in the , education of the public.

Доклад

NEW APPLICATIONS IN RADIATION PROCESSING OF FOOD

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Sometime, the fresh looking and otherwise perfectly safe food may be harmful to certain categories of people, who's immune system has been tempered by disease or medical treatment. Preservation of food and achievement of its 'cleanness" is a prerequisite for food safety in case of Immune-compromised Patients.

The aim of the presented work is to prove that food irradiation is suitable for reduction of microbial contamination and in the same time does not change quality of the processed foods. The degree of contamination of foods was tested by microbiological indicators before and after the treatment.

The foods were irradiated at a 60-Co source. Radiation processing of food with dose levels of 5 kGy for dry foodstuffs and 2.5 kGy for freshly prepared ready to eat meals provides highly efficient and relatively low cost technology with a good cost-benefit ratio and Relatively low doses, below 5kGy, decontaminated the foods from microorganisms.

Results showed that after exposure of food to gamma irradiation the total number of microorganisms decreased significantly, i.e. the microbial content is reduced to safe levels. The results of organoleptic evaluation showed that in most cases the dose of irradiation does not adversely affect the appearance, taste and aroma of tested foods.

The appearance, taste and other important qualities of foods do not change after irradiation with low dose gamma-rays. The tested foods are safe and delicious as the non-irradiated samples having the additional benefit of being "clean". There is a potential for application of food irradiation in development of clean diets.

Key words: Safety, radiation processing, food, microbiological indicators

NUTRITION AND REPRODUCTION ANTIOXIDANT THERAPY IN MALE INFERTILITY

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Recent years the problem of infertility is becoming more and more actual. According to official statistics, in Bulgaria the number of childless couples is about 270 000, i.e. almost every 6-th family is directly affected. Pooled data show that worldwide between 3 -7 % of all couples have infertility lasting problem (WHO, 2010) and this number will increase in future. The existing data show that in many of infertility cases, the cause of sterility is disabled sperm, resulting from the oxidative stress (OS). There are several sources of reactive oxygen species in sperm. A range of strategies for sperm prevention of OS are developed. They include changes in living habits, reduction and cessation of smoking, change of dietary regime, directed to intake of foods rich in antioxidants, incl. vitamins and minerals, etc. It is well known that many fruits and vegetables are rich in antioxidants. Although the relationship between good nutrition and reproduction is well established, accurate scientific studies are scanty. Many researches concern the antioxidants and their impact on sperm function, but there are many contradictions in terms of doses and types of combinations. Future studies should aim to specify the most appropriate diet for resolving each individual problem, because nutritional deficiency has been identified as one factor that may impair the production and function of healthy sperm.

Keywords: **antioxidants, infertility, nutrition**