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Organizovanjem Trećeg studentskog kongresa „HRANA-ISHRANA-ZDRAVLJE“ sa međunarodnim učešćem, studenti i nastavnici fakulteta medicinske, biotehničke i humanističke grupacije, pokazuju svoju želju da održe kontinuitet ove multidisciplinarnе konferencije. Time je pokazana svijest naše akademske zajednice da nastavi da se bori sa najvećim izazovom 21. stoljeća, a to je rastuća nejednakost u pogledu ostvarivanja osnovnih ljudskih prava na adekvatnu prehranu i zdravlje. Multidisciplinarni karakter kongresa omogućava da se nađu adekvatni odgovori i rješenja na izazove u domenu hrane, ishrane i zdravlja.

Za 3. Kongres „HRANA-ISHRANA-ZDRAVLJE“ Organizacioni odbor je odabrao 5 tematskih cjelina: 1. Primarna proizvodnja i prerada hrane; 2.. Toksikologija i sigurnost hrane; 3. Ishrana tokom životnog ciklusa, 4. Dijetoterapija i 5. Savremena dijagnostika i analitika hrane. Na kongresu će biti predstavljena 73 studentska rada, koja su prošla recenziju Naučnog odbora i čije sažetke donosimo u ovoj Knjizi sažetaka. Ocjena i naučna verifikacija iznijetih tvrdnji i rezultata je prepuštena učesnicima Kongresa i široj naučnoj i stručnoj javnosti. Tekstovi rukopisa kratkih sadržaja nisu lektorisani.

U organizaciji i realizaciji 3. Kongresa uzeli su učešće studenti Poljoprivredno-prehrambenog, Farmaceutskog, Veterinarskog, Pedagoškog, Stomatološkog fakulteta sa klinikama, Fakulteta zdravstvenih studija i Medicinskog fakulteta Univerziteta u Sarajevu, čime su pokazali svoje opredjeljenje da usvajaju nova znanja i vještine i na najbolji način predstave svoje fakultete.

Ovom prilikom se zahvaljujemo i učesnicima svih odobra bez čijeg požrtvovanog rada ne bi bilo moguće realizovati ovaj sada već tradicionalni događaj.

Održavanje Kongresa bez pomoći sponzora bi bilo nemoguće, pa im ovom prilikom izražavamo veliku zahvalnost.

Prof. dr Faruk Čaklović, predsjednik Koordinacionog odbora

FOREWORD

By organizing the third congress "FOOD-NUTRITION-HEALTH", with international participation, students and their teachers from faculties of medical, biotechnical and humanistic studies of the University of Sarajevo, show their willingness to maintain the continuity of this multidisciplinary conference.

This clearly shows the awareness and will of our academic community to keep on fighting with the greatest challenge of the 21st century, which is growing inequality in exercising fundamental human rights to have adequate nutrition and health.

The multidisciplinary character of the congress allows us to find proper answers and solutions to many issues in this field.

The Organizing Committee selected five sections for the 3rd Congress "FOOD-NUTRITION-HEALTH": 1. Primary production and processing of food; 2. Toxicology and food safety; 3. Nutrition through the life cycle, 4. Dietotherapy and 5. Modern food diagnostics and analysis. Upon the review of the Scientific Committee 73 students' works were approved for presentation and their abstracts are published in this Book of abstracts. Evaluation and scientific verification of the statements and results are left to the participants of Congress and to a scientific and professional public. The English translations of the abstracts are not proofread.

Students of the Faculty of Agriculture and Food Sciences, Faculty of Pharmacy, Veterinary Faculty, Faculty of Educational Sciences, Faculty of Health Sciences, Faculty of Dentistry with Clinics and Faculty of Medicine from the University of Sarajevo took part in the organization and realization of the congress. This confirms the commitment of our students to acquire new knowledge and skills and also to represent their faculties in the best way. We take this opportunity to thank the Scientific, Organizing, Coordination and Technical Committee members for their hard work and efforts to organize this traditional event.

The realization of this Congress would not be possible without the help of the sponsors, to whom we are very grateful.

Prof. dr Faruk Čaklovića, Chairman of the Coordinating Committee

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1. PRIMARNA PROIZVODNJA I PRERADA HRANE
PRIMARY PRODUCTION AND PROCESSING OF FOOD

Viskozitet kao parametar kvaliteta kašastih sokova

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SAŽETAK

Kašasti voćni sok podrazumijeva proizvod koji, pored soka iz ćelija voća s rastvorljivim sastojcima, sadrži nerastvorljive sastojke voća koji se mogu djelimično taložiti. Stoga je viskozitet, kao osnovno reološko svojstvo tečnih materijala, veoma bitan parametar u proizvodnji kašastih sokova. Viskozitet je pod utjecajem niza faktora kao što je hemijski sastav medija, temperatura i sl.

Cilj rada bio je utvrditi korelaciju između viskoziteta i senzorne ocjene konzistencije i punoće okusa kašastih sokova. Viskozitet kašastih sokova jagode i breskve mjereno je na rotacionom viskozimetru pri sobnoj temperaturi korištenjem nastavka R2. Senzornu ocjenu provelo je 50 priučenih laika, a navedeni senzorni atributi ocjenjeni su ocjenama od 1-5. Nije utvrđena statistički značajna razlika u viskozitetu između analiziranih sokova jagode i breskve. Međutim, senzornom ocjenom su utvrđene razlike u konzistenciji i punoći okusa između kašastih sokova.

Ključne riječi: kašasti sok, viskozitet, senzorna ocjena, punoća okusa

1-O-1

Viscosity as a quality parameter of pulpy fruit juices

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ABSTRACT

Pulpy fruit juice is a product that, in addition to fruit juices with soluble ingredients, contains insoluble ingredients of fruit that can be partially deposited. Because of that, viscosity, as the basic rheological characteristic of liquid materials, is very important in the production of pulpy juices. Viscosity is influenced by many factors of which the most important are: media chemical composition, temperature, etc.

The aim of the work was to determine the connection between viscosity of pulpy fruit juices and sensory evaluation of their consistency and fullness of taste. Strawberry and peach pulpy juices viscosity was measured by the rotation viscosimeter on room temperature where the R2 extension was used. 50 laymen were submitted to the assessment where abovementioned organoleptic attributes were rated with marks from 1 to 5. Statistically significant difference between the viscosity of strawberry and peach juices was not determined. However, the data obtained by the sensory evaluation indicated differences between consistency and fullness of taste.

Key words: pulpy fruit juice, viscosity, sensory evaluation, fullness of taste

Značaj mesa puževa u ishrani ljudi

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Sažetak

Meso puževa sadrži veoma malu količinu masti (do 1,7%), do 16 % bjelančevina i oko 1,5% mineralnih soli, te je nisko kalorična namirnica, jer 100 grama mesa puževa daje samo 67 kcal (poput jedne jabuke). Uprkos tome, u odnosu na ostale vrste mesa, njegova upotreba u ljudskoj prehrani vrlo je mala, uglavnom radi nepostojanja navike njegove konzumacije u našem podneblju. Pored toga, meso puževa je teško kategorizirati, što utiče na kupce, odnosno njihov stav da je najbolje ne jesti ono što još nije dobro provjereno.

Cilj rada je prvenstveno bio ukazati na značaj mesa puževa u ljudskoj prehrani, te provjeriti stavove i mišljenja građana Sarajeva o upotrebi ove namirnice. Podaci su prikupljeni ličnim verbalnim anketiranjem. Ispitano je ukupno 120 građana, od kojih 112 (93,3%) nikada nije i ne želi probati meso puža, njih dvoje (1,66%) je probalo meso, a preostalih 6 ispitanika (5%) je iskazalo želju da proba ovu namirnicu.

Rezultati istraživanja su pokazali veoma nizak stepen zainteresovanosti stanovništva za upotrebu ove namirnice u ishrani. Smatramo da bi adekvatna edukacija o nutritivnoj vrijednosti mesa puževa, kao i o relativno malim ulaganjima u njegovu proizvodnju vjerovatno rezultirala promjenom svijesti potrošača, te unaprijedila potrošnju ovog mesa u skladu sa njegovim nutritivnim vrijednostima.

Ključne riječi: meso puževa, prehrambene navike, nutritivna vrijednost

1-O-2

Importance of snail meat in human diet

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Abstract

Snail meat contains very small amount of fat (up to 1.7%), 16% of proteins and approximately 1.5% of mineral salts. It is a very low-caloric food, because 100 grams of the meat contain only 67 kcal (the amount of an apple). In spite of that, comparing to other meats, the use of snail meat in human diet is low, mainly due to the lack of habit of its consumption in our region. Additionally, snail meat is difficult to categorize, which affects the customers, i.e. their attitude to not eating something that is not well checked. The goal of the paper was primarily to draw attention to the importance of snail meat in human diet and to examine the attitudes and thoughts of Sarajevo citizens about the consumption of this food. The data were collected by personal interviews. In total, 120 citizens were interviewed, out of which 112 (93,3%) never tried nor wanted to try snail meat, two(1,66%) citizens have tasted it, while the rest of 6 citizens (5%) said they would like to taste it. Survey results showed very low level of interest in using this food in human diet. We consider that adequate education on the quality of snail meat, as well as on relatively low investments in its production, would probably result in changing the perception of consumers and improve the consumption of this food proportional to its nutritive values.

Key words: snail meat, diet habits, nutritive value

Beenola- početak iz prirode

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Sažetak

U današnje vrijeme, veoma je izražen brzi tempo življenja, pa ljudi često zbog nedostatka slobodnog vremena posežu za nezdravom hranom, što je uzrok povećane incidence gojaznosti i bolesti povezanih sa njom. Dodatno, problem zaštite i sigurnosti okoliša je iz godine u godinu sve prisutniji. Zagađenje vazduha, zemljišta i vode, uglavnom je uzrokovano saobraćajem, a istovremeno je uzrok brojnih promjena u biosferi, što utiče na sve žive organizme, posebno ljude.

Mi vjerujemo da male ideje mogu dovesti do značajnih promjena. Naša prva inovacija je Beenola.

Beenola je rezultat kombinacije tradicije i inovacije. Ona predstavlja klasičnu i dobro poznatu granolu uz dodatak tradicionalnog slovenskog propolisa. Beenola ne sadrži rafinisane šećere, aditive niti pesticide. Sav sirovi materijal je iz biološkog uzgoja domaćih proizvođača. Pakovanje proizvoda omogućava da ga uvijek nosite sa sobom i imate zdravu užinu u svakom trenutku. Pošto je cijela kutija 100 % biorazgradiva, njen negativan uticaj na okoliš je minimalan.

Ključne riječi: inovacija, zdrava hrana, sigurnost okoliša, domaći proizvođači

1-O-3

Beenola- start with nature

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Abstract

Nowadays, it dominates a really fast rhythm of life, and people more frequently opts for anything but healthy food just because of the lack of time, which shows up with a higher incidence of obesity and diseases connected with it. Besides, it's a fact that the problem about environmental safety is becoming more serious every year, just like pollution, which is mainly caused by transport. Air, soil and water pollution is the cause of a lot of changes of the biosphere, which affect the lives of all the organisms, including of the humans.

We believe that also with simple ideas we can make big changes. So, our first innovation is Beenola.

Beenola is the results of the combination of tradition and innovation. It's the classic and well known granola with the addiction of traditional slovenian propolis. Beenola doesn't contain any rafined sugars, any additives or pesticides. All the raw material are from bio origin from local producers. Beenola's packaging is suitable for keeping it always with you, so you can have a healthy snack wherever you are. Since the whole box is 100 % biodegradable, it's impact on the enviroment is minimal.

Key words: innovation, healthy food, environmental safety, local producers

Određivanje koncentracije sumpor dioksida u džemovima dostupnim na sarajevskom tržištu

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Sažetak

Da bi se održala stabilnost i trajnost proizvoda od voća i povrća dodaju se konzervansi, ali pri tome treba voditi računa o količini koja se dodaje jer veće koncentracije mogu imati štetne efekte po zdravlje ljudi. Hemijski konzervansi koji se najčešće koriste u prerađevinama od voća i povrća su sorbinska kiselina i sorbati, benzojeva kiselina i benzoati, te sumpor dioksid i sulfiti.

Proizvodnja prerađevina od voća i povrća mora biti u skladu sa važećim Pravilnikom o prehrambenim aditivima, osim boja i zaslađivača u hrani, koji definiše vrstu i količinu dozvoljenih konzervanasa.

U cilju utvrđivanja sadržaja ukupnog i slobodnog sumpor dioksida (Ripperovom metodom) provedeno je ispitivanje na 5 džemova, odnosno na 2 džema od jagode, džemu od miješanog voća, džemu od kupine i džemu od marelice, dostupnih na sarajevskom tržištu.

Ispitivanje je pokazalo je da su džemovi sadržavali sumpor dioksid u količinama koje se prema važećem Pravilniku o prehrambenim aditivima, osim boja i zaslađivača u hrani nalaze u dozvoljenim granicama, odnosno sadržaj ukupnog sumpor dioksida je bio u rasponu od 30 do 50 mg/kg.

Ključne riječi: konzervansi, pravilnik, ukupni i slobodni sumpor dioksid

1-O-4

Determination of sulfur dioxide concentration in jams that can be found on the Sarajevo market

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Abstract

Preservatives are added to fruit and vegetables products, in order to maintain their stability and durability, but care should be taken when it comes to concentrations that are added, because larger quantities can have harmful effects on human health. Chemical preservatives that are mostly used in fruit and vegetable products are sorbic acid and sorbates, benzoic acid and benzoates and sulfur dioxide and sulfites.

Production of preserved products must strictly be in accordance with the applicable Regulation on food additives other than colours and sweeteners, that contain types and quantities of authorized preservatives.

In order to determine the content of total and free sulfur dioxide (Ripper method), a study was performed on 5 jams: 2 strawberry jams, mixed fruit jam, blackberry jam and apricot jam, that can be found on the Sarajevo market.

Study showed that jams contained sulfur dioxide in concentrations that are within the limits allowed by Regulation on food additives other than colours and sweeteners, and the content of total sulfur dioxide was in the range of 30 to 50 mg/kg.

Keywords: preservatives, regulations, total and free sulfur dioxide

Uticaj načina proizvodnje na senzorna svojstva mariniranog bijelog luka

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Sažetak

Bijeli luk je tradicionalna povrtlarska kultura koja se koristi u ishrani kako zbog svojih aromatskih, tako i ljekovitih i antibakterijskih svojstava. U ljudskoj ishrani koristi se svjež ili prerađen. Najzastupljeniji način prerade bijelog luka jeste mariniranje.

Međutim, neposredno nakon mariniranja dolazi do promjene boje bijelog luka u tirkiznu ili plavo – zelenu boju, koja nema negativan utjecaj za zdravlje ali kod potrošača izaziva skepticizam.

Stoga je i cilj našeg rada bio analizirati uticaj načina proizvodnje na senzorna svojstva mariniranog bijelog luka. Nakon pripremnih operacija: inspekcije, ljuštenja i sječenja (keramičkim i metalnim nožem) bijeli luk je potopljen u salumuru sa 16, 20 i 24 % koncentracije soli tokom četiri nedjelje. Zatim je slijedila operacija ispiranja vodom tokom 24h, cijedenje, mariniranje sa sirćetnom kiselinom, pasterizacija i hlađenje. Na proizvedenim marinadama određen je sadržaj sirćetne kiseline kao i senzorni atributi (boja, miris, okus i izgled).

Statističkom analizom nije utvrđen utjecaj vrste noža kao niti koncentracije soli u salamuri na analizirane senzorne attribute. Također, nije utvrđen ni utjecaj sirćetne kiseline na ispitivane parametre. Sve proizvedene marinade zadržale su boju polazne sirovine. S obzirom na navedeno, a zbog rentabilnosti proizvodnje preporučuje se proizvodnja marinada iz salamure sa 16% soli.

Ključne riječi: bijeli luk, salamurenje, mariniranje, promjena boje

1-O-5

Influence of production manners on the sensory characteristics of garlic marinara

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Abstract

Garlic is a traditional gardening culture that is used in the diet for its aromatic, medicinal, and antibacterial characteristics. In the human diet, garlic is used fresh or processed. The most common way of processing of garlic is marinating.

However, soon after marinating, garlic changes its color to turquoise or to blue – greenish, which does not have a negative impact for the health, but causes skepticism.

Therefore the main goal of our research was to analyze the influence of production manners on the sensory properties of marinated garlic. After preparatory operations: inspection, peeling and cutting (using ceramic and metal knife) garlic was submerged in souse with 16, 20, 24% salt concentration during the four week. Later that was followed with water rinsing for 24 hours, then squeezing, marinating with acetic acid, pasteurization and cooling.

Produced marinades are determined by the contents of acetic acid as well as sensory attributes (color, smell, taste and looks).

Statistical analysis of the influence of knife blade type as well as the salt concentration in brine was not proven on the analyzed sensory attributes. It has not been determined nor the influence of acetic acid on the examined parameters. All produced marinades retained the starting color of raw materials. Given all the above, and because of profitability of production it is recommended to produce marinade from souse with 16% salt.

Key words: garlic, marinating, grinning, color change

Proizvodnja i tehnološke karakteristike hladno prešanog ulja iz sjemena nara (*Punica granatum L.*)

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Sažetak

Ulje iz sjemena nara je relativno novi proizvod na tržištu. Dobija se mehaničkim prešanjem na kontinuiranim pužnim presama pri temperaturi do 50°C. Na taj način proizvodi se sirovo ulje, koje se zatim filtrira, taloži i centrifugira kako bi se dobio finalni proizvod. Ulje nara je bogato punicinskom kiselinom, polifenolima i tokoferolima. Punicinska kiselina je polizasićena masna kiselina koja ima jako protuupalno dejstvo i isključivo je prisutna u ulju iz sjemena nara. Zbog prisustva fitohemikalija ulje se primjenjuje u farmaceutskoj industriji, kozmetici i u ishrani. Ulje ima antikancerogeno dejstvo koje je povezano sa antioksidativnim svojstvima polifenolnih jedinjenja. Pored toga ulju se propisuju antidijabetično, hipolipidemijsko, antibakterijsko, antiinflamatorno, antiviralno, hemopreventivno i hemoterapeutsko dejstvo. Veoma je osjetljiv proizvod i podliježe hemijskim, enzimatskim i mikrobiološkim reakcijama, koje izazivaju kvarenje ulja. Kako bi sprečili nepoželjne procese, i kako bi poboljšali stabilnost ulja, u ulje se dodaju prirodni ili vještački antioksidansi. Nadalje, u cilju stabilizacije ulja neophodno ga je skladištiti u tamnoj prostoriji, bez prisustva kiseonika i pri niskoj temperaturi. Ambalaža za pakovanje treba da bude tamna radi sprečavanja interakcije između okoliša i proizvoda, te ne smije reagovati sa proizvodom i mijenjati njegova nutritivna i organoleptička svojstva. Cilj rada je istražiti kako se proizvodi ulje iz sjemena nara, njegove tehnološke karakteristike, te gdje se primjenjuje.

Ključne riječi: Ulje, sjeme nara, punicinska kiselina, stabilnost, kvarenje, antioksidans

**Production and technological characteristics of cold pressing
pomegranate seeds oil (*Punica Granatum L.*)**

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Technology, B&H

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Abstract

Pomegranate seed oil is relatively new product on the market. It is made with continuous mechanical pressing on temperatures up to 50⁰C. This way crude oil is produced, which is followed by filtration, sedimentation and centrifugation to get to the final product. Pomegranate oil is rich with puniic acid, polyphenols, tocopherols, anthocyanins. Puniic acid is polyunsaturated fatty acid which has strong anti-inflammatory effect and is only present in pomegranate seeds oil. Because of the presence of phytochemicals, oil is applied in the pharmaceutical industry, cosmetics and nutrition. Oil has anticancerogenic effects which is related with antioxidant properties of polyphenol compounds. Besides that, oil is prescribed antidiabetic, hypolipidemic, antibacterial, antiinflammatory, antiviral, chemopreventive and chemotherapeutic effects. It is very sensitive product and it is subject to chemical, enzymatic and microbiological reactions, which cause oil spoilage. To prevent unwanted processes and to improve oil stability, natural or artificial antioxidants are added. Further, in order to stabilize the oil it is necessary to store it in dark place, without presence of oxygen and in low temperatures. Wrapping material for packaging should be dark so it can prevent interaction between the environment and product, and it should not react with the product and change its nutritional and organoleptic properties. The aim of this work is to explore the production of pomegranate seeds oil, its technological characteristics and where it is applied.

Keywords: oil, pomegranate seeds, puniic acid, stability, spoilage, antioxidants

Utjecaj soli za salamurenje na kvalitet mesnih prerađevina

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Sažetak

Salamurenje je tehnološki proces konzerviranja smjesom soli za salamurenje koja uključuje kuhinjsku sol, nitrate i nitrite, te druge dopuštene sastojke (šećer-glukoza, dekstroza i saharoza, ocat, mliječna, vinska, limunska i askorbinska kiselina i njihove natrijeve soli, te polifosfati). Salamurenje se primjenjuje u proizvodnji suhomesnatih proizvoda, nekih vrsta kobasica i mesnih konzervi kod kojih se želi postići termostabilna ružičastocrvena boja proizvoda.

Konzervirajuće djelovanje salamure (vodene otopine smjese soli za salamurenje) rezultat je difuzije iona soli zbog razlike u osmotskim pritiscima, te reakcija soli s komponentama mišićnih vlakana. Cilj ovog rada je ispitati utjecaj soli za salamurenje na kvalitet mesnih prerađevina. Utvrđeno je da kuhinjska sol povoljno djeluje na povećanje sposobnosti vezivanja vode, odnosno hidrataciju mesa, a smanjivanje aktivnosti vode u proizvodu ima i bakteriostatski učinak. Nitrati utiču na održivost boje, šećeri koji svojim razlaganjem stvaraju mliječnu kiselinu, čime se snižava pH vrijednost mesa, te askorbinska kiselina koja ubrzava sam proces salamurenja i razvija intenzivnu boju mesa. Na osnovu navedenih podataka možemo zaključiti da djelovanje soli za salamurenje na kvalitet mesa ima vrlo kompleksnu ulogu, te njihovom neadekvatnom primjenom možemo ugroziti zdravlje potrošača.

Ključne riječi: soli, salamurenje, meso, kvalitet

1-O-7

The influence of salts on the quality of meat products

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Abstract

Brining is the technological process of preserving mixture salty salt which includes kitchen salt, nitrates and nitrites and other permitted ingredients (sugar-glucose, dextrose and sucrose, vinegar, lactic, tartaric, citric and ascorbic acid and their sodium salts and polyphosphates). Brining is used in the production of dried meat products, some types of sausages and meat tins for which a thermostable pink-red color of the product is desired.

The conservative effect of salamure (aqueous solutions of saline salt mixture) is the result of the diffusion of salt ions due to differences in osmotic pressure, and the reaction of salts with muscle fiber components.

The aim of this student work is to examine the influence of salts for the quality of meat products. It was found that the kitchen salt has a beneficial effect on increasing the ability of water binding, that is, the hydration of the meat, and the decrease in the activity of water in the product also has a bacteriostatic effect.

Nitrates influence on color sustainability, sugars, which by their decomposition create lactic acid, which reduces the pH of the meat, as well as ascorbic acid that accelerates the process of salamiation and develops intense meat color.

Based on the above data, we can conclude that the action of salting for meat quality plays a very complex role, and by their inadequate application, we can endanger the health of consumers.

Keywords: salts, brining, meat, quality

Utjecaj mlijeka i surutke u prahu na reološke osobine brašna T-500

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Sažetak

Istraživanje je obuhvatalo ispitivanje uticaja mlijeka u prahu (MUP) i surutke u prahu (SUP) na reološke osobine pšeničnog brašna T-500. Obogaćivanje različitih pekarskih i brašneno-konditorskih proizvoda dodavanjem mlijeka i surutke u prahu nije nepoznata praksa. S obzirom na hemijski sastav mlijeka i surutke oni doprinose boljem kvalitetu pekarskih proizvoda u pogledu nutritivnog i senzornog kvaliteta. Mlijeko i surutka u prahu posjeduju nutritivno visoko vrijedne proteine koji su sačinjeni od esencijalnih aminokiselina i kao takvi pozitivno utiču na finalni proizvod, naročito kada se uzme u obzir da su pekarski proizvodi deficitarni sa esencijalnim aminokiselinama. Istraživanje je podrazumijevalo analizu reoloških osobina standardnim metodama na farinografu i ekstenzografu. Ispitivanjem uticaja MUP i SUP dodatih u koncentracijama od 0, 1, 3, 5 i 10% na pšenično brašno T-500 u pogledu reoloških osobina ustanovljeno je da se moć upijanja vode tijesta smanjuje, dok se svi ostali parametri povećavaju. Na osnovu dobijenih rezultata može se uočiti da su se promjene u pogledu reoloških svojstava najviše očitovale kod koncentracija M-UP i SUP 5 i 10%. Vrijednosti od 0 FJ (MUP) i 10 FJ (SUP) za stepen omekšanja tijesta i 650 FJ (MUP) i 820 FJ (SUP) za otpor su nepovoljne u smislu obrade tijesta, odnosno tijesto je suviše jako i kratko, te nepodesno za mašinsku obradu. Međutim, dodatak MUP i SUP u koncentracijama od 1-5% poboljšava reološke karakteristike tijesta, kao što su elastičnost, stabilitet i energija tijesta, i mogu se preporučiti u proizvodnji pekarskih proizvoda.

Ključne riječi: pšenično brašno T-500, mlijeko u prahu, surutka u prahu, farinograf, ekstenzograf

1-O-8

Influence of milk and whey powder on the rheological properties of wheat flour T-500

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Abstract

The aim of this study was to examine effects of milk (MP) and whey powder (WP) addition on the rheological properties of wheat flour T-500. The enrichment of various bakery and flour-confectionery products by adding milk and whey powder is not an unknown practice. Given the chemical composition of milk and whey, they contribute to better quality of bakery products in terms of nutritive and sensory quality. They have nutritionally high-value proteins made up of essential amino acids and as such have a significant effect on the final product, especially when considering that bakery products are deficient with essential amino acids. The research involved the analysis of rheological properties by standard methods on farinograph and extensograph. By examining the influence of MP and WP addition in different concentrations of 0, 1, 3, 5 and 10% on wheat flour T-500 in terms of rheological properties, it was found that the water absorption capacity was decreasing while all other parameters increasing when concentration of MP and WP increased. On the basis of the obtained results, it can be noticed that the changes in terms of rheological properties were the most evident for 5 and 10% MP and WP concentrations. Softening degree values of 0 BU (MP) and 10 BU (WP) and 650 BU (MP) and 820 BU (WP) for resistance were unfavorable in terms of dough manipulation, that is, the dough was too strong, rigid and short, and unsuitable for the industrial processing. However, the MP and WP addition in concentrations of 1-5% improved the rheological characteristics of the dough, such as elasticity, stability and energy of the dough (area under the extensograph curve), and can be recommended for production of bakery products.

Keywords: Wheat flour T-500, milk powder, whey powder, farinograph, extensograph

Dozvoljeni zaslađivači u prerađevinama od voća i povrća

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Sažetak

Današnja proizvodnja niza prehrambenih proizvoda nezamisliva je bez upotrebe aditiva. Među njima posebnu važnost zauzimaju zaslađivači kako prirodni tako i vještački, jer je spoznaja o štetnom utjecaju šećera (kristalnog šećera saharoze) svakim danom sve veća. Prirodni zaslađivači poput glukoze, fruktoze, sorbitola, steviol glikozida, eritritola, ksilitola i poliglicitol sirupa imaju nižu kalorijsku vrijednost od šećera. Karakteristike vještačkih zaslađivača su da generalno nemaju kalorijsku vrijednost (izuzev aspartama i neohesperidin dihidrolaktona), da su iznimno visoke slasti zbog čega se koriste u izrazito malim količinama u odnosu na šećer. Stoga se vještački zaslađivači upotrebljavaju za proizvodnju osvježavajućih bezalkoholnih pića, nisko energetske hrane i hrane namijenjene dijabetičarima. Vještački zaslađivači koji se mogu naći na tržištu i koji su odobreni od strane FDA (Administracije za hranu i lijekove) su: saharin, aspartam, acesulfam, neotam i sukraloza. Ciklamat je zabranjen u Americi a koristi se u Evropi i Kanadi. Kako bi se utvrdila sigurnost vještačkih zaslađivača za korištenje utvrđen je prihvatljivi dnevni unos za svaki zaslađivač. Općenito, za sve zaslađivače koje se unose u organizam, vrijedi isto pravilo: upotrebljavaju se umjereno i u granicama prihvatljivog dnevnog unosa.

Ključne riječi: prirodni zaslađivači, vještački zaslađivači, prihvatljivi dnevni unos

1-O-9

Permitted sweeteners in fruit and vegetable products

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Abstract

Today's production of a range of food products is unimaginable without the use of additives. Among them special attention is given to sweeteners, both natural and artificial because awareness of the harmful effect of sugar is increasing every day. The use of sweeteners in the food industry is rather high, although its use is mainly in fruit products, while in vegetable products it is rarely used. Natural sweeteners such as glucose, fructose, sorbitol, steviol glycoside, erythritol, xylitol, and polyglitol syrup have lower calorie value than sugars. The characteristic of artificial sweeteners is that they are generally not calorific (except for aspartame and neohesperidine dihydrolactone), they have extremely high sweetness and are used in extremely small amounts compared to sugar. Therefore, artificial sweeteners are used in the production of soft drinks, low energy foods and foods for diabetics. The artificial sweeteners that can be found on the market and are approved by the FDA (Food and Drug Administration) are: saccharin, aspartame, acesulfame, neotam and sucralose. Cyclamate is banned in America and is used in Europe and Canada. In order to determine the safety of artificial sweeteners for use, an acceptable daily value for each sweetener is determined, in which they are not considered harmful to health. In general, the same rule applies for all sweeteners that enter the body: they are used moderately and within the limits of an acceptable daily intake.

Keywords: natural sweeteners, artificial sweeteners, acceptable daily intake

Utjecaj tretmana kaše na fizičko-hemijske parametre mutnog soka od jabuke

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Sažetak

Voćni sokovi su jedna od najznačajnijih skupina prerađevina od voća, a njihov kvalitet je pod utjecajem niza faktora, kako prije tako i nakon berbe. Osnovni uslov u proizvodnji vrijednog gotovog proizvoda je da sirovina namijenjena za preradu bude odgovarajućih svojstava, a također i postupci prerade voća u sok mogu značajno utjecati na kvalitet samog proizvoda. Iako jabuke sadrže različite grupe bioaktivnih komponenti, njihova antioksidativna svojstva se uglavnom pripisuju fenolnim komponentama koje služe kao jak antioksidans u organizmu. Međutim, sadržaj ovih komponenti zavisi od velikog broja faktora i zbog same prirode ovih nestabilnih jedinjenja potrebno je obratiti pažnju prilikom odabira sirovine, kao i samog načina prerade. Proizvodnja mutnog soka bazirala se na dvije sorte jabuke: Idared i domaća sorta. Cilj rada bio ispitati utjecaj tretmana kaše (zamrzavanje, blanširanje, enzimski tretman i tretman askorbinskom kiselinom) na fizičko-hemijske parametre (sadržaj ukupnih fenola, rastvorljive suhe materije, kiselosti i randman) mutnog soka od jabuke. Statističkom analizom utvrđen je utjecaj sorte i tretmana kaše na sadržaj fenola i rastvorljivu suhu materiju, dok na titracionu kiselost i randman nije utvrđen značajan utjecaj. Blanširanjem je najbolje očuvan sadržaj fenolnih komponenti u gotovom proizvodu.

Ključne riječi: fizičko-hemijski parametri, jabuke, kaša, mutni sok

The effect of the mash treatment on the physical-chemical properties of the cloudy apple juice

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Abstract

Fruit juices are one of the most important groups of fruit products, and their quality is influenced by a number of factors both before and after harvesting. The basic condition in the production of a valuable finished product is that the raw material intended for processing is of the corresponding properties, and also the process of juice making can significantly affect the quality of the product itself. Although apples contain different groups of bioactive components, their antioxidant properties are largely attributed to phenolic components that serve as a strong antioxidant in the body. However, the content of these components depends on a large number of factors and due to the very nature of these unstable compounds, it is necessary to pay attention to the selection of the raw material as well as the way of processing itself. Therefore, the aim of the study was to examine the effect of the treatment of mash (freezing, blanching, enzymatic treatment and treatment with ascorbic acid) on physico-chemical parameters (content of total phenols, soluble dry matter, acidity and randman) of cloudy apple juice. The production of cloudy juice was based on two varieties of apples: Idared and domestic variety. The statistical analysis determined the influence of variety and the treatment of mash on the content of phenol and soluble dry matter, while no significant influence was found on titration acidity and randman. The content of phenolic components in the finished product is best preserved by blanching.

Keywords: physical-chemical parameters, apples, mash, cloudy juice

Značaj dezinfekcije u mesnoj industriji

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Sažetak

Tehnološki razvoj mesne industrije pridaje veliki značaj primjeni dezinficijensa. Cilj dezinfekcije je sprječavanje i suzbijanje pojave zaraznih bolesti, pa se ona sprovodi na mjestima gdje postoji rizik od prenošenja istih. Izbor vrste dezinficijensa zavisi od stepena onečišćenja, vrste podloge i predmeta, vrste mikroorganizama i količine mikrobiološke kontaminacije. Efikasnost dezinfekcije zavisi od više faktora: mehaničko pranje i čišćenje, pH medijuma, temperature, koncentracije dezinficijensa i vremena djelovanja. Dezinficijensi moraju zadovoljiti sljedeće kriterije: širok spektar djelovanja, dobra površinska aktivnost, slaba toksičnost i antikorozivnost. Najčešći dezinficijensi u prehrambenoj industriji su: amfotenzidi, kvatarni amonijevi spojevi i spojevi peroksida. Amfotenzidi praktično ispunjavaju sve kriterije. Imaju nisku toksičnost, nemaju kancerogeno svojstvo, ne ostavljaju rezidue u proizvodima i ne zagađuju spoljašnu sredinu. Kvatarni su djelotvorni protiv plijesni, kvasaca i bakterija i slabo su toksični, ali im treba dosta vremena da ispolje djelovanje, što može uzrokovati rezistenciju mikroorganizama. Od spojeva peroksida najpoznatiji su hidrogen-peroksid i peracetatna kiselina, koja je dosta potentnija. Peracetatna kiselina ima dugo germicidno djelovanje, ne ostavlja toksične rezidue na proizvodu, međutim dokazano je da ne djeluje na biofilm bakterije. Od dezinficijensa koji se najčešće koriste najbolje karakteristike imaju amfotenzidi. Zbog pojaver ezistencije treba povremeno mijenjati dezinficijense i vršiti redovnu kontrolu njihove efikasnosti. Značaj dezinfekcije je veliki, jer je kvalitetna dezinfekcija uvjet higijenske ispravnosti proizvoda.

Ključne riječi: dezinficijesi, prehrambena industrija, mesna industrija, dezinfekcija

Significance of disinfection in the meat industry

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Abstract

Technological development of the meat industry attaches great importance to the disinfection. The aim of the disinfection is to prevent and suppress the occurrence of infectious diseases, so it is carried out in places where there is a risk of transmitting it. The choice of disinfectant depends on the level of contamination, the type of substrate and objects, the type of microorganisms and the amount of microbiological contamination. Efficiency of disinfection depends on several factors: mechanical cleaning, pH of the medium, temperature, concentration of disinfectant and time of action. Disinfectants must meet the following criteria: wide spectrum of action, good surface activity, poor toxicity and anti-corrosion. The most common disinfectants in the food industry are: amphotensides, quaternary ammonium compounds and peroxide compounds. Amphotensides practically meet all criteria. They have low toxicity, no carcinogenic properties, no residue in the products, and no polluting the outside environment. Quaternary ammonium compounds are effective against molds, yeasts, bacteria, and poorly toxic, but they need a long period to produce the action, which can cause resistance to microorganisms. Peroxide compounds are most known as hydrogen peroxide and peracetic acid, which is far more potent. Peracetic acid has long germicidal activity, does not leave residues on the product, but it has been proven not to act on the biofilm of the bacterium. The most commonly used disinfectants are the best characteristics of amphotensides. Due to the appearance of resistance, disinfectants should be changed periodically and make regular control of their efficacy. The importance of disinfection is great because quality disinfection is a condition of hygienic correctness of the product.

Keywords: disinfectants, food industry, meat industry, disinfection

Hljeb od ozime raži sa sjemenkama, inovativni prehrambeni proizvod

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Sažetak

Savremene napredne prakse i kontrola u proizvodnji hrane obezbjeđuju njenu sigurnost. Međutim, kvalitet hrane, zaštita okoliša i vrijednost nus produkata u prehrambenoj industriji često su zanemareni. Ukoliko se ne vodi računa i o ovim aspektima u svim fazama proizvodnje i trgovine hranom, koncept sigurnosti za čovjeka je nepotpun. Ograničenja održivog razvoja polako, ali trajno ugrožavaju okoliš u kojem živimo. Stoga buduće generacije možda neće biti u prilici da uživaju u istim uslovima života kakvi vladaju danas.

Glavni cilj našeg projekta bio je rješavanje prethodno navedenih problema, čija je kompleksnost povezana sa različitim faktorima. Naš rad uključivao je različite aspekte kao što su: inovativnost proizvoda, nutritivna vrijednost, proces proizvodnje, aspekti održivog razvoja, analiza tržišta, komunikacija sa potrošačima, finansijski aspekti i uticaj na okoliš. Razvili smo jednostavan, inovativan prehrambeni proizvod sa visokim sadržajem dijetalnih vlakana i kalija. Blagu ukus hljeba je obogaćen dodatkom sirovog materijala, koji je do otkrića njegovih pozitivnih zdravstvenih učinaka, smatran otpadnim produktom u proizvodnji hrane. On doprinosi kvalitetu proizvoda inhibiranjem rasta plijesni, što posljedično povećava i sigurnost upotrebe ovakvog proizvoda. Kako bi se adekvatno informisali konzumenti napravili smo i pakovanje koje je sigurno za okoliš (*eco friendly*). Tokom cijelog procesa razvoja proizvoda oslanjali smo se na izvodivost i održivost proizvodnje.

Ključne riječi: prehrambena industrija, inovativni prehrambeni proizvod, održivi razvoj, zaštita okoliša, kvalitet proizvoda

Green rye bread with seeds, an innovative food product

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Abstract

Today's advanced and controlled practices in food chains ensure food safety. Nevertheless, food quality, environmental protection and the value of by-products in the food industry are often neglected. If the above-mentioned aspects are not taken into account at all stages of production and food trade, the concept of human security is undermined. The limitation of sustainable development slowly but persistently damages the environment in which we live. Therefore, future generations may not be able to enjoy the living conditions which we are experiencing today.

The main goal of our project was to solve the above-mentioned problems, the complexity of which is related to various factors. Our work includes taking into account aspects such as innovative features, nutritional facts, production processes, aspects of sustainable development, market analysis, communication with customers, financial aspects, environmental impacts. We have developed a simple, innovative food product with high dietary fiber content and potassium minerals. The gentle taste of bread is enriched by the use of a raw material which, until the discovery of its medicinal effects, was considered a food processing waste product. It contributes to product quality by inhibiting the growth of mold, which consequently increases the safety of this kind of product. In order to effectively inform consumers, we manufactured an environmentally friendly packaging. During the whole process, we relied on the feasibility and suitability of the products industrial production.

Keywords: food industry, innovative food product, sustainable development, environmental protection, product quality

Određivanje ukupne suhe materije i jačine sirćeta

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Sažetak

Sirće je tečnost koja se sastoji uglavnom od sirćetne kiseline i vode. Sirćetna kiselina se proizvodi putem fermentacije alkohola etanola djelovanjem bakterija sirćetne fermentacije. Kao sirovina za proizvodnju sirćeta može se koristiti bilo koja biljka koja sadrži u svom sastavu šećer koji je osnova za fermentaciju. Sirće može biti proizvedeno različitim metodama. Sadržaj suhe materije u sirćetu je u direktnoj vezi sa načinom proizvodnje sirćeta, te stepenom fermentacije. Jačina sirćeta je određena količinom organskih kiselina proizvedenih tokom fermentacije i izraženih preko sirćetne kiseline. Iznos i intenzitet kiseline ovisi od sirovina korištenih za fermentaciju, kao i toka vođenja fermentacije. Jačina sirćeta u indirektnoj je vezi sa količinom ukupne suhe materije u sirćetu. S obzirom na navedeno, postavljen je cilj rada. Cilj rada bio je ispitati količinu ukupne suhe materije u uzorcima sirćeta i jačinu uzoraka sirćeta, te uporediti dobijene rezultate i zaključiti kakav je odnos sadržaja suhe materije i jačine sirćeta. Za očekivati bilo je da su sadržaj suhe materije i jačina sirćeta u indirektnoj vezi. U uzorcima koji sadrže veću količinu suhe materije, očekivala se niža jačina sirćeta i obratno. Laboratorijskim ispitivanjem navedenih parametara potvrđeni su očekivani rezultati. Laboratorijsko ispitivanje vršeno je na uzorcima sirćeta proizvedenim na tradicionalan i industrijski način putem volumetrijske i gravimetrijske (metoda sušenja) analize.

Ključne riječi: sirće, jačina sirćeta, suha materija, standardizacija baze

1-P-1

Determination of total dry matter and strength of vinegar

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Abstract

The vinegar is an acid that is mainly made up of vinegar acid and water. Vinegar acid (acetic acid) is produced by the fermentation of ethanol by acetic acid bacteria. As raw materials for the production of vinegar any plant that contains sugar can be used, because sugar is the basis for fermentation. The vinegar acid can be produced in many ways and methods. The content of dry matter in the wheat is directly related to the production of whey and the degree of fermentation. The strength of the vinegar is determined by the amount of organic acid produced during fermentation that is expressed through acetic acid. The amount and intensity of the acid depends on the raw materials used for fermentation and during fermentation. The strength of vinegar is indirectly related to amount of total dry matter. In view of the above, the goal of the work is set. The aim of the paper was to examine the amount of total dry matter in the samples of the wafers and the strength of the walnut samples, and compare the results obtained and to conclude the relationship between the content of dry matter and the strength of the wedge. It was to be expected that the content of dry matter and the strength of the pulp were in an indirect relationship. In samples containing a higher amount of dry matter, a lower wattage was expected and vice versa. Laboratory testing of these parameters confirmed the expected results. Laboratory testing was performed on samples of cheese produced in a traditional and industrial way through volumetric and gravimetric (drying method) analysis.

Keywords: vinegar (acetic acid), vinegar strength, dry matter, standardization base

Genetska modifikacija u ishrani: retrospektiva i budućnost

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Sažetak

Genetska modifikacija (GM) u poljoprivredi je jako kontroverzna tema. Nauka i javno mišljenje, o ovoj temi, su odavno otišli odvojenim putevima. Dok je ideja GM u drugim granama opće prihvaćena, modifikacije na biljkama koje se koriste u ishrani ljudi još uvijek stvaraju nelagodu. Ova neopravdana stigmatizacija je rezultat anksioznosti koju donose nova otkrića i nedovoljno poznavanje činjenica. Cilj ovog rada jeste da se istraže svi benefiti i potencijal genetske modifikacije u poljoprivredi, čime bi se mogle donekle rasvijetliti određene nedoumice. Rezultati dosadašnjih istraživanja objavljeni u literaturi jasno sugerišu da nema naučnih dokaza koji povezuju GMO sa većim rizikom za okoliš ili za sigurnost hrane i prehranjivanja, u odnosu na konvencionalno uzgojene biljke. Štaviše, GMO potencijalno osigurava priliku za smanjenje malnutricije, naročito u manje razvijenim zemljama. Primjena nekih od metoda poboljšanja genetskih svojstava osigurava povećanje prinosa i potencijala, te veću sposobnost adaptacije usjeva klimatskim promjenama. Prema podacima UN na dnevnoj bazi se potroši oko 5 miliona kilograma hrane, a predviđanje je da će se ova brojka povećati za 70% do 2050. godine. Podaci Svjetske zdravstvene organizacije govore da oko 805 miliona ljudi nema dovoljno hrane da vodi zdrav život, a da će se ukupna populacija do kraja stoljeća povećati na više od 11 milijardi stanovnika. Nema sumnje da se poljoprivredna produktivnost mora nastaviti povećavati, kako bi mogla da zadovolji potrebe rastuće populacije, GM je neizbježna stepenica u ovom procesu.

Ključne riječi: GMO, hrana, budućnost

Genetic engineering in nutrition: retrospective and the future

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Abstract

Genetic engineering (GE) in agriculture is a very controversial topic. Science and public opinion, on this subject, have long since departed separate ways. While the idea of GE in other sciences is generally accepted, modifications to the plants used in human nutrition still is not well received. This unjustified stigmatization is the result of anxiety brought about by new discoveries and insufficient knowledge of the facts. The aim of this paper is to investigate all the benefits and potential of genetic engineering in agriculture, which could illuminate certain concerns. The results of previous research published in the literature clearly suggest that there is no scientific evidence associating GMOs with higher risks for the environment or for food and feed safety than conventional plants. Moreover, GMOs potentially provide opportunities to reduce malnutrition, especially in lesser developed countries, as well as to increase yields and assist towards the adaptation of agriculture to climate change. According to the UN data, about 5 million kilograms of food is consumed on a daily basis, and the prediction is that this figure will increase by 70% by 2050. World Health Organization data show that around 805 million people lack enough food to lead a healthy life, and that the total population will increase to more than 11 billion inhabitants by the end of the century. There is no doubt that agricultural productivity must continue to increase in order to meet the needs of a growing population, GE is an inevitable step in this process.

Key words: GMO, food, future

2. TOKSIKOLOGIJA I SIGURNOST HRANE
FOOD SAFETY AND TOXICOLOGY

Kvalitet mljevenog mesa na bosanskohercegovačkom tržištu

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Sažetak

Kada govorimo o konzumiranju namirnica animalnog porijekla glavni akcenat se stavlja na higijensku ispravnost tih proizvoda, tj. zadovoljavanje mikrobioloških kriterija u skladu sa važećim regulativama. Međutim, sam kvalitet tih istih proizvoda se do prije nekoliko godina smatrao nerelevantnim ili, u najbolju ruku, manje relevantnim za konzumente. Pravilnikom o usitnjenom mesu, poluproizvodima i proizvodima od mesa „Zakona o hrani BiH“ su se propisali uslovi koji moraju biti ispunjeni za usitnjeno meso, proizvode i poluproizvode od mesa, kako u proizvodnji, tako i u prometu. Cilj ove studije je bio ispitati fizikalno-hemijske parametre mljevenog mesa (junećeg, svinjskog i miješanog) kako bismo utvrdili kvalitet ovih proizvoda na bosanskohercegovačkom tržištu. Pod „mljevenimmesom“ podrazumijeva se meso bez kostiju koje je samljeveno na sitne komadiće i koje sadrži manje od 1% soli. Ispitivani parametri su: sadržaj proteina, masti, kolagena u proteinima mesa i soli (NaCl). Uzorci su prikupljeni iz maloprodajnih objekata (mesnica) u periodu 2016. i 2017. godine u kantonima: Sarajevski, Zeničko-dobojski, Tuzlanski, Hercegovačko-neretvanski, Unsko-sanski i Srednjobosanski. Ispitano je 88 uzorka navedenih proizvoda, te su utvrđena odstupanja u svim parametrima, izuzev soli (NaCl), u odnosu na važeći Pravilnik. Rezultati ovih ispitivanja su pokazali najviše odstupanja od normativa u parametru količine kolagena u proteinima mesa.

Ključne riječi: kvalitet, mljeveno meso, fizikalno-hemijski parametri

The quality of minced meat on the Bosnian and Herzegovinian market

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Abstract

As we talk about consuming foods of animal origin, the main emphasis is on hygiene of those products, or in other words, meeting the microbiological criteria in accordance with the applicable legislation. However, until few years ago the quality of those products was considered irrelevant or, at least less relevant for the consumers. Regulation on minced meat and raw finished and semi-finished meat products of “Bosnian and Herzegovinian Food Law” has issued terms for minced meat production and trade. The aim of this paper was to examine physico-chemical parameters of minced meat (beef, pork and mixed meat), in order to determine the quality of these products on the Bosnian and Herzegovinian market. ‘Minced meat’ is boned meat that has been minced into fragments and contains less than 1% salt. Examined parameters are: content of proteins, fat, collagen in meat proteins and salt (NaCl). Samples were collected from retail facilities (butcheries) in years of 2016 and 2017 in cantons: Sarajevo, Zenica-Doboj, Tuzla, Herzegovina-Neretva, Una-Sana and Central Bosnia. 88 samples of mentioned products were examined, where deviations in all parameters, except salt (NaCl), were found in relation to the valid Regulation. Results of these examinations showed most aberrations in content of collagen in meat proteins in relation to applicable legislation.

Keywords: quality, minced meat, physico-chemical parameters

Anaerobi – uzročnici kvarenja mesa

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Sažetak

Meso predstavlja izuzetno povoljan medij za kolonizaciju i rast mikroorganizama, koji se međusobno razlikuju kako po osobinama tako i po načinu života. One u meso dospijevaju za vrijeme života životinje ili nakon klanja, te primarne obrade i prerade mesa. U procesima kvarenja mesa učestvuju aerobne i anaerobne bakterije. Od anaerobnih bakterija koje učestvuju u kvarenju mesa i mesnih prerađevina najpoznatije su bakterije iz roda *Clostridium*. Pripadnici ovog roda su štapičaste, anaerobne bakterije, koje spadaju u grupu gram pozitivnih bakterija, s sposobnošću stvaranja spora. Veoma su rasprostranjene u prašini, zemljištu, na biljkama te u probavnom traktu ljudi i životinja. Patogeni ovog roda imaju sposobnost stvaranja toksina, koji može uzrokovati trovanje. Vrste roda *Clostridium* u pakovanom i konzerviranom mesu proizvode izuzetno velike količine plina, što rezultuje „bombažom“ ambalaže te izrazito neugodnim mirisom. Djelovanjem anaerobnih bakterija dolazi do razgradnje bjelančevina i azotnih jedinjenja u mesu i proizvodima od mesa, koja rezultuju nastankom toksičnih biogenih amina. Samim tim dolazi i do promjena mesa u vidu kvarenja. U tom procesu meso postaje sve tamnije, javlja se sluzavi dio na površini mesa, konzistencija postaje mlohava dok miris mesa podsjeća na trulež. Među poznatijim vrstama roda *Clostridium* navode se: *C. botulinum*, *C. perfringes*, *C. difficile*, *C. tetani*, *C. septicum* i *C. chauvoei*. Pored roda *Clostridium* za kvarenje mesa odgovorne su i bakterije iz rodova: *Leuconostoc*, *Pseudomonas*, *Carnobacterium*, *Enterobacterium*, te *Brochotrix thermosphacta* i mnoge druge.

Ključne riječi: anaerobne bakterije, kvarenje mesa, trovanje, rod Clostridium

Anaerobes – organisms that cause food spoilage

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Abstract

Meat is an extremely favorable medium for colonization and growth of microorganisms, which differ in each other according to the characteristics and lifestyle. These microorganisms contaminate meat either during the animal lifetime or during slaughtering process, where primary processing and adaptation of meat is done. Both, aerobic and anaerobic bacteria, are involved in meat spoilage processes. Of the all anaerobic bacteria involved in the deterioration of meat and meat products, the most common are *Clostridium*. Members of this genus are rodent, anaerobic bacteria, which belong to the group of gram positive bacteria, with the ability to create a spore. They are widespread and can be found in all kind of soil, dust, on plants and in the digestive tract of humans and animals. The pathogens of this genus have the ability to create toxins, which can cause poisoning. Species of the genus *Clostridium* in packaged and preserved meat produce extremely large quantities of gas, resulting the „swollen“ of packaging and extremely unpleasant smell. Anaerobic bacteria cause degradation of proteins and nitrogen compounds in meat and meat products resulting occurrence of toxic biogenic amines. This is why the meat changes in the spoilage form. In this process, the meat becomes darker, the mucus appears on the surface of the meat, the consistency becomes flabby while the smell of the meat resembles the rot. The most important species of the genus *Clostridium* are: *C. botulinum*, *C. perfringens*, *C. difficile*, *C. tetani*, *C. septicum* and *C. chauvoei*. Except *Clostridium*, spoilage of meat can be caused also by bacteria from other genera, such as: *Leuconostoc*, *Pseudomonas*, *Carnobacterium*, *Enterobacterium*, *Brochotrix thermosphacta* and many others.

Keywords: anaerobic bacteria, meat spoilage, poisoning, genus Clostridium

Mikotoksini – dijagnostika i značaj

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Sažetak

Plijesni su mikroskopske gljive koje proizvode metabolite i ispuštaju ih na podlogu na kojoj rastu. Mikotoksini su jedan od takvih metabolita, s više od 400 različitih toksina proizvedenih od približno 350 vrsta gljivica. Unešeni u organizam mogu se nakupljati i uzrokovati određene poremećaje, bolesti ili smrt. Oni mogu utjecati na zdravlje životinja i ljudi kontaminirajući hranu. Najznačajniji mikotoksini su: aflatoksin, zearalenon, ohratoksin, trihotecen, fumozin i patulin. Aflatoksini pripadaju grupi izuzetno toksičnih mikotoksina, te su stoga kategorizirani kao kancerogeni skupine I od strane Međunarodne agencije za istraživanje raka (IARC). Cilj ovog rada bio je vidjeti da li u hrani biljnog porijekla, mlijeku i mliječnim proizvodima ima mikotoksina.

U tri laboratorije analizirano je ukupno 5 728 različitih uzoraka hrane u periodu od 2013. do 2018. godine. Ukupno 38 uzoraka hrane biljnog porijekla je bilo pozitivno na aflatoksin B1 (0,66%), u 347 uzoraka mlijeka i mliječnih proizvoda su se nalazile nedozvoljene koncentracije aflatoksina M1. Na ohratoksin A je bio pozitivan 331 uzorak hrane biljnog porijekla (5,8%).

Da bi se smanjila kontaminacija, važno je pažljivo standardizirati svaki korak koji se odnosi na proizvodnju, pohranu, distribuciju i pripremu hrane. Međutim, unatoč najboljim mjerama kontrole, nema hrane koja ne sadrži barem jednu štetnu tvar. Stoga je potrebno provesti analizu procjene rizika i odrediti maksimalnu koncentraciju tih tvari prisutnih u hrani kako bi se bolje razumjela prijetnja koju oni predstavljaju.

Ključne riječi: mikotoksini, aflatoksini, ohratoksini, humani kancerogeni, IARC

2-O-3

Mycotoxins-diagnostics and importance

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Abstract

Molds are microscopic fungi that produce metabolites and release them to the surface where growth occurs. Mycotoxins are one such metabolite, with over 400 different toxins produced by approximately 350 species of fungi. Introduced in organism, they can cumulate and cause certain disorders, diseases or death. They can affect animal and human health by contaminating food. The most significant mycotoxins are: aflatoxin, zearalenon, ochratoxin, trichotecen, fumosin and patulin. Aflatoxins belong to a group of extremely toxic mycotoxins, and are therefore categorized in as Group I carcinogens by the International Agency for Research on Cancer (IARC). The aim of this study was to see whether the food of vegetable origin, milk and milk products have mycotoxins.

The three laboratories analyzed a total of 5,728 different food samples during the period from 2013 to 2018. A total of 38 samples of plant origin were positive for aflatoxin B1 (0.66%), 347 samples of milk and dairy products contained the unauthorized concentrations of aflatoxin M1. On ochratoxin A was positive 331 sample foods of plant origin (5.8%).

In order to minimize contamination, it is important to carefully standardize every step related to production, storage, distribution and preparation of food. However, despite the best control measures, there is no food that does not contain at least one harmful substance. It is therefore necessary to conduct risk assessment analysis and to determine the maximum concentration of these substances present in food in order to better understand the threat they pose.

Keywords: mycotoxins, aflatoxins, ochratoxins, human carcinogens, IARC

Mikrobiološka ispravnost oblikovanih mesnih proizvoda sa sarajevskog tržišta

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Sažetak

Mikroorganizmi mogu dospjeti u meso infekcijom životinje prije klanja i u toku iskrvarenja i kontaminacijom mesa nakon iskrvarenja, u toku obrade, prerade i prometa. Njihov opstanak i razvoj u mesu direktno utiču na trajnost i ispravnost finalnih proizvoda, te na sigurnost konzumenata. Ta činjenica, kao i sve naglašeniji zahtjevi za higijenom u ishrani, nalažu temeljitije poznavanje mikrobiologije i širu primjenu mikrobioloških ispitivanja u proizvodnji i kontroli mesa i mesnih prerađevina.

Mikrobiološka ispitivanja oblikovanih mesnih proizvoda porijeklom sa sarajevskog tržišta obavili smo u periodu 2015, 2016 i 2017. godina u laboratoriju Zavoda za higijenski nadzor namirnica... Veterinarskog fakulteta Univerziteta u Sarajevu. Ispitivani uzorci su uzimani u proizvodnim pogonima i dostavljani na analizu u rashladnim uređajima.

Mikrobiološkim ispitivanjima obuhvatili smo sve relevantne mikroorganizme koje propisuje Pravilnik o mikrobiološkim kriterijima za hranu (Sl.glasnik BiH br 11/13 i 79/16), a metode mikrobiološke pretrage rađene su prema zahtjevima standarda BAS EN ISO/IEC 17025:2006. U navedenom vremenskom periodu ukupno je ispitano na mikrobiološku ispravnost cca 300 uzoraka čevapčića, pljeskavica i hamburgera kao oblikovanih mesnih proizvoda. Broj neispravnih uzoraka se kretao od 71 (23,6%) u 2015, do 32 (10,6 %) u 2017. Od ispitivanih uzoraka, najveći procenat neispravnih je utvrđen u grupi pljeskavica i iznosio je 63 (21 %) u 2015.

Ključne riječi: oblikovani mesni proizvodi, mikrobiološka ispravnost, sigurnost konzumenata

2-O-4

Microbiological correctness of shaped meat products on the Sarajevo market

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Abstract

Microorganisms can get into meat by animal infection before slaughter, during the bleeding out, by meat contamination after the bleeding out, during processing, adaptation and trafficking. Its subsistence and development in meat directly affect durability and correctness of the final products, in addition to safety of the consumers. That fact, as well as more and more demanding food hygiene requirements, insist on a thorough knowledge of microbiology and wider use of microbiological examinations in production and control of meat and meat products.

Microbiological tests of shaped meat products from the Sarajevo market were done in the years of 2015, 2016 and 2017 in the laboratory of Institute for hygiene control of foodstuffs... at Veterinary faculty of University of Sarajevo. Tested samples were collected from manufacturing plants and delivered for the analysis in cooling devices.

Microbiological studies included all relevant microorganisms prescribed by the Regulation on microbiological criteria for food („Sl.glasnik BiH br. 11/13 i 79/16“), and methods of microbiological examinations were made according to the requirements of the standards BAS EN ISO/IEC 17025:2006. In the mentioned time period about 300 samples of ćevapčići, pljeskavica and hamburger were microbiologically tested. Number of invalid samples ranged from 71 (23,6%) in 2015 to the 32 (10,6%) in 2017. Of the tested samples, the highest percentage of incorrect ones were found in the group of pljeskavica and it was 63 (21%) in the year of 2015.

Key words: shaped meat products, microbiological correctness, safety of consumers

Kontrola rezidua antibiotika i hormona u namirnicama animalnog porijekla

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Sažetak

Zbog sve učestalije upotrebe antibiotika i hormonskih preparata u cilju veće proizvodnje hrane animalnog porijekla, potreban je kontinuiran nadzor kvalitete sirovine i finalnih proizvoda. Kontrola rezidua ima za cilj zaštitu zdravlja potrošača i osiguranje uvjeta za nesmetanu trgovinu životinjama i proizvodima životinjskog podrijetla.

U Bosni i Hercegovini kontrola rezidua provodi se sukladno odredbama Odluke o praćenju rezidua određenih tvari u živim životinjama i u proizvodima životinjskog podrijetla ("Službeni glasnik BiH", broj 1/04) i plana monitoringa rezidua (PMR) koji se na temelju navedene Odluke, donosi za svaku godinu. Na prvom mjestu je uvijek sigurnost potrošača, a maksimalna su ograničenja najčešće postavljena na približno 100 puta manju vrijednost od utvrđene vrijednosti toksičnog djelovanja rezidua. Niz je negativnih efekata kako rezidua antibiotika tako i hormona na zdravlje čovjeka, kao potrošača namirnica animalnog porijekla. Jedan od najvažnijih negativnih efekata antibiotskih rezidua jeste razvoj rezistentnih bakterijskih sojeva patogenih, a i saprofitskih bakterija. Zbog ekonomske isplativosti pri proizvodnji mesa, od samog uzgoja stoke do klanja, prerade i daljnje distribucije, s ciljem povećanja proizvodnje i smanjenja gubitaka, koriste se razni hormonski preparati. Brojna toksikološka istraživanja su pokazala da veliki broj hormonskih preparata djeluje mutageno, teratogeno i kancerogeno. Zbog navedenih štetnih efekata 1981. godine od strane Europske komisije uslijedila je zabrana uporabe stilbena, njihovih derivata, soli i estera te, tireistatskih tvari za tov životinja. Pojedina istraživanja također pokazuju da povećane razine estrogena i njegovih metabolita mogu biti uzrokom karcinoma reproduktivnog sustava. Cilj kontrole i sistemskog praćenja ovih vrsta rezidua je da se ispitivanjem odgovarajućeg broja uzoraka obezbjedi efikasno praćenje nivoa rezidua u tkivima i organima životinja.

Ključne riječi: kontrola rezidua, antibiotici, hormoni

Residual control of antibiotics and hormones in food of animal origin

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Abstract

Due to the increasingly frequent use of antibiotics and hormonal drugs in order to increase the production of food of animal origin, continuous monitoring of the quality of raw materials and final products is needed. The control of the residues is aimed at protecting the health of the consumers and ensuring the conditions for unhindered trade in animals and products of animal origin.

In Bosnia and Herzegovina, residual control is carried out in accordance with the law „residual monitoring of certain substances in live animals and products of animal origin“ (Službeni glasnik BiH, broj 1/04) and the Residue Monitoring Plan (PMR) which is based on that law for every year. Safety of the consumers is always first place, and the maximum limitations are usually set at about 100 times lower than the established value of the residual toxicity. There are numerous negative effects due to antibiotic and hormonal residues on human health, as consumers of foods of animal origin. One of the most important negative effects of antibiotic residues is the development of resistant bacterial strains of pathogenic and saprophytic bacteria. Due to economic cost-effectiveness in meat production, from the livestock itself to slaughtering, processing and further distribution, hormonal drugs are used, all in order to increase production and reduce losses. Numerous toxicological studies have shown that a large number of hormonal drugs are mutagenic, teratogenic and carcinogenic. Due to the aforementioned adverse effects, in 1981, the European Commission banned the use of stilbene, their derivatives, salts and esters, and tireist substances for animals. Some studies also show that increased levels of estrogen and its metabolites can be the cause of reproductive system carcinoma. The objective of controlling and systematic monitoring of these types of residues is to ensure effective monitoring of residual levels in tissues and animal organs by testing an appropriate numbers of samples.

Keywords: residual control, antibiotics, hormones

Značaj cisticerkoze goveda u javnom zdravstvu

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Sažetak

Tenijaza/cisticerkoza kao parazitarna bolest koja je zoonotskog karaktera predstavlja značajan javno-zdravstveni problem. Akcenat je stavljen na širenje bolesti, prvenstveno na pregledu mesa u klaonicama i neškodljivo uklanjanje konfiskata, a zatim i na ljudski faktor. Epidemiološki podaci su najbolji pokazatelj da ova bolest životinja i ljudi nije iskorijenjena u svijetu. Smatra se da je jako raširena i da ima tendenciju rasta u nerazvijenim zemljama. Incidenca pojave bolesti kod ljudi uslovljena je manjkom edukacije o zdravstveno-ispravnoj hrani, te izostankom veterinarsko-zdravstvenog pregleda mesa. U prevenciji ove zoonoze, bitno je zajedničko djelovanje institucija veterinarske i humane medicine kako bi se broj zaraženih goveda i broj oboljelih ljudi sveo na minimum.

Ključne riječi: cisticerkoza, javno-zdravstveni problem, prevencija

2-O-6

Importance of bovine cysticercosis in public health

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Abstract

Taeniasis/cysticercosis as parasite disease, which is zoonosis, represents a significant public health problem. We pointed out spreading of above mentioned disease. Also, we paid attention, firstly on meat inspection in abattoirs and process of harmless removal of confiscate, and afterwards on human impact. Epidemiological data are the best indicator, that this animal and human disease is not eradicated in the world, furthermore is widespread. However, it is considered to have tendency of growth in undeveloped countries. Incidence of occurrence this disease, in care of the people is conditioned with lack of knowledge about healthy food and absence of veterinary-health meat inspection. Prevention of this zoonosis is very important for common action, both veterinarian and human health institutions, to put number of infested cattle and sick people on minimum.

Keywords: cysticercosis, public-health problems , prevention

Trihinelozna – zajednički problem veterinarske i humane medicine

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Sažetak

Trihinelozna je opasna parazitarna, zoonotična bolest rasprostranjena širom svijeta. Javlja se prilikom konzumacije živog ili nedovoljno termički obrađenog mesa i mesnih prerađevina, infestiranog vrstama roda *Trichinella* spp. Kao takva, trihinelozna predstavlja opasnost za ljudsku zajednicu i u nekim zemljama svijeta značajan javnozdravstveni problem. Kontinuirano praćenje, identifikacija vrsta roda *Trichinella* spp. i otkrivanje potencijalnih rezervoara trihinele nužno je u kontroli ove bolesti. Mnoge životinje mogu služiti kao rezervoari, međutim najčešći način infestacije ljudi jeste putem mesa svinja i konja. Veterinarska struka u ovom segmentu detekcije i sprječavanja pojave parazitarne zoonoze, ima veliku odgovornost. U prevenciji oboljenja je potrebna kontinuirana edukacija stanovništva sa naglaskom na važnost kontrole mesa, koje se koristi u ishrani ljudi. Podaci o broju infestiranih pacijenata, mogu nam ukazati na efikasnost primijenjenih mjera u prevenciji trihineloze. U ovom radu smo istakli značaj trihineloze, potrebu za praćenjem epidemiološke situacije, te načine suzbijanja i profilakse iste.

Ključne riječi: trihinelozna, parazitarna zoonoza, javno zdravlje, prevencija

2-O-7

Trichinellosis – problem of the veterinary and human medicine

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Abstract

Trichinellosis is a dangerous parasitic, zoonotic disease spread all over the world. It occurs through consumption of raw or undercooked meat and meat products, infested with the parasite *Trichinella* spp. Trichinellosis as such, poses a threat to human beings and in some countries takes a significant place in terms of public health problems. Continuous monitoring, identification of *Trichinella* spp. and detection of potential trichinous reservoirs is necessary in the control of this disease. Many animals can serve as reservoirs, however the most common way of infestation is through pork and horse meat. Needless to say, how much the veterinary profession is responsible for detecting and preventing the occurrence of parasitic zoonoses. Prevention of the disease requires continuous education of the population with an emphasis on the importance of meat control used in human diet. Collected data about the number of infested patients could draw our attention on the efficiency of the measures that have been applied in terms of trichinellosis. In this paper we have highlighted the importance of trichinellosis, the need for the tracking of epidemiological situation as well as the methods for its suppression and prophylaxis.

Keywords: trichinellosis, parasitic zoonosis, public health, prevention

Uloga doktora veterinarske medicine u borbi protiv bioterorizma

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Sažetak

Upotreba patogenih mikroorganizama kao oružja nije nova, premda je tek nedavno napravljen pregled njene povijesti. Iako je primarni cilj ove vrste oružja nanošenje štete ljudskoj populaciji, koristi se i protiv životinja, ali i zbog uzrokovanja štete u poljoprivredi kao fundamentu civilizacije. Biološka opasnost, koja je u prošlosti gotovo uvijek bila pod nadzorom vlada, sve je više u domeni marginalnih skupina društva što nam nedvojbeno daje za pravo da je svrstamo među teme koje su od javnog interesa. Većina biološkog oružja je namijenjena upravo životinjama, te na taj način indirektno predstavlja ogroman javnozdravstveni problem. Treba napomenuti kako od pet glavnih mikroorganizama, uzročnika biološke prijetnje o kojima će biti govora u ovom radu, četiri inficiraju i životinje i ljude. Prema tome, lako je utvrditi kako veterinarske institucije trebaju dobar dio svog djelovanja usmjeriti prema ovim temama za koje su u velikoj mjeri odgovorne.

Doktori veterinarske medicine, izravno suočeni sa problemom kao što je bioterorizam, imaju izvanrednu priliku za unaprjeđivanje profesije, kao i za ono što je najbitnije, upotpunjavanje svoje iznimno važne uloge u održavanju javnog zdravlja kroz nesebično pomaganje životinjama.

Ključne riječi: bioterorizam, veterinarska medicina, javno zdravlje

2-O-8

The role of veterinarians in the fight against bioterrorism

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Abstract

The use of pathogenic microorganisms as a weapon is not new, although a review of its history has just been made. Even though the primary objective of this type of weapon is to inflict harm on the human population it is also used against animals, as well as for causing damage to agriculture as the foundation of civilization. The biological danger, which has almost always been under government supervision in the past, is increasingly in the domain of marginal groups of society which undoubtedly gives us the right to put it among the topics of public interest. Most biological weapons are intended for animals, and indirectly represent a huge public health problem. It should be noted that out of five major microorganisms which represent causes of the biological threat and which are to be discussed in this paper, four of them infect animals and humans. Therefore, it is easy to determine how veterinary institutions need to focus much of their work on these topics for which they are largely responsible.

Doctors of veterinary medicine, directly facing the problem of bioterrorism, have an outstanding opportunity to improve the profession and, most importantly, to complement their extremely important role in maintaining public health through selfless animal assisting.

Keywords: bioterrorism, veterinary medicine, public health

Parazitoze prenosive namirnicama animalnog porijekla

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Sažetak

Paraziti su organizmi koji hranjive materije pribavljaju od domaćina u/na kojem parazitiraju, pri tome mu nanoseći štetu u većoj ili manjoj mjeri. Značajan broj vrsta parazita smatra se uzročnicima „foodborne“ oboljenja. Prema podacima CDC-a najčešće parazitoze prenosive hranom su uzrokovane sa *Cryptosporidium* spp., *Giardia intestinalis*, *Cyclospora cayetanensis*, *Toxoplasma gondii*, *Trichinella* spp., *Anisakis* spp., *Diphyllobothrium* spp. i *Taenia* spp. Najvažnije helmintoze u Evropi uključuju „foodborne“ helmintoze i infekcije uzrokovane larvenim oblicima cestoda. Većina ovih infekcija ustanovljena je u Istočnoj Evropi i Turskoj. Procjenjuje se da će godišnja proizvodnja mesa porasti sa prvobitnih 218 miliona tona u periodu od 1997-1999. na 376 miliona tona do 2030.godine. Konzumacija ribe bilježi stopu rasta 3.6% godišnje od 1961. godine. Porast potražnje animalnih proteina i namirnica animalnog porijekla općenito, rezultat je urbanizacije i ekspanzije populacije. Veterinarska struka porast konzumacije mora pratiti strogom kontrolom proizvodnje hrane od farme do stola. Ljudi se najčešće infestiraju parazitima putem nedovoljno termički obrađenog mesa ili kontaminirane hrane. Visoka seroprevalenca kongenitalne toksoplazmoze u Srbiji je dominantno rezultat konzumacije nedovoljno kuhane govedine. Intenzitet parazitoza prenosivih namirnicama animalnog porijekla na nekom području zavisi od razvijenosti veterinarsko - sanitarnog i zdravstvenog sistema, postojanja registrovanog broja klaonica ali i kulinarske tradicije nekog naroda.

Profilaksa ovih oboljenja podrazumijeva formiranje monitoring jedinica na državnom i lokalnom nivou, edukaciju stanovništva, inspekciju namirnica i provođenje dijagnostičkih metoda.

Ključne riječi: parazitoze, foodborne, kontrola, profilaksa, konzumacija

2-O-9

Parasitosis transmitted through the consumption of animal source foods

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Abstract

Parasites are organisms that live within or on a host from which they consume nutrients, causing them harm on different levels. A respectable number of parasite species are known to be etiological agents of foodborne disease. According to CDCs collected data, the most common foodborne parasites are *Cryptosporidium* spp., *Giardia intestinalis*, *Cyclospora cayentanensis*, *Toxoplasma gondii*, *Trichinella* spp., *Anisakis* spp., *Diphyllobothrium* spp. i *Taenia* spp. The major helminth infections in Europe include foodborne helminthiasis and larval cestode infections. Most of these infections are found in Eastern Europe and in Turkey. Annual meat production is projected to increase from 218 million tonnes in 1997-1999 to 376 million tonnes by 2030. The total food fish consumption has been growing at a rate of 3.6% per year since 1961. The global demand for animal protein and animal source foods is considered to be the result of urbanisation and world population growth. Accordingly, veterinary profession is obligated to strictly monitor food production from farm to table. Most commonly, humans are infested through the consumption of undercooked or contaminated food. For instance, high seroprevalence and evidence of congenital *Toxoplasma* infection have been reported from Serbia, where the infection has been linked primarily to consumption of undercooked beef. Foodborne parasitosis intensity of a certain area depends on the efficiency of veterinary and health care system, number of registered slaughterhouses, and among other things, culinary customs.

Prophylaxis of these diseases implies forming local and state monitoring units, population education, food inspection and conducting diagnostic methods.

Keywords: parasitosis, foodborne, monitoring, prophylaxis, consumption

Zdravstvene osobitosti hemijske kontaminacije vode

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Sažetak

Voda koja čini 75 % površine planete Zemlje nije neiscrpan rezurs. Izložena kontaminaciji koja podrazumijeva, zavisno od kontaminanta, promjenu fizičkih, hemijskih ili bioloških svojstava bilo kog obima vode, može da dovede do oštećenja zdravlja. Sa nekvalitetom vodom i/ili sanitarnim standardom povezano je oko 80% svih bolesti na neposredan ili posredan način, dok oko 500 hiljada ljudi godišnje oboli, a 10 hiljada ljudi umire zbog zagađene vode.

Cilj rada je prikazati zdravstvene aspekte nekih hemijskih kontaminanata i ocijeniti potrebu preventivno promotivnih programskih aktivnosti.

Prisustvo hemijskih supstanci u vodi za piće posljednjih decenija ima trend porasta kako u pogledu sadržaja tako i raznovrsnosti. U pogledu uticaja hemijskih elemenata na zdravlje, svako deseto jedinjenje je tek adekvatno ispitano. Hemijske materije koje se mogu naći u vodi za piće mogu prouzrokovati veoma ozbiljne zdravstvene probleme djelujući na živu ćeliju. Imajući nejednak afinitet prema raznim tkivima imaju i različite oblike zdravstvenih posljedica, među kojima izražene i kancerogene, te mutagene učinke.

Obzirom da očuvanje životne sredine općenito, podrazumijeva i smanjenje hemijske kontaminacije vode koja ima negativne zdravstvene učinke, neophodnim se smatra uvođenje okolišnih preventivno promotivnih programa.

Ključne riječi: voda; hemijska kontaminacija, uticaj na zdravlje, preventivno promotivni programi

2-O-10

Health characteristics of chemical contamination of water

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Abstract

The Earth's surface consists 75% of water and is not an inexhaustible resource. Exposed to contamination which implies the change in physical, chemical or biological properties of any volume of water can be harmfulness to health depending on the contaminant.

About 80% of all diseases are directly or indirectly related with poor quality of water and / or sanitary standards, and about 500,000 people get sick annually, while 10 thousand people die from contaminated water. The aim of this study is to present the health aspects of some chemical contaminants and assess the need for preventive promotional program activities. The presence of chemical substances in drinking water in recent decades had a growing trend in content and diversity. In terms of the impact of chemical elements on health, every tenth compound has only been adequately tested.

Chemical substances that can be found in drinking water can cause very serious health issues affecting the living cell, i.e. on mitochondria. Chemical substances can have an uneven affinity for various tissues and also different forms of health consequences, including carcinogenic and mutagenic effects. Considering that environmental conservation generally implies reduction of chemical contamination of water that has negative health effects, it is necessary to consider introduction of environmental preventive promotional programs.

Keywords: water; chemical contamination, health effects, preventive promotional programs

Hemijski hazardi iz ambalaže koja dolazi u kontakt s hranom

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Sažetak

Jedan od bitnih segmenata koji mogu uticati na zdravstvenu bezbjednost hrane namijenjene za ljudsku upotrebu je zdravstvena ispravnost ambalažnih materijala koji dolaze u kontakt s hranom (**Food Contact Material**). Materijali i predmeti koji dolaze u kontakt s hranom su potencijalni izvori onečišćenja u svim vrstama hrane. Hrana koja je upakovana u ambalažu uglavnom dolazi u kontakt s jednim ili nekoliko vrsta materijala, uključujući jednoslojne ili višeslojne materijale, koji u različitim interakcijama s hranom ili okolišem mogu direktno uticati na zdravstvenu ispravnost hrane. Svi materijali koji dolaze u direktan ili indirektan kontakt s hranom moraju biti dovoljno inertni da bi se isključio prijenos tvari u hranu u količinama dovoljnim da bi ugrozili ljudsko zdravlje ili izazvali neprihvatljivu promjenu u sastavu hrane ili pogoršanje njenih organoleptičkih svojstava.

Cilj rada bio je pregledom dostupne literature prikazati potencijalne hemijske hazarde iz ambalaže koja dolazi u kontakt s hranom, te objasniti mehanizam migracije istih u hranu.

Otpuštanje komponenti ambalaže i njihov prijelaz u hranu naziva se migracija. Tvari koje mogu migrirati iz ambalaže u hranu mogu biti organske ili anorganske prirode. Migracija zavisi od hemijskog sastava i funkcionalnog svojstva ambalažnog materijala, vrste i sastava hrane, kao i uticaja mikroklimatskih faktora.

Važno je poštivati principe dobre higijenske i proizvođačke prakse (legislativu) kako bi se rizik od kontaminacije hrane putem migracije tvari iz ambalažnih materijala sveo na minimum ili u potpunosti eliminisao.

Ključne riječi: hrana, hemijski hazardi, FCM, kontaminacija

2-O-11

Chemical Hazards from Food Contact Materials

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Abstract

One of the most important segments which can affect safety of food that is intended for human consumption is health safety of packaging material which comes into direct contact with food (**Food Contact Material**). Materials and articles intended to come into contact with food are potential sources of pollution in all types of food. The food that is packaged in the container substantially is in contact with one or several types of material, including single-layer or multi-layer materials, which in different interactions with food and environment can directly affect food safety. All materials that come into direct or indirect contact with food must be sufficiently inert to exclude the transfer of the substance to food in quantities large enough to endanger human health or causing an unacceptable change in the composition of the food or a deterioration in its organoleptic properties.

The aim of this paper was to present the potential chemical hazards from the packaging that comes in contact with food, and to explain the mechanism of their migration into food, by reviewing the available literature.

Release of packaging components and their transition into food is called migration. The substance which can migrate from the packaging into the food can be organic or inorganic nature. Migration depends on the chemical composition and functionality of the packaging material, the type and composition of food, as well as the impact of microclimate factors.

It is important to provide the principles of good hygiene and manufacturing practices (legislation) in order to minimize or completely eliminate the risk of food contamination by migrating substances from packaging materials.

Keywords: food, chemical hazards, FCM, contamination

Antinutrijenti i biljni toksini u hrani

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Sažetak

Biljke ili različiti biljni dijelovi su bogati hranjivim materijama pa su zbog toga u širokoj upotrebi u ljudskoj ishrani. Međutim, sadrže i niz tvari koje mogu djelovati štetno na ljudski organizam. Mehanizam štetnog djelovanja može biti direktan, određena tvar je toksična sama po sebi, ili indirektan, na način da otežava apsorpciju nekog od nutrijenata. Tvari koje interferiraju apsorpciju nutrijenata nazivaju se antinutrijenti. Biljke kao nepokretni organizmi za svoj opstanak stvaraju potrebne materije. Te materije u ovisnosti od doze, odnosno količine mogu imati pozitivna djelovanja koja bi se koristila kao lijekovi te negativna, koja bi bila toksična. Neke od njih tek nakon unosa u organizam, ili obrade određenim postupkom mogu ispoljiti štetno djelovanje. Cilj je prikazati najpoznatije i najrasprostranjenije antinutrijente i biljne toksine, njihova svojstva, mehanizam djelovanja, izvore i poznate načine uklanjanja. Mahunarke sadrže velike količine antinutrijenata i otrovnih tvari, a zatim žitarice i začinske biljke. Najpoznatije skupine spojeva koji djeluju kao antinutrijenti su inhibitori proteaza i amilaza, lektini, saponini, tanini, alkaloidi, fitinska kiselina. Rezultat neželjenog djelovanja je da često joni metala budu vezani i neapsorbovani, probavni enzimi postanu inhibirani ili inaktivirani ili se neki makronutrijenti i mikronutrijenti ne mogu apsorbirati. Poznavanje hemijskih osobina antinutrijenata i toksina, mehanizma djelovanja i njihovih izvora važno je zbog smanjivanja njihove količine u hrani kako bi ona bila sigurnija za ljudsku upotrebu.

Ključne riječi: inhibitori enzima, fitinska kiselina, saponini, alkaloidi, lektini

Antinutrients and plants toxins in the food

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Abstract

Plants or various plant parts are rich with nutrients so there are widely used in human nutrition. However, they also contain a number of substances that can adversely affect the human body. The mechanism of adverse action may be direct, a particular substance is toxic in itself, or indirectly, in a manner that makes it difficult to absorb any of the nutrients. Substances that interfere with absorption of nutrients are called antinutrients. Plants as immobile organisms for their survival create the necessary substances. These dose-related substances, or amounts, may have positive effects that would be useful as a healing and negative, which would be toxic. Some of them can only be adverse to the body after ingestion or treatment with a certain procedure. The aim is to show the most known and most widely used antinutrients and plant toxins, their properties, mechanism of action, sources and known ways of removal. Legumes contain large amounts of antinutrients and toxic substances, cereals and spice plants. The most known groups of compounds acting as antinutrients are protease inhibitors and amylases, lectins, saponins, tannins, alkaloids, phytic acid. As a result of unwanted action, often metals are bound and unscreened, digestive enzymes become inhibited or inactivated and other macronutrients and micronutrients can't be absorbed. Knowing the chemical properties of antinutrients and toxins, mechanism of action and their sources is important because of their reduction in food in order to make it more favorable for human use.

Keywords: enzyme inhibitors, phytic acid, saponins, alkaloids, lectins

Ispitivanje mikrobiološke ispravnosti svježeg zeljastog povrća

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Sažetak

Prisustvo mikroorganizama je u velikoj mjeri zastupljeno u hrani što može predstavljati veliku brigu za potrošače, te ukoliko se o tome ne vodi dovoljno računa može doći do trovanja organizma hranom. Samim tim kroz ovaj rad se nastoji istaći važnost pranja povrća prije njegoveu potrebe. Cilj ovog rada je da se predstav imikrobiološka ispravnost namirnica koje se svakodnevno koriste, odnosno u ovom slučaju svježeg zeljastog povrća iz porodica Brassicaceae syn. Cruciferae i Asteraceae syn. Compositae. Obavljeno je ispitivanje mikrobiološke ispravnosti kupusa, kelja, salate, blitve i špinata. Rezultati ovog ispitivanja su pokazali kontaminaciju zeljastog povrća (kupus, kelj, salata, blitva i špinat) sljedećim grupama mikroorganizama: aerobne mezofilne bakterije, enterobakterije, Escherichie Coli, Salmonella spp., te kvasci i gljive.

Ključne riječi: mikroorganizmi, mikrobiološka ispravnost, zeljasto povrće

2-P-1

Determination of microbiological contamination of fresh leafy vegetables

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Abstract

Microorganisms are frequently present in food, which may represent a big concern to consumers, and if not properly taken care of, the human organism can be poisoned. Therefore, this thesis emphasizes the importance of washing the vegetables before consumption. The aim of this paper is to present the microbiological correctness of groceries that are used daily, in this case, freshly steamed vegetables from the Brassicaceae syn. Cruciferae and Asteraceae syn. Compositae families. The microbiological correctness of cabbage, kale, salad, mangel and spinach was examined. The results of this thesis have shown the contamination of steamed vegetables (cabbage, kale, salad, mangel and spinach) with the following microorganisms: aerobic mesophilic bacteria, enterobacteria, Escherichia Coli, Salmonella spp., as well as yeasts and fungi.

Keywords: microorganisms, microbiological correctness, steamed vegetables

Ispitivanje mikrobiološkog statusa svježeg korijenasto-krtolastog povrća

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Sažetak

Trovanje hranom često izazivaju mikroorganizmi u hrani kojom se nije rukovalo pravilno ili nije termički dobro obrađena. Takva hrana može imati normalan izgled, miris i okus, a ipak biti opasna za zdravlje ljudi. Zbog toga i jeste cilj ovoga rada utvrditi mikrobiološki status namirnica koje se svakodnevno koriste, u ovom slučaju korijenasto-krtolastog povrća. Kroz rad je ispitan mikrobiološki status uzorka mrkve, rotkve i krompira. Rezultati su pokazali kontaminaciju uzoraka mrkve, rotkve, krompira bakterijama (aerobne mezofilne bakterije, enterobakterija, *Escherichia coli*, *Salmonella spp.*) i kvascima i plijesnima.

Ključne riječi: mikroorganizmi, mikrobiološki status, korijenasto-krtolasto povrće

2-P-2

Determination of microbiological status of fresh root vegetables

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Abstract

Food poisoning often causes microorganisms in food that hasn't been properly handled or processed. That food can have a normal appearance, smell and taste, and still be dangerous to people's health. Consequently, the aim of this paper is to determine the microbiological status of foods that we use on a daily basis, in this case of root carotid vegetables. The microbiological status of the carrot, radish and potato sample was tested through the work. The results showed contamination of carrot, radish and potato with aerobic mesophilic bacteria, enterobacteria, *Escherichia coli*, *Salmonella spp.*, and also with yeast and mold.

Keywords: microorganisms, microbiological status, root carotid vegetables

3. ISHRANA TOKOM ŽIVOTNOG CIKLUSA
LIFECYCLE NUTRITION

Prehrambene navike studenata Pedagoškog fakulteta Univerziteta u Sarajevu

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Sažetak

Prehrambene navike studenata Pedagoškog fakulteta su loše, jer tokom razdoblja studiranja mladi ljudi se najčešće suočavaju sa samostalnošću i kreiraju vlastite životne, pa tako i prehrambene navike. Njihova omiljena hrana su hamburgeri, slatkiši, grickalice i gazirana pića, a posljedica toga je pojava gojaznosti kod velikog broja studenata. Cilj ovog istraživanja bio je ispitati prehrambene navike studenata Pedagoškog fakulteta Univerziteta u Sarajevu. Korištena metoda je anketni upitnik, koji je sadržavao 9 pitanja o tome šta studenti konzumiraju u svojoj cjelodnevnoj prehrani. Anketu je popunilo 100 studenata (96 žena i 4 muškaraca) u dobi od 20-28 godina.

Rezultati istraživanja su pokazali da većina ispitanih studenata, njih 65% ne doručkuje svakog dana, iako znaju da je to najvažniji obrok (93%), dok njih 35% doručkuje. Za 6% sudenata najvažniji obrok je ručak, a za 1% večera. Svakog dana imaju 1 obrok i 1 užinu (35%) studenata, 3 obroka (24%), 2 obroka i 1 užinu (23%), 2 obroka (11%), 3 obroka i 2 užine (7%). Kući najčešće jedu kuhana jela (42%), pržena jela (37%) i grickalice i slatkiše (21%). Prije nego što krenu na fakultet većina ispitanika ne jede (64%). Većina studenata (75%) se izjasnilo da o zdravoj prehrani zna puno, malo (24%) i ništa (1%), a hrane se nezdravo. Najviše vole da jedu grickalice i slatkiše (47%), voće (28%), povrće (21%), meso (3%) i tjesteninu i pekarske proizvode (1%). Studenti najčešće piju vodu (46%), gazirane sokove (45%) i prirodne sokove (9%). Sumarno, rezultati istraživanja pokazuju da ispitanici imaju loše prehrambene navike, primarno karakterizirane previsokim unosom prženih jela, grickalica i slatkiša, kao i gaziranih sokova i nedovoljnim unosom voća, povrća, mesa i vode, iako se većina izjašnjava da znaju puno o zdravoj prehrani.

Ključne riječi: prehrambene navike, ishrana, studenti, znanja studenata

Nutrition habits of Faculty of Educational Sciences' students

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Abstract

Nutrition habits of Faculty of Educational Sciences' students are bad, because during the period of studies young people are most often confronted with independence and creating their own life and nutrition habits. Their favorite food are hamburgers, candy, snacks and carbonated drinks, and the consequence of that is the case of obesity with great number of students. The goal of this research was to examine the nutrition habits of Faculty of Educational Sciences' students. The method used for this is a questionnaire made of 9 questions about what students consume in their daily nutrition. The questionnaire was answered by 100 people (96 women and 4 men) at the age of 20 to 28. The results of the research have shown that most of the examinees, 65% of them, does not have breakfast every day, even though they know it is the most important meal (93%), while 35% of them has breakfast every day. For 6% of the students, the most important meal is lunch, and for 1% is dinner. Every day they have 1 meal and 1 snack (35% of the students), 3 meals (24%), 2 meals and 1 snack (23%), 2 meals (11%), 3 meals and 2 snacks (7%). At home, they usually eat cooked dishes (42%), fried meals (37%) and snacks and candy (21%). Before they go to the faculty, most of the examinees doesn't eat (64%). Most students (75%) stated that they know a lot about healthy nutrition, a little (24%) and nothing (1%), and they have bad nutrition. They like to eat snacks and candy the most (47%), fruit (28%), vegetables (21%), meat (3%) and pasta and bakery products (1%). The students most often drink water (46%), carbonated drinks (45%) and natural juices (9%). To conclude, the results of the research show that the examinees have bad nutrition habits, primarily characterized by too high intake of fried meals, snacks and candy, as well as carbonated drinks and insufficient intake of fruit, vegetables, meat and water, even though most of them states that they know a lot about healthy nutrition.

Keywords: nutrition habits, nutrition, students, students' knowledge

Fizička aktivnost i stepen uhranjenost studenata Pedagoškog fakulteta Univerziteta u Sarajevu

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Sažetak

Današnje savremeno društvo karakterizira izrazito smanjena fizička aktivnost i nepravilna ishrana što dovodi do pojave gojaznosti i lošeg stanja kardiovaskularnog sistema. Svakodnevno fizičko vježbanje ima posebnu preventivnu vrijednost kako za održavanje optimalne tjelesne težine tako i za prevenciju i suzbijanje raznih bolesti.

Cilj ovog istraživanja bio je uvrđiti fizičku aktivnost i stepen uhranjenosti studenata Pedagoškog fakulteta Univerziteta u Sarajevu. Korištene metode su anketni upitnik, kao i metode za mjerenje tjelesne težine i visine u cilju izračunavanja stepena uhranjenosti (BMI). Anketu je popunilo 100 studenata (93 žene i 7 muškaraca) dobi od 20-28 godina.

Rezultati istraživanja su pokazali da se većina ispitanih studenata, njih 75% nikako ne bavi sportom, 25% se rekreativno bavi sportom, dok se nijedan student ne bavi aktivno sportom. Najveći broj studenata rekreativno se bavi fizičkom aktivnošću 1-2 puta sedmično (15%), 2-3 puta sedmično (7%), 3-4 puta sedmično (3%). Na fakultet najčešće dolaze gradskim prevozom (85%), pješke (9%) i autom (6%). Na osnovu antropometrijskih podataka utvrđen je stepen uhranjenosti. Normalna uhranjenost (BMI 18,5-24,99) je zastupljena u 37% ispitanika, gojaznost II stepena (BMI 35-39,99) u 19% ispitanika, pretjerana uhranjenost (BMI 25-29,99) u 15% ispitanika, gojaznost I stepena (BMI 30-34,99) u 8% ispitanika, gojaznost III stepena (BMI > 40) u 8% ispitanika, slaba uhranjenost (BMI 17-18,49) u 5% ispitanika, pothranjenost (BMI 15-16,99) u 4% ispitanika i teška pothranjenost (BMI < 15) u 4% ispitanika. Vrlo je važno stvoriti naviku vježbanja u najranijoj dobi da bi kasnije prerasla u način življenja, a samim time utjecalo i na kvalitetu življenja.

Ključne riječi: fizička aktivnost, sport, studenti, stepen uhranjenosti

3-O-2

Physical activity and the level of nutrition of Faculty of Educational Sciences' students

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Abstract

Today's contemporary society is characterized by an extremely reduced physical activity and irregular nutrition which leads to obesity and bad condition of cardiovascular system. Daily physical exercise has a special preventive value for keeping the optimal weight, as well as for the prevention and suppression of various diseases. The goal of this research was to determine the physical activity and the level of nutrition of Faculty of Educational Sciences' students of the University of Sarajevo. The applied methods are a questionnaire, as well as methods for measuring of physical weight and height with the goal of calculating the level of nutrition (BMI). The questionnaire was answered by 100 people (96 women and 4 men) at the age of 20 to 28.

The results of the research have shown that most of the examinees, 75% of them doesn't do sports at all, 25% do sports recreationally, while none of the students does sports actively. The greatest number of students has recreational physical activity once or twice a week 15%, 2-3 time a week 7%, 3-4 times a week 3%. Students mostly come to the faculty by city transport 85%, on foot 9% and by car 6%. Based on the anthropometric data, a level of nutrition is determined. Normal nutrition (BMI 18,5-24,99) is represented with 37% of examinees, obesity of II degree (BMI 35-39,99) with 19% of examinees, excessive nutrition (BMI 25-29,99) with 15% of the examinees, I degree obesity (BMI 30-34,99) with 8% of the examinees, III degree obesity (BMI>40) with 8% of examinees, poor nutrition (BMI 17-18,49) with 5% of the examinees, malnutrition (BMI 15-16,99) with 4% of the examinees and severe malnutrition (BMI < 15) with 4% of the examinees. It is very important to create the habit of exercising in the earliest age so that it could later grow into a lifestyle, and at the same time affect the quality of living.

Keywords: level of nutrition, physical activity, sports, students

Mlijeko u prehrani- nutritivni i zdravstveni značaj

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Sažetak

Mlijeko je rastvor mineralnih materija, laktoze i vitamina, emulzija ili suspenzija masti i koloidni rastvor proteina. Kao namirnica bogatog nutritivnog sastava predstavlja važnu namirnicu stanovništva zemalja u razvoju, gdje je ishrana stanovnika često vrlo loša, a konzumacija namirnica životinjskog porijekla vrlo često ograničena. Mlijeko predstavlja važnu namirnicu u ishrani čovjeka kojom se obezbjeđuju određene količine kalcija, magnezija, selena, riboflavina, vitamina B₁₂ i pantotenske kiseline (vitamin B₅). S druge strane mlijeko ne sadrži dovoljne količine željeza i folata.

Uprkos činjenici da je mlijeko bogatog nutritivnog sastava njegov uticaj na zdravlje ljudi se sve više preispituje. Upotreba mlijeka je s jedne strane povezana sa smanjenim rizikom od oboljevanja od npr. osteoporoze i dijabetesa melitusa tipa II, a s druge strane njegova konzumacija se dovodi u vezu sa kardiovaskularnim oboljenjima i karcinomom prostate.

Cilj rada je bio istražiti da li mlijeko kao nutritivno bogata namirnica doista treba zauzimati važno mjesto u ishrani čovjeka ili se ipak njegova primjena više povezuje sa negativnim uticajem na zdravlje. Kao izvori podata korišteni su članci koje smo pronašli u bazi PubMed. Konzumacija mlijeka doprinosi rastu, statusu mikronutrijenata, razvoju kognitivnih performansi i motorike u djece slabo razvijenih zemalja. Mlijeko ima ključnu ulogu u tretiranju pothranjenosti kod djece. Rezultati pojedinih studija dovode konzumaciju mlijeka i mliječnih proizvoda u vezu sa mogućnošću nastanka metaboličkog sindroma, kardiovaskularnih oboljenja ili kancera. Mlijeko i mliječni proizvodi mogu imati benefite na organizam svakog pojedinca ukoliko se konzumiraju u adekvatnoj količini u pravilnoj kombinaciji sa drugim namirnicama, sa ciljem zadovoljenja potreba organizma za svim nutrijentima.

Ključne riječi: mlijeko, mliječni proizvodi, nutritivni sastav, svojstva mlijeka, značaj mlijeka

3-O-3

Milk in Diet- Nutritional and Health Significance

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Abstract

Milk is a complex colloidal dispersion containing fat globules, casein micelles and whey proteins in an aqueous solution of lactose and minerals. Due to its exceptional nutritive value it is of great dietary importance, especially in developing countries and poor communities with limited access to meat and other valuable protein and energy sources. Milk contains a considerable amounts of calcium, magnesium, selenium, riboflavin, vitamin B12 and pantothenic acid (vitamin B5). However, milk is low in iron and folate.

Despite the fact that milk is rich in macronutrients and micronutrients its role in health is recently extensively re-examined. Consumption of milk is connected with decrease in risk of developing e.g. osteoporosis and diabetes mellitus II. However, its consumption has also been connected with increased risk of developing cardiovascular diseases and prostate cancer.

The aim of this work was to assess the benefits and risks of milk consumption based on data published in peer- reviewed journals. The main search for publication was conducted in the PubMed database.

Milk consumption contributes to growth, micronutrient's status, development of cognitive performances and motoric abilities in children in undeveloped countries. Milk has the key role in treatment of child malnutrition. Studies showed that inadequate combination milk and other food can add to obesity. Results of some studies suggest that milk consumption is connected with metabolic syndrome, cardiovascular diseases or cancer. However, there are many contradictory results so a definite cause- effect relationship cannot be established Milk and dairy may well be beneficial if they are consumed in adequate amount as a part of varied and balanced diet.

Keywords: milk, dairy products, nutrition, milk properties, health effects

Stav i konzumacija mlijeka i mliječnih proizvoda među odraslim stanovništvom Kantona Sarajevo

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Sažetak

Mlijeko i mliječni proizvodi predstavljaju značajan izvor energije, proteina, masti, vitamina (B₂, B₁₂, B₅) i minerala (kalcij, magnezij, selen). Većina smjernica za zdravu prehranu stanovništva preporučuje barem jedno serviranje na dan namirnica iz ove grupe namirnica. Međutim, prakse konzumacije mlijeka i mliječnih proizvoda među stanovništvom se razlikuju. Pojedine osobe izbjegavaju konzumaciju mlijeka i mliječnih proizvoda zbog uticaja informacija o potencijalnim štetnim efektima ovih proizvoda. Dodatno, pojedine osobe izbjegavaju konzumaciju mlijeka zbog vlastitog uvjerenja da su laktoza intolerantni ili da laktoza iz mlijeka i mliječnih proizvoda na drugi način štetno djeluje na njihovo zdravlje. Eliminacija bilo koje grupe namirnica iz prehrane, posebno u vulnerabilnih grupa kao što su djeca nosi rizik od nutritivnih deficita, te se ne savjetuje bez jasnog utemeljenog razloga.

Cilj ovog rada je bio utvrditi prakse i stav potrošača u Kantonu Sarajevo vezane za konzumaciju mlijeka i mliječnih proizvoda. S tim ciljem je formulisan anketni upitnik koji je sadržavao 14 pitanja. Anketu je popunilo 44 ispitanika dobi od 18 do 45 godina.

Rezultati su pokazali da 31,8% ispitanika mlijeko konzumira svakodnevno, a 20,5% ispitanika ga konzumira više puta sedmično, dok 15,9% ispitanika ne konzumira mlijeko. Većina ispitanika, njih (90,9%), smatra mlijeko i mliječne proizvode važnim dijelom ishrane djeteta kao i odraslog čovjeka. Na osnovu provedene ankete smo zaključili da 23 (52,3%) ispitanika slijedi preporuke za zdravu prehranu u smislu učestalosti konzumacije mlijeka, ali da većinom biraju mlijeko sa većim udjelom masti (2,8% i 3,2% mliječne masti). Na osnovu rezultata ankete mlijeko i mliječni proizvodi predstavljaju bazičnu namirnicu ispitanika.

Ključne riječi: mlijeko, mliječni proizvodi, ishrana

3-O-4

Consumption frequency and attitudes towards milk and dairy among adults in Sarajevo Canton

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Abstract

Milk and dairy products are important source of energy, proteins, fats, vitamins (B₂, B₁₂, B₅) and minerals (calcium, magnesium, selenium). Most dietary guidelines recommend at least one serving from this food group per day. However, consumption of milk and dairy products varies among adults. Some people do not consume milk and dairy products because of influence of information about possible adverse effects connected with their consumption. Additionally, some people do not consume milk because of their belief that they are lactose intolerant or that lactose from milk and dairy may have other harmful effects on their health. Elimination of any food group from diet, especially in vulnerable groups (e.g. children) could result in nutrient deficiency, and it's only recommended in clearly justified cases (e.g. allergy). The aim of this work was to determine frequency of consumption and attitudes towards milk and dairy among adults in Sarajevo Canton. Data were collected using specially designed 14-item questionnaire. Forty-four participants (age 18-45 years) completed the questionnaire.

Results showed that 31,8% of respondents consume milk daily, 20,5% consume it more than once per week and 15,9% do not consume milk. Most of respondents (90,9%) believe that milk and dairy products are important part of children's and adult's diet. The results also showed that 23 (52,3%) of respondents follow recommendations in terms of frequency of milk consumption, but most of them choose milk with higher fat content (2,8% or 3,2% milk fat). Consumption of milk was not connected with respondents' demographic characteristics. Based on our results, we can conclude that milk and dairy can be considered a staple food for adults in Sarajevo Canton.

Keywords: milk, dairy products, diet

Pravilna ishrana pacijenata prije uzimanja uzoraka za laboratorijsku analizu

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Sažetak

Uticaj pravilne pripreme pacijenta na tačnost laboratorijskih rezultata je izuzetno velika. Međutim zbog opterećenosti zdravstvenih radnika pacijenti su često nedovoljno informisani o faktorima koji mogu da utiču na rezultate laboratorijskih analiza . Neki od najčešćih faktora koji dovode do grešaka je vrlo lako otkloniti . Zbog toga je važno da pacijent bude informisan o njima i o tome kako da ih izbegne .

Vrijeme uzimanja uzoraka krvi je veoma značajno, kao i priprema pacijenta. Najbolje je krv od pacijenata uzimati ujutru, prije obroka. Za većinu laboratorijskih analiza poželjno je da pacijent ne jede ništa šest do dvanaest sati prije vađenja krvi. I uobičajena terapija za hronične bolesnike, hipertenzičare, dijabetičare ili srčane bolesnike može da da pogrešne rezultate.

Laboratorijski djelatnici svakodnevno u svom radu nastoje na neki način educirati i uputiti pacijente kako da se pripreme za izvođenje laboratorijskih analiza jer su upravo oni od kojih to zavisi.

Samosvijest i adekvatna informisanost samih pacijenata rezultuje pozitivnošću sa obje strane- u neku ruku posao zdravstvenim radnicima se olakšava, a sa druge strane pacijent dobija vjerodostojne rezultate.

Ključne riječi: ishrana, laboratorijski analize, vađenje krvi

3-O-5

Correct nutrition of patients before taking samples for laboratory analysis

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Abstract

The influence of the correct preparation of the patient on the accuracy of the laboratory results is extremely high. However, due to the burden on health workers, patients are often insufficiently informed about factors that can affect the results of laboratory analyzes. Some of the most common factors that lead to errors are very easy to remove. It is therefore important that the patient be informed of them and how to avoid them.

The time taken to take blood samples is very important, as is the preparation of the patient. It is best to take blood from patients in the morning, before meals. For most laboratory analyzes it is desirable that the patient does not eat anything six to twelve hours before extracting blood. And the usual therapy for chronic patients, hypertensives, diabetics or cardiac patients may give wrong results.

Laboratory staff, in their daily work, endeavors in some way to educate and instruct patients how to prepare for performing laboratory analyzes because they are the ones on which it depends.

Self-awareness and adequate information of the patients themselves results in positive on both sides - in some way the work is facilitated by healthcare workers, and on the other hand, the patient gets credible results.

Keywords: nutrition, laboratory analysis, blood extraction

Ishrana kao jedan od rizikofaktora u prevenciji osteoporoze

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Sažetak

Osteoporoza je najčešća metabolička bolest kostiju, a karakteriziraju je mala koštana masa i poremećena mikroarhitektonska građa kosti, te povećana lomljivost. Iako je to bolest koja se može prevenirati, osteoporoza zahvata 25 miliona ljudi širom svijeta, uzrokuje 1 milion prijeloma, 40 000 smrtnih slučajeva godišnje i košta zdravstveni sustav nekoliko biliona dolara. Jedna od dvije žene oboljevaju od osteoporoze, jedan od osam muškaraca oboljevaju preko 50 godina starosti. Najznačajniji faktori rizika za nastanak osteoporoze su: starija životna dob, ženski spol, gracina konstitucija, pozitivna porodična anamneza, rasa – bijelci, upotreba određenih lijekova, izlaganje povećanim koncentracijama estrogena ili testosterona, dugotrajna imobilizacija, dugotrajan nizak unosa kalcija i vitamina D, BMI < 19, tjelesna neaktivnost, konzumacija alkohola, kofeina i cigareta. Prehrana u prevenciji i terapijskom režimu osteoporoze u prvom redu podrazumijeva adekvatan unos kalcija i vitamina D. Krucijalno vrijeme za unos kalcijuma je period ranog punoljetstva. Vitamin D je nužan za adekvatnu apsorpciju kalcija u probavnom sistemu. Najvrijedniji izvori vitamina D su mlijeko, žumanjak jajeta, jetra, ulja jetre bakalara i drugih masnih riba poput sardine, lososa i sleđa. Najznačajnije mjere u prevenciji osteoporoze su: dovoljan unos kalcija i vitamina D, zatim tjelesna aktivnost, izloženost suncu, izbjegavanje loših životnih navika (pušenje, prekomjerne količine kofeina i sl.). Kod osteoporoze od posebnog značaja je tjelesna aktivnost. Tjelesnom aktivnosti (šetanje, tračanje, ples, gimnastika, plivanje) povećava se koštana masa, a s njom i snaga i gibljivost mišića što smanjuje rizik od padova i prijeloma. Utjecaj tjelesne aktivnosti na povećanje koštane mase ovisan je o dobi i najintenzivniji je u periodu rasta. Nedostatak tjelesne aktivnosti u mladosti ubrzava gubitak koštane mase u starosti.

Ključne riječi: osteoporoza, ishrana, prevencija, tjelesna aktivnost

3-O-6

Nutrition as one of the risk factors in prevention of osteoporosis

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Abstract

Osteoporosis is the most common metabolic bone disease, characterized by a small bone mass and a disturbed bone microarchitecture and increased fractures. Although it is a preventable disease, osteoporosis is targeted by 25 million people around the world, causes 1 million fractures, 40 000 deaths per year and costs a few billion dollars health system. One of the two women is suffering from osteoporosis, one in eight men suffering from that disease, over 50 years of age. The most important risk factors for the development of osteoporosis are: older age, female gender, constitution scales, positive family history, race - white, use of certain drugs, exposure to increased concentrations of estrogen or testosterone, long - lasting immobilization, prolonged low calcium and vitamin D intake, BMI <19, physical inactivity, alcohol consumption, caffeine and cigarettes. Nutrition in prevention and therapeutic regimen of osteoporosis primarily involves adequate intake of calcium and vitamin D. The critical time for calcium intake is the period of early ages. Vitamin D is essential for adequate absorption of calcium in the digestive system. The most valuable sources of vitamin D are milk, egg yolk, liver, cod liver oil, and other fatty fish such as sardines, salmon and lard. The most important measures to prevent osteoporosis are: sufficient calcium and vitamin D intake, then physical activity, sun exposure, avoiding bad habits (smoking, excessive amounts of caffeine, etc.). Very important thing for osteoporosis patients is physical activity. Physical activity (walking, stretching, dancing, gymnastics, swimming) increases bone mass, and with it strength and muscle flexibility, which reduces the risk of falls and fractures. The influence of body activity on bone mass increase depends on age and is the most intense in the growth period. Lack of bodily activity in youth accelerates bone loss in old age.

Key words: osteoporosis, nutrition, prevention, physical activity

Problem kantina na fakultetima u Sarajevu

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Za vrijeme studiranja, većinu svog vremena studenti provode na fakultetu. U vrijeme pauza studenti traže pogodna mjesta za odmor od predavanja i vježbi, a kantine su najbolje rješenje za to.

Pedagoški fakultet je posegao za istraživanjem u kojem bi se razmatralo koji to sve fakulteti ne posjeduju kantine, kakvu ponudu imaju i da li su cijene prihvatljive. Činjenica je da se na području Kantona Sarajevo nalazi mnogo fakulteta od kojih većina ne posjeduje kantine u kojima bi studenti mogli odmarati, a ujedno jesti i piti. Sa takvim problemom se susreću i studenti našeg fakulteta, koji za vrijeme kraćih ili dužih pauza nemaju mjesto gdje bi se mogli družiti, razgovarati, ali i odmarati. Zbog toga studenti posežu za brzom hranom, pekarama, grickalicama itd. i idu u kafiće u kojima su cijene poprilično neprilagođene studentima. Kao prikladno i potrebno rješenje smatramo da bi se na svim fakultetima, na području Kantona Sarajevo, trebale omogućiti kantine u kojima bi se i sami studenti mogli zaposliti i na taj način sebi obezbijediti novčana sredstva za život. U studentskim kantinama u ponudi pored osvježavajućih i toplih napitaka i gotovih jela bi trebala biti i zdrava hrana obogaćena vitaminima i proteinima. Pored toga cjenovnik bi trebao biti prilagođen studentskim standardima. Što se tiče veličine prostora jedne kantine, smatramo da bi trebao biti poprilično velik kako bi primio što veći broj studenata, ali bi također trebao biti funkcionalan i opremljen udobnim namještajem.

Tijekom našeg istraživanja spoznale smo da su studenti oštećeni u pogledu kantina na svojim fakultetima, te da je to jako veliki nedostatak za jedan državni fakultet. Zbog toga, u cilju nam je pokrenuti akciju u kojoj bi fakulteti omogućili kantine svojim studentima.

Ključne riječi: *studenti, kantina, pauza, prehrana*

3-O-7

Problem with messhalls in Sarajevo

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Abstract

Students most of their time spend on facultaties. In break time they search for a place to relax from lectures and practices and messhalls are the best place for it. The Pedagogic faculty made a research whose theme was which facultaties on University of Sarajevo have messhalls, what food is served there and what are the prices. The fact is that most facultaties on University of Sarajevo don't have messhalls, where students could relax and eat. That is also the problem of our faculty. Students who have long breaks from one lecture to another don't have place where they could relax or chit chat with each other. That is the reason why they eat junk food and snacks. They go to coffe shops where prices are too expensive for students. Our suitable and very much needed suggestion is that every faculty on University of Sarajevo should have a messhalls where also students could work and earn some money. Menu should have refreshing and hot beverages and cooked meals, healthy food with a lot of vitamins and proteins. Prices should also fit students. The size of masshalls should fit the number of students of faculty. Through our research we noticed that students are damaged because facultaties don't have messhalls. It is a big deficit for national university. Our goal is to start action in which facultaties would enable messhalls to their students.

Keywords: students, messhalls, break, food

Hormonalni disbalans kod gojazne djece

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Sažetak

Pretilost kod djece zasigurno je od najvećih zdravstvenih izazova modernog svijeta sa mogućim ozbiljnim posljedicama po fizičko i mentalno zdravlje individue. Pretilost se kod djece definiše drugačije u odnosu na odrasle. Ako je tjelesna težina djeteta veća od 95-100% idealne težine za visinu, onda se dijete može smatrati gojaznim. Pretiła djeca i adolescentni uglavnom imaju veću visinu i ubrzano starenje prije pubertetskog perioda, što se zatim usporava ulaskom u pubertet. Značajan parametar u ovom smislu je inzulinu sličan faktor rasta-1 (IGF-1) koji je često povišen kod pretile djece. Pretilost je povezana sa složenim promjenama hipotalamus-hipofizno-adrenalne osovine kao što je povećanje sekrecije kortizola te pojačanim odgovorom na stimulanse. Pretiła djeca često pokazuju i manifestacije poremećene funkcije štitne žlijezde, primarno kroz povišene koncentracije tireoidnog stimulirajućeg hormona (TSH), trijodtironina (T3) i tiroksina (T4). Također, gojazna djeca imaju znatno veće nivoe parathormona (PTH) i niže koncentracije 25-hidroksi vitamina D u poređenju sa djecom normalne tjelesne mase. Pretilost u ranom djetinjstvu vrlo brzo afektira spolne hormone, uzrokujući već tad disbalans i poremećen tempo odvijanja prepubertetskog i pubertetskog razvoja. To je važno zbog toga što promjene u spolnim hormonima u ovom dobu značajno se reflektiraju na zdravlje pacijenta u kasnijoj dobi. Pretlost kod djevojčica ubrzava početak puberteta, a kod dječaka usporava. Efektima gojaznosti djece na fiziološke funkcije u djetinjstvu i kasnije tokom života treba posvetiti dodatnu pažnju, a detaljnija spoznaja o ovim efektima pomaže da se ustanove noviji tretmani eventualnih posljedica na zdravlje.

Ključne riječi: gojaznost, hormonalni disbalans, indeks tjelesne mase

3-O-8

Hormonal imbalance in obese children

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Abstract

Obesity in children is certainly one of the greatest health challenges of the modern world with potentially serious consequences for the physical and mental health of individuals. Obesity in children is defined differently from adults. If the body weight of the child is greater than 95-100% of ideal weight for height, then the child may be considered obese. Obese children and adolescents generally have higher height and accelerated aging before puberty, which is then slowed down by entering puberty. Significant parameter in this respect is insulin-like growth factor-1 (IGF-1), which is often elevated in obese children. Obesity is associated with complex changes in the hypothalamus-pituitary-adrenal axis such as increased cortisol secretion and increased response to stimuli. Obese children often exhibit manifestations of impaired thyroid function, primarily through increased levels of thyroid stimulating hormone (TSH), triiodothyronine (T3) and thyroxine (T4). Also, obese children have significantly higher levels of parathormone (PTH) and lower levels of 25-hydroxy vitamin D compared to children with normal body weight. Obesity in early childhood affects sex hormones very quickly, causing the imbalance and disturbance of pre-puberty and puberty development. This is important because the changes in sex hormones in this age are significantly reflected on the health of the patient at a later age. Obesity in girls accelerates the onset of puberty, and for boys it slows down. The effects of obesity on physiological functions in childhood and adulthood should be addressed more seriously, and better knowledge of these effects can help with further treatment of obesity.

Keywords: obesity, hormonal disbalance, body mass index

Učinak smoothie napitaka na tvrda zubna tkiva

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Sažetak

Tvrda zubna tkiva, kao sastavni dio krune zuba, direktno su izložena djelovanju raznih sastojaka unešene hrane i pića. Poznato je da određeni napici, poput mlijeka i vode blagotvorno djeluju na oralno zdravlje. S druge strane, napici kao što su gazirana pića i zaslađeni sokovi, mogu izazvati negativne učinke i proizvesti erozivne promjene na tvrdim zubnim tkivima. S dvadeset i prvim stoljećem, smoothie napici su u svijetu postali popularna zamjena za konzumiranje svježeg voća i povrća u njihovom izvornom obliku. Istraživanja su pokazala da je, samo u Velikoj Britaniji, konzumacija smoothie napitaka u periodu od 2001. do 2010. godine porasla sa 6 miliona na 51 milion litara godišnje. U popularističkoj kulturi koja promovira zdravu ishranu, smoothie napici su prezentirani kao praktičan način unošenja beneficijalnih nutritivnih sastojaka, među kojima su antioksidansi, vitamini i vlakna. Međutim, visoka koncentracija šećera i kiselina u ovim pićima ukazuje na mogućnost štetnog djelovanja na zube, to jest, njihovog erozivnog, a potencijalno i kariogenog učinka. Cilj ovog rada bio je, na osnovu postojeće literature i ankete sprovedene u svrhu dobivanja podataka o upućenosti populacije o smoothie napicima, istražiti potencijalnu štetnost njihove učestale konzumacije.

Ključne riječi: smoothie, tvrda zubna tkiva, erozija, voće, ishrana

The effect of smoothies on dental hard tissues

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Abstract

Dental hard tissues are, as integral components of a tooth crown, directly exposed to the effects of food and beverage ingredients. It is known that some beverages, like milk and water, have beneficial effects on oral health. On the other hand, soft drinks and sweetened juices can provide negative impacts and make erosive changes on dental hard tissues. In 21st century, smoothies have become a popular substitute for intake of fresh fruit and vegetables in their original form. Researches have shown that, in Great Britain only, the consuming of smoothies have grown from 6 million to 51 million litres per year in a period from 2001 to 2010. In a modern culture which promotes a healthy nutrition, smoothies are presented as a practical way of intake of beneficial nutritive ingredients as antioxidants, vitamins and fibers. However, the high concentration of sugars and acids in these beverages shows possibility of their erosive and potentially cariogenic effects. The goal of this research was to explore potentially harmful effects of smoothies and their frequent consumption. The research was based on literature and questioning the knowledge of consumers about this type of beverages.

Keywords: smoothies, dental hard tissues, erosion, fruit, nutrition

Ishrana sportista

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Sažetak

Prema Institutu Mulier (Holandija) preko 60 miliona ljudi u Evropi su članovi nekog sportskog kluba. Uprkos potencijalno negativnim ishodima, kao što su, relativno česte povrede i slično, prevladava mišljenje da pozitivni aspekti bavljenja sportom u mnogo stvari nadmašuju one negativne. Cilj ovog rada jeste opisati i istaknuti važnost i značaj pravilne prehrane za očuvanje zdravlja i sportsku izvedbu kod sportaša i rekreativaca. Na prvom mjestu zadatak samog rada jeste da se upozna koliko je ishrana sportista važna, te da ona predstavlja ključni faktor za postizanje dobrih rezultata. Jedan od limitirajućih faktora sportske izvedbe je i adekvatna hidracija. Unos tekućine mora biti dovoljan i konstantan kako bi se spriječila dehidracija i zdravstveni rizici uzrokovani njome. Prehrana siromašna određenim hranjivim tvarima zahtijevat će upotrebu različitih vrsta dodataka. Sportaši svakodnevno hranom moraju unositi dovoljne količine svih hranjivih tvari (ugljikohidrata, masti i bjelančevina), kao i vitamina i minerala koji često imaju presudan utjecaj na kvalitetu izvođenja treninga. Oblik pregledanog članka koji ima za svrhu dati uvid u već raspoložive informacije vezane za ishranu, te za najčešće greške koji sportisti prave prilikom planiranja svog jelovnika. Rezultati koji se očekuju su edukativnog karaktera, te će pokazati kako profesionalcima, tako i rekreativcima, da je zapravo prehrana bitna koliko i sam trening. Formula dobrog rezultata leži 80% u prehrani, a samo 20% u treningu.

Ključne riječi: sportista, dijeta, ishrana, trening, hidratacija

3-O-10

Nutrition for athletes

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Abstract

According to Mulier Institute, over 60 million people in Europe are part of some sports club. Despite the potential drawbacks such as frequent injuries, it is commonly believed that the positive aspects outweigh the negative ones. The goal of this work is to describe and point out the importance of a healthy diet for health's sake, as well as for the sake of the athlete's performance. The most important task of this work is to shed light on the importance of a good diet for athletes, and also to show that it's a key component of good results. One of the potentially limiting factors of athletes is adequate hydration. The intake of liquids has to be sufficient and constant, so as to prevent dehydration and the health risks that come with it. A diet poor in certain nutritious elements would require the use of different kinds of additives and supplements. Athletes have to, by means of food, take in sufficient amounts of all nutrients (carbohydrates, fats and proteins), as well as vitamins and minerals which often have a decisive impact on the quality of training. This work aims to make clearer already available info about nutrient intake and about the most common mistakes athletes make when planning their diet. The expected results are of an educational character and, hopefully, will show just how important a good diet is; as important as the actual training. 80% of a great result lies in a well planned diet, and only 20% in training.

Keywords: sportist/athlete, diet, training, hydration

Osobitosti ishrane djece osnovnoškolskog uzrasta

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Sažetak

Za pravilan rast, razvoj i uspješno usvajanje znanja, postizanje dobrog uspjeha u školi potrebno je da se zadovolje sve nutritivne potrebe organizma što se postiže adekvatnom ishranom. Djeca ovog uzrasta usvajaju navike, a posebno prehrambene, pa je neophodno posvetiti pažnju pravilnoj ishrani i faktorima koji direktno i indirektno učestvuju u formiranju istih.

Cilj ovog rada je ispitivanje prehrambenih navika djece nižih razreda (trećih i četvrtih) i djece viših razreda (sedmih i osmih) na području opštine Pale. U istraživanju je učestvovalo 79 ispitanika (učenika) iz Osnovne škole "Mokro" starosti od 8-14 godina. Zadatak je bio da se izvrši anketiranje, obrada i interpretacija dobivenih rezultata.

Djeca sedmih i osmih razreda imaju nezadovoljavajuću ishranu u većem procentu, nego djeca trećih i četvrtih razreda. Uzevši u obzir rezultate ovog rada možemo zaključiti da ispitanike tj. djecu treba edukovati o pravilnoj ishrani i njenom značaju po njihovo zdravlje. Aktivno informisanje i podizanje svijesti djece od nižih razreda osnovne škole do starijih generacija o važnosti pravilne ishrane, posebno u periodu odrastanja je veoma važno kako bi djeca od malih nogu stekla zdrave navike.

Ključne riječi: hrana, ishrana, djeca, škola

3-O-11

Dietary habits of pupils from elementary school

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Abstract

For proper growth, development and successful acquisition of knowledge, achieving good success in school, it is necessary to satisfy all the nutritional needs of the organism that are achieved with adequate nutrition. Children of this age adopt habits, especially dietary habits so it is necessary to pay attention to proper nutrition and factors that directly and indirectly participate in their formation.

The aim of this paper is to examine the dietary habits of children of lower grades (third and fourth) and children of higher grades (seventh and eighth) in the area of the municipality of Pale. The research involved 79 respondents (pupils) from the elementary school "Mokro" aged 8-14 years.

Children of the seventh and eighth grades have an unsatisfactory diet in a higher percentage than children in the third and fourth grades. Taking into account the results of this paper, we can conclude that respondents, children, should be educated about proper nutrition and its importance for their health. Active awareness and raising awareness of children from lower grades of the elementary school to older children about the importance of healthy eating, especially during the growing up period, is very important for children to develop healthy habits from their young age.

Keywords: food, nutrition, children, school

Pothranjenost kod mladih

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Sažetak

Pothranjenost je povezana s mnogim poremećajima i okolnostima, uključujući siromaštvo i društvenu oskudicu. Opasnost je također povećana u određenim razdobljima života (odnosno, tokom dojenačke dobi, ranog djetinjstva, adolescencije, trudnoće, dojenja i u starosti). Pothranjenost može nastati zbog nedovoljnog unosa hranjivih tvari, malapsorpcije, poremećenog metabolizma, gubitka hranjivih tvari uslijed proljeva, ili povećanih prehrambenih potreba (kao što je to slučaj kod raka ili infekcije).

Cilj rada je istaći činjenicu da je pothranjenost učestala i rasprostranjena kod mladih, a njenu prisutnost prepisujemo raznim faktorima zbog kojih se mladi, svjesno ili nesvjesno podvrgavaju ovakvom načinu ishrane.

Pothranjenost napreduje kroz stadije, a svakom je stadijuobično za razvoj potrebno duže vrijeme. Prvo se mijenjaju razine hranjivih tvari u krvi i tkivima, nakon čega slijede intracelularne promjene biokemijske funkcije i građe. Na kraju se pojavljuju simptomi i znakovi pothranjenosti.

Simptomatologiju čini trijas simptoma: strah od debljine i hrane, opsesivna misao o smanjenju tjelesne težine i poremećaj tjelesne šeme. Početak bolesti je postepen i podmlukao. Kreće se smanjenjem unosa hrane, probirljivošći, žalbama na stomachne tegobe, nemanje apetita. Oboljeli uživa u osjećanju gladi, to mu daje osjećaj moći.

Anorexia nervosa je vrlo teški psihijatrijski poremećaj s najčešće fatalnim ishodom. Ulazi u kategoriju poremećaja hranjenja, odnosno izglednjivanja uzrokovanog najčešće strahom od debljanja. Osoba gubi apetit. Bulimija se opisuje kao poremećaj hranjenja karakteriziran kao sindrom prežderavanja/praznjenja, s epizodama velikog prežderavanja poslije kojih osoba samoinicijativno povraća ili upotrebljava laksative.

Ključne riječi: pothranjenost, mladi, posljedice

3-O-12

Malnutrition at young age

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Abstract

Malnutrition is related to many disorders and circumstances, including poverty and social scarcity. A danger from malnutrition is also increased in some stages of life (infant period, early childhood, adolescence, pregnancy, breastfeeding and in old age). Malnutrition can appear owing to insufficiently food intake, malabsorption, metabolic disorder, the loss of nutrients due to presence of diarrhea, or increased nutritional needs (which is known in tumor states or infection).

The aim of this work is to point out a fact that malnutrition is frequent in youth, and its presence is related to many different influences, for which young people potentiate this way of food intake, consciously or unconsciously. Malnutrition is progressing through stages, and each of them needs a longer time to develop. First, the level of nutrients in blood and tissue become to change, and after that it comes to intracellular changes in biochemical functions and structures. In the end, symptoms and signs of malnutrition are completely visible.

Symptomatology consist three symptoms: a fear of food and gaining weight, obsessive thought of weight reduction and disorder of physical scheme. The beginning of a disease is gradual and threacherous. It starts by decreasing of food intake, fussiness, complaining about stomach issues, the lack of appetite. Patient likes being hungry and it gives him feeling of power.

Anorexia nervosa is a very difficult psychiatric disorder and most often, it ends fatal. It's located in category of feeding disorders, respectively, starvation which is caused by fear of gaining weight. Person loses appetite. Bulimia is a feeding disorder, characterized by overeating/inanitioning with overeating episodes after which person vomits or uses laxatives willingly.

Keywords: malnutrition, young people, consequences

Reklamna poruka u dječijim TV emisijama

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Sažetak

Reklame u toku dječijih emisija veoma utiču na djecu bilo da se reklamiraju sportski iliprehrambeni proizvodi. Djeca su dobra ciljna grupa u marketingu, jer oni se ugledaju, žele biti kao oni, što podrazumijeva konzumiranje reklamiranih proizvoda.

Sproveli smo istraživanje na 6 domaćih TV kanala, na kojima se emitiralo 12 dječijih emisija, koristeći metodu Analize sadržaja. Na osnovu tog istraživanja došli smo do zaključka da se reklame namijenjene djeci najčešće pojavljuju prije TV emisija, ali u vrijeme predviđeno za emisiju. U toku jedne emisije uglavnom se prikazuju dvije reklame, koje ne traju dugo, što je u skladu sa prosječnim trajanjem pažnje djece uzrasta kojem je emisija namijenjena.

Proizvodi koji se najčešće reklamiraju su gazirana pića, slatkiši (čokolade, bombone, slatka peciva, keksi) i slane grickalice (čipsevi, smoki), a nešto rjeđe mliječni napitci i energetska pića, a skoro nikada voda, voće i povrće. Kako bi se djeca dodatno motivirala da konzumiraju proizvode, u reklamama se najčešće ističu i propratni proizvodi, kao što su: sličice, naljepnice, igračke, ali i nagradne igre, kako bi se u djeci probudila želja za takmičenjem, što povećava potražnju za proizvodom.

Zbog izraženog oblika učenja po modelu, proizvode najčešće reklamiraju poznati sportisti i sama djeca. I reklamna poruka je u skladu s tim, pa reklame najčešće šalju poruku sretne obitelji ili „budi cool“, jer se kod djece javlja osjećaj za pripadanjem i takmičenjem „ko će biti bolji“, što je u djetinjstvu izraženo mnogo više nego u ostalim periodima života.

Ključne riječi: dječije emisije, reklame, proizvodi, djeca, poruka

Advertising message in children's TV shows

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Abstract

Advertisements during children's show greatly affect the child's psyche whether they advertise sports or food products. Children are a good target group in marketing because they sympathize and identify themselves characters in advertisements, they want to be like them, which means consuming advertised products.

We conducted research on 6 local TV channels, which broadcast 12 children's emission using the content analysis method. Based on this research, we have come to the conclusion that advertisements intended for children mostly appear before TV shows, but at the time scheduled for the show. During a single show, two commercials are usually shown, which do not last long, which is in line with the average duration of attention of children of the age to whom the show is intended.

Products that are most often advertised are carbonated drinks, sweets (chocolates, candies, sweet pastries, biscuits) and salty snacks (chips, smokies), and somewhat rarely milk drinks and energy drinks, and almost never water, fruits and vegetables. In order to further motivate children to consume products, adverts are also often used to display accompanying products, such as: thumbnails, stickers, toys, and prize games, in order to awaken the desire for competition in children, which increases the demand for the product.

Due to the expressed form of learning by model, products are most often advertised by well-known athletes and children themselves. And the advertising message is in line with this, so advertisements usually send a message to a happy family or "be cool", because there this stimulates the sense of belonging and competition "who will be better", which are more in pronounced in childhood than in any other period in life.

Keywords: children's shows, advertisements, products, children, message

Promocija zdravlja u skrivenom kurikulumu nastavnika

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Sažetak

Zdrav način života se može promovirati kroz različite odgojne i obrazovne sadržaje tokom studija. Pojedini nastavni predmeti sadržajno više koreliraju sa zahtjevima i uopće konceptom zdravog načina života – sportske aktivnost, amatersko bavljenje sportom, očuvanje životne sredine, itd, dok su drugi predmeti više usmjereni na društvena i tehnička područja, pa propisanim sadržajima ne moraju nužno promovirati zdrav način života. No, u okviru skrivenog kurikuluma, svi nastavnici mogu promovirati određene životne stilove.

Skriveni kurikulum je dio „nepisanog“ nastavnog plana i programa koji omogućava nastavniku da promovira svoje ili društvene vrijednosti. Sa obzirom da se može definirati kao učenje stavova i normi, skriveni kurikulum je vrlo kompleksan dio nastavnog procesa, koji može pozitivno utjecati na promociju zdravog načina života. Upravo stoga nas je zanimalo da ispitamo studente koliko njihovi nastavnici koriste skriveni kurikulum u promociji zdrave ishrane.

U istraživanju smo koristili fokus grupe kako bismo studente ispitali koje su to vrijednosti koje nastavnici promoviraju, koliko često ih promoviraju, te koliki utjecaj to ima na same studente. Kvalitativnom analizom se pokazalo da većina nastavnika u okviru skrivenog kurikuluma promovira ne konzumiranje štetnih i opojnih supstanci, konzumiranje vode umjesto gaziranih i ostalih sokova, provođenje vremena u vanjskim aktivnostima, te kupovinu domaćih proizvoda. Također, pokazalo se i da promoviranje zdravih stilova života više ovisi o sistemu vrijednosti samog nastavnika nego o sadržajima koje predaje.

Ključne riječi: zdrav način života, skriveni kurikulum, studenti, fokus grupe, sistem vrijednosti, sadržaji

3-O-14

Promoting health in teacher's hidden curriculum

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Abstract

A healthy lifestyle can be promoted through various educational content during the studies. Some teaching subjects are more in correlation with the requirements and general concept of a healthy lifestyle - sports activity, amateur sports, environmental protection, etc., while other objects are more focused on social and technical areas, so the prescribed content does not necessarily promote a healthy lifestyle. However, within a hidden curriculum, all sequences can promote certain lifestyles.

A hidden curriculum is part of an "unwritten" curriculum that allows the teacher to promote his or her social values. Since it can be defined as learning attitudes and norms, the hidden curriculum is a very complex part of the teaching process, which can positively influence the promotion of a healthy lifestyle. It was precisely why we were interested in examining how much teachers at the Faculty of education use a hidden curriculum in promoting healthy eating.

In the research, we used a focus group to examine student's opinion what are the values that teachers promote, how often they promote them, and what influence on students it makes. Qualitative analysis has shown that most teachers within the hidden curriculum promote avoidance of addictive substances and drugs abuse, consuming water instead of carbonated and other juices, spending time in outdoor activities, and buying domestic products. Also, it has been shown that the promotion of healthy lifestyles depends more on the teacher's own system of values than on the content taught.

Keywords: healthy lifestyle, hidden curriculum, students, focus groups, value system, content

Uloga adipokina u patogenezi pretilosti kod ljudi i životinja

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Sažetak

Pretilost je jedan od vodećih zdravstvenih problema kod ljudi i životinja (posebno pasa i mačaka) posljednjih godina. Procjenjuje se da oko 39% odraslih u svijetu ima prekomjernu tjelesnu masu, a oko 13% ih je pretilo. Takođe, ovaj problem ima veliku važnosti u veterinarskoj medicini, budući da se procjenjuje da je oko 33% pasa koji posjete veterinarske klinike pretilo. Prekomjerna tjelesna masa može uzrokovati niz zdravstvenih poremećaja uključujući kardiovaskularne bolesti i poremećaje metabolizam agluoze kao što su inzulinska rezistencija, hiperinzulinemija i diabetes. Osim nepravilne ishrane i manjka tjelesne aktivnosti, kod pretilosti je važan i sam metabolički i endokrinološki status. Iako se adipozno tkivo prije posmatralo isključivo kao skladište energije, ono luči preko 700 različitih faktora-adipokina, koji imaju značajnu ulogu u različitim funkcijama u organizmu. Neki od najvažnijih adipokina kod pretilosti su: adiponektin, leptin, vaspin, koštan imorfologeni protein-7, faktor nekroze tumora- α , interleukin-6 i dr. Sa porastom količine masnog tkiva dolazi do hipertrofije adipocita i kroničnog stresa u masnom tkivu, što utječe na koncentraciju izlučenih adipokina. Ovakvo stanje je povezano i sa inzulinskom rezistencijom, te lučenjem određenih proinflamatornih faktora. Osim toga na koncentracije adipokina utječe i ishrana, te tjelesna aktivnost. Pretilost kao multifaktorijalni poremećaj vodi ozbiljnim posljedicama po zdravlje jedinke. Adipokini imaju veliki utjecaj u njezinoj patogenezi, stoga se trebaju nastaviti istraživanja na tom području s ciljem detaljnog utvrđivanja mehanizama njihovog djelovanja.

Ključne riječi: pretilost, adipokini

3-O-15

The role of adipokines in humans and animals

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Abstract

Obesity is one of the leading health problems among humans and animals (especially dogs and cats) in recent years. It is estimated that around 39% of adults in the world have excessive body mass, and about 13% are overweight. Also, this problem is of great importance in veterinary medicine, as it is estimated that about 33% of dogs which visit veterinary clinics are overweight. Excessive body mass can cause a range of health disorders including cardiovascular diseases and glucose metabolism disorders such as insulin resistance, hyperinsulinemia, and diabetes. Apart from improper diet and low physical activity, metabolic and endocrinological status is also important in obesity. Although adipose tissue has only been considered as energy storage, it has over 700 different adipokines, which play a significant role in various functions in the body. Some of the most important adipokines in obesity are: adiponectin, leptin, vaspin, bone morphogenic protein-7, tumor necrosis factor- α , interleukin-6 etc. The increase in fatty tissue amounts to hypertrophy of adipocytes, chronic stress in fatty tissue and increase of concentration of secreted adipokines. This condition is also associated with insulin resistance, as well as certain proinflammatory factors. In addition, adipokine concentrations are also affected by diet and physical activity. Obesity as a multifactorial disorder leads to serious consequences for the health of the individual. Adipokines have a major influence on its pathogenesis, therefore research in this area needs to be continued with a detailing view to the mechanisms of their action.

Keywords: obesity, adipokines

Utjecaj posta na organizam čovjeka

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Sažetak

Kroz dugu historiju medicine suzdržavanje od jela i pića, post, upražnjavao se iz duhovnih, zdravstvenih ali čak i kozmetičkih razloga.

Herodot nam prenosi da su stari Egipćani još u XV vijeku p.n.e. smatrali da osnovu zdravlja i mladosti predstavlja post. Veliki matematičar Pitagora u VI vijeku p.n.e. praktikovao je post, smatrajući da to povećava umno opažanje, čak je primoravao i svoje studente da poste. Post je zastupljen u većini svjedstkih religija. Historija bilježi još mnogo primjera prakse upražnjavanja posta.

Danas nam medicina svakim danom potvrđuje vjerovanja i zapažanja naših predaka o dobrobiti posta za organizam čovjeka što nam svjedoče mnoge studije na temu posta. Studija koju je provela grupa američkih profesora pokazala je da post obnavlja cijeli imunološki sistem i pomaže oboljelima od raka. Prema US Nacionalnoj akademiji nauka zdravstvene koristi posta uključuju: otpornost na stres, povećanu osjetljivost inzulina, smanjenu morbidnost, te povećan životni vijek.

Cilj rada je pobliže predstaviti dobrobiti posta na organizam čovjeka i ispitati koliko je u praksi zastupljen post kod studenata Pedagoškog fakulteta UNSA. Rezultati istraživanja će biti prezentirani u radu.

Ključne riječi: čovjek, organizam, post, utjecaj

3-O-16

The effects of fasting on the human organism

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Abstract

Throughout the long history of medicine abstaining from food and drink, fasting, has been practised for spiritual, health and even cosmetic benefits.

According to Herodotus, ancient Egyptians, as far back as the XV century B.C., considered the act of fasting the foundation of health and youth. The great mathematician Pythagoras in VI B.C. practised fasting, considering it an enhancement tool for his mental strength, and he even forced his students to fast as well. Fasting is a part of most religions. Throughout history there are many examples of fasting being an integral part of life.

Today, medicine confirms the beliefs and observations of our ancestors about the benefits of fasting for the human organism, on which many studies can testify. A study, taken by a group of American professors, shows that fasting regenerates the entire immune system and helps those suffering from cancer. According to the US National academy of sciences the health benefits of fasting include: stress resistance, increased insulin sensitivity, decreased morbidity and increased life expectancy.

The end goal of this study is to shine a light on the benefits of fasting for the human organism and to examine the frequency of fasting among the students of the Faculty of educational sciences Sarajevo. The research results will be presented in the work.

Keywords: human, organism, fasting, influence

Prehrambene navike studenata za vrijeme ispitnih rokova

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Sažetak

Studenti su jedna od najpogođenijih kategorija zahvaćenih lošim prehrambenim navikama. Razlozi za to su mnogobrojni, ali u pojedinim dijelovima godine one najviše dolaze do izražaja, a to su periodi ispitnih rokova.

Govoreći o studentskom životu uopće, najteži njegov dio većini predstavlja polaganje ispita, jer je to i krajnji cilj studiranja. Prolazeći kroz mnogobrojne stresove izazvane dovršavanjem odlaganih obaveza, samim učenjem, nedostatkom vremena i sna, studenti često zanemaruju svoju prehranu, te idu iz krajnosti u krajnost – ili pribjegavaju unošenju pretjerane količine (uglavnom brze) hrane, ili se njihov dan zasniva na jedva jednom obroku dnevno. Obje solucije imaju loš uticaj na zdravlje, energiju i koncentraciju prilikom pripreme ispita, pogotovo ako se u obzir uzme i kvaliteta hrane koja čini te obroke. Sa ciljem istraživanja ove teme, proveli smo anketu na uzorku studenata Pedagoškog fakulteta u Sarajevu. Većina studenata je navela brojna odstupanja u odnosu na njihovu uobičajenu, normalnu prehranu mimo ispita, te se izjasnila da se njihova prehrana u ovom periodu neizbježno sastoji od velikih količina kofeina (bilo u kafi ili u energetskim napicima), nezdravih šećera i čokoladica, grickalica, različitih vrsta tijesta i pržene hrane, a vrlo rijetko od voća i povrća. Iako ni prehrana zasnovana samo na voću, povrću i salatama nije idealna, itekako ih je potrebno uključiti u nju. Baveći se ovom tematikom, cilj nam je osvijestiti studente da svojoj ishrani tokom ispita posvete više pažnje, te koriste namirnice koje im pružaju dovoljno energije, a pritom su zdrave i korisne.

Cljučne riječi: prehrambene navike, studenti, ispiti

3-O-17

Students' Nutrition During Exam Period

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Abstract

Students are one of the social categories whose eating habits are bad. There are many reasons for it. The time when they are most expressed is time of final exams.

When we talk about students' life, its hardest part is taking exams. That is the goal of studying. Students are very stressed because they have a lot of non-finished obligations, they have to study hard. They have a little time to sleep and rest. Because of all those reasons they don't care about food they eat. Most of that food is junk food or they have only one meal per day. Both solutions have a bad influence on health, energy and concentration during studying, because the quality of food is very bad. With the objective to research this theme, we have taken a poll on students of Pedagogic Faculty in Sarajevo. Most of the students said that there exist some differences in their nutrition during exams period, than in normal days. They consume big concentration of caffeine (either in coffee or in energy drinks), unhealthy sugars, candies, snacks and all kind of pastries or grilled food. They eat fruit or vegetables very rarely. The food based only on fruit, vegetables and salads is also not so healthy. We need to combine the groceries. With this theme, our goal is to awake students. They need to take more care of their nutrition during final exams, they need to use groceries which give them more energy, but they need to be healthy and useful.

Keywords: eating habits, students, exams

Navike u pogledu higijene zuba i usne šupljine učenika razredne nastave

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Sažetak

Zdravlje je česta tema u većini kultura i temeljno ljudsko pravo, bez obzira na rasu, vjeru i politička uvjerenja, ekonomske i socijalne uvjete. Oralno zdravlje predstavlja standard zdravlja usne šupljine i srodnih tkiva koje omogućava pojedincu osnovne aktivnosti kao što je konzumiranje hrane, komunikaciju i socijalizaciju bez osjećaja boli ili nelagode. Karijes i parodontne bolesti česte su pojave u oralnoj šupljini u svakoj životnoj dobi, ali posebno kod djece. Zbog njihove visoke prevalencije u svim regijama svijeta nužno je obratiti pažnju na uzroke, te poboljšanje higijene i navika od najmlađih naraštaja. Cilj ovog ispitivanja je bio ustanoviti kakve su navike učenika razredne nastave kada je u pitanju higijena zuba te ukazati na važnost redovnog pranja i održavanja zuba kao i negativan zdravstveni utjecaj slatkša na naše zube. Za potrebe našeg istraživanja anketirali smo 160 učenika trećih, četvrtih i petih razreda, osnovnih škola u Sarajevu, gdje se pokazalo da većina ispitanika najmanje dva puta dnevno četkaju zube, jednom dnevno jedu slatkiše i redovno idu na kontrolu zuba. Na osnovu dobijenih rezultata ankete možemo zaključiti da učenici često konzumiraju slatkiše o čemu ćemo detaljnije govoriti u prezentaciji istraživanja.

Ključne riječi: *higijena, navike, slatkiši, učenici razredne nastave, zubi*

3-O-18

Habits regarding of the tooth hygiene and oral cavity of primary school students

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Abstract

Health is a common theme in most cultures, it is one of the fundamental rights, regardless of the race, religion, political conviction, economic or social conditions. Oral health represents the health standard of oral cavity and related tissues which allow a person to consume food, communicate and socialize without feeling pain or uncomfortable. Caries and paradental diseases are common in every age, especially in childhood. Because of their prevalence in all regions of the world it is important to pay attention on the causes of these problems and how to improve hygienic habits of youngsters. Aim of the examination was to establish students' habits when it comes to the teeth, but also to point out the importance of brushing teeth as well as pointing out the negative influence of sweets. For the needs of our examination we questioned 160 students in 3, 4, 5 grades in elementary school in Sarajevo. Results showed that most of the students brush their teeth 2 times a day, eat sweets every day, and they visit dentists regularly. Based on the results we can conclude that the students often consume sweets and we will talk about that in detail in the presentation of the examination.

Keywords: hygiene, sweets, teeth, students, teaching

Prehrambene navike i fizička aktivnost studenata Medicinskog fakulteta Univerziteta u Sarajevu

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Sažetak

Pravilna ishrana je temelj zdravog načina života. Cilj našeg istraživanja bio je utvrditi kakve su prehrambene navike i fizička aktivnost studenata Medicinskog fakulteta Univerziteta u Sarajevu. Sprovedena je deskriptivna studija, a posebno dizajnirani samopopunjavajući upitnik je primjenjen za prikupljanje podataka o demografskim karakteristikama, prehrabnim navikama, i fizičkoj aktivnosti. Upitnik je bio je dostupan za popunjavanje u periodu od 06.06. do 07.06.2018. godine na facebook grupama studenata svih šest godina Medicinskog fakulteta. Na osnovu subjektivnih podataka o tjelesnoj težini i visini i spitanika izračunavan je indeks tjelesne težine. Deskriptivna statistička analiza je urađena na licenciranom statističkom softveru MS Excel.

Upitnik je popunilo ukupno 163 studenta od kojih 69.9% žena i 30.1 % muškaraca, prosječne dobi $21.832.05 \pm SD$ godina. U odnosu na prehrambene navike njih 56 (34.9%) doručkuje svaki dan, 17 (10.5%) doručkuje 5-6 dana u sedmici, 33 (20.2%) doručkuje 3-4 dana u sedmici, njih 43 (26.3%) doručkuje 1-2 puta u sedmici, a 13 (8.0%) ispitanika ne doručkuje nikako. Brzu hranu 1-2 puta sedmično konzumira 75 ispitanika (46.1%). 44 ispitanika (26.8 %) dnevno u prosjeku hodajući provede do 30 minuta, dok njih 74 (45.5%) u prosjeku dnevno hoda 31 i 60 minuta. 106 (65%) ispitanika je odgovorilo da se ne bavi nekim sportom, dok je od 57 ispitanika koji su odgovorili da se bave nekim sportom njih 53 odgovorilo da se sportom bave rekreativno. Samo 34.9% ispitanika doručkuje svaki dan, dok 8.0% ispitanika ne doručkuje nijednom u toku sedmice. Za užinu 55.9% ispitanika jede slatkiše, a "brzu hranu" konzumira 46.1% ispitanika. Fizički aktivnom osobom se smatra 57.7% ispitanika. Pored navedenih prehrambenih navika izračunate prosječne vrijednosti indeksa tjelesne težine (ITT) kg/m^2 se nalaze u granicama anormalnih.

Ključne riječi: prehrambene navike, student medicine, fizička aktivnost

3-O-19

Eating habits and physical activity among students of the Medical Faculty of the University of Sarajevo

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Abstract

Proper nutrition is the foundation of a healthy lifestyle. The aim of our research was to determine the eating habits and physical activity of students of the Faculty of Medicine at the University of Sarajevo. A descriptive study was conducted, and a specially designed self-replicating questionnaire was used to collect data on demographic characteristics, eating habits, and physical activity. The questionnaire was available for completion during the period from 06.06. until 07.06.2018 on Facebook groups of students of all six academic years of the Faculty of Medicine. On the basis of subjective data on body weight and height of the subjects, the body weight index was calculated. A descriptive statistical analysis was done on the licensed statistical software MS Excel.

The questionnaire was filled out by a total of 163 students, of which 69.9% were women and 30.1% were men, the average age being $21.83 \pm 2.05 \pm SD$ years. In relation to eating habits, 56 (34.9%) have breakfast each day, 17 (10.5%) have breakfast for 5-6 days a week, 33 (20.2%) have breakfast for 3-4 days a week, 43 (26.3%) 2 times a week, while 13 (8.0%) do not have breakfast at all. 75 respondents consume fast food 1-2 times per week (46.1%). 44 respondents (26.8%) daily spend an average of 30 minutes on average walking, while 74 (45.5%) on average daily walk between 31 and 60 minutes. 106 (65%) respondents answered that they did not engage in any type of sport, while 57 respondents answered that they take part in some sporting activity. 53 responded they play sports recreationally. Only 34.9% of the respondents have breakfast every day, while 8.0% of the respondents do not have breakfast during the week at all. For snacks, 55.9% of the respondents eat sweets, and "fast food" is consumed by 46.1% of the respondents. 57.7% of respondents are considered physically active people. In addition to the eating habits, the calculated average values of the weight index (ITT) kg / m² are in the normal range.

Keywords: eating habits, medical student, physical act

Znanje, stav i praksa studentske populacije o pravilnoj ishrani i tjelesnoj aktivnosti na području Balkana - pregled literature

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Sažetak

Prelazak na fakultet mnogim studentima znači drastičnu zamjenu dotadašnjeg načina života u roditeljskom domu, samostalnim životom u novim uvjetima, često i u novom gradu. Zbog rasporeda predavanja, ispitnih rokova i dodatnih radnih obveza, studenti često zanemaruju važnost redovitih zdravih obroka za umno i tjelesno funkcioniranje u stresnoj svakodnevnicu. Početak studiranja je kod mnogih studenata kritičan period smanjivanja tjelesne aktivnosti i povećanja sedentarnih aktivnosti. Tjelesna aktivnost varira u studentskoj populaciji i pod uticajem je brojnih čimbenika, od samodiscipline, dostupnosti i mogućnosti uključivanja u sportske i tjelovježbene aktivnosti, uticaja medija, do uvjeta i načina života u univerzitetском okruženju, te tempa studentskih obveza.

Cilj rada bio je pregledom dostupne naučne i stručne literature prikazati znanje, stav i praksu studentske populacije na teritoriji Balkana o pravilnoj ishrani i tjelesnoj aktivnosti tokom studiranja.

Istraživanje je provedeno pregledom relevantnih baza podataka (Pub Med, Science Direct, Google scholar) koristeći ključne riječi: pravilna ishrana, tjelesna aktivnost, studentska populacija. Ukupno je pronađeno 32 članka o značaju pravilne ishrane i tjelesne aktivnosti za studentsku populaciju, kao i članci koji se odnose na znanje, stav i ponašanje o pravilnoj ishrani i tjelesnoj aktivnosti među studentima različitih fakulteta na području Balkanskih zemalja. Pregledom dostupne literature zaključuje se da znanje i praksa studenata o pravilnoj ishrani i tjelesnoj aktivnosti nije u korelaciji. Ispitanici prepoznaju važnost pravilne ishrane i redovne tjelesne aktivnosti u svakodnevnom životu ali istovremeno iskazuju i stav da je neke od njih teško primjeniti u praksi. Zbog toga je neophodno početi raditi na podizanju nivoa stavova i prakse o pravilnoj ishrani i redovnoj tjelesnoj aktivnosti među studentskom populacijom.

Ključne riječi: *studentska populacija, ishrana, tjelesna aktivnost*

3-P-1

Knowledge, attitude and practice of a student population about regular nutrition and physical activity in Balkan – literature review

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Abstract

Starting college to many students means a big change of a lifestyle from what they had in a family home, and that change includes independent life in new conditions, and mostly, in new town. Because of lecture schedules, exams and other obligations, students are often neglecting and importance of a regular, healthy meals which are needed for mental and physical functioning in a stressful everyday. College period is a critical one, because it brings to many students reduction of a body weight and it increase sedentary activities. Physical activity varies in the student population and it's affected by a numerous factors, including self – discipline, availability and possibility of inclusion in sport and physical activities, media influence, lifestyle in a university environment and student obligations tempo.

The aim of work is to show knowledge, attitude and practice of a student population in Balkan about regular nutrition and physical activity during college, by available scientific and professional literature review.

Research is carried out by a review of relevant database (Pub Med, Science Direct, Google Scholar), using the keywords: regular nutrition, physical activity, student population. It has 32 articles about importance of a regular nutrition and physical activities for a student population and there are also articles that refer to knowledge, attitude and behaviour about nutrition and physical activity between students from different faculties in Balkan countries. From the available literature review, it is concluded that knowledge and practice of students about regular nutrition and physical activity aren't in a correlation. Respondents are recognizing an importance of regular nutrition and physical activity in everyday life, but they also express an attitude that some of it is hard to apply in practice. Because of that, it's important to raise the level of attitudes and practice about regular nutrition and physical activity in student population.

Keywords: student population, nutrition, physical activity

Cervikalni bolni sindrom – bolest modernog društva

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Sažetak

Vratni bolni sindrom označava smetnje koje su uzrok promjene vratnog dijela kičmenog stuba. Ovo stanje karakteriše degenerativne promjene na vratnom dijelu kičmenog stuba, hipertonus mišića vrata i ramenog pojasa, ograničene pokrete i vegetativne smetnje u području glave (vrtoglavice i glavobolje) i gornjih ekstremiteta. Faktori rizika koji utiču na ovaj sindrom jesu sedatarni način života, rad za računarom, fizička neaktivnost, izloženost stresu te svakako neupućenost svih generacija o pravilnom držanju posture tijela. Bol u vratu bar jednom u životu ima trećina populacije. Vratni bolni sindrom je socijalno medicinski problem koji zahtijeva multidisciplinarno rješavanje. Važan faktor u tretmanu je svakako prevencija koja mora biti integralni dio liječenja. Kako bi spriječili ili barem smanjili mogućnost nastanka cervikalnog sindroma, pomoći će kineziterapija odnosno jačanje mišića. Potrebno je provoditi edukaciju o važnosti prevencije, te svakako informisati pacijente o značaju fizičke aktivnosti koja je pred uslov za bolje opće zdravlje. Fokus prevencije treba da bude na promjeni načina života i pravilnom držanju posture tijela, raditi češće pauze tokom dugog sjedenja i dugih vožnji, prilagoditi radno okruženje, te svakako promjena ishrane i otklanjanje stresa.

Ključne riječi: cervikalni bolni sindrom, bol u vratu, prevencija

3-P-2

Cervical pain syndrome – illness of modern society

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Abstract

Neck pain syndrome refers to disorders that are caused by the change in the neck area of the spinal column. This condition is characterized by degenerative changes in the neck of the spinal column, hypertension of the neck and shoulder muscles, restricted movements and vegetative disorders in the head area and upper extremities. Risk factors that affect this syndrome are poor body hold, sedation lifestyle, computer work, physical inactivity, exposures to stress, and certainly professional exposure. A neck pain at least once in a lifetime has a third of the population, and in most patients the neck pain is caused by poor bodyholding or forced body position at the workplace. To prevent or at least to reduce the possibility of cervical syndrome, kinesiotherapy and muscle strengthening will help. An important factor in the treatment is certainly preven which must be an integra l part of a treatment. It is necessary to conduct patient education on the importance of prevention, as well as regular pharmacological therapy and home program and exercise. The focus of prevention should be the change in a lifestyle and proper posture of the body, taking often breaks during long seating and long journeys, as well as adjusting the work environment. Neck pain syndrome is a social medical problem that requires multidisciplinary resolution.

Keywords: cervical pain syndrome, neck pain, prevention

Uloga prehrane i tjelesne aktivnosti u prevenciji kardiovaskularnih bolesti

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Sažetak

Kardiovaskularne bolesti (KVB) su vodeći uzrok umiranja u većini razvijenih zemalja, ali i u mnogim zemljama u razvoju. KVB su značajan uzrok invalidnosti, gubitka radne sposobnosti, smanjene kvalitete života, prijevremene smrtnosti i sve većih troškova zdravstvene zaštite. Na početku 20.vijek, od KVB umirao je tek svaki 10. stanovnik, da bi se napočetku 21. vijeka, usljed nove faze tzv. „epidemiološke tranzicije“, taj broj povećao na 30%. U kardiovaskularne bolesti se među ostalima ubrajaju infarkt miokarda, ishemijska bolest srca i ateroskleroza. Faktori rizika KVB mogu se podijeliti na one koji se ne mogu modificirati (spol, dob, genetska predispozicija, tjelesna građa, rasa) i na one koji mogu (pušenje, niska fizička aktivnost, konzumiranje alkohola, prehrana, gojaznost, hipertenzija, dijabetes, stres). Prehrana je uvijek prva faza u liječenju osoba s dijagnozom neke od KVB. Prilikom planiranja prehrane treba se voditi svjetskim, odnosno Europskim smjernicama. Dijetetički pristup je u osnovi hipokalorijska prehrana bazirana na DASH principu (The Dietary Approaches to Stop Hypertension), odnosno prehranbenim smjernicama za borbu protiv hipertenzije. Ovaj se princip prehrane zasniva na niskom unosu zasićenih masti i natrija, a ujedno predstavlja ishranu bogatu voćem, povrćem i mliječnim proizvodima. Tjelesna aktivnost i terapija pokretom, priznati su kao moguće strategije u liječenju pacijenata sa kardiovaskularnim rizikom. Mehanizmi uticaja tjelesne aktivnosti na kardiovaskularni system ogledaju se u smanjenoj srčanoj frekvenciji i smanjenom radu simpatikusa, što vodi redukciji potreba za kiseonikom pri istom naporu, kao i radu srca. Veliki javnozdravstveni značaj KVB ističe potrebu za pravovremenom i učinkovitom preventivnom akcijom.

Ključne riječi: kardiovaskularne bolesti, faktori rizika, DASH prehrana, tjelesna aktivnost

3-P-3

The role of nutrition and physical activity in the prevention of cardiovascular diseases

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Abstract

Cardiovascular disease (CVD) is the leading cause of death in most developed countries, but also in many countries in development. CVDs are a significant cause of disability, loss of working ability, reduced quality of life, premature mortality and increasing costs of health care. Statistics shows that in the first part of 20th century 0.10% people died of CVDs, by the 21th century that number increased to 30% due to “Epidemiological transition”. Cardiovascular diseases include myocardial infarction, ischemic heart disease and atherosclerosis. Risk factors for cardiovascular diseases can be divided into those that can't be modified (gender, age, genetic predisposition, physical activity, race) and those who can (smoking, low physical activity, alcohol consumption, diet, obesity, hypertension, diabetes, stress). Nutrition is always the first phase in the treatment of people diagnosed with some of the CVD. When planning the diet, the world or European guidelines should be guided. Dietary approach is basically a hypocalorian diet based on the DASH principle (Dietary Approaches to Stop Hypertension), or dietary guidelines for the fight against hypertension. This diet principle is based on a low intake of saturated fats and sodium, and at the same time it represents a diet rich in fruits, vegetables and dairy products. Physical activity and kinesitherapy are recognized as possible strategies for treating patients at risk of cardiovascular disease. The mechanisms of the impact of physical activity on the cardiovascular system are reflected in reduced heart rate and reduced sympathetic work, which leads to the reduction of oxygen demand for the same effort, as well as the work of the heart. Efficient prevention is of great significance with CVDs.

Keywords: cardiovascular diseases, risk factors, DASH nutrition, physical activity

4. DIJETOTERAPIJA
DIETOTHERAPY

Medicinski značaj ishrane u toku premenstrualnog sindroma i primarnih simptomatskih stanja u toku mjesečnice

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Sažetak

Urban stil života i neadekvatna prehrana uvjetovali su sve veći procenat žena koje pate od premenstrualnog sindroma i redovne simptomatologije u toku mjesečnice. Kao posljedica hormonalnog disbalansa, javlja se i deficit određenih nutrijenata. Kod žena kojima se javljaju psihičke i emocionalne tegobe u toku PMSa zapažen je relativan višak estrogena, manjak progesterona u laboratorijskom krvnom nalazu, obično se bilježi i veća osjetljivost na smanjenje nivoa glukoze u krvi (subjektivni simptom u odsustvu biohemijski registrovane hipoglikemije). Navedena hormonska promjena rezultira povećanim unosom ugljikohidrata zbog visoke osjetljivosti na hipoglikemiju u toku PMSa. Ovakvom ishranom primarno će se javiti akutna hiperglikemija, hipomagnezijemija i hipokalcijemija, koje će za posljedicu imati akne, masnu, u nekim slučajevima suhu kožu i kosu, probleme sa digestijom, nadutost, crijevne i menstrualne grčeve, malaksalost, menstrualne migrene i probleme sa zadržavanjem vode u organizmu. Zbog velikog procenta žena koje pate od PMSa, važno je znati da li žene paze na pravilnu ishranu da li su upoznate sa vezom hormonalnog disbalansa i ishrane u toku PMSa i mjesečnice. Dana 22. i 23.05.2018. godine, među 46 učenica Treće gimnazije u Sarajevu sprovedena je online anonimna anketa pod nazivom "Anketa o ishrani u toku predmenstrualnog sindroma i mjesečnice". 46 ispitanica dobi od 18 do 20 godina je odgovorilo na 10 pitanja vezanih za pridržavanje dijeta u toku PMSa, te izvorima nutrijenata u hrani. Rezultati ankete su pokazali da 73.3 % ispitanica pati od PMSa, njih 95.6 % se ne pridržava dijeta u toku PMSa i mjesečnice, te da 68.2% ispitanica ne zna za vezu hormonalnog disbalansa i ishrane. Samo 5.8 % pazi na unos magnezija, a 6.8 % pazi na unos kalcijuma u toku PMSa. Sa prehrambenim izvorima Mg i Ca u hrani je upoznato 33.3 % i 44.4 % ispitanica, respektivno. Čak 73.3% ispitanica ne pazi pravilan unos šećera u toku PMSa, a samo 15.3% ih je upoznato sa pravilnim unosom ugljikohidrata u toku PMSa. Većina ispitanica (91.1 %) smatraju da je potrebna dodatna edukacija o prehrani u toku PMSa i mjesečnice.

Ključne riječi: ishrana, zdravlje, magnezijum, kalcijum, ugljikohidrati

4-O-1

Medical importance of nutrition in premenstrual syndrome and primary symptomatic conditions during the period

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Abstract

Urban lifestyle and inadequate nutrition are causing an increasing number of women suffering from premenstrual syndrome and regular symptomatology during the month. As a result of hormonal imbalances, there is a deficit of certain nutrients. In women with psychological and emotional problems during the PMS, there is a relative excess of estrogen, and a lack of progesterone in the laboratory blood test, and there is a higher sensitivity to lack of glucose in blood (a subjective symptom in the absence of biochemically registered hypoglycaemia). The hormonal change results in increased carbohydrate intake because of high sensitivity to hypoglycaemia during PMS. This problem will cause primarily acute hyperglycaemia, hypomagnesaemia, and hypocalcaemia, which will result in acne, oily, in some cases dry skin and hair, problems with digestion, flatulence, intestinal and menstrual cramps, menstrual migraines and water retention problems in the body. Because of the high percent of women who suffer from PMS, it is important to know about proper nutrition, and acknowledgment about the connection of hormonal imbalance and nutrition during the PMS and the month. In May 22nd and 23rd of 2018 among 46 students of the Third Gymnasium in Sarajevo, was conducted an online anonymous survey, by name "Survey about nutrition during premenstrual syndrome and the month". 46 subjects aged 18 to 20 answered 10 questions about diet during the PMS, as well as nutrition sources in food. The results of the survey showed that 73.3% of respondents suffer from PMS, 95.6% of them do not take any diet during the PMS and the month, and that 68.2% of respondents do not know about the relationship of hormonal imbalance and nutrition. Only 5.8% watch magnesium intake, and 6.8% and watch calcium intake during PMS. With nutrition sources of Mg and Ca in food, 33.3% and 44.4% of subjects were informed, respectively. Even 73.3% of respondents do not care about proper intake of sugar during PMS, and only 15.3% know about the correct intake of carbohydrates during PMS. Most respondents (91.1%) believe that education about nutrition during the PMS and month is needed.

Keywords: nutrition, health, magnesium, calcium, carbohydrates

Zastupljenost različitih tipova masti i ulja u prehrani

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Sažetak

Mnoge bolesti kao npr. oboljenja srca i krvnih sudova, hipertenzija, dijabetes, žučni kamenci, neke vrste karcinoma, artritis, osteoporozna i dr., se povezuju sa neuravnoteženom ishranom. Cilj ovog rada je ispitivanje i evidencija zastupljenosti različitih tipova masti i ulja u prehrani kroz odabranu ciljnu grupu, koju u radu predstavljaju studenti Farmaceutskog fakulteta Univerziteta u Sarajevu. Cilj je dobiti uvid u prehrabene navike studenata i uočiti da li se razlikuju sa trenutnim globalnim statusom unosa masti. Uzorak na kojem je provedeno istraživanje čini 17 studenata Farmaceutskog fakulteta koju su sačinjavali 82,4% ženskih (n=14) i 17,6% muške osobe (n=3). Instrument kojim smo proveli ovo istraživanje je anketa. Svaki student je u toku pet dana pravio svoj dnevnik ishrane i bilježio sve konzumirane namirnice.

Rezultati ovog istraživačkog rada su pokazali takvu raspodjelu dnevnog energetskeg unosa da 47,25% energije potiče iz ugljikohidrata, 18,97% iz proteina, te 33,78% iz masti. Dobivena prosječna vrijednost unosa masti je u skladu sa preporukama Svjetska zdravstvena organizacija (SZO), te sa unosom ugljikohidrata i proteina, ukazuje na relativno uravnoteženu ishranu studenata Farmaceutskog fakulteta. Mono- i polinezasićene masne kiseline čine 25,27% dnevnih energetskih potreba, a prema preporukama treba unijeti 13% energije iz mononezasićenih, dok unos iz polinezasićenih masnih kiselina treba iznositi 2,5-3,5%, a studenti su unosili 17,65%, odnosno 6,9%, što upućuje na povišen unos mono- i polinezasićenih masnih kiselina. Holesterol je u prosjeku konzumiran u količinama od 145,7 mg/dan što je niže od maksimalno preporučenih 300 mg/dan. Prosječni preporučeni unos trans masti bi trebao biti <1%, a njihov unos je prema dobivenim rezultatima nešto viši i iznosi u prosjeku 1,2%. Kroz istraživanje je uviđeno da iako je ukupna vrijednost unosa masti u sklopu preporučenih vrijednosti, vrijednosti unosa pojedinih grupa masti su van ovih okvira.

Ključne riječi: masti, ulja, zasićene, mononezasićene, polinezasićene masti

4-O-2

The presence of different types of fat and oil in the diet

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Abstract

Many diseases such as cardiovascular disease, hypertension, diabetes, gallstones, some forms of cancer, arthritis, osteoporosis are related to unbalanced nutrition. Objectiv of this paper is examination and representation records of different types of fats and oils in nutrition through target group, which in this case are students from Faculty of Pharmacy, University of Sarajevo. The purpose is to get insight in nutritional habits of these students and to notice if there is a divergency from current global status of fat intake.

The sample was conducted by 17 students of the Faculty of Pharmacy, which consisted of 82.4 % female (n = 14) and 17.6 % male (n = 3). The instrument we conducted this research is a survey. Each student made his diet diary for five days and recorded all the consumed foods. In the end, data were provided which gave a great deal of information and based on which clear and valid results were obtained.

Results of this research paper have shown distribution of daily energy intake, 47,25% energy comes from carbohydrates, 18,97% from proteins and 33,78% from fats. Average fats, carbohydrate and protein intake, from these results, is in accordance with the World Health Organization (WHO) recommendations, and it shows that these students have balanced nutrition. Mono and polyunsaturated fats make 22.57% of daily energy needs, and according to recommendations it should be 13% of monounsaturated and 2,5-3,5% of polyunsaturated fats. Students have shown intake of 17,65 % and 6,9% which indicates higher intake of mono and polyunsaturated fats. Average intake of cholesterol was 145,7 mg/day which is lower than recommended, 300 mg/day. Average intake of trans fats should be <1%, but the results show it is higher, around 1,2%. Through the results we see that even though total value of fat intake is within recommended limits. Intake of several groups of fats are beyond recommended limits.

Keywords: fats, oils, saturated, monounsaturated, polyunsaturated fat

Efikasnost kurkume i njenih ekstrakata u ublažavanju bola kod pacijenata sa osteoartritisom koljena-sistematski pregled

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Sažetak

Kurkuma je začim koji je veoma zastupljen u indijskoj kuhinji. Osim u kulinarstvu, koristi se u istočnjačkoj tradicionalnoj medicini već hiljadama godina. Kurkuma djeluje antiinflamatorno, smanjenjem nastanka proinflamatornih citokina. Cilj ove studije bio je da se sumiraju dosadašnja saznanja o djelovanju kurkume kod osteoartritisa. Kako bi se realizovao postavljeni cilj vršen je sistematski pregled literature i to digitalnih online baza podataka, PubMed i Google Scholar. Ključne riječi koje su korištene u pretrazi bile su: kurkuma, artritis, osteoartritis, antiartrogeno djelovanje, antiinflamatorno djelovanje, upala kostiju.

Korištenjem specifičnih kriterija odnosno filtera za pretraživanje baza kao što su epidemiološke studije, članci objavljeni u recenziranim naučnim časopisima i isključivanjem duplih rezultata pretrage, od ukupno pronađenih 135 članaka, devet studija je zadovoljilo uslove pretrage. Objavljeni rezultati kliničkih studija u kojima je ispitivana primjena preparata sa kurkumom u tretmanu osteoartritisa pokazali su jednaku efikasnost kao i NSAID i donekle glukozamin, međutim postojala su određena značajna ograničenja studija koja dovode u pitanje validnost rezultata.

Prema trenutnoj teoretskoj procjeni, potrebna su dodatna rigorozna ispitivanja, kako bi se dokazala efikasnost kurkume kao alternativne terapije za različite vrste osteoartritisa, posebno osteoartritisa koljena. Dodatno potrebno je obratiti pažnju na ostale sastojke u formulacijama i njihov uticaj na tretman bolesti.

Ključne riječi: kurkuma, artritis, osteoartritis, antiartrogeni, inflamacija, upala kostiju

4-O-3

Effect of using turmeric and its extracts on decreasement patients with knee osteoarthritis - systematic review

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Abstract

Turmeric is widely used spice in Indian cuisine. Beside its culinary role it is used in traditional medicine of East for thousands of years. Turmeric has anti-inflammatory effect acting on pro-inflammatory cytokines to be silenced.

Objective of this study was to summarize the current state of the effect of turmeric on osteoarthritis.

Systematic review of literature is performed. We used online, digital databases in PubMed and Google Scholar. Main keywords of the search were: turmeric, arthritis, osteoarthritis, anti-arthritic, curcuma, and inflammation, bone swelling.

Using inclusion of specific criteria in search base such as human studies, articles published in peer-reviewed scientific journals and excluding duplicates, a total number of articles were 135, excluding criteria removed all articles and finally we found, at total, nine studies satisfying our general inquiries, which have been found in common online depositories. Published clinical trials evaluating curcuma formulations for treatment of osteoarthritis have found similar efficacy compared to NSAIDs, and potentially to glucosamine; however, they also contain significant limitations that call into question validity of the results.

According to current theoretical analysis of diseases and further rigorous studies are needed prior to recommending curcuma as an effective alternative therapy for differently positioned osteoarthritis, especially in knee type. Also additional concerning is about role of other component in formulations and their impact in treating of disease.

Keywords: Turmeric, arthritis, knee osteoarthritis, anti-arthritic, inflammation, bone swelling

Nutritivna potpora u pacijenata s gastrointestinalnim karcinomom

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Sažetak

Oboljenja probavnog sistema, posebno karcinomi, kao i njihovo liječenje, mnogo zavise od same ishrane. Nesposobnost održavanja nutricionog statusa kod onkoloških bolesnika je problem i izazov za kliničare. S obzirom na komplikovanost oboljenja i vrste tretmana, javlja se potreba za specijalnim režimom ishrane, u smislu zdravijom, potpunijom i ciljanom ishranom. Proteinsko-kalorijska malnutricija je najčešća od svih paraneoplastičkih pojava koje su uzrokovane malignim oboljenjima i predstavlja glavni uzrok morbiditeta i mortaliteta, gdje 20% onkoloških bolesnika umire od efekta malnutricije.

Pored malnutricije, koji predstavlja progresivni gubitak tjelesne težine i depleciju tjelesnih tkiva, javljaju se i drugi problemi kao što su anoreksija, nedostatak apetita, kaheksija, disfagija, mučnina i povraćanje, anemija, diareja, bol i ostali simptomi i komplikacije. Adekvatna ishrana, odnosno sprječavanje ili ublažavanje ovih posljedica, poboljšava kvalitet života onkološkog pacijenta, povećava toleranciju na terapijske procedure i vjerovatnoću za uspješnost terapije.

Prvi cilj ovog rada je da se upoznamo sa mogućim komplikacijama tokom liječenja pacijenata s kancerom nekog dijela probavnog sistema i adekvatnom ishranom kao neizostavnim dijelom u toku tog perioda.

Drugi cilj je istražiti na koji način pravilnim načinom ishrane prevenirati ili ublažiti ove pojave kod onkoloških bolesnika. Skrenuti pažnju na važnost ishrane tih pacijenata, te ulogu nutricioniste u planiranju ishrane posebno za svakog pacijenta.

Ključne riječi: onkološki bolesnici, terapijske komplikacije, adekvatna ishrana, dijetoterapija

Nutritional care of patients with gastrointestinal cancer

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Abstract

Diseases of gastrointestinal tract, especially cancer include treatment that affects the food intake. Inability to maintain constant nutritional balance is a main problem for physicians when it comes to patients with oncological diseases. Due to the complications, they need a special type of treatment for food intake, in a way to promote health and healthy diet .

Protein caloric malnutrition is the most common out of paraneoplastic appearance which causes malignancy and represents the main cause of morbidity and mortality, where 20% of oncological patients die due to malnutrition. Besides malnutrition which represent progressive weight loss and depletion of body tissue, the main problems are also anorexia, loss of appetite, dysphagia, nausea, vomiting, anemia, diarrhea, pain and others symptoms and complications. Adequate nutritional care can improve patient's nutrition status, the ability to take the prescribed medical treatment and the quality of life.

Objective 1: Better understanding of the complications during treatment of patients with carcinoma of GI tract and adequate diet during treatment is crucial.

Objective 2: Investigate how diet affects patients with carcinoma and to draw attention to importance of healthy diet and significance of nutritional planing during treatment.

Key words: oncological patients, therapeutic complications, adequate nutrition, dietotherapy

Suplementacija pacijenata sa poremećajima štitne žlijezde

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Sažetak

Štitna žlijezda je endokrina žlijezda, oblika leptira, koja se nalazi u donjoj trećini vrata. Osnovna funkcija štitne žlijezde je stvaranje hormona tiroksina i trijodtironina, koji se izlučuju u krv i zatim prenose u svako tkivo.

Hipotireodizam je umanjena funkcija štitne žlijezde, kada štitna žlijezda ne proizvodi dovoljno hormona kako bi tijelo normalno funkcionisalo. Hipertireodizam se odnosi na bilo koje stanje u kojem se proizvodi previše hormona štitne žlijezde u tijelu. Drugim riječima štitna žlijezda je preaktivna. Disfunkcija štitne žlijezde je jedan od vodećih endokrinih poremećaja, i predstavlja oko 30% do 40% endokrinoloških oboljenja. Meta-analiza objavljena 2014. pokazala je da je prevalencija nedijagnosticirane hipotireoze i hipertireoze u Europi iznosila 4,94% i 1,72%, respektivno.

Mnogi medijski izvori i popularistički članci savjetuju suplementaciju, dok su adekvatna naučna istraživanja, pogotovo sa rezultatima koji podržavaju suplementaciju, ograničena.

Hipotireoza se ne može izliječiti, a tretman pacijenata sa smanjenom funkcijom štitne žlijezde se zasniva na zamjeni hormona, koje štitna žlijezda ne producira u adekvatnoj količini. Tretman hipertireodizma ovisi o više faktora, a primarni tretman se zasniva na ordiniranju antitiroidnih lijekova, tretmanu radioaktivnim jodom, ili pak hirurškom zahvatu. Suplementacija pacijenata treba da je zasnovana na najboljim dostupnim naučnim dokazima, kao i kliničkoj procijeni statusa pojedinog pacijenta.

Cilj ovog rada je ispitivanje i analiziranje rezultata naučnih studija u kojima je ispitivana efikasnost suplementacije vitaminima i mineralima u bolestima štitne žlijezde.

Pretraživanje literature provedeno je u PUBMED, COHRANE LIBRARY, JCEM bazama podataka u potrazi za studijama objavljenima od 2000. do 2018. godine, koristeći ključne riječi štitnjača, hipotireoza i hipertireoza, suplementacija, vitamini, minerali. Rezultati pregleda će biti prikazani u samom radu.

Ključne riječi: štitna žlijezda, štitnjača, hipertireoza, hipotireoza, suplementacija

4-O-5

Supplementation of patients with thyroid gland disorders

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Abstract

The thyroid gland is an endocrine organ a butterfly-shaped, located in the lower third of the neck. The main function of the thyroid gland is the formation of thyroxine and triiodothyronine hormones, which are secreted into the blood and then distributed in various tissues.

Hypothyroidism is a diminished function of the thyroid gland, when the thyroid gland does not produce enough hormones to help the body function normally. Conversely, hyperthyroidism refers to overproduction of the thyroid.

The thyroid gland dysfunction is one of the leading endocrine disorders, representing about 30% to 40% of endocrine patients. According to a meta-analysis published in 2014, it showed that prevalences of undiagnosed hypothyroidism and hyperthyroidism in Europe were 4.94% and 1.72%, respectively. Many media sources and popular articles advise the supplementation in thyroid disorders, while adequate scientific research, especially with the results supporting the supplementation, is limited.

Hypothyroidism cannot be cured and treatment of patients with reduced function of the thyroid gland is based on the replacement of hormones, which the thyroid gland does not produce in an adequate amount. Treatment of hyperthyroidism depends on several factors; the primary treatment is based on the administration of antithyroid drugs or the treatment with radioactive iodine, or surgical intervention. Patient supplementation should be based on the best available scientific evidence as well as the clinical assessment of the individual patient's status.

The aim of this paper is to examine and analyze the results of scientific studies investigating the efficacy of vitamin and mineral supplementation in thyroid gland disorders. Literature review was conducted on PUBMED, COCHRANE LIBRARY, JCEM databases in search of studies published from 2000 to 2018 using the following key words: hypothyroidism and hyperthyroidism, supplements, vitamins and minerals. The review results will be presented in the work itself.

Keywords: thyroid gland, thyroid disorder, hyperthyroidism, hypothyroidism, supplementation

Vitamin C – čuvar vida, regenerator kože, spasilac kod alergija

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Sažetak

Ovaj rad je napisan korištenjem bibliografskih podataka, u cilju upoznavanja i proširivanja spoznaja o koristima vitamina C, s osvrtom na njegov doprinos čulu vida, koži, te sprečavanju alergija, odnosno poboljšanju simptoma kod istih.

Iz samog naziva vitamina C, koji je poznat i kao askorbinska kiselina, da se zaključiti njegova važna uloga u prevenciji i liječenju skorbuta. Pored sprečavanja spomenutog oboljenja, vitamin C pokazuje mnogobrojne pozitivne efekte na različite funkcije organizma.

Vitamin C igra ključnu ulogu u sintezi kolagena. Služi kao kofaktor enzimima prolizil i lizil hidrosilaza, koji su odgovorni za stabilizaciju i povezivanje kolagenih molekula, te stimulira lipidnu peroksidazu, dovodeći do pojačane sinteze kolagena, kao i boljeg kvaliteta sintetiziranog kolagena. Na ovaj način vitamin C doprinosi i zdravlju oka, jer stimulira sintezu kolagena prisutnog u rožnjači. Postoji obrnuto proporcionalna povezanost između koncentracije vitamina C u organizmu i šanse za razvoj katarakte.

Suplementacija vitaminom C, čija koncentracija u plazmi i leukocitima naglo opada tokom infekcija i stresa, poboljšava funkciju ljudskog imunog sistema. Naime, on se nakuplja u fagocitima i pojačava hemotaksu, kao i fagocitozu, te stimulira proliferaciju limfocita, što konačno dovodi do pojačanog antimikrobnog efekta.

Postoje teorije da vitamin C pomaže u prevenciji nastanka karcinoma, kao i da produžava život pacijenata sa terminalnim stadijem karcinoma, koje su u nekoliko navrata i eksperimentalno potvrđene.

Ključne riječi: vitamin C, imunitet, zaštita, kolagen

Vitamin C – protector of eyesight, regenerator of the skin, cure for allergies

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Abstract

This paper is written using bibliographic data, with the goal of expanding knowledge about vitamin C benefits, with the focus on its effect on eyes, skin, and allergy prevention.

The importance of vitamin C in prevention of scurvy can be realized from the very name of the vitamin, ascorbic acid. Other than treating scurvy, vitamin C shows many beneficial effects on different organism functions.

Vitamin C plays a key role in collagen synthesis. It serves as a cofactor for prolyl and lysyl hydroxylase enzymes, which are responsible for stabilization and binding of collagen molecules. Vitamin C also stimulates lipid peroxidase, increasing collagen synthesis, as well as the quality of the synthesized collagen. The collagen in cornea is also stimulated this way, meaning vitamin C is beneficial for eye health. People with lack of vitamin C have a higher risk of developing cataract later on in life.

Vitamin C supplementation enhances the human immune system function. It gathers in fagocytes and increases hemotaxis, phagocytosis, as well as stimulates lymphocyte proliferation, which, in the end, leads to enhanced antimicrobial effect.

There are theories, of vitamin C preventing the formation of cancer and increasing the life of patients with terminal stage cancer, that were confirmed in few cases.

Keywords: vitamin C, immunity, protection, collagen

Uticaj kofeina na psihotičke sindrome osoba sa šizofrenijom

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Sažetak

Šizofrenija je mentalni poremećaj koji oboljeloj osobi onemogućava da razlikuje stvarne od nerealnih događaja ili iskustava, da razumno razmišlja i kontroliše emocije. Mehanizam nastanka ovog poremećaja leži u hipofunkciji glutamatskih neurona čija je koncentracija u cerebrospinalnoj tečnosti pacijenata sa šizofrenijom bila smanjena, te ovo doprinosi tome da antagonisti glutamatskih receptora uzrokuju psihotičke sindrome. Ovaj mentalni poremećaj karakterišu deluzije, halucinacije, dezorijentisanost u govoru i ponašanju. Kofein kao stimulans centralnog nervnog sistema (CNS) mijenja dopaminergičku aktivnost na postsinaptičkim neuronima kroz svoja djelovanja na adenozin A2 receptorima što može pogoršati pozitivne simptome kao što su deluzije i halucinacije. Dokazano je da osobe sa šizofrenijom uzimaju visoke doze kofeina zbog toga što kofein kao stimulans CNS-a dovodi do povećanog uzbuđenja, povišenog raspoloženja, i blagotvornog efekta na širok spektar kognitivnih procesa, uključujući verbalnu, radnu memoriju te održava pažnju, što je smanjeno kod ovih pacijenata. Cilj ovo rada je prikazati uticaj kofeina na funkcionisanje mozga tokom kognitivnih zadataka kod pacijenata sa šizofrenijom i da li je u pitanju placebo efekat. Istraživanja su potvrdila da u poređenju sa placebom, kofein je prouzrokovao značajno povećanje maničnih simptoma, poremećaja mišljenja i povećane euforije kod pacijenata sa šizofrenijom.

Ključne riječi: šizofrenija, kofein, psihotički sindromi, neurotransmiteri, glutamatski receptori

Effects of intake of caffeine on psychotic syndromes in patients with Schizophrenia

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Abstract

Schizophrenia is a mental disorder that prevents a person from distinguishing real from unreal events or experiences, reasonable thinking and controlling emotions. The mechanism of the emergence of this disorder lies in the hypofunction of the glutamate neurons whose concentration in the cerebrospinal fluid has been reduced in patients with schizophrenia. That contributes to the fact that glutamate receptor antagonists can cause psychotic syndromes. This mental disorder is characterized by delusions, hallucinations, disorientation in speech and behavior. Caffeine as a central nervous system (CNS) stimulant changes the dopaminergic activity in postsynaptic neurons through its effects on adenosine A2 receptors, which may exacerbate positive symptoms such as delusions and hallucinations. It has been proven that people with schizophrenia are taking high doses of caffeine because caffeine as a CNS stimulant leads to increased excitement, increased positive mood and beneficial effect on a wide range of cognitive processes, including verbal, working memory and attention, which is reduced in these patients. The aim of this paper is to demonstrate the effect of caffeine on the brain function during cognitive tasks in patients with schizophrenia and whether it is a placebo effect. Studies have shown that, compared with placebo, caffeine causes a significant increase in manic symptoms, disorders of thinking, and increased euphoria in schizophrenic patients.

Keywords: schizophrenia, caffeine, psychotic syndromes, neurotransmitters, glutamate receptors

Osteoartritis i reumatoidni artritis- medicinska i nutricionarna terapija

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Sažetak

Osteoartritis je najčešća reumatska bolest, a pripada skupini degenerativnih oboljenja. Njena učestalost može se objasniti sve dužim životnim vijekom, ali i savremenim nezdravim načinom života te štetnim faktorima iz okoline. Reumatoidni artritis je hronično oboljenje u kojem dolazi do upale zglobova, njihovog oticanja, bolnosti, ukrućenosti i gubitka funkcije. Osteoartritis i reumatoidni artritis su bolesti koje u velikom procentu smanjuju kvalitete života oboljelih i ograničavaju ih u obavljanju svakodnevnih aktivnosti, a posebno težim fizičkim aktivnostima. Pored priznate medikamentozne terapije, primjena preporučenih nutricionarno-dijetetnih mjera može uveliko poboljšati, kako trenutno stanje zglobova tako i uticati na progresiju bolesti. Zato je pacijente neophodno educirati o preporučenoj ishrani koja će na prvom mjestu biti izbalansirana, i ishrani koja će sadržati sve potrebne sastojke. Cilj ovog rada jeste da se upozna sa samom tematikom ove dvije bolesti koje u posljednje vrijeme uzimaju dosta maha. Na prvom mjestu zadatak samog rada je da se upozna o načinu prevencije, te načinu liječenja (djelovanje medicinske i nutricionarne terapije) na osteoartritis i reumatoidni artritis. Oblik preglednog članka koji ima za svrhu dati uvid u već raspoložive informacije vezane za osteoartritis i reumatoidni artritis. Rezultati koji se očekuju ovim radom su edukativnog karaktera, koji će omogućiti prodor ove teme ka pacijentima, ali i medicinskom osoblju koji će moći u budućnosti drugim načinom prilaziti ka ovoj temi. Ishrana u osteoartritisu i reumatoidnom artritisu igra veliku ulogu, ali ona mora biti pravilno energetska izbalansirana.

Ključne riječi: osteoartritis, reumatoidni artritis, ishrana, dijeta

Osteoarthritis and rheumatoid arthritis- medical and nutrition therapy

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Abstract

Osteoarthritis is most common rheumatic disease, and belongs to the group of degenerative diseases. Her frequency can be explained all long life century, but also with modern unhealthy way of life and harmful environmental factors. Rheumatoid arthritis is chronic disease in which it comes to inflammation of the joints, their swelling, pain, agility and loss of function. Osteoarthritis and rheumatoid arthritis are diseases which in a large percentage reduce the quality of life of the ill and limit them to performing daily activities, and especially in more difficult activities. Besides the recognized medical therapy, the application of recommended nutritional dietary measures can greatly improve, currently condition of joints and also affect the progression of the disease. That is the reason why patients need to be educated about recommended nutrition which will be balanced in the first place, and a diet that will contain all the necessary ingredients. The aim of this paper is to get acquainted with the topic of these two diseases which have been taking a lot of space lately. In the first place the task of work is to learn about the method of prevention, the way of treatment (the effects of medical and nutritional therapy) on osteoarthritis and rheumatoid arthritis.

The form of a review article which has a purpose give insight already available information about osteoarthritis and rheumatoid arthritis. The results expected with this work are of educational character, which will enable the breakthrough of this topic both for patients and for medical staff who will be able to approach this topic in the future in a different way. Nutrition in osteoarthritis and rheumatoid arthritis plays a major role, but it must be properly balanced.

Keywords: osteoarthritis, rheumatoid arthritis, nutrition, diet

Uticaj mediteranske i kontinentalne ishrane na vrijednosti lipida (triglicerida i holesterola) kao predispozicije za razvoj kardiovaskularnih bolesti

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Sažetak

Za normalno funkcionisanje ljudskog organizma potrebni su lipidi, ali povećane koncentracije LDL ili lošeg holesterola i smanjene koncentracije HDL-a ili dobrog holesterola, proporcionalne su povećanju rizika za razvoj srčanih bolesti. Zbog njihove važnosti bitno je poznati faktore koje utiču na njihove koncentracije, jedan od tih faktora je i ishrana. Cilj ovog istraživanja je utvrditi tj. istražiti kako povezanost mediteranske i kontinentalne ishrane korespondira sa koncentracijama lipida i sa razvojem kardiovaskularnih oboljenja. Istraživanje je obuhvatilo podatke o referentnim vrijednostima holesterola i triglicerida za stanovništvo koje živi u mediteranskim i kontinentalnim zemljama, kao i statističke podatke o zastupljenosti kardiovaskularnih oboljenja u ovim zemljama. Na temelju podataka o referentnim vrijednostima lipida za Bosnu i Hercegovinu dobivenih na Univerzitetskom Kliničkom Centru u Sarajevu, na odjelu za kliničku biohemiju i rezultata pronađenih na googlescholaru za Španiju kao zemlju u kojoj je zastupljen mediteranski način ishrane zaključili smo da su koncentracije LDL kod stanovnika Španije nešto manje nego kod stanovništva Bosne i Hercegovine, dok su vrijednosti HDL veće za otprilike 1.39 mmol/L. Također prema podacima preuzetih sa stranice SZO-a zastupljenost kardiovaskularnih oboljenja kao vodećih uzroka smrti je za oko 3 puta manja u Španiji u poređenju sa BiH. Manje prisustvo ispitivanih faktora rizika, kao i kardiovaskularnih oboljenja u Španiji u odnosu na BiH je moguće povezano i sa različitom tipičnom prehranom u ovim zemljama.

Ključne riječi: lipidi, kardiovaskularne bolesti, ishrana

4-O-9

The influence of mediterranean and continental nutrition on the values of lipids (triglycerides and cholesterol) as risk factors for cardiovascular diseases

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Summary

For the normal functioning of the human body, lipids are needed, but increased concentrations of LDL or bad cholesterol and reduced levels of HDL or good cholesterol are proportional to the increase in the risk of developing heart disease. Because of their roles, it is important to know the factors that influence their concentration, one of these factors is nutrition. The aim of this research is to determine or to explore how the correlation between mediterranean or continental nutrition corresponds to lipid concentrations and the development of cardiovascular diseases. The study included data on cholesterol and triglyceride reference values for the population living in mediterranean and continental countries, as well as statistics on the prevalence of cardiovascular diseases in these countries. Based on the data on lipid reference values for Bosnia and Herzegovina obtained at the University Clinical Center in Sarajevo, the Department of Clinical Biochemistry and the results found on the google scholar for Spain as the country where the mediterranean diet is present, we concluded that LDL concentrations in the population of Spain are slightly lower than in the population of Bosnia and Herzegovina, while HDL values are higher by approximately 1.39 mmol/L. Also, according to data taken from the WHO site, the prevalence of cardiovascular diseases as the leading causes of death is about 3 times lower in Spain than in BiH. Based on the results of this search, it can be concluded that dietary variations affect lipid values, and hence the risk of cardiovascular disease.

Keywords: lipids, cardiovascular diseases, nutrition

Ishrana hemodijaliznih pacijenata

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Sažetak

Hemodijaliza je metoda odstranjivanja otpadnih tvari iz krvi, kao što su kalij i urea, ali i viška vode u slučaju zatajenja bubrega i jedna je od tri terapije za zamjenu funkcije bubrega. Bubrezi izlučuju otpadne materije iz organizma, održavaju potrebnu količinu vode, minerala i elektrolita u ljudskom organizmu i izlučuju višak kiselina iz organizma. Početak liječenja hemodijalizom predstavlja prekretnicu u načinu ishrane jer je od izuzetnog značaja smanjiti unos materija koje bubrež ne može da odstrani, a povećati unos materija koje se prekomjerno gube iz organizma. U ishrani je najvažnije obratiti pozornost na kontrolisan unos bjelančevina, natrija, kalija, kalcija, fosfora i vitamina. Planiranje ishrane hemodijaliznih bolesnika je često individualno pa je potrebno kreirati vodiče ishrane bazirane na osnovnim pravilima i smjernicama. Cilj je formirati ishranu za pacijente na hemodijalizi, te na taj način poboljšati zdravlje i kvalitet života. Bitno je napraviti adekvatnu ishranu za pacijente na hemodijalizi koja će istovremeno biti jednostavna, jasno definisana i praktična da bi se mogla upotrebljavati u svakodnevnom životu. Prema evropskim smjernicama preporučuje se uzimanje normalnih ili nešto slobodnijih količina bjelančevina (1-1,2 gram na kilogram tjelesne težine dnevno) i manji unos natrijuma. Kalijum se vrlo dobro odstranjuje dijalizom, pa je uz redovno liječenje rijetko potrebno provoditi strogu dijetu ili poseban način pripremanja hrane. Veliki problem jesu fosfati i kalcij. Duže ili češće povišenje fosfora u krvi dovodi do posljedičnih padova kalcijuma. Pošto je fosfate teško kontrolisati samom ishranom, pacijenti koriste lijekove tzv. vezače fosfata. Kao nadoknada za vitamine koji se gube dijalizom preporučuje se dnevna upotreba multivitaminskih tableta koje mogu sadržavati sve vitamine B-grupe, folnu kiselinu i željezo, kao i C i E-vitamin. Naučne studije pokazuju da adekvatan unos nutritivnih elemenata ima veliki uticaj na hemodijalizne pacijente.

Ključne riječi: hemodijaliza, ishrana, bjelančevine, elektroliti, vitamini

4-O-10

Diet of patients on Hemodialysis

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Abstract

Hemodialysis is a method of removing waste materials from the blood, such as potassium and urea, as well as excess water in the event of kidney failure and it's one of three replacement method for normal renal function. Kidneys secretion waste matter from the body, maintain the required amount of water, minerals and electrolytes in the human body and excrete excess body acids from the body. The beginning of hemodialysis treatment is a turning point in nutrition because it is of utmost importance to reduce the intake of substances that the kidney can not cure and increase the intake of substances that are excessively debilitating from the body. In the diet, it's most important to pay attention to the controlled intake of proteins, of sodium, potassium, calcium, phosphorus and vitamins. Planning of hemodialysis patients is often individual and it is necessary to create diet guides based on basic rules and guidelines. The goal is to provide nutrition for patients on hemodialysis, thus improving the health and quality of life. It is important to provide adequate nutrition for patients on hemodialysis, which will at the same time be simple, clearly defined and practical for use in everyday life. According to European guidelines, it is recommended to take normal or slightly more protein (1-1.2 grams per kilogram of body weight per day) and lower sodium intake. Potassium is very well removed by dialysis, so with regular treatment it is rarely necessary to carry out a strict diet or a special way of preparing food. The big problem are phosphate and calcium. The phosphor who stays long or more elevated in the blood ledas to calcium losses. Since phosphates are difficult to control by eating alone, patients use drugs called "phosphate binders". It is recommended to tako multivitamin tablets daily that may contain all vitamin B-groups, folic acid and iron, as well as vitamin C and vitamin E. Scientific studies have shown that adequate nutrition inputs have a major influence on hemodialysis patients.

Keywords: hemodialysis, nutrition, proteins, electrolytes, vitamins

5. SAVREMENA DIJAGNOSTIKA I ANALITIKA HRANE
CURRENT TRENDS IN FOOD ANALYSIS

Spektrofotometrijsko određivanje hroma u vodi za piće

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Sažetak

Analizom vode za piće utvrđuje se njen kvalitet i zdravstvena ispravnost. Osnovne pretrage uključuju između ostalog i određivanje prisustva toksičnih metala kao što su: kadmij, selen, arsen, olovo, cink, željezo i hrom. Hrom se prirodno nalazi u vodi za piće, jer ga u zemljinoj kori ima oko 10-200 ppm. Pri dužem konzumiranju vode za piće u kojoj se nalaze veće koncentracije hroma može doći do oštećenja nervnog tkiva, jetre i bubrega.

U eksperimentalnom dijelu ovoga rada određen je sadržaj hroma u 7 uzoraka vode za piće iz vodovodne mreže sa različitih lokaliteta. Analiza uzoraka je rađena spektrofotometrijskom metodom sa difenilkarbazidom u kiseloj sredini, uz prethodnu pripremu uzoraka, pri čemu su apsorbance mjerene na talasnoj dužini od 540 nm. Sadržaj hroma u uzorku očitao je sa prethodno pripremljene kalibracione krive. Koncentracije hroma dobivene u ovom ispitivanju su znatno niže u odnosu na one propisane Pravilnikom o zdravstvenoj ispravnosti vode za piće (Službeni glasnik BiH, 40/10).

Ključne riječi: voda za piće, hrom, spektrofotometrija, dozvoljeni limit hroma

5-O-1

Spectrophotometric determination of chromium in drinking water

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Abstract

Analysis of drinking water determines its quality and health safety. Basic research includes determination of the presence of toxic metals such as cadmium, selenium, arsenic, lead, zinc, iron and chromium. Chromium is naturally found in drinking water because soil contains chromium in concentration of 10-200 ppm. Drinking water with higher concentrations of chromium for long period can result in damage to the nerve tissue, liver and kidneys.

The content of chromium was determined in 7 samples of drinking water from the water supply network of different localities. Sample analysis was performed by spectrophotometric method with diphenylcarbazide in the acidic medium, with the prior preparation of the samples, whereby the absorbance was measured at a wavelength of 540 nm. The content of chromium in the sample is explained by pre-prepared calibration curves. Chromium concentrations obtained in this study are considerably lower than those prescribed by the Ordinance on Drinking Water Health (Official Gazette of Bosnia and Herzegovina, 40/10).

Keywords: *drinking water, chromium, spectrophotometry, allowed chromium limit*

Rezidue lijekova u namirnicama animalnog porijekla

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Sažetak

Rezidue lijekova predstavljaju ostatke lijekova ili njihovih metabolita u jestivim tkivima ili organima životinja za klanje, kao i proizvodima od njih. Javnozdravstveni nadzor rezidua u hrani važan je zbog bezbjednosti potrošača, jer izloženost pojedinim hemijskim supstancama u hrani može dovesti do neželjenih zdravstvenih posljedica. Proizvodi životinjskog porijekla namijenjeni prehrani ljudi koji sadrže, ili sadrže u količinama većim od dopuštenih, rezidue i druge onečišćivače škodljive za ljudsko zdravlje ne smiju se stavljati u promet za javnu potrošnju jer su zdravstveno neispravni. Ovlašteni veterinar svojim potpisom na potvrdi o zdravstvenom stanju životinje i njenih proizvoda garantuje zdravstvenu ispravnost istih. Legislativa Bosne i Hercegovine propisuje metode detektovanja i dozvoljene količine rezidua lijekova u namirnicama animalnog porijekla. Stručnom primjenom preparata i poštivanjem karence mogu se izbjeći nepoželjne posljedice, poput nastanka hroničnih oboljenja ljudi, alergijskih reakcija, promjene hormonalne razvnoteže organizma, toksično, kancerogeno, mutageno i teratogeno djelovanje, te pojave rezistentnih sojeva bakterija.

Ključne riječi: rezidue lijekova, sigurnost hrane, djelovanje na čovjeka

Drug residue in foods of animal origin

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Abstract

Drug residues represent remainings of drugs or their metabolites in edible tissues or organs of slaughter, as well as their products.

Public health monitoring of food residues is important for consumer safety, as exposure to certain chemical substances in food can lead to unwanted health consequences. Products of animal origin intended for the consumption of humans containing, or containing more than permitted, residues of medicine should not be placed on the market for public consumption because they are health improper. The authorized veterinarian, by signing the certificate of health of the animal and its products, guarantees the health of the animals.

The law of Bosnia and Herzegovina provides the methods of detection and the permitted amount of residues of medicaments in foods of animal origin. Professional use of the medication and compliance with the waiting period can avoid undesirable consequences such as chronic diseases, allergic reactions, hormonal imbalance, toxic, carcinogenic, mutagenic and teratogenic effects and the appearance of resistant bacterial strains.

Key words: drug residues, food safety, effect on man

Određivanje cijanovodonične kiseline u domaćim rakijama proizvedenim u BiH

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Sažetak

Domaća proizvodnja alkoholnih pića, najčešće rakije, nije najsigurniji vid proizvodnje s obzirom da izostaje adekvatna kontrola u samom procesu proizvodnje te stoga ovakvi proizvodi mogu da sadrže i nedozvoljene sastojke ili njihov sadržaj može prelaziti maksimalno dozvoljenje koncentracije. Neadekvatnom proizvodnjom mogu nastati i toksični produkti koji prouzrokuju neželjene efekte na konzumente. Cilj ovog rada bio je da se odredi sadržaj cijanovodonične kiseline u domaćim rakijama. Sadržaj cijanovodonične kiseline određen je volumetrijskom metodom zasnovanom na taloženju cijanida srebrno nitratom i titraciji viška srebrnog nitrata amonij rodanidom. Ukupno je u radu analizirano 8 uzoraka, od čega su 1 specijalna rakija (klekovača), te 7 voćnih rakija (šljiva, kajsija i višnja). Nađene vrijednosti cijanovodonične kiseline kretale su se od 0,0 do 8,1 g HCN /hl preračunato na 100 vol % alkohola. Najveći sadržaj nađen je u domaćoj voćnoj rakiji pripremljenoj od kajsije, što je i očekivano, obzirom da košpice kajsije sadrže cijanogene heterozide. U svim ispitivanim uzorcima sadržaj HCN bio je manji od MDK propisane Pravilnikom o jakim alkoholnim pićima i alkoholnim pićima (Sužbeni glasnik BiH broj 87/08).

Ključne riječi: cijanovodonična kiselina, domaća rakija, domaća proizvodnja

5-O-3

Determination of hydrocyanic acid content in homemade brandies produced in BiH

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Abstract

Homemade production of alcoholic beverages, especially brandy, sometimes can pose certain level of risk, since there is no stringent control system and these kinds of products can contain unwanted ingredients and contaminants, and often their levels can exceed maximum permissible concentration. Inadequate production can also result in toxic products that can cause harmful effects on consumers. The aim of this study was to determine the content of hydrocyanic acid in homemade brandies. The content of hydrocyanic acid was determined by volumetric method based on the deposition of cyanide with silver nitrate and the titration of excess silver nitrate with ammonium rhodanide. In total, 8 samples were analyzed, 1 special kind of brandy (juniper) and 7 fruit brandies (plum, apricot and cherry). The content of hydrocyanic acids in analyzed samples ranged from 0.0 to 8.1 g of HCN / hl calculated on 100 vol. % of ethanol. The highest amount was found in homemade fruit brandy made from apricot, which is not unusual, because the pits of apricot contain cyanogens. The content of HCN in all tested samples was less than the maximum permissible concentration set by the Ordinance on Strong Alcoholic Beverages and Alcoholic Beverages (Official Gazette of BiH No. 87/08).

Keywords: cyanide, homemade brandy, homemade production

Spektrofotometrijsko određivanje metanola u domaćim rakijama proizvedenim u BiH

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Sažetak

Alkoholna pića su postala dio svakodnevnice. Veliki dio populacije ih koristi u zabavne svrhe i uživa u nekim stanjima do kojih alkohol dovodi. No, alkohol ima svoje loše strane pogotovo ako se konzumira neumjereno i ako sadrži sastojke koji mogu predstavljati rizik po zdravlje konzumenta.

Metanol nastaje u malim koncentracijama tokom procesa alkoholne fermentacije. Ovo može predstavljati problem kod pripreme alkoholnih pića u kućnoj radinosti gdje se često ne obavlja adekvatna frakciona destilacija u cilju smanjenja količine metanola, što nije slučaj sa komercijalnim proizvođačima. Iz tog razloga, u domaćim alkoholnim pićima metanol može biti prisutan u većoj koncentraciji.

Cilj ovog rada bio je odrediti sadržaj metanola u uzorcima domaćih jakih alkoholnih pića. U radu je ispitano 15 uzoraka domaćih jakih alkoholnih pića i to: 2 rakije od grožđa (lozovača), 1 specijalna rakija (klekovača), te 12 voćnih rakija (šljiva, kajsija, višnja, kruška, dunja, jabuka). Sadržaj metanola u ispitivanim uzorcima određen je spektrofotometrijski.

Nađeni sadržaj kretao se u rasponu od 67,48-1162,24 g/hl i prema Pravilniku o jakim alkoholnim pićima i alkoholnim pićima (Službeni glasnik BiH broj 87/08) u svim ispitivanim uzorcima, osim jednog bio je manji od maksimalne dozvoljene koncentracije.

Ključne riječi: alkohol, metanol, zdravstveni rizik

Spectrophotometric determination of methanol in homemade brandy in BiH

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Abstract

Alcoholic beverages have become a part of everyday life. A larger portion of the population consumes alcoholic beverages for fun and enjoys the buzz feeling alcohol provides. However, there is a downside to alcohol, especially if consumed irrationally or if it has substances which are harmful for the consumer. Small amount of methanol is produced during the process of fermentation. Unlike commercial factories, homemade producers lack the technique of separating methanol from ethanol. This leads to homemade drinks having more methanol. The aim of this research was to determine methanol levels in various samples of home-distilled spirits. The research included 15 different samples of spirits: Two grape brandies, one juniper brandy “Klekovaca” and twelve fruit brandies (plum, apricot, cherry, pear, quince, apple). Methanol concentration was determined by spectrophotometric analysis and it ranged from 67.48-1162.24 g/hl. According to the Ruling on Strong Alcoholic Beverages and Alcoholic Beverages (Official Gazette of BiH No. 87/08), in all the analyzed samples, except one, methanol content was below the maximum allowed concentration.

Keywords: alcohol, methanol, health risk

Educiranost potrošača o β -glukanima kao funkcionalnim sastojcima u prehrani

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Sažetak

β -glukani predstavljaju neskrobne polisaharide. Značajan izvor β -glukana su ječam i zob, dok u brašnima sadržaj varira i zavisi od načina ugoja i sorte. Osim u žitaricama, nalaze se i u nekim vrstama algi, bakterija, kvasaca i gljiva poput *reishi*, *shiitake* i *maitake*. Međutim, zahvaljujući brojnim naučnim istraživanjima kojima je dokazan njihov pozitivan učinak na zdravlje, β -glukanima se u sve većoj mjeri obogaćuje i ostala hrana koja ih prirodno ne sadrži. Tako se danas sve više koriste i kao funkcionalni sastojci svakodnevne prehrane, prvenstveno zbog svog imunomodulatornog, antikancerogenog i antiinfektivnog djelovanja. S toga je i cilj ovog rada bio prikazati značaj β -glukana kao funkcionalnih sastojaka u svakodnevnoj prehrani te analizirati nivo educiranosti potrošača u BiH o njima. Provedena je anketa na 200 ispitanika u Sarajevu koja je pored opštih pitanja: spol, starosna dob, te nivo obrazovanja obuhvatila još i specifična koja su se odnosila na definisanje termina funkcionalna hrana, te izvor i značaj β -glukana u ishrani.

Obradom rezultata ankete utvrđeno je da je nešto manje od polovine ispitanika upoznato sa terminom funkcionalna hrana, dok polovina ispitanika poznaje termin β -glukani, Međutim, neznatan je broj ispitanika kojima je poznat njihov učinak na zdravlje.

Ključne riječi: funkcionalna hrana, β -glukani, educiranost potrošača

Consumer awareness of β -glucans as functional ingredients in the diet

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Abstract

β -glucans represent unsaturated polysaccharides. The significant source of β -glucans are barley and oats, whereas in flour the amount of β -glucans may vary depending on the type of cultivation and variety. Apart from cereals, they are found in some types of algae, bacteria, yeasts and fungi such as reishi, shiitake and maitake. However, thanks to numerous scientific researches that have proven their positive effect on health in general, other foods that naturally do not contain β -glucans are increasingly enriched with them. They are increasingly used in the form of dietary supplements, primarily because of their immunomodulatory, anticancerogenic and anti-infective effects. That is the reason why the aim of this paper was to describe the importance of β -glucans as components of functional foods in daily diet and to analyze the level of broad awareness of population in Bosnia and Herzegovina about them. We have surveyed 200 people in Sarajevo. The survey included general questions such as: gender, age and education and specific ones as well; definition of "functional foods" term and the importance of β -glucans in diet. The survey has showed that less than a half of respondents were familiar with "functional foods" term, whereas half of them were familiar with " β -glucans" term. However, only a few were aware of the effect of β -glucans on health.

Keywords: functional food, β -glucans, consumers awareness

Teoretski pristup osobinama vode i njihov značaj

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Sažetak

Voda je materija koja na prvi pogled ima jako jednostavnu građu, a u suštini je to jedna od najistraživanijih i najmističnijih materija. To je složeni sistem čiju osnovu čini hemijsko jedinjenje koje ima jedinstvenu formulu H_2O i tako voda spada u grupu najprostijih hemijskih jedinjenja. Osim toga, voda nosi sa sobom niz aniona i kationa koji su potrebni ili nisu potrebni organizmu, kao i neke vrste mikroorganizama, što sve zavisi od stepena čistoće vode. Voda se ističe svojom strukturom, koja se razlikuje u kojem se agregatnom stanju voda nalazi, te nizom osobina kao što su: gustina, pothlađenost, polimorfizam, permitivnost, provodljivost, redoks-potencijal, dipolni karakter, specifična toplota vode, latentna toplota isparavanja, Mpemba efekat i drugo. Svaka od ovih osobina / anomalija vode utječe bitno na procese u organizmu, te također na tehnološke i druge procese. Sve hemijske reakcije u organizmu se odvijaju u vodenoj sredini prema zakonima razblaženih rastvora, što govori da je nemoguće zamisliti nijedan metabolizam bez vode koja čini vodeći postotak organizma. Tako voda čini ne samo najveći dio planete, već i najveći dio čovjeka i to u vrlo sličnom procentu, oko 70%. Zbog toga je cilj ovog rada bio istražiti najbitnije osobine vode i njihov značaj kako bi se ljudskom rodu približio značaj ove materije i probudio interes za daljnja istraživanja ili barem poboljšao naš odnos prema jednom od najbitnijih elemenata života.

Ključne riječi: voda, struktura, osobine, značaj

Theoretical approach to water properties and their character

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Abstract

Water is a substance which at first sight has a very simple structure, but essentially it is one of the most researched and the most mystical matter. It is a complex system, the basis of which is a chemical compound that has a unique formula H_2O and this the water belongs to the group of the simplest chemical compounds. In addition, water carries with it a series of anions and cations that are needed or not needed by the organism, as well as some types of microorganisms, which all depend on the degree of water purity. Water is distinguished by its structure, which is different in which the physical condition of the water is, and a series of properties such as bulk density, hypothermia, polymorphism, permittivity, conductivity, redox potential, dipole character, the specific heat of water, the latent heat of vaporization, Mpemba effect and the other. Each of these characteristics / anomalies of water influence the processes of the organism, as well as technological and other processes. All chemical reactions in the body take place in an aqueous medium under the rules of dilute solutions, which indicate that it is impossible to imagine any metabolism without water to keep the leading percentage body. So water makes not only the largest part of the planet, but also the largest part of man, in a very similar percentage, about 70%. Therefore, the aim of this study was to investigate the most important properties of water and its importance to the human race closer to the significance of this matter and awakened interest in further research or at least improve our relationship with one of the most essential elements of life.

Keywords: water, structure, properties, importance

Spektrofotometrijsko određivanje nitrata u lisnatom zelenom povrću

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Sažetak

Nitrati su rasprostranjeni i učestali spojevi koje pronalazimo u tlu, vodi i hrani. Postoji indicija da povećan unos nitrata/nitrita i nastanaka nitrozamina može imati za posljedicu razvoj karcinoma. Aproximativno, 80-90% nitrata koji dospiju u ljudski organizam su porijeklom iz voća i povrća.

Cilj ovog rada je analiza potencijalne izloženosti nitratima prisutnim u zelenom lisnatom povrću.

U eksperimentalnom dijelu ovoga rada je analizirano 5 uzoraka lisnatog zelenog povrća koji su uključivali i komercijalne i uzorke organskog porijekla sa različitih lokaliteta u BiH ("Iceberg" kristal salata, svježa zelena salata (*Lactuca sativa L.*), svježi špinat (*Spinacia oleracea L.*), svježa blitva (*Beta vulgaris var. cicla*), zaleđena blitva (*Beta vulgaris var. cicla*)). Sadržaj nitrata određen je nakon prethodne redukcije u nitrite primjenom spektrofotometrijske metode, uz mjerenje apsorbance na 465 nm. Rezultati ispitivanja pokazuju da ispitivani uzorci odgovaraju zahtjevima Pravilnika o maksimalno dozvoljenim količinama za određene kontaminante u hrani (Sl. glasnik BIH 68/14) za sadržaj nitrata koji je u svim uzorcima bio ispod MDK, pa se može zaključiti da se radi o zdravstveno ispravnim proizvodima. Međutim nađeni sadržaj je u pojedinim uzorcima bio značajno veći u poređenju sa rezultatima drugih sličnih studija.

Ključne riječi: nitrati, kontaminanti, zeleno lisnato povrće

Spectrophotometric determination of nitrate content in green leafy vegetables

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Abstract

Nitrates are widespread and frequent compounds that are found in the soil, water and food. There is an indication that increased intake of nitrates/nitrites and formation of nitrosamine may result in cancer development. Approximately, 80%-90% nitrates that enter the human organism originate from fruits and vegetables.

The purpose of this study is to analyze the potential exposure to nitrates present in green leafy vegetables.

In the experimental part of this paper, we analyzed five samples of different green leafy vegetables, which included both commercial and organic samples from different locations in BiH ('Iceberg' Crystal salad, fresh green salad (*Lactuca sativa L.*), fresh organic spinach (*Spinacea oleracea L.*), fresh chard (*Beta vulgaris var. cicla*) and frozen chard (*Beta vulgaris var. Cicla*). The nitrates were detected and determined with a spectrophotometric method, upon previous reduction to nitrites, where the absorbance was measured at the wavelength of 465 nm. Results of our study show that examined samples are in line with requirements of Rolebook on maximum permitted levels for some contaminants in food (Official GazetteBiH 68/14) for nitrate content, which in all samples was below MPC, and we can therefore conclude that our samples are safe for consumption. However, content of nitrates in some of our samples was bit higher in comparison to other similar studies.

Keywords: nitrates, contaminants, green leafy vegetables

Ispitivanje uticaja ulja čurekota na rast gram negativnih bakterija

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Sažetak

Od davnina se u narodnoj medicini koristi čurekot ulje (*Nigella sativa*) zbog antibakterijskog, antivirusnog i antimikotičnog djelovanja. Čurekot u svojoj čahuri, koja izgledom podsjeća na čahuru maka, sadrži tamne sjemenke, koje se nakon žetve suše. Iz ovog sjemena se hladnim cijedenjem dobiva ulje, koje je bogato nezasićenim masnim kiselinama. Te kiseline su esencijalne (od životne važnosti), pa ih je uz hranu potrebno unositi u organizam. Cilj ovog rada jeste utvrditi da li ulje čurekota utiče na rast gram negativnih bakterija primjenom disk difuzione metode. Za izvođenje testa korištene su prethodno pripremljene hranjive podloge: Endo agar (EA), *Salmonella Shigella* (SS), Baird-Parkeragar (BPA) i *Pseudomonas* agar (PS). Nakon pripreme podloga, njihove sterilizacije i hlađenja na 45°C iste su razlivene u sterilne Petri posude u volumenu od po 15 ml. Na ohlađene i očvrsnute hranjive podloge, metodom iscrpljenja na njih su zasijane sljedeće kulture: EA - *Escherichia coli*, SS – *Salmonella*, BPA – *Enterococcus* i PS – *Pseudomonas*. U radu je analizirano čisto, nerazblaženo ulje čurekota. Rezultati su pokazali inhibitorno djelovanje na vrstu *Salmonella* sa prosječnom vrijednošću prečnika zone inhibicije od 12,45 mm.

Ključne riječi: ulje čurekota, gram negativne bakterije, disk difuziona metoda

5-O-8

Investigation of the influence of nigella sativa oil on the growth of gram negative bacteria

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Abstract

Since ancient times traditional medicine uses natural nigella sativa oil, because of its antibacterial, antiviral and antimycotic activity. Nigella sativa in its shell, which looks like a poppy coat, have dark seeds, that are dried after harvest. From this seed, a cold pressed oil is made. This oil is rich in unsaturated fatty acids. These acids are essential (of vital importance), meaning that they cannot be synthesized in the body and must be obtained from food. The main aim of this work was to determine whether Nigella sativa oil can affect the growth of gram negative bacteria by using the disc diffusion method. In order to preform testing we have used the following nutrient agars which were prepared previously: Endo agar (EA), Salmonella Shigella (SS), Baird-Parkeragar (BPA) i Pseudomonas agar (PS). After preparation of the substrate, their sterilization and cooling to 45 ° C, they were poured into sterile Petri boxes in a volume of 15 ml. On chilled and hardened nutrients, the following cultures are swayed by the method of exhaustion: EA - *Escherichia coli*, SS – *Salmonella*, BPA – *Enterococcus*, i PS – *Pseudomonas*. For the test, we used a pure Nigella sativa oil that was not diluted. The results have shown that this oil is quite effective and has the inhibitory effect, with average value of the inhibition zone for Salmonella of 12.45 mm.

Keywords: nigella sativa oil, gram negative bacteria, disc diffusion method

Ispitivanje senzornih osobina biskvita od pseudožitarica

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Sažetak

Pseudožitarice su jedne od nežitnih vrsta koje se koriste na isti način kao i žitarice. Njihovo sjeme se može preraditi u brašno i koristiti kao i kod žitarica. Cilj rada bio je ispitati senzorne karakteristike biskvita od brašna pseudožitarica (amarant, heljda, kinoa), u odnosu na biskvite od pšeničnog brašna, kako bi se ocijenila njihova prihvatljivost. Proizvodnja biskvita rađena je u laboratorijskim uslovima, nakon čega se pristupilo senzornoj ocjeni od strane 11 priučenih laika. Senzornom analizom ispitivanih uzoraka, ustanovljeno je da se u pogledu teksture, biskviti od amaranta statistički razlikuju od svih ostalih, dok se heljdini biskviti razlikuju po pitanju boje. Biskviti od amaranta se značajno razlikuju od ostalih ispitivanih uzoraka u pogledu tvrdoće, hrskavosti, topivosti i mrvljivosti, na što ukazuju niže ocjene, dok su biskviti od pšenice, heljde i kinoe približno jednaki. Biskviti od amaranta su znatno više nosioci gorčine, u odnosu na ostale ispitivane uzorke. U pogledu slatkoće i arome pečenog, biskviti od pšenice i heljde se razlikuju od onih od kinoe i amaranta. Po pitanju tipičnosti, samo su biskviti od pšenice imali svojstvene karakteristike, dok su biskviti od pseudožitarica odstupali. Naknadni i ukupni dojam biskvita od pšenice i heljde su značajno bolje ocijenjeni od biskvita kinoe i amaranta. Najbolje ocijenjeni uzorak biskvita od pseudožitarica bio je od heljdinog brašna.

Ključne riječi: biskviti, heljda, kinoa, amarant, senorna ocjena

5-O-9

Determination of sensory characteristics of biscuits made of pseudo cereals

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Abstract

Pseudo cereals are non-grasses that are used in much the same way as cereals (true cereals are grasses). Their seed can be ground into flour and otherwise used as cereals. The aim of this study was to examine the sensory characteristics of biscuits made from this grains flour (buckwheat, quinoa, amaranth), in relation to biscuits from wheat flour, in order to assess their acceptability. The production of biscuits was made in laboratory conditions, after which the sensory evaluation of the biscuit samples was conducted by panel consisted of 11 trained members. Sensory analysis showed that in terms of texture, amaranth biscuits were statistically different from the others, while buckwheat biscuits differed in color. Amaranth biscuits were significantly different from the other tested samples in terms of hardness, crispness, melting and fragility, as indicated by lower grades, while no significant differences were found between wheat, buckwheat and quinoa biscuit samples according to those sensory properties. Amaranth biscuits were significantly bitterer compared to other examined samples. In terms of sweetness and roasted aroma, wheat and buckwheat biscuits significantly differed from quinoa and amaranth samples. In terms of overall acceptability only wheat biscuit samples had typical characteristic, while samples produced from buckwheat, quinoa and amaranth flour significantly deviated. According to after taste and overall impression wheat and buckwheat biscuit samples were more favorable than the other samples. The buckwheat flour biscuit were the best-rated then other pseudo cereals samples.

Keywords: biscuits, buckwheat, quinoa, amaranth, sensory evaluation

Znanje, stav i praksa studenata Fakulteta zdravstvenih studija o prehranbenim aditivima

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Sažetak

Prehranbeni aditivi su tvari koje se dodaju namirnicama tokom proizvodnje, transporta, oblikovanja, prerade i čuvanja hrane. Aditivi moraju biti označeni nazivom kategorije kojoj pripadaju nakon čega slijedi njihov specifični naziv ili E broj.

Istraživanja su pokazala da se među potrošačima javljaju sumnje o upotrebi pojedinih proizvoda koji sadrže aditive, a na osnovu kojih kreiraju stavove koji nisu u potpunosti opravdani.

Cilj rada bio je ispitati znanje, stav i praksu studenata Fakulteta zdravstvenih studija o prehranbenim aditivima.

U istraživanju je uključeno 100 studenata Fakulteta zdravstvenih studija u Sarajevu sa tri različita studijska programa. Istraživanje je provedeno u mjesecu maju 2018. godine. Kao instrument istraživanja korišten je modifikovani anonimni anketni upitnik. Studija je provedena kao deskriptivna studija.

Svi ispitanici upoznati su sa pojmom aditiva u hrani. Iako 2/3 ispitanika smatra da je važno navesti informacije o aditivima na deklaraciji proizvoda, samo 40 % ispitanika čita ove informacije. 62 % ispitanika stava je da proizvodnja namirnica nije moguća bez upotrebe prehranbenih aditiva u tehnologiji proizvoda, al ipak više od polovine ispitanika smatra da aditivi mogu imati negativan uticaj na zdravlje konzumenta. 77 % ispitanika smatra da je moguća zloupotreba aditiva u prehranbenoj industriji.

Znanje, stav i praksa studenata u vezi prehranbenih aditiva nije zadovoljavajuća. Postoji statistički značajna razlika među studentima koji su okviru studija detaljnije izučavali oblast prehranbenih aditiva u odnosu na studente druga dva studija, što ukazuje na potrebu provođenja dodatnih edukacija iz ove oblasti.

Ključne riječi: prehranbeni aditivi, studentska populacija, deklarisanje

Knowledge, attitude, and practice from students of Faculty of Health Studies

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Abstract

Food additives are added to food mainly for food production, transportation, shaping, processing and keeping food for longer periods of time. Additives must be labeled with the name of the category to which they belong, followed by their specific name or E number.

Research has shown that there are doubts among consumers about the use of certain products containing additives, and on the basis of which they create attitudes that are not fully justified.

Objective of this research was to examine the knowledge, attitude, and practice of students of the Faculty of Health Studies on Food Additives.

The research involved 100 students of the Faculty of Health Studies in Sarajevo with three different study programs. The survey was conducted in May 2018. A modified anonymous questionnaire was used as a research tool. The study was conducted as a descriptive study.

All respondents are familiar with the concept of food additives. Although 2/3 of the respondents consider it important to provide information on additives on the product declaration, only 40% of the respondents read this information. The 62% of respondents said that food production is not possible without the use of food additives in technology products, but more than half of the respondents believe that additives can have a negative impact on the health of the consumer. The 77% of respondents believe that abuse of additives in the food industry is possible.

Knowledge, attitude and practice of students regarding nutritional additives is not satisfactory. There is a statistically significant difference among the students who studied field of nutritional additives in more details than the students of the other two course of studies, which points to the need to implement additional education in this field.

Keywords: *food additives, student population, declaration*

Spektrofotometrijsko određivanje željeza u domaćim rakijama proizvedenim u BiH

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Sažetak

Domaća alkoholna pića-rakije, spadaju u kategoriju jakih alkoholnih pića. Jaka alkoholna pića imaju posebna senzorna svojstva, namijenjena su za ljudsku upotrebu, a sadrže najmanje 15 vol.% alkohola. Proizvode se postupkom destilacije (pečenjem) prevrelih komina. Zbog slabijeg sistema kontrole tehnološkog postupka proizvodnje domaće rakije, može se dogoditi da konačni proizvod sadrži određene kontaminante čiji sadržaj može prelaziti maksimalno dozvoljene koncentracije propisane legislativom. Cilj ovog rada je bio da se odredi sadržaj željeza u domaćim rakijama proizvedenim u BiH. Sadržaj željeza je određen spektrofotometrijskom metodom. U tu svrhu je ukupno analizirano 15 uzoraka od čega su dva bila rakije od grožđa (lozovača), jedna specijalna rakija (klekovača), te 12 voćnih rakija (šljiva, višnja, kajsija, kruška, dunja, jabuka). Nađene vrijednosti željeza su se kretale od 0,01 do 1,75 mg/kg. Najveći sadržaj željeza je nađen u domaćoj rakiji napravljenoj od višnje, što je i očekivano, jer plod višnje sadrži velike količine željeza. U svim ispitivanim uzorcima sadržaj željeza bio je ispod maksimalno dozvoljene koncentracije (10 mg/kg) definisane Pravilnikom o maksimalno dozvoljenim količinama za određene kontaminante u hrani (Sužbeni glasnik BiH broj68/14).

Ključne riječi: željezo, domaća rakija, domaća proizvodnja

Spectrophotometric determination of iron content in homemade brandies from BiH

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Abstract

Homemade alcoholic beverages called "rakija" are categorized as strong alcoholic beverages. These kind of distilled alcoholic beverages are intended for human consumptions, they have special sensory properties and at least 15 vol.% of ethanol. They are produced by distillation (burning) of fermented fruit mash. Because of the poor control of production process of homemade brandies, sometimes is possible to find contaminants in these beverages, such as iron, with the content that can exceed the maximum allowed concentrations. The main aim of this study was to determine the content of iron in homemade brandies produced in BiH, using spectrophotometric method. For this purpose, a total of 15 samples were analyzed, two of which were grape brandy ("lozovača"), one special kind of brandy (made of juniper) and 12 fruit brandy (plum, apricot, cherry, pear, quince, apple). The content of iron in analyzed samples ranged from 0.01 to 1.75 mg/kg. The highest content of iron was found in brandy made of cherry, which is not unusual, because the stone fruit of cherry contains large amount of iron. In all analyzed samples iron content was bit lower than maximum contaminants level (10 mg/kg), defined by the Ordinance on maximum permitted quantities for certain contaminants in food (Official Gazette of BiH No.68/14).

Keywords: iron, homemade brandy, domestic production

Energetska vrijednost i koncentracija hlorida u soku od jabuke i koncentrisanom soku od jabuke: Bosanskohercegovačko tržište

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Sažetak

Konzumacija voćnih sokova je postala popularan trend u ishrani modernog čovjeka koji vjeruje u izuzetna hranjiva, funkcionalna i terapijska svojstva ovih pića. Sokovi su prepoznati kao dobar izvor za organizam korisnih komponenti, odnosno, igraju vitalnu ulogu u održavanju dobrog zdravlja. Zbog sve veće potrošnje ovih pića, znanje o njihovim mineralnim svojstvima, koje se odnosi na bitne makro- i mikroelemente, kao i anorganske jone od najveće je važnosti. Obzirom na poznatu važnost hloridnih jona, cilj ovog istraživanja bio je odrediti koncentraciju hloridnih jona u nekoliko komercijalnih sokova od jabuke. Hloridi se smatraju glavnim elektrolitima, oni predstavljaju ekstracelularne anione i imaju više bitnih funkcija u tijelu. Potrebni su za regulaciju tečnosti i ravnotežu elektrolita. Pomažu u održavanju normalnog krvnog pritiska, a osim toga, pomažu u provođenju električnih impulsa kada su spareni sa kalijem ili natrijem. Metoda određivanja hlorida temelji se na spektrofotometrijskoj analizi jona u sokovima od jabuke. Od četiri ispitana uzorka, najveća koncentracija hloridnih jona je izmjerena u uzorku 2 (4,254 g/l), dok je najniža koncentracija zabilježena u uzorku 3 (1,205 g/l). Najveću energetska vrijednost među ispitivanim uzorcima imao je uzorak broj 1 (54,53 kcal/100 ml). Najmanja energetska vrijednost u ispitivanim uzorcima iznosi 38 kcal/100 ml i zabilježena je kod uzorka broj 2. Zbog visoke kalorijske vrijednosti, kao i visokog sadržaja ugljikohidrata u analiziranim sokovima, sokove ne bi trebali konzumirati dijabetičari, kao ni osobe sa dijetalnim režimom ishrane.

Ključne riječi: energetska vrijednost, hloridi, sok od jabuke

5-P-1

Energetic value and chloride concentration in apple juice and apple concentrate juice: Bosnia and Herzegovina market

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Abstract

Consumption of fruit juices has become a popular trend in the diet of a modern man, who believes in the exceptional nutritional, functional and therapeutic properties of these drinks. Due to the increasing consumption of these drinks, knowledge of their mineral properties, relevant to macro- and microelements, as well as inorganic ions is of utmost importance. Given the known importance of chloride ions, the aim of this study was to determine the concentration of chloride ions in several commercial apple juices. Chlorides are extracellular anions, they are one of the most important electrolytes in the blood. They help maintain the balance of fluids inside and outside of our cells, proper blood volume, blood pressure and pH of body fluids, and they help in conducting electrical impulses when coupled with potassium or sodium. The chloride determination method is based on the spectrophotometric analysis of ions in apple juices. Of the four samples tested, the highest concentration of chloride ions was measured in sample 2 (4,254 g / l), while the lowest concentration had sample 3 (1,205 g / l). The highest energy value among the tested samples had sample 1 (54.53 kcal / 100 ml). The lowest energy value in the tested samples was recorded in sample 2 (38 kcal / 100 ml). Due to the high caloric value of analyzed juices, as well as high concentration of carbohydrates, diabetics should not consume them as well as people on energy restricted diet.

Keywords: energy value, chlorides, apple juice

GENERALNI MEDIJSKI POKROVITELJ

Sarajevo 98,7 fm - Zenica 89,8 fm - Tuzla 106,3 fm



Banja Luka 104,2 fm - Mostar 101,7 fm

MEDIJSKA PODRŠKA



SPONZORI



