



I Studentski Kongres

„HRANA-ISHRANA-ZDRAVLJE“

sa međunarodnim učešćem

KNJIGA SAŽETAKA

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with international participation**

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Kongres „HRANA-ISHRANA-ZDRAVLJE“ je prvi interdisciplinarni studentski kongres koji organizuju studentske asocijacije više fakulteta Univerziteta u Sarajevu, s ciljem promovisanja univerzalnih vrijednosti zajedništva i multidisciplinarnog pristupa u proizvodnji hrane, njenom higijenskom statusu i kvalitetu, različitim načinima ishrane, kao i mogućim implikacijama na zdravlje čovjeka, što je od izuzetne važnosti u rješavanju značajnijih pitanja u ovoj životnoj oblasti. Ovakav pristup u sagledavanju ovog kompleksnog pitanja, kroz multidisciplinarnost, predstavlja i savremeni trend „evropske nacije“, u iznalaženju najracionalnijih odgovora na mnoga pitanja gotovo u svim sferama društvenog života i djelovanja. U tom cilju za 1. Kongres „HRANA-ISHRANA-ZDRAVLJE“ Organizacioni odbor je odabrao sedam tematskih cjelina: 1. Primarna proizvodnja i prerada hrane; 2. Aditivi u prehrambenoj industriji; 3. Toksikologija i sigurnost hrane; 4. Savremena dijagnostika i analitika hrane; 5. Ishrana tokom životnog ciklusa; 6. Dijetoterapija; i 7. Organska i tradicionalna hrana.

Kratki sadržaji radova štampani u Zborniku prošli su recenziju Naučnog odbora. Ocjena i naučna verifikacija iznijetih tvrdnji i rezultata je prepuštena učesnicima Kongresa i široj naučnoj i stručnoj javnosti. Tekstovi rukopisa kratkih sadržaja nisu lektorisani.

Kroz dvodnevni radni dio kongresa bit će prezentirano 65 oralnih i poster prezentacija autora iz šest zemalja. Iskustva i rezultati koje će autori referata i postera prikazati u okviru Kongresa obogatiće znanja učesnika i omogućiti bolje razumijevanje i primjenu nekih od njih u daljem stručnom ili naučno-istraživačkom radu.

U organizaciji i realizaciji Kongresa uzeli su učešće studenti Poljoprivredno-prehrambenog, Farmaceutskog, Veterinarskog, Pedagoškog, Stomatološkog fakulteta sa klinikama i Fakulteta zdravstvenih studija Univerziteta u Sarajevu, što govori o njihovom opredjeljenju da na najbolji način predstave svoje fakultete, na što smo veoma ponosni na čemu smo im posebno zahvalni. Nadamo se da će konceptijski sličnih studentskih konferencija biti u budućnosti sve više, te da će to postati tradicija u studentskim aktivnostima Univerziteta u Sarajevu. Zahvaljujemo se svim članovima odbora kongresa na njihovom bespoštednom radu. Posebno se zahvaljujemo i svim autorima prezentiranih radova, koji su doprinijeli izuzetnom kvalitetu kongresa.

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

Prof.dr. Faruk Čaklovica
predsjednik Koordinacionog odbora

A Word from the Editor

The Congress „FOOD-NUTRITION-HEALTH“ is the first multidisciplinary student congress organized by the students associations of the faculties of the University of Sarajevo, which aims to promote the universal values of community and multidisciplinary approach to food production, its hygienic status and quality, different dietary patterns, as well as possible implications for human health, all of which are of great importance in solving the major issues in this area of life. This multidisciplinary approach in comprehension of this complex issue represents the current trend towards "European nation" in finding the most rational response to the many questions in virtually all spheres of social life and activity. Therefore the Organizing Committee adopted the scientific program with seven sections: 1. Primary production and processing of food, 2. Food additives, 3. Food safety and toxicology, 4. Current trends in food analysis, 5. Lifecycle nutrition, 6. Dietotherapy, and 7. Organic and traditional food.

The abstracts published in this book of abstracts were reviewed by the members of the Scientific Committee. The authors are responsible for the content of their abstracts. The text of the abstracts was not language edited.

During the Congress 65 oral and poster presentations will be presented by the authors from six countries. The presented results will enhance the knowledge of participants and lead to better understanding and application of this knowledge in their further professional and scientific work.

We are very proud of our students (students of the Faculty of Agricultural and Food Science, Faculty of Pharmacy, Veterinary faculty, Faculty of Educational Sciences, Faculty of Dental Medicine with Clinics and Faculty of Health Science) who actively participated in organization and realization of the Congress. These efforts illustrate their strong commitment to represent their faculties in the best way. We hope to have more of similar student conferences in the future, and that it will become traditional student activity at the University of Sarajevo.

We thank the Scientific, Organizing, Coordination and Technical Committee members for their hard work in making this Congress a successful event. Special thanks goes to all the authors for their high quality contributions.

We are grateful to our sponsors for their kind contributions and support in organizing this Congress.

Prof.dr. Faruk Čaklovica
Chairman of the Coordination Committee

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

Uticaj temperature zagrijavanja tokom destilacije na sadržaj furfurola i aromu destilata od jabuke

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Sažetak

Iako su dvije osnovne komponente destilata etanol i voda, u destilatima su prisutne i mnoge druge supstance čiji je kvalitativni i kvantitativni sastav odlučujući faktor koji utiče na karakter, aromu i u konačnici sami kvalitet destilata. Jedna od takvih supstanci je furfurol, koji nastaje u toku destilacije usljed procesa dehidratacije pentozna i pentozana, te manjim dijelom usljed razgradnje pektinskih materija. Razlozi povećanog interesovanja za furfurol mogu se tražiti u još uvijek nedovoljno jasno definisanoj toksičnosti furfurola. Naime, pojedine studije su pokazale jasno dokazanu in vitro genotoksičnost na ćelije sisavaca, iako se sa druge strane nisu mogli iznijeti definitivni zaključci o in vivo genotoksičnosti. Također, potrebno je napomenuti da istraživanja pokazuju da se 85% unesenog furfurola izluči putem urina tokom 72 sata, u obliku metabolita poput furol-glicina, furoične i furanakrilne kiseline. Bez obzira na oprečne stavove o toksičnosti, zbog činjenice da se svrstava u supstance koje pružaju dvosmislene dokaze o potencijalnoj kancerogenosti, te poznatog mehanizam nastanka, poželjno je što više znati o uticaju faktora koji uslovljavaju nastanak furfurola tokom destilacije. Jedan od navedenih faktora je temperatura zagrijavanja tokom destilacije, koja također utiče na dinamiku prelaska supstanci u destilate.

Stoga je cilj ovoga rada ispitati uticaj temperature zagrijavanja tokom destilacije (600°C, 650°C i 700°C) na sadržaj furfurola i senzornu ocjenu arome destilata od jabuke.

Rezultati rada pokazuju da više temperature zagrijavanja tokom destilacije uslovljavaju njeno kraće vrijeme trajanja, što rezultira nižim sadržajem furfurola. Nasuprot toga, destilati proizvedeni na nižim temperaturama zagrijavanja tokom destilacije su se odlikovali većim senzornim ocjenama za aromu.

Ključne riječi: furfurol, aroma, destilati, destilacija, temperatura zagrijavanja

1-O-1

The effect of temperature of heating during distillation on the content of furfural and the aroma of apple distillate

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Abstract

Even though the two primary components of distillate are ethanol and water, other substances are present in the distillate, substances whose qualitative and quantitative composition is a determining factor which influences the character, aroma and in the end the quality of the distillate itself. One of the aforementioned substances is furfural, which occurs during distillation, the process of dehydration of pentose and pentosan at raised temperature, and in smaller part during degradation of pectin substances. The reasons of increased interest for furfural can be looked for in the still not well enough defined toxicity of furfural. Namely, studies have shown clearly proven in vitro genotoxicity for the cells of mammals, even though on the other hand definite conclusions about in vivo genotoxicity could not be made. Also, it is necessary to mention that 85% of ingested furfural gets excreted through urine in 72 hours, in the form of metabolite like furfural-glycine, furfural and furfural acrylic acid. Regardless of the opposite views about toxicity, due to the fact that it is classified with the substances which provide ambiguous evidence about potential carcinogenicity, and the known mechanism of occurrence, it is desirable to know as much as possible about the effect of the factors which condition the occurrence of furfural during distillation. One of the aforementioned factors is the temperature of heating during distillation.

Therefore the purpose of this study is to examine the effect of temperature of heating during distillation (600°C, 650°C i 700°C) of the content of furfural and the sensory evaluation of the aroma of apple distillate.

The results of the study show that higher temperatures of heating during the distillation condition shorter distillation time, which in turn results in lower furfural content. Opposite of that, distillates produced at lower temperatures of heating during distillation have been characterized with higher sensory evaluation for aroma.

Keywords: furfural, aroma, distillate, distillation, temperature of warming

Agrofortifikacija pšenice folijarnom aplikacijom cinka i selenaIvona KUČERA,¹ Vladimir IVEZIĆ,¹ Zdenko LONČARIĆ^{1*}

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Sažetak

Biofortifikacija predstavlja oplemenjivačke i agronomske postupke obogaćivanja jestivih dijelova biljaka esencijalnim elementima, među kojima zbog rasprostranjenog deficita u hrani biljnog podrijetla veliki značaj pripada Zn i Se.

Cilj provedenog istraživanja bio je utvrditi utjecaj folijarne aplikacije Zn i Se na njihovu koncentraciju u zrnu pšenice.

Pokus sa dvije sorte (Srpanjka i Renata) proveden je 2014. godine na dva lokaliteta istočne Hrvatske, uz 4 razine gnojidbe dušikom: 1. kontrola bez gnojidbe, 2. reducirana (110 kg/ha), 3. optimalna (145 kg/ha) i 4. prekomjerna gnojidba (180 kg/ha N). Na svim gnojidbenim tretmanima je početkom cvatnje uz kontrolu bez mikroelemenata provedena biofortifikacija istovremenom folijarnom aplikacijom 1,5 kg/ha Zn (u obliku sulfata) i 10 g/ha Se (u obliku Na-selenata). Prosječno je biofortifikacija rezultirala povećanjem (46 %) koncentracije Zn (21,60 na 31,62 mg/kg) i povećanjem (6,6 puta) koncentracije Se (35 na 231 µg/kg). Sorta Renata akumulirala je prosječno više Zn (28,48 mg/kg) i Se (149 µg/kg) nego sorta Srpanjka (24,75 mg/kg Zn i 117 µg/kg Se), a kod obje je sorte ostvareno statistički značajno povećanje koncentracija Zn (Renata 39 %, Srpanjka 55 %) i Se (6,4 i 6,8 puta). Gnojidbe dušikom značajno su utjecale samo na povećanje koncentracije Zn (13-19 %) u odnosu na kontrolni tretman bez gnojidbe, a biofortifikacija je pri svim razinama gnojidbe rezultirala povećanjima koncentracija Zn (40-52 %) i Se (6,1-7,1 puta).

Zaključak je provednog istraživanja da sorta i gnojidba dušikom značajno utječu na koncentracije Zn u zrnu, ali ne na koncentracije Se, te da istovremena folijarna aplikacija Zn i Se rezultira njihovom povećanom akumulacijom u zrnu istraživanih sorata na svim razinama gnojidbe dušikom.

Ključne riječi: biofortifikacija, cink, selen, folijarna aplikacija

1-O-2

Winter wheat agrofertilization by foliar application of zinc and selenium

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Abstract

Biofortification represents breeding and agronomic practices of enrichment edible plant parts with essential elements. Among the other elements, Zn and Se are also of great importance due to the widespread deficit in food of plant origin.

The aim of this study was to determine the effect of foliar application of Zn and Se on their concentration in wheat grain.

The experiment with two varieties (cv. Srpanjka and cv. Renata) was carried out in 2014 at two sites in eastern Croatia with 4 levels of nitrogen fertilization: 1. control without fertilization, 2. reduced (110 kg/ha), 3. optimum (145 kg/ha) and 4. over-fertilization (180 kg/ha N). Foliar treatments included Zn and Se simultaneously and were conducted during stage of early flowering at all fertilization treatments with control without trace elements. Applied amounts were 1.5 kg/ha Zn (in the form of sulphate) and 10 g/ha Se (in the form of Na-selenate). Biofortification in average resulted in an 46% increase of Zn concentrations (21.60 to 31.62 mg/kg) and 6.6 times increased Se concentration (35 to 231 µg/kg). Variety Renata in average accumulated more Zn (28.48 mg/kg) and Se (149 µg/kg) than the variety Srpanjka (24.75 mg/kg Zn and 117 µg/kg Se). Both varieties achieved a statistically significant increase in the concentration of Zn (Renata 39%, Srpanjka 55%) and Se (6.4 and 6.8 times) by biofortification. Nitrogen fertilization significantly affected only the concentration of Zn (13-19%) compared to the control treatment without fertilization, and biofortification at all levels of fertilization resulted in increases in the concentration of Zn (40-52%) and Se (6.1 to 7.1 times).

The conclusion is that the variety and nitrogen fertilization significantly influence the concentration of Zn in the grain, but not Se concentration, and that simultaneous foliar application of Zn and Se results in their increased accumulation in wheat cultivars at all levels of nitrogen fertilization.

Keywords: biofortification, zinc, selenium, foliar application

***In vitro* bioraspoloživost željeza i cinka u zrnu pšenice**Sanja GRUBIŠIĆ,¹ Andrijana REBEKIĆ,^{1*} Zdenko LONČARIĆ¹¹Sveučilište Josipa Jurja Strossmayera u Osijeku, Poljoprivredni Fakultet u Osijeku, Republika Hrvatska

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Sažetak

Cilj istraživanja bio je utvrditi postoje li razlike između sorti pšenice u *in vitro* bioraspoloživosti željeza i cinka. U istraživanje je bilo uključeno 17 sorti pšenice (9 sorti vrste *Triticum aestivum*, 3 sorte vrste *Triticum durum* te 5 divljih srodnika pšenice). Simulacija probave *in vitro* provedena je metodom po Kiersu. Koncentracije željeza i cinka u uzorcima brašna cjelovitog zrna prije i nakon provedene *in vitro* probave izmjerene se pomoću ICP-OES tehnike te je izračunat postotak bioraspoloživosti željeza i cinka.

Koncentracija željeza u brašnu cjelovitog zrna ispitivanih sorti kretala se u rasponu od 28,8 – 68,9 mg kg⁻¹, a cinka od 16,2 – 39,1 mg kg⁻¹, dok je bioraspoloživost željeza bila u rasponu od 15,9 – 42,6%, a cinka 9,3 – 32,4%. Najviša prosječna koncentracija željeza (54,2 mg kg⁻¹) utvrđena je u skupini sorti vrste *Triticum aestivum* uz prosječnu bioraspoloživost od 25,1%, dok je najviša prosječna koncentracija cinka (31,6 mg kg⁻¹) utvrđena u skupini divljih srodnika uz, u odnosu na ostale skupine, nisku bioraspoloživost (15,5%). U skupini durum pšenica utvrđen je najviši prosječni postotak bioraspoloživosti željeza (30,2%) i cinka (24,1%). Između koncentracija željeza odnosno cinka u brašnu cjelovitog zrna prije i nakon provedene probave *in vitro*, nije utvrđena značajna veza što može ukazivati na značajnu ulogu antinutrijenata u probavljivosti željeza i cinka. Unutar ispitivanog uzorka utvrđena je značajna varijabilnost sorti s obzirom na koncentraciju i bioraspoloživost željeza i cinka. Dobiveni rezultati koristit će se za daljnje istraživanje *in vitro* bioraspoloživosti i uloge antinutrijenata u bioraspoloživosti mikroelemenata iz zrna pšenice, što su vrlo korisni podaci za oplemenjivački biofortifikacijski program.

Ključne riječi: probavljivost, biofortifikacija, fitinska kiselina

1-O-3

***In vitro* bioavailability of wheat grain iron and zinc**

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Abstract

The aim of this study was to examine differences between wheat varieties in *in vitro* bioavailability of iron and zinc. The study included 9 *Triticum aestivum* and 3 *Triticum durum* varieties and 5 wild relatives of wheat. *In vitro* digestion was carried out according to the method proposed by Kiers. The concentrations of iron and zinc in samples of whole-wheat flour before and after *in vitro* digestion were measured by ICP-OES technique and the percentage of iron and zinc bioavailability were calculated.

In the samples (n=17) of whole-wheat flour iron concentration was 28.8 to 68.9 mg kg⁻¹ while zinc concentration was 16.2 to 39.1 mg kg⁻¹. Bioavailability of iron in the whole sample was 15.9 to 42.6% and zinc 9.3 to 32.4%. The highest average concentration of iron (54.2 mg kg⁻¹) was found in the *Triticum aestivum* varieties with an average bioavailability of 25.1%. Wild relatives of wheat had highest average zinc concentration (31.6 mg kg⁻¹), but compared to other groups, they had the lowest zinc bioavailability (15.5%). Durum wheat had highest bioavailability of iron (30.2%) and zinc (24.1%). Iron and zinc concentrations in whole-wheat flour before and after *in vitro* digestion were not in significant relationship. That may indicate an important role of the antinutrients in digestibility of iron and zinc. Large variability in iron and zinc concentrations and bioavailability has been found between tested wheat varieties. Obtained results will be used for further research of *in vitro* bioavailability, role of antinutrients in the bioavailability of trace elements and for selection of wheat varieties for the biofortification breeding programme.

Keywords: digestibility, biofortification, phytic acid

Mogućnosti unaprijeđenja autohtone pasmine goveda Buše kroz model proizvodnje hrane iz ekološkog uzgoja

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Sažetak

Svaka pasmina domaćih životinja ima sebi svojstvenu unikatnu frekvenciju gena koja tu pasminu čini poželjnom u odgovarajućem uzgojnom programu. Autohtone pasmine najčešće su lokalno zastupljene i njihova specifična genetska struktura nije značajno raširena ni korištena. Budući da zahtjevi potrošača za hranom iz ekološkog uzgoja iz dana u dan sve više rastu, ekstenzivan uzgoj autohtonih pasmina može dati svoj doprinos tom zahtjevu i kao takav u mnogim zemljama sve više dobija na značaju. Sa stanovišta dobrobiti životinja i proizvodnje hrane iz ekološkog uzgoja, ekstenzivan uzgoj pruža životinji mogućnost obitavanja u prirodnoj sredini uz ispoljavanje proizvodnih karakteristika. Mogućnost zaštite autohtone pasmine goveda Buše u Bosni i Hercegovini ogleda se i kroz model uzgoja u ruralnim područjima te plasman „marketinški oplemenjenih“ proizvoda. Obzirom da Buša kao takva predstavlja kulturološko i tradicijsko nasljeđe, a ujedno je okarakterisana velikom genetičkom varijabilnošću, njena zaštita, te valorizacija „marketinški oplemenjenih“ proizvoda od mesa i mlijeka ogledat će se u povećanju brojnog stanja pasmine, te izgradnjom prepoznatljive marke mesa i mlijeka Buše. Pored osnovnog cilja ovoga rada koji je iskazan kroz mogućnosti i potencijale izgradnje prepoznatljivih proizvoda od Buše, sticanje oznake izvornost (PDO) i oznake geografskog porijekla (PGI) spomenutih proizvoda, bitan efekat također manifestovat će se i kroz povećanje svijesti potrošača o vrijednostima proizvoda i same pasmine. Uspostavljanje ovakvog vida uzgoja i plasmana proizvoda rezultiralo bi direktno povećanjem brojnog stanja, odnosno efektivne veličine buše u Bosni i Hercegovini, koja sada spada u kritično ugroženu pasminu.

Ključne riječi: Buša, ekološki uzgoj, modeli proizvodnje hrane, „marketinški oplemenjeni“ proizvodi

1-O-4

Opportunities of improving autochthonous cattle breed Busha through organic farming production model

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Abstract

Every breed of domestic animals has unique gene frequency that makes her desirable for compatible breeding programme. Autochthonous breeds are usually present in local areas and their unique genetic structure is not significantly spread nor used. Whereas increased consumers requests for organic food, „open range“ farming of autochthonous breeds can give his contribution in fulfillment of that request and as such in many countries is getting more and more significance. In terms of animal welfare and production organic food, „open range“ farming gives animal opportunities to live in natural ambience along with manifesting production characteristics. Opportunities for preservation autochthonous Busha breed in Bosnia and Herzegovina are also through model of production in rural areas along with placement of „marketing refined“ products. Since that Busha as such presents culturally and traditionally heritage and is also characterized by large genetic variability, preservation and valorisation of „marketing refined“ milk and meat products will be reflected in increasing number of cattle breed building recognizable Busha's meat and milk brand. Along with main objective which is expressed through possibilities and potentials of building recognizable Busha's products, acquisition of marks for protected designations of origin (PDO) and protected geographical indication (PGI) for mentioned products, also an important effect will be manifested through increasing awareness of consumers about values of products and breed. Establishing this way of farming and products placement would result in direct increase in number of cattle heads and effective population size of Busha in Bosnia and Herzegovina which is currently endangered.

Keywords: Busha, organic farming, model of food production, „marketing refined“ products

Cisticerkoza (bobičavost) goveda

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Sažetak

Iako se čini da su parazitarne bolesti gastrointestinalnog trakta stvar prošlosti, one i dalje predstavljaju jednu od najvećih prijetnji ljudskom zdravlju. Među njima, bobičavost goveda je jedna od istaknutijih. *Taenia Saginata* spada u skupinu trakavica i kao konačni domaćin joj služi čovjek. Za infekciju čovjeka od najvećeg značaja su cisticerkusi u mišićnom tkivu goveda, najčešće locirani u žvakačoj muskulaturi, jeziku, srcu i dijafragmi tako da je zakonski predviđen post mortalni pregled uglavnom fokusiran na ove dijelove tijela. U principu, inspekcijom mesa, palpacijom i zarezivanjem otkriva se samo oko 15-50% životinja koje su zapravo zaražene. Lakše infekcije se često ne dijagnosticiraju ovim metodama. Danas se radi na otkrivanju novih i poboljšanju postojećih seroloških metoda dijagnostike koji bi ubrzali rad veterinarskih inspektora i smanjili troškove pregleda.

Meso u kome je inspekcijom pronađeno manje od 10 cisticerkusa proglašava se uslovno upotrebljivim, a ono u kome se nalazi više od 10 meso se proglašava neupotrebljivim za ljudsku ishranu.

Terapija zaraženih goveda je moguća, ali se obično ne sprovodi. U terapiji ljudi se koristi

Albendazol, Rikobendazol i Prazikvantel.

Od mjera prevencije, najveći značaj ima pravilan veterinarski pregled mesa i edukacija stanovništva. Na ovaj način nastoji se prekinuti razvoj parazita u kompleksu čovjek-govedo preveniranjem kontakta životinja sa ljudskim izmetom, i čovjeka sa bobičavim mesom.

Ključne riječi: cisticerkoza, bobičavost, goveda, pregled, meso

1-O-5

Bovine cysticercosis

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Abstract

Paratactic diseases of the gastro intestinal tract may seem like a thing of past, but they are still a constant threat to human health. Amongst them, bovine cysticercosis is one of the most prominent. Humans are the final host for *Tenia Saginata* and they are infected by eating raw or undercooked meat containing its developmental forms, cysticerci bovis. For the transmission of the disease to humans, cysticerci located in the masticatory muscles, tongue, heart and diaphragm of the cattle are the most significant. Therefore, those parts are inspected during the post mortal examination of the carcasses. In general, inspection, palpation and incision, detect only 15-50% of the infected animals. More benign infections often go undetected. More accurate, serological methods are being developed with the intent of speeding up the work of the veterinary inspectors and lower the cost of the examination.

Meat that contains less than ten cysticerci is deemed as conditionally fit for human usage and should be refined. Meat with more than ten cysticerci is presumed as unconditionally unfit for human consumption.

Infected cattle are usually not threatened. Praziquante, niclosamide and albendazole can be used to treat infected humans.

Preventive measures include veterinary control of the carcasses of the slaughtered animals and education of the population regarding the hygienic and sanitary measures. Their task is to stop the developmental circle of the parasite by preventing animals from consuming human feces and preventing humans from ingesting meat that contains cysticerci.

Key words: cysticercosis, cattle, inspection, meat

Rezultati proučavanja produktivnosti nekih holandskih sorti krompira u brdsko-planinskom području Crne Gore

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Sažetak

U radu su prikazani rezultati dvogodišnjih proučavanja šest holandskih sorti krompira u agroekološkim uslovima sjevera Crne Gore.

U dvogodišnjem prosjeku najveći broj krtola utvrđen je kod sorte Arnova (8,4), dok su najmanje krtola dale Arrow (6,8), Rudolph (6,8) i Riviera (6,9). Povećanje broja krtola kod sorte Arnova u poređenju sa ostalim sortama bilo je statistički opravdano.

Sorte Rudolph (116,5 g) i Kuroda (100,5 g) dale su prosječno najkrupnije krtole. Prosječna masa krtola ostalih proučavanih sorti bila je na približno istom nivou i kretala se od 80,4 g kod sorte Arrow do 88,6, kod Arнове. Rudolph i Kuroda su u poređenju sa svim ostalim varijantama imale statistički značajno krupnije krtole.

Najveći prinos u ogledima ostvaren je na parcelama gdje su gajene sorte Rudolph – 33,7, Kuroda – 32,0 i Arnova – 31,5 t ha⁻¹. Najmanji prinos izmjeren je kod sorte Arrow – 23,2 t ha⁻¹. Prinosi kod sorti Rudolph, Kuroda i Arnova bili su u poređenju sa svim ostalim proučavanim sortama statistički veoma značajni.

Ova istraživanja su pokazala da se u agroekološkim uslovima brdsko-planinske klime najveći prinosi krtola postižu gajenjem srednje kasnih i srednje ranih sorti krompira.

Ključne riječi: krompir, broj krtola, masa krtole, prinos

1-O-6

**Study of the productivity of some Dutch potato varieties
in the mountain region of Montenegro**

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Abstract

This paper presents the results of a two-year study of six Dutch potato varieties in agroecological conditions of northern Montenegro.

The two-year average of the highest number of tubers were found in the variety Arnova (8.4), while the lowest tuber number was obtained in varieties Arrow (6.8), Rudolph (6.8) and Riviera (6.9). Increasing the number of tubers in the variety Arnova compared to other varieties was statistically significant.

Varieties Rudolph (116.5 g) and Kuroda (100.5 g) gave averagely biggest tubers. The average weight of tuber of other varieties studied was approximately at the same level, and ranged from 80.4 g, for the cultivar Arrow to 88.6, for the Arnova. Rudolph and Kuroda were, compared with all other varieties, had significantly larger tubers.

The highest yield in trials was on plots planted with varieties Rudolph - 33.7, Kuroda - 32.0 and Arnova - 31.5 t ha⁻¹. The lowest yield was measured at variety Arrow - 23.2 t ha⁻¹. Yields of varieties Rudolph, Kuroda and Arnova were compared to all other investigated varieties statistically significant.

This research showed that the highest yields of tubers in agroecological conditions of mountain climates are achieved by growing medium late and middle early varieties of potatoes.

Keywords: potato, tuber number, tuber weight, yield

Genetički modificirane biljke kao hrana

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Sažetak

Danas se u svijetu uzgajaju različite genetički modificirane biljke na više od 180 miliona hektara u preko 30 zemalja svijeta. Od preko 30 genetički modificiranih biljaka najviše se uzgajaju soja, kukuruz, pamuk i uljana repica sa genima koji im najčešće daju otpornost na insekte i herbicide. Međutim, suša, kao jedan od velikih problema današnjice, ima za posljedicu brzo smanjenje obradivih površina u svijetu što uz globalno zagrijavanje i povećanje ljudske populacije stavlja pitanje prehrane stanovništva u prvorazredno i egzistencijalno pitanje opstanka čovjeka.

Jedan od načina za smanjenje ili prevazilaženje ovih hroničnih problema današnjice je i povećanje proizvodnje genetički modificiranih biljaka, na prvom mjestu žitarica: pšenice, ječma, riže i drugih koje se primarno koriste u prehrani stanovništva. Pošto je pšenica (*Triticum sp.*) nedovoljno otporna na sušu, jedna od mogućnosti je dobijanje genetički modificirane pšenice ugradnjom gena koji joj daju otpornost na sušu. Kao donor takvog gena mogu se koristiti razne sorte ječma (*Hordeum vulgare*), koje su otporne na sušu, ili neke druge srodne žitarice za koje je utvrđeno da imaju visok stepen tolerancije na sušu. Kao vektor se najčešće koristi *Agrobacterium tumefaciens*, najpogodnija bakterija za dobijanje genetički modificiranih biljaka. Geni koji daju otpornost na sušu svojom ekspresijom utiču na nivo apscinske kiseline (ABA), čime se reguliše zatvaranje stominog aparata pri malim količinama vode te na taj način biljke mogu da prežive problem suše. Rezultat takvog prenošenja gena u pšenicu može omogućiti veću proizvodnju pšenice u svjetskim razmjerama, što može smanjiti glad i broj gladnih u svijetu.

Ključne riječi: Genetički modificirane biljke (GMO), transformacija, manipulacija gena, Agrobacterium tumefaciens, pšenica

1-P-1

Genetically modified plants as food

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Abstract

Nowdays, in world are grown different genetically modified plants on more than 180 million hectares in over 30 countries worldwide. There are more than 30 genetically modified plants of which soybeans, corn, cotton and canola are the most cultivated. These plants have genes that usually provide resistance to insects and herbicides. However, drought, as one of the greatest problems today, results in rapid decrease of arable land in the world. This problem, along with global warming and increasing population, begs the question of nutrition of the human population as existential question for survival.

One of the ways to reduce or overcome these chronic problems is increasing production of genetically modified plants, primarily grains: wheat, barley, rice and others which are mainly used in the diet of the population. Since the wheat (*Triticum sp.*) is sufficiently resistant to drought, one of the possibilities is to obtain genetically modified wheat incorporating genes that confer resistance to drought. As the donor of such gene, it can be used a variety of barley (*Hordeum vulgare*), which are resistant to drought, or some other related grains which have been found to have a high degree of tolerance to drought. *Agrobacterium tumefaciens* is most commonly used as a vector. It is the most suitable bacteria for obtaining genetically modified plants. Genes, that are resistant to drought, with their expression affect level of abscisic acid (ABA), which regulates the closure of stomatal apparatus with small amounts of water and thus the plants can survive drought problem. The result of such transfer of genes in wheat may empower higher production of wheat worldwide, which can reduce hunger and the number of hungry people in general.

Keywords: Genetically modified plants (GMO), transformation, gene manipulation, Agrobacterium tumefaciens, wheat

2. ADITIVI U PREHRAMBENOJ INDUSTRIJI
FOOD ADDITIVES

Koliko šećera ste pojeli danas?

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Sažetak

U današnje vrijeme često nismo svjesni koliko šećera unesemo putem hrane u toku dana. Takođe među opštom populacijom nisu dovoljno poznate posljedice prekomjernog unosa šećera. Ovo je posebno problem među djecom i adolescentima, jer oni često konzumiraju hranu sa visokim sadržajem šećera. Iz tog razloga pokrenut je specijalni projekat (Koliko šećera ste pojeli danas?) kao svojevrsna kampanja usmjerena na očuvanje javnog zdravlja. Projekat je započeo na inicijativu IFEH (Međunarodna federacija za okoliš i zdravlje), u okviru obilježavanja Svjetskog dana okoliša i zdravlja 2015. Glavni cilj projekta bio je da se podigne svijest o negativnim efektima prekomjernog unosa šećera na zdravlje opšte populacije. Rezultati projekta su prezentovani kao izložba, gdje je na neobičan način prikazan sadržaj šećera u različitim prehrambenim proizvodima. Takođe su data posebna upozorenja sa kratkim izjavama o negativnim efektima prekomjernog unosa šećera. Posebno je značajna premijera kratkog dokumentarnog filma pod nazivom "Da li nam šećer može naškoditi?". (<https://www.youtube.com/watch?v=BsLlcicinRk>). U filmu eksperti u oblasti javnog zdravlja, prehrambene industrije, osobe oboljele od diabetesa i sportisti daju svoja mišljenja i preporuke o načinima smanjenja unosa šećera, kao i praktičnim uputama za pripremanje obroka sa manjim sadržajem šećera. Do prijave ovog rada dokumentarni film je prikazan na različitim internetskim stranicama i do sada je imao više od 14 500 pregleda.

Ključne riječi: javno zdravlje, prehrana, šećer, dokumentarni film

2-O-1

How much sugar did you eat today?

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Abstract

Nowadays, we are often not aware of how much sugar can be consumed with our food during the day. Also the consequences of excessive sugar intake are not well known among general public. The excessive sugar intake is especially problematic among children and adolescents because they are frequently consume foods with high sugar content. Therefore a special project (How much sugar did you eat today?) was developed as a public health campaign. The project was started on the initiative of IFEH (International Federation of Environmental Health), in context of World Environmental Health Day 2015. The main goal of the project was to raise awareness of the negative effects of excessive sugar consumption on our health among general public. The outcomes of this project were presented during the special event organized as an exhibition where sugar content in different food products was demonstrated in an extraordinary way. Also special warnings with short statements about the negative effects of excessive sugar intake were exhibited. The highlight was a premiere of short documentary movie (<https://www.youtube.com/watch?v=BsLlcicinRk>) entitled »Can sugar harm us?». In the movie opinions and recommendations how to reduce sugar intake were given by experts in the field of public health, food industry, people with diabetes and an athlete. Also practical alternatives how to prepare meals during the day with less sugar content are given. Until the submission of this paper the movie was summed up in various websites and was seen by more than 14.500 people.

Keywords: public health, nutrition, sugar, documentary movie

Aspartam kao zaslađivač

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Sažetak

Aspartam je jedan od najviše analiziranih zaslađivača, koji ima izuzetno veliku primjenu u prehrambenoj industriji. Sačinjen je od dvije aminokiseline, L-asparaginske i L-fenilalanina, povezanih sa metil ester vezom. Ovaj zaslađivač je predmet mnogih kontroverzi još od samog otkrića. Naišao je na mnoge optužbe, od onih da podstiče debljanje pa do toga da je potencijalni uzročnik karcinoma. U brojnim istraživanjima koje su proveli stručnjaci EFSA (Europska agencija za sigurnost hrane) i FDA (Administracija za hranu i lijekove), dokazano je da je aspartam siguran za opću populaciju, kao i za djecu, trudnice i dojilje. Stručnjaci EFSA su zaključili da izloženost metanolu iz aspartama ne izaziva nikakve negativne efekte s obzirom da su to male količine u poređenju sa prirodnom proizvodnjom metanola u organizmu. Negativni efekti fenilalanina se odnose na potrošače sa fenilketonurijom. To je bolest do koje dolazi zbog nedostatka enzima fenilalanin hidrosilaze koji pretvara esencijalnu aminokiselinu fenilalanin u tirozin, te uzrokuje oštećenje mozgu. Aspartam se primjenjuje u proizvodnji osvježavajućih bezalkoholnih pića, žvakaćih guma, proizvoda za dijabetičare, konditorskih i mliječnih proizvoda, kao i za proizvodnju farmaceutskih proizvoda. Prihvaljiva dnevna doza je 40 mg/kg tjelesne mase.

Ključne riječi: aspartam, zaslađivač, sigurnost

Aspartame as a sweetener

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Abstract

Aspartame is one of the most tested sweeteners with wide application in food industry. Aspartame is composed of two amino acids, L-aspartic acid and L-phenylalanine, associated with methyl ester link. This sweetener is the subject of many controversies since its approval. It came across a lot of accusations, like those that it encourages weight gain and is even carcinogenic. In numerous studies conducted by experts of EFSA (European Food Safety Authority) and the FDA (Food and Drug Administration), it's proven that aspartame is safe for the general population, as well as for children, pregnant and lactating women. EFSA scientists concluded that exposure to methanol from aspartame doesn't cause any negative effects given it's small amounts compared to natural production of methanol in the body. The negative effects of phenylalanine are related to consumers with phenylketonuria. It is a disease that occurs due to the lack of the enzyme phenylalanine hydroxylase that converts the essential amino acid phenylalanine to tyrosine, which leads to brain damage. Aspartame is applied in drinks, desserts, sweets, chewing gums, products for diabetics, confectionery and dairy products and also in pharmaceutical products. Acceptable daily dose for aspartame is 40 mg/kg body weight.

Key words: aspartame, sweetener, safety

Nutricini u funkciji ublažavanja stresa kod proizvodne peradi

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Sažetak

Posljednjih godina iznalaze se načini kako povećati iskoristivost hrane za perad, postići dobre proizvodne i zdravstvene rezultate u uzgoju, a istovremeno sniziti stresogene utjecaje. Perad pripadaju skupini izuzetno osjetljivih životinja, i izložene su različitim stresnim situacijama tokom proizvodnog ciklusa. Perad su izložena stresu odmah nakon izlijeganja kada njihov nezreli probavni sistem dolazi u dodir sa mikroorganizmima kako hrane tako i okoliša. U tom razdoblju života su vrlo podložni invaziji patogenih mikroorganizama, a kako su sve životinje u bliskom kontaktu velika je mogućnost pojave zaraznih bolesti. Vrlo je važno razumijeti ograničene sposobnosti rasta i proizvodnosti s nutritivnog aspekta. Stoga pažnju treba usmjeriti na smanjenje stresa poboljšanjem iskoristivosti hraniva upotrebom nutracina, što potpomaže otpornosti na zarazne bolesti. Prema mnogim istraživanjima upotreba nutracina u ishrani peradi očitovale se boljim prirastom, konzumacijom, konverzijom, ali i povoljnim utjecajem na zdravlje peradi. Nutricini doprinose i smanjenoj upotrebi drugih neprirodnih tvari (farmakoloških preparata) koje se inače koriste u cilju sprečavanja bolesnih stanja. Dodatkom nutracina u hraniva smanjuje se i onečišćenje okoliša, te povoljno djeluje na cjelokupan organizam peradi i doprinosi smanjenu stresogenih faktora. Na osnovu ovoga nezaobilazna je spona između nutracina i redukcije stresa, te će njihova upotreba imati sve važniju ulogu u svim proizvodnim segmentima intenzivnog uzgoja domaće peradi.

Ključne riječi: hraniva, zdravlje, perad, nutracini, stres

2-O-3

Nutricines in function reducing stress at production domestic poultry

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Abstract

In recent years, people are exploring different ways to increase the efficiency of feed for poultry, in order to achieve good production and health outcomes in the cultivation, the goal at same time is try to reduce the stressful effects for poultry because these animals are extremely sensitive. Poultry were exposed to stress immediately after hatching when their undeveloped digestive system got in contact with microorganisms. It is important to understand the limited ability of growth and productivity with nutritional point of view. Therefore, attention should be focused on reducing stress by improving the efficiency of use nutritious which promotes resistance to infectious diseases. According to many studies about use nutritious in feeding poultry has been reflected in gain, consumption, conversion, and a favorable impact on the health of poultry. Nutritious contributions and reduced use of other unnatural substances (pharmacological preparations) that are normally used to prevent of developing the diseases. Nutritious as an supplement in nutrients help in reducing environmental pollution, and beneficial effect on the whole body of poultry. Therefore this link between nutritious and stress reduction is unavoidable, and its use could have a very important role in all production segments of intensive breeding for domestic poultry .

Keywords: nutrients, health, poultry, nutritious, stress

Kvalitativna i kvantitativna analiza vještačkih boja u instant sokovimaŠejla NEFIĆ,^{1*} Sabina GOJAK-SALIMOVIĆ,¹ Jasna HUREMOVIĆ¹¹ Univerzitet u Sarajevu, Prirodno-matematički fakultet, Odsjek za hemiju, BiH

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Sažetak

Vještačke boje su samo jedna od dvadesetak različitih kategorija aditiva koje predstavljaju hemijske tvari tačno poznate strukture i koje nemaju prehrambene vrijednosti. Dodaju se hrani tokom proizvodnje da bi se nadomjestila prirodna boja koju je hrana izgubila tokom prerade ili se dodaju da bi proizvod bio atraktivniji. Na etiketama proizvoda vještačke boje su označene E brojem. Budući da nisu prirodan sastojak hrane, vještačke boje nose određene zdravstvene rizike. U okviru ovog rada izvršena je kvalitativna i kvantitativna analiza vještačkih boja u petnaest različitih instant sokova dostupnih u lokalnim marketima. Za kvalitativnu analizu korištena je metoda papirne hromatografije, a za kvantitativnu analizu metoda UV/Vis spektrofotometrije. Izvršena je identifikacija sljedećih vještačkih boja: Sunset žuta (E110), Tartrazin (E102), Amarant (E123), Indigotin (E132) i Eritrozin (E127). Od ispitivanih boja identifikovane su Tartrazin i Sunset žuta u nekim uzorcima instant sokova sa ukusom narandže, limuna i manga. U poređenju sa maksimalno dozvoljenim koncentracijama, iz Pravilnika o upotrebi boja u hrani, ("Službeni list BiH" broj 85/08) sa vrijednostima dobivenim ovim ispitivanjem, niti u jednom analiziranom uzorku sadržaj boja nije prelazio maksimalno dozvoljene koncentracije. Međutim, treba napomenuti da je u Pravilniku o izmjenama i dopunama Pravilnika o upotrebi boja u hrani, objavljenog u "Službenom listu BiH" broj 30/11 navedeno da vještačke boje Tartrazin i Sunset žuta mogu imati štetno djelovanje na aktivnost i pažnju djece, ali se još uvijek nalaze na listi odobrenih boja u hrani.

Ključne riječi: vještačke boje, sokovi, hromatografija, spektrofotometrija

2-P-1

Qualitative and quantitative analysis of artificial colors in instant juices

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Abstract

Artificial colors are one of the twenty different categories of additives which presents chemical substances with exactly known structure and with no nutritional value. They are added to food during production to substitute natural color lost during food processing or they can be added so the product looks more attractive. On product labels artificial colors are marked with E numbers. Since they are not a natural food ingredient, artificial colors carry certain health risks. In this research, qualitative and quantitative analysis of artificial colors has been made on fifteen different instant juices available in local market. During qualitative analysis was used a paper chromatography method and for quantitative analysis method of UV/VIS spectrophotometry. Following artificial colors were analyzed: Sunset Yellow (E110), Tartrazine (E102), Amaranth (E123), Indigotine (E132) and Erythrosine (E127). Sunset Yellow and Tartrazine were identified in some samples of instant juice with orange flavor, lemon and mango. In comparison with maximum allowed concentration, which is provided by Regulations of using colors in food (Official Gazette BiH, 85/08), none of the tested samples contained increased level of colour content. However, it should be noted that in the Regulations amending of the Regulations on the use of color in food ("Official Gazette BiH", 30/11) is stated that artificial color, Sunset Yellow and Tartrazine, can cause adverse effect on activity and attention of children, but are still on the list of approved colors in food.

Keywords: artificial colors, juices, chromatography, spectrophotometry

3. TOKSIKOLOGIJA I SIGURNOST HRANE
FOOD SAFETY AND TOXICOLOGY

Farmakološka sredstva za oporavak sportaša

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Sažetak

Sport u modernom vremenu zahtjeva pomjeranje granica performansi ljudskoga tijela. Prema definiciji suplementi ili dodaci ishrani su proizvodi koji svojim aktivnim sastojcima mogu da pomognu, pojačaju ili asistiraju jačanju prirodnih funkcija organizma. Samom upotrebom suplemenata sportisti skraćuju vrijeme oporavka, poboljšavaju performanse i omogućavaju bolju izvedbu na natjecanjima. Nažalost u sportu se pojavljuju sredstva (doping) koja se zloupotrebljavaju s ciljem postizanja boljih rezultatata. Radi bližeg upoznavanja materije dat je pregled najpopularnijih suplemenata (dozvoljenih) i dopinga (nedozvoljenih), skupa sa njihovim mehanizmom djelovanja, koji se u današnje vrijeme koriste kako od strane profesionalnih sportista tako i od strane rekreativaca.

Ključne riječi: sport, suplement, ishrana, doping

3-O-1

Pharmacological agents for athletes recovery

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Abstract

Sports nowadays demands pushing human bodies over their limits. According to definition Sports supplements (also called **ergogenic aids**) are products used to enhance athletic performance that may include vitamins, minerals, amino acids, herbs, or botanicals (plants) — or any concentration, extract, or combination of these. Unfortunately over last few decades there are many pharmacological agents (doping) that are being misused as a illegal and unfair sports performance enhancers. This article gives short review of most popular supplements as well as drugs that are used by professional athletes and amateurs.

Keywords: sports, supplement, doping

Tržište suplemenata za sportaše - primjer BiH

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Sažetak

Netransparentno izakonom neregulisano bosansko-hercegovačko tržište suplemenata za sportaše predstavlja potencijalnu opasnost po zdravlje i sigurnost profesionalnih i rekreativnih sportaša BiH. S obzirom na mogućereperkusijske nekontrolisane konzumacije lako dostupnih ergogena i drugih biološki aktivnih materija na zdravlje pojedinaca, višestruka je problematika koja se vezuje za iste, od zdravstvene ispravnosti, zdravstvene izjave, preko zakonske legislative do kontrole efikasnosti, identiteta i kvaliteta. Cilj ovog rada je bio ispitati stanje sarajevskog tržišta dijetetskih suplemenata primarno namjenjenih sportašima obzirom na njihovo deklarisanje i reklamiranje.

Pregledom preparata dostupnih u postojećim prodavnicama, bibliografskim istraživanjem različitih suplemenata i kontaktiranjem zvaničnih regulatornih i nadležnih institucija BiH spoznali smo da je zabrinutost ne samo opravdana, već i nužna. Rezultati pokazuju da većina suplemenata dospjeva na tržište bez gotovo ikakve kontrole i nerijetko bez svjesnosti institucija BiH o prisutnosti istih. Veliki je broj neregistrovanih preparata što ih čini ilegalnim proizvodima! Ukoliko proizvod odgovara navedenoj deklaraciji, upitna je njegova efikasnost i toksičnost obzirom na kontroverznost i nejasnoću provedenih studija (uglavnom od strane proizvođača). Stoga osiguravanje kontrole u svim segmentima koji se odnose na dijetetske suplemente je prijeko potrebna. Apsolutno je nužno donijeti Pravilnik o dodacima prehrani, te osigurati adekvatnu implementaciju zakonskih propisa.

Ključne riječi: dijetetski suplementi, BiH tržište, sigurnost, zdravstveni efekti

Sports supplement market—example of BiH

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Abstract

The non-transparent and insufficiently regulated BiH market of sports supplements is a potential threat to the health and safety of professional and recreational athletes. With regard to the possible health consequences of uncontrolled consumption of readily available ergogenic and other bioactive substances, multiple problems are associated with supplements use, ranging from safety issues and health claims to the official control of their efficiency, identity and quality. The aim of this work was to investigate the current situation in respect to labeling and advertising of the sports supplements in the city of Sarajevo.

The investigation on the supplements offered in the shops, bibliographic research and the information collected from the official regulatory bodies in BiH shows that there are many reasons for concern. According to our results, the vast majority of (sports) supplements reaches the market virtually with no control and very often without knowledge of the authorities in BiH. There is a huge number of unregistered supplements on the market, which makes them illegal products! Even if the product complies to the information on the label, its effectiveness and toxicity is still questionable due to the inconsistency and ambiguity of the conducted studies (mainly by the manufacturer himself). Thus there is an essential need to ensure a proper control in every segment of dietary supplements production and marketing. It is absolutely necessary to adopt a Regulation on dietary supplements, and to ensure adequate implementation of the legislation.

Keywords: dietary supplements, BiH market, safety, health effects

Implementacija HACCP sistema u školama na području Kantona Sarajevo

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Sažetak

Sistem analize opasnosti i kritičnih kontrolnih tačaka (HACCP) predstavlja sistematičan pristup identifikaciji opasnosti i rizika u postupanju sa namirnicama. U BiH poslovanje po principima HACCP-a dijelom je definisano Zakonom o hrani („Službeni Glasnik BiH“ br. 50/04) i Pravilnikom o higijeni hrane („Službeni Glasnik BiH“ br. 4/13). Udruženje za popularizaciju sigurne hrane je poslije incidenta koji se desio krajem aprila 2015. godine u vrtićima Kantona Sarajevo, pokrenulo inicijativu implementacije HACCP sistema u svim kuhinjama koje posluju u sastavu škola i internata na području Kantona Sarajevo.

Cilj: Prikazati aktivnosti Udruženja kroz projekat „Sigurna hrana za sve“, kao i problematiku pri implemetaciji HACCP-a.

Rezultati: U okviru projekta „Sigurna hrana za sve“ Udruženje je pokrenulo projekte implementacije certifikacije HACCP sistema u školskoj kuhinji Zavoda „Mjedenača“, Prvoj Bošnjačkoj gimnaziji, te u kuhinji Centra Vladimir Nazor. U navedenim objektima izvršen je pregled sanitarno-higijenskih i tehničkih uslova, na osnovu čega su date smjernice i preporuke za korekcije u prostorijama u kojima se vrši manipulacija hranom. Prepreke za implementaciju HACCP sistema u navedenim objektima ogledaju se u nedostatku finansijskih sredstava, kao i pasivnost državnih organa u pomoći za osiguranje istih. Projekat je u potpunosti zaživio u Prvoj Bošnjačkog gimnaziji. Urađena je rekonstrukcija infrastrukture u školskoj kuhinji, edukacija osoblja, te su stvoreni uslovi za implementaciju HACCP sistema.

Zaključak: Odluka o implementaciji HACCP sistema od strane rukovodstva škola i posvećenost usposlenika, predstavlja primjer pozitivne prakse u smislu osiguravanja bezbjednosti hrane u školskim kuhinjama, kao i usklađivanja sistema poslovanja sa zakonskom regulativom BiH.

Ključne riječi: HACCP, školske kuhinje, Kanton Sarajevo

3-O-3

Implementation of HACCP system in schools of Sarajevo Canton

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Abstract

Hazard Analysis and Critical Control Point (HACCP) represents systematic approach to dangers and risk identification in dealing with food. In BiH, implementation of HACCP is partly defined by Food Law ("Službeni Glasnik BiH" No. 50/04) and Hygiene policy ("Službeni Glasnik BiH" No. 4/13). Association for promotion of food safety, after the incident that happened in preschool of Kanton Sarajevo in late April 2015, started the initiative of implementing HACCP to the kitchens that supply the meals to schools in Kanton Sarajevo.

Objective: To show the activity of Association through a project "Safe food for all", and issues with HACCP implementation.

Results: Within the project "Safe food for all", the Association started with preparation for implementation and certification of HACCP systems in school kitchen of "Mjedenica" Institute, First Bosniak High school, and the kitchen of Vladimir Nazor Centre. In these institutions a sanitary-hygienic and technical inspection was conducted, after which are given the directions and recommendations for implementing the HACCP to the compartments in which the food is dealt with. The barriers for implementing HACCP in these institutions include the insufficient funding and lack of support from the state authorities. Project was brought to its full potential in First Bosnian high school. There was a reconstruction of infrastructure in school kitchen, education of staff, and the conditions for implementing HACCP were created.

Conclusion: The decision of implementing HACCP system by the schools' management and the dedication of workers represent an example of positive practice in a sense of securing the safety of food in school kitchens and the coordination of business systems and law regulations of BiH.

Keywords: HACCP, school kitchens, Sarajevo Canton

Trihineloza- epidemiološki i zoonotski potencijalNikolina GALIĆ,¹ Aida DERVIŠAGIĆ,² Noemi ENGI³¹Univerzitet u Sarajevu, Veterinarski fakultet, Katedra za higijenu i tehnologiju namirnica**Sažetak**

Trihineloza je zoonoza raširena u cijelom svijetu uzrokovana nematodom *Trichinella spp.* Parazitarne zoonoze predstavljaju stalnu, neposrednu ili potencijalnu opasnost za ljudsku zajednicu. Radi održavanja parazitskih zoonoza pod kontrolom, nužno je njihovo stalno praćenje, proučavanje odnosno znanstvena obrada prikupljenih podataka s ciljem određivanja uspješnih mjera suzbijanja i prevencije njihova nastanka i širenja. Trihineloza je još uvijek tema koja zaslužuje pozornost struka javnog zdravstva, uključujući i veterinarsku struku na čijoj organizaciji i aktivnosti leži dio prevencije i nadzora nad parazitarnim zoonozama. U ovom radu će biti više riječi o ovoj bolesti kod ljudi koja se na svu sreću u našem području rijetko javlja. Razlog tome je stalna edukacija stanovništva i kontrola životinja na prisustvo trihinele.

Ključne riječi: trihineloza, parazitarne zoonoze, veterinarsko javno zdravstvo

3-O-4

Trichinellosis– epidemiology and zoonotic potential

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Abstract

Trichinellosis is a worldwide zoonotic disease caused by a nematode *Trichinella spp.* Zoonotic parasitic diseases are a constant, immediate or potential danger for human community. In order to maintain zoonotic parasitic diseases under control, continuous monitoring, study, and scientific analysis of the collected data is essential, all with the aim to identify successful measures for the eradication and prevention of the diseases and their spread. Trichinellosis is still an issue for the public health profession, including the veterinary profession that is organizing and conducting activities to prevent and monitor the zoonotic parasitic diseases. In this paper will be discussed about this illness in people who are fortunately in our region is rare. The reason for this is the continuing education of the population and control of animals for the presence of *Trichinella*.

Keywords: trichinellosis, zoonotic parasitic diseases, veterinary public health

Kampilobakterioza – aktuelni problem javnog zdravstva

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Sažetak

Kampilobakterioza predstavlja važan zdravstveni problem, naročito u zemljama sa intenzivnom stočarskom proizvodnjom. Bolest je zoonotskog karaktera, a kao primarni izvori su meso peradi i svinja kao i sirovo ili nedovoljno pasterizirano mlijeko i prerađevine od takvog mlijeka. Bolest se može prenositi i putem vode. Nehigijena ruku radnika može biti također izvor bolesti. Uzročnici kampilobakterioze su *Campylobacter jejuni* kod peradi i *Campylobacter coli* kod svinja. Oba ova patogena mogu biti prisutna u mješanoj infekciji. Posebno se ukazuje u svjetskoj literaturi na učestalost pojava enterokolitisa uzrokovanog sa *Campylobacter jejuni/coli*, koji je kao uzročnik zaraznog proljeva izbio u prvi plan u brojnim zemljama. Danas meso peradi predstavlja jedan od najznačajnijih izvora ove bolesti. Bolest nastala infekcijom sa *Campylobacter spp.* je najčešće gastrointestinalne prirode, ali zabilježene su i infekcije urinarnog trakta, holecistitis i dr. Temperatura i pH medija su značajan faktor u preživljavanju ovog mikroorganizma. Temperatura zamrzavanja od -12°C djeluje sasvim pogubno na *Campylobacter spp.*, ali i visoke temperature koje se primjenjuju u primarnoj fazi obrade trupova tokom šurenja i toplotne obrade proizvoda u industrijskim pogonima, također nisu pogodne za *Campylobacter spp.* Poseban problem predstavlja terapija ove bolesti, jer se u zadnje vrijeme javlja rezistencija na antibiotike, što se može povezati sa građom ove bakterije, ali i nekontrolisanom upotrebom antibiotika, kako u humanoj tako i u veterinarskoj medicini. Zbog navedenih razloga smatramo da veterinarsko-zdravstveni nadzor treba da ima težište u primarnoj animalnoj proizvodnji i preradi animalnih proizvoda, jer je to najefikasniji i najracionalniji sistem kontrole i prevencije od ove i drugih bolesti zoonotskog karaktera.

Ključne riječi: Campylobacter, zoonoze, javno zdravstvo

3-O-5

Campylobacteriosis– current problem of public health

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Abstract

Campylobacteriosis is an important health problem, particularly in countries with intensive animal farming. The disease has zoonotic character, and as the primary sources are poultry and pigs as well as raw or inadequately pasteurized milk and milk products from such. The disease can be transmitted through water. Poor hygiene of the workers can also be a source of disease. The causes of campylobacteriosis are *Campylobacter jejuni* in poultry and *Campylobacter coli* in pigs. Both of these pathogens may be present in mixed infection. Particular points in the world literature on the frequency of occurrence of enterocolitis caused by the *Campylobacter jejuni/coli*, which is as the cause of infectious diarrhea broke out in the forefront in many countries. Today the meat poultry is one of the most important sources of the disease. A disease resulting from infection by *Campylobacter spp.* is the most common gastrointestinal in nature, or have been recorded, and urinary tract infection, cholecystitis, etc. The temperature and pH of the medium were important factors in the survival of the microorganism. Freezing temperature of -12°C works quite devastating on *Campylobacter spp.*, and the high temperature applied in the primary stage of processing of carcasses during scalding and thermal processing products in industrial plants, also are not suitable for survival of *Campylobacter spp.* A particular problem is treatment of the disease, because lately occurring antibiotic resistance, which can be associated with structure of bacteria, but also with the uncontrolled use of antibiotics, both in human and veterinary medicine. For these reasons we believe that the animal health surveillance should have a focus in the primary animal production and processing of animal products, because it is the most efficient and most cost effective system of control and prevention of this disease and other zoonotic diseases.

Keywords: Campylobacter, zoonotic diseases, public health

Toksoplazmoza u javnom zdravstvu

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Sažetak

Toksoplazmoza je multisistemska infekcija uzrokovana protozoarnim parazitom *Toxoplasma gondii* (Nicolle & Manceaux, 1908). Veliki broj potencijalnih međudomaćina za ovu protozou, koji uključuje sisare i ptice, doprinosi globalnoj raširenosti i čini ovu zoonozu jednu od najraširenijih na planeti. Konačni domaćin su jedinke iz porodice mačaka, gdje spada i *Felis catus* L., koja u direktnom suživotu sa ljudima predstavlja primaran izvor infekcije. Mačke se mogu infestirati bilo kojim od tri infektivna stadija *T. gondii* (Nicolle & Manceaux, 1908): tahizoitima, tkivnim cistama ili sporuliranim oocistama. Ukoliko se mačka infestira tahizoitima iz glodara ili sporuliranim oocistama, više od 50% mačaka izlučit će oociste u fecesu, dok ukoliko se infestiraju bradizoitima iz tkivnih cista, skoro sve mačke lučit će u fecesu oociste, koje u vanjskoj sredini sporuliraju. Ljudi se mogu infestirati tkivnim cistama ili sporuliranim oocistama. Najčešći putevi infekcije kod ljudi jeste konzumacija nedovoljno termički obrađenog kontaminiranog mesa, nedovoljna higijena poslije čišćenja mačijeg fecesa, kontaminiranim priborom za jelo, kontaminiranom vodom, nedovoljno pranje ruku nakon rukovanja kontaminiranim namirnicama ili predmeta, kongenitalni prenos i nešto rjeđe transfuzijom zaražene kvi ili transplantacijom zaraženih organa. Ovo oboljenje predstavlja opasnost za imunosupresivne osobe, žene tokom graviditeta (ukoliko prethodno nisu bile infestirane ovim parazitom) i novorođenčad. Cilj ovog rada je ukazati na potencijalnu opasnost ove zoonoze i manjak edukacije vezanu za ovu bolest.

Ključne riječi: Toxoplasma, gondii, mačke, zdravlje, protozoa

3-O-6

Toxoplasmosis in public health

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Abstract

Toxoplasmosis is a multisystemic infection caused by ingestion of *Toxoplasma gondii* (Nicolle & Manceaux, 1908), an obligate intracellular protozoan parasite. A large number of possible interhosts, including mammals and birds, contributes to the global prevalence and makes this disease one of the most widespread zoonoses in the world. The final hosts are animals from cat family, where belongs *Felis catus* L., which is in direct coexistence with human and represents the primary source of infection. Cats become infected with any of the three infective stages of *T. gondii* (Nicolle & Manceaux, 1908): tachyzoite, tissue cysts or sporulated oocysts. If the cats are infected by tachyzoite from rodents or sporulated oocysts, more than 50% of cats will excrete oocysts in faeces, while if cats are infested with bradyzoites of tissue cysts, almost all cats will be excreting oocysts in faeces, which sporulate in the external environment. People can be infected by tissue cysts or sporulated oocysts. The most common routes of infection in humans is consumption of contaminated meat, insufficient of hygiene after cleaning the cat's feces or hand washing after handling contaminated food or objects, contaminated utensils, contaminated water, congenital transmission and something rarely transfusions of infected blood or transplantation of infected organs. This disease poses a threat to immunosuppressive people, women during pregnancy (if not previously infested with these parasites) and infants. The goal of this paper is to point out the potential danger of zoonoses and lack of education related to this disease.

Keywords: Toxoplasma, gondii, cats, health, protozoa

RASFF sistem kao alat za osiguranje sigurnosti hrane

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Sažetak

Osiguranja sigurnosti i kvalitete hrane u EU, a i globalno, važan je element u brizi za javno zdravlje. RASFF (Rapid Alert System for Food and Feed), osnovni je alat za razmjenu informacija između kompetentnih institucija u slučaju direktne ili indirektno prijetnje po zdravlje ljudi.

Cilj ovog rada je prikazati način funkcionisanja RASFF sistema, te dosadašnja iskustva u njegovoj implementaciji u Bosni i Hercegovini (BiH).

Rezultati: Prema Uredbi br. 178/2002 Evropskog parlamenta i Vijeća, Evropska komisija je uspostavila Sistem brzog uzbunjivanja RASFF, koji je dodatno regulisan Regulativom (EZ) br. 16/2011. U skladu sa navedenom Regulativom kada zemlja članica RASFF mreže ustanovi na osnovu analize svih raspoloživih podataka postojanje ozbiljnog rizika koji zahtijeva ili bi mogao zahtijevati trenutnu akciju u drugoj zemlji članici, šalje obavještenje Evropskoj agenciji za sigurnost hrane (EFSA). Obavještenje sadrži sve dostupne informacije vezane za rizik i proizvod od kojeg rizik potiče. EFSA po prijemu obavještenja, isto dostavlja na verifikaciju svim članicama mreže u roku od 24 sata nakon prijema. BiH kao "treća zemlja" članica RASFF mreže, putem svoje nacionalne kontaktne tačke, Agencija za sigurnost hrane prima RASFF obavijesti ukoliko se zna da je proizvod koji je predmet obavijesti izvezen, te ako je proizvod koji je predmet obavijesti porijeklom iz BiH. Nakon prijema obavještenja u zemlji se provodi niz mjera koje su opisane procedurom, a koje za cilj imaju zaštitu zdravlja potrošača.

Zaključak: Razmjena informacija putem RASFF sistema pomaže svim državama članicama RASFF mreže da djeluju brže i efikasnije u slučaju zdravstvenih prijetnji koje potiču od hrane.

Ključne riječi: RASFF, sigurnost hrane, BiH

RASFF system as the tool for ensuring food safety

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Abstract

Ensuring the safety and quality of food in the EU and globally, is an important element in the care of public health. RASFF (Rapid Alert System for Food and Feed), the main tool for exchanging information between the competent institutions in case of direct or indirect threat to human health.

The aim of this article is to describe how the RASFF system works, and previous experiences in its implementation in Bosnia and Herzegovina (B&H).

According to Regulation No. 178/2002 of the European Parliament and the Council, the European Commission has established RASFF system, which is additionally regulated by the Regulation No. 16/2011. In accordance to this Regulation the Member States immediately sends notification to the European Food Safety Authority in case of existence of a serious risk that requires or might require immediate action in another Member State. The notification includes all available information on risk and the product from which the risk originates. EFSA sends notifications to all member states on verification within 24 hours after receiving. B&H as a "third country" in RASFF network, through national contact points The Food Safety Agency receives notification only if product was exported in B&H or originally from B&H. After receiving the notification series of measures which are described with procedures are implemented, with aim to protect health of consumers.

Conclusion: The exchange of information through the RASFF system helps all Member States of RASFF network to react faster and more effectively.

Keywords: RASFF, food safety, B&H

Mikroplastika u hrani: higijenski proizvodi kao mogući izvor kontaminacija

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Sažetak

Odabrani higijenski proizvodi komercijalno dostupni na bosanskohercegovačkom tržištu kvantitativno su analizirani na sadržaj mikroplastike, kao mogućeg kontaminanta okoliša. Mikroplastika se dodaje u higijenske proizvode u svrhu povećanja volumena i poboljšanja dejstva istih. Svakodnevna upotreba proizvoda ovog tipa za posljedicu ima kontaminaciju obalnih voda, primarno putem otpadnih voda. Posljedično tome nerijetko biva ingestirana od strane brojnih konzumenata, od kojih se mnogi koriste u ljudskoj ishrani. Potrebno je naglasiti da priprema brojnih marinskih vrsta ne uključuje eliminaciju gastrointestinalnog traka, mikroplastika na koncu završava u ishrani čovjeka. Prisustvo mikroplastike ispitivana je na tri uzorka sačinjena sa deset higijenskih produkata različitih proizvođača od kojih je analizirano po 10 ml samog produkta. Pomenuti uzorci su podvrgnuti laboratorijskim eksperimentima koji su obuhvatali različite fizičko-hemijske tretmane. Stereomikroskopskim i svjetlosnomikroskopskim opserviranjem izvršena je kvalitativna analiza mikroplastika koja je detaljno prezentirana u ovom radu.

Ključne riječi: mikroplastika, ishrana, kozmetika, kontaminacija, ribe

3-P-1

Microplastics in food: hygienic products as a possible source of contamination

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Abstract

The chosen hygienic products that are commercially available on the Bosnian market have been quantitatively analyzed on the content of microplastics as a possible environmental pollutant. Microplastics are added in hygienic products with the purpose of raising the volume and enhancing the intensity of the product. Using these hygienic products on a daily basis can lead to contamination of coastal waters, primarily through waste waters. As a consequence, microplastics are often ingested by many consumers, many of which are used in the human diet. It is important to emphasize that meal preparation of countless marine species does not include the elimination of digestive tract and ultimately microplastics end up in human food. The presence of microplastics has been examined on three samples, each made of 10 hygienic products from different producers, where 10 ml of each has been used. The mentioned samples were exposed to laboratory experiments that included different physical and chemical treatments. Microplastics were qualitatively analyzed with both stereomicroscope and compound microscope, obtained results are described in this paper.

Keywords: microplastics, diet, hygiene, contamination, fish

Mikroplastični kontaminanti digestivnog i respiratornog sistema konzumne ribe *Sprattus sprattus* Linnaeus, 1758 dostupne na BiH trzistu

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Sažetak

Kontaminacija marinskih staništa mikroplastikom kao fenomen počinje se aktivno istraživati krajem prošlog vijeka. Pomenuta nerijetko biva ingestirana od različitih marinskih konzumenata, a može biti transportirana duž trofičkog lanca, što se direktno odražava na čovjeka kroz ishranu. Ispitivanje sadržaja različitih sintetskih i semisintetskih mikroplastičnih kontaminanata unutar konzumnih skupina riba je sprovedeno na vrsti *Sprattus sprattus*, L. Pomenuta skupina naseljava marinske ekosisteme koji su u visokom stepenu izloženi kontaminaciji, čime se povećava stepen prisutnosti mikroplastičnih polutanata u jedinkama pomenute vrste, koje dospjevaju u organizam čovjeka potencijalno uzrokujući metaboličke promjene. Prikupljeno je po 30 uzoraka jedinki iz ribarnica i veleprodajnih centara, što je omogućilo komparativnu analizu istih na nivou različitih ciljanih dijelova tijela koji obuhvataju digestivni i respiratorni sistem. Ciljani organski sistemi ispitivanih jedinki su tretirani 30% peroksidom, nakon čega je izvršena vakuumska filtracija te filtracija destilovanom vodom na filter papiru. Pripremljeni su preparati, koji su pregledani pod svjetlosnim mikroskopom te je utvrđeno prisustvo čestica mikroplastike u ispitivanim organskim sistemima. Rezultati dobiveni u ovom radu pružaju direktan uvid u sastav i količinu mikroplastičnih kontaminanata prisutnih u ispitivanoj vrsti, koji se na koncu mogu naći i u humanoj ishrani.

Ključne riječi: mikroplastika, kontaminacija, konzumna riba, ishrana

3-P-2

Microplastic contaminants of the digestive and respiratory system of consumer fish *Sprattus sprattus* Linnaeus, 1758 available at markets within Bosnia and Herzegovina

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Abstract

The contamination of marine ecosystems by microplastics has been a subject of research starting with the end of last century. The previously mentioned contaminant is often ingested by different marine consumers and can be transported along the trofic chain, directly affecting the humans through their diet. Examination of the content of various synthetic or semisynthetic microplastic contaminants within the consumer groups of fish has been conducted on the fish species *Sprattus sprattus*, L. The mentioned groups inhabit marine ecosystems exposed to contamination at a high level, which increases the degree of presence of microplastic pollutants in the individuals of the targeted fish species, often reaching the human organism and potentially causing metabolic changes. Thirty samples have been collected both from fish markets and supermarkets. This enabled comparative analysis of the samples of targeted body parts that include the respiratory and gastrointestinal system. Targeted organ systems have been treated with 30% peroxide, after which vacuum filtration and filtration with destiled water on to filter paper have been conducted. The samples were then examined by microscope and the presence of microplastic particles was confirmed in the targeted organ systems. The results presented in this paper provide direct insight in the contents od ammount of microplastic contaminants present in the selected fish species that can ultimately be found in the human diet.

Keywords: microplastic, contamination, consumer fish, diet

Mikotoksini u lancu ishrane

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Sažetak

U današnjim ekološki narušenim uvjetima življenja problem mikrobne kontaminacije hrane, primarno patogenim mikroorganizmima, odnosno njihovim toksinima, tokom čitavog prehrambenog lanca (od polja do stola) na svjetskoj razini poprima sve veći značaj. Razlog tome je zaštita zdravlja ljudi i životinja, zaštita ekonomije i trgovine, uz dosljedno pridržavanje zakonske regulative. Štetan utjecaj konzumiranja pljesnive hrane na zdravlje ljudi i životinja poznat je od davnina, ali specifičan uzrok dugo nije bio poznat. Cilj ovog rada ukazati na značaj mikotoksina, prevenciju njihovog razvoja, te metode (tretmanima) koje se provode u slučaju pojave mikotoksina, a u skladu sa zakonskom regulativom u zaštiti zdravlja ljudi i životinja. Svaka materija može biti toksična ako je sadržana u dozi koja može prouzrokovati toksični efekat. Zato je nizom procedura određena doza materije koja se može naći u hrani, a da neće dovesti u pitanje sigurnost zdravlja. To je definisano Zakonskom regulativom o hrani. Do sada nije pronađena nijedna metoda koja može ukloniti aflatoksine upotpunosti iz žitarica i mlijeka, mada se taj broj može smanjiti primjenom nekih metoda. Stoga je bit u prevenciji, jer ako nema aflatoksina u žitnoj hrani, neće ih biti ni u mlijeku, ni u mesu životinje, a time ni u hrani koju konzumiraju ljudi.

Ključne riječi: aflatoksini, prevencija, zakonska regulativa

Mycotoxins in food chain

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Abstract

In today's environmentally disrupted conditions of life, problem of microbial contamination of food, primary pathogens or their toxins, throughout the whole food chain (from farm to fork) at the global level takes on higher significance. The reason for this is to protect human and animal health, environmental economics and trade, with consistent adherence to regulations. Bad effects of consuming moldy food on human and animal health has been known since ancient times, but the specific cause was not known for a long time. The aim of this study is to highlight the importance of mycotoxins, to prevent their development and methods (treatments) which should be implemented in case of mycotoxins presence, and in accordance with legislation to protect human and animal health. Any substances can be toxic if it is present in a dosage that can cause toxic effects. Therefore, specified dose of substances that can be found in food and can not cause devastating effects to health security is determined with a series of procedures. It is defined by food legislation. So far, there is no any method that can remove aflatoxins completely from cereal and milk, although this number can be reduced by using certain methods. Therefore, it is the prevention, since if no aflatoxin in cereals, they will not be present in the milk, even in meat, and therefore not in the food for human consumption.

Keywords: aflatoxin, prevention, legislation

Fizičko - hemijska svojstva livadskog meda sakupljenog na području Kantona Sarajevo

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Sažetak

Svjedoci smo da postoje industrije, odnosno proizvođači kojima je potrošač na prvom mjestu, a kvalitet njihovog proizvoda konstantan i neupitan. Nažalost, mnogo je i onih proizvođača kojima je osnovni cilj prodaja proizvoda i „maskiranje“ određenih nedostataka koje proizvod ima.

U ovom radu su prikazani rezultati istraživanja sprovedenih na uzorcima meda koji su prikupljeni sa tržišta (trgovačkih marketa) i direktno od proizvođača. Primarni cilj ovoga rada je bio da se na osnovu fizičko - hemijskih parametara procijeni kvalitet livadskog meda u zavisnosti od mjesta kupovine. Svi uzorci su pripremljeni na odgovarajući način i u njima je određen sadržaj vlage, kiselosti, električna provodljivost i HMF.

Rezultati su pokazali da je prosječna vlaga za uzorke tržišnog livadskog meda 17,43%, a za uzorke meda prikupljenih direktno od proizvođača 16,83%. Prosječna kiselost je bila viša kod uzoraka prikupljenih direktno od proizvođača (25,95 meqv./1000g) za razliku od uzoraka nabavljenih na tržištu (18,60 meqv./1000g). HMF za uzorke sa tržišta je imao prosječnu vrijednost 62,59 mg/kg, a za uzorke koji su prikupljeni direktno od proizvođača 12,19 mg/kg. Električna provodljivost je bila viša kod uzoraka livadskog meda prikupljenih direktno od proizvođača (0,923 mS/cm) u odnosu na tržišne uzorke (0,375 mS/cm). Za kiselost, provodljivost i HMF je pokazana statistički značajna razlika u srednjim vrijednostima između uzoraka kupljenih na tržištu i prikupljenih direktno od proizvođača, dok se uzorci nisu statistički značajno razlikovali u prosječnom sadržaju vode. Od ukupno 10 ispitivanih medova sa tržišta 80% ima neadekvatnu deklaraciju, dok 20% uopće nema deklaracije.

Ključne riječi: livadski med, vlaga, kiselost, električna provodljivost, HMF

3-P-4

Physicochemical properties of meadow honey collected in the area of the Sarajevo Canton

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Abstract

We are witnesses that there are industries and producers who put consumer at the first place and quality of their products is constant and unquestionable. Unfortunately, there are many of them whose primary goal is to sell products and „camouflage/mask“ deficiencies of products.

This paper presents the results of research which are carried out on the honey samples collected from the market (retail market) and directly from the producers. The main aim of this study was to evaluate the quality of meadow honeys (bought on different places) based on the physical-chemical parameters. All samples were prepared appropriately and analysed content of the moisture, acidity, electrical conductivity and HMF.

The results showed that the average content of the moisture for honey samples from the market was 17,43% and for samples collected directly from the producers 16,83%. The average acidity was higher in samples which are bought directly from the producers (25,95 meqv/1000g) unlike the honey samples bought at the market. (18,60 meqv/1000g). For samples which are bought from market average results of HMF were 62,59 mg/kg, while the HMF results for samples collected directly from the producers were 12,19 mg/kg. Electrical conductivity was higher in honey samples collected directly from the producers (0,923 mS/cm) compared to the samples bought from market (0,375 mS/cm). There are statistically significant difference in average values of acidity, conductivity and HMF between samples bought in the market and collected directly from producers. On the other hand, there aren't statistically significant differences in average values of water content between samples collected from different places. From ten total analyzed honeys bought on the market 80% of them had appropriate declaration, while 20% didn't have declaration at all.

Keywords: meadow honey, moisture, acidity, electrical conductivity, HMF

Upotreba Ginkgo bilobe (*Ginkgo biloba L.*), djelovanje i toksikologija

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Sažetak

Ginkgo biloba (fam. Ginkgoaceae) je drvo sa karakterističnim listovima. Iako je to biljka porijeklom iz Azije, njen ekstrakt je jedan od najčešće prodavanih biljnih dodataka prehrani u svijetu. Prženo sjeme ginkga bez pulpe smatra se jestivom namirnicom u Japanu i Kini. Njegovi biološki efekti uključuju: smanjenje oksidativnog stresa, popravku neuroloških oštećenja, smanjenje agregacije trombocita, antitumorsko djelovanje i prevenciju starenja. Klinički je našao svoju primjenu u tretmanu nekih poremećaja CNS-a, kao što su Alzheimer-ova bolest i kognitivni deficiti. Takođe se koristi za tretman stanja povezanih sa usporenom moždanom cirkulacijom, posebno kod starijih osoba. List ginkga se koristi u tretmanu poremećaja pamćenja izazvanog hemoterapijom ili depresijom. Zbog potencijalnog povećanog rizika od krvarenja, potreban je oprez kod njegove upotrebe tokom trudnoće i dojenja. Obzirom da povećava rizik od krvarenja, potrebno je izbjegavati njegovu primjenu kod osoba sa poremećajem koagulacije krvi ili kod istovremenog uzimanja antikoagulatnih lijekova. Neki od neželjenih efekata ginkga su: abdominalna bol, konstipacija, diareja, povećan apetit, inflamacija anusa i rektuma, povećan nivo inzulina u krvi, promjene u ponašanju, zamućen vid, vrtoglavica, edem, smanjena plodnost, poremećen srčani ritam i rad srca, hemoragija, intrakranijalna krvarenja, gubitak svijesti, srčani arrest, koma, smrt. mučnina. Obzirom na značajno povećanje upotrebe biljnih dodataka prehrani, veoma je važno da regulatorna tijela provedu adekvatne mjere zaštite javnog zdravlja, na način da osiguraju da su ovakvi proizvodi sigurni i odgovarajućeg kvaliteta.

Ključne riječi: dodaci prehrani, bolesti CNS, biološki i toksikološki efekti

3-P-5

Usage of ginkgo biloba (*Ginkgo biloba L.*), its effects and toxicology

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Abstract

Ginkgo biloba (fam.Ginkgoaceae) is a large tree with fan-shaped leaves. Although Ginkgo is native parts of Asia, its extract is among the most widely sold herbal dietary supplements in the world. In foods, roasted ginkgo seed, which has the pulp removed, is an edible delicacy in Japan and China. Its biological effects include: lowering oxidative stress; reducing neural damages, reducing platelets aggregation; anti-tumor activities; and anti-aging. Clinically, it has been prescribed to treat CNS disorders such as Alzheimer's disease and cognitive deficits. It is also used for conditions that seem to be due to reduced blood flow in the brain, especially in older people. Ginkgo leaf is also used for thinking disorders related to chemotherapy and depression. Ginkgo should be used with caution during pregnancy, due to the potential for increased bleeding risk, and during breast feeding. Ginkgo may increase the risk of bleeding, therefore it should be avoided in people with bleeding disorders or taking drugs that may increase the risk of bleeding. Ginkgo may also cause altered insulin levels, behavioral changes, blurred vision, cardiac arrest, coma, constipation, death, diarrhea, dizziness, edema, fertility reduction, gastrointestinal pain, heart disorders, irregular heartbeat, hemorrhage, increased appetite, inflammation of the anus and rectum, internal bleeding in the skull or brain, loss of consciousness, nausea. Since the use of herbal dietary supplements grows rapidly, it becomes imperative, that regulatory authorities put in place appropriate measures to protect public health by ensuring that these products are safe and of suitable quality.

Keyword: Dietary supplement, CNS disorders, Biological and toxicological effects

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

Razvoj jednostavne metode ekstrakcije rezidua lijekova iz riba

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Sažetak

Rezidue lijekova u okolišu su rastući problem zbog njihovog stalnog otpuštanja u okoliš i mogućeg uticaja na vodene organizme. Izbor ciljnih supstanci za određivanje u tkivu riba zasniva se na njihovim fizičko-hemijskim osobinama, potencijalu za bioakumulaciju i rezultatima prethodnih ispitivanja u efluentu iz WWTP Sevnica u martu 2015. Za praćenje smo odabrali tramadol, risperidon, desipramin, karbamazepin, irbesartan, naproksen, valsartan, atorvastatin, triklosan, simvastatin i diklofenak. Metoda je razvijena za mišićno tkivo riba i zasniva se na njegovoj homogenizaciji, ekstrakciji s acetonitrilom, centrifugiranju i prečišćavanju ekstrakcijom na čvrstim fazama (SPE). Instrumentalna analiza je provedena primjenom LC-MS/MS sistema. Najbolje i najreproducibilnije iskorištenje (*recovery*) postignuto je kod uzoraka razblaženih do 25 mL sa 50 mM fosfatnim puferom pH 7. Metoda je validirana i određena linearnost za raspon koncentracija 0.1 – 1000 ng/g, u zavisnosti od ispitivane supstance. Iskorištenja za ispitivane lijekove kretala su se u rasponu od 24.0 – 108.5%, sa dobrom reproducibilnošću (RSD vrijednosti za sve supstance je bila manja od 7.5%). Vrijednosti LOQ su bile u rasponu od 0.1 – 50 ng/g. Metoda je primijenjena na uzorke tkiva riba izlovljenih u rijeci Savi i iz vještačkog uzgoja. Za analizu su odabrani mišićno tkivo, jetra, koža i uzorci tkiva bubrega. Rezultati su pokazali prisustvo tramadola i karbamazepina u nekim od ispitivanih uzoraka, ali su koncentracije bile ispod LOQ metode.

Ključne riječi: residue lijekova, riba, SPE, LC-MS/MS

4-O-1

Development of a simple method for the extraction of pharmaceuticals from fish

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Abstract

Pharmaceuticals are considered as emerging pollutants of particular concern due to their continuous release into the environment and the potential impact on aquatic organisms. The selection of the target compounds for evaluation in fish tissue was based on physico-chemical properties, bioaccumulation potential and the results of the screening of pharmaceuticals in the effluent of WWTP Sevnica in March 2015. We chose tramadol, risperidone, desipramine, carbamazepine, irbesartan, naproxen, valsartan, atorvastatin, triclosan, simvastatin and diclofenac. The method was developed on muscle tissue and is based on the tissue homogenization with stainless steel beads, followed by extraction with acetonitrile, centrifugation and sample clean-up with solid-phase extraction (SPE). The instrumental analysis was performed with LC-MS/MS. The best and the most reproducible recoveries were observed for the samples that were diluted to 25 mL with 50 mM phosphate buffer pH 7. The method was validated and the linearity range was established, which was in the range of 0.1 – 1000 ng/g, depending of the compound. The recoveries for the target pharmaceuticals were in the range of 24.0 – 108.5 %, with good reproducibility as the relative RSD values for all compounds were below 7.5 %. LOQ values for the compounds were in the 0.1 – 50 ng/g range. We applied the method to the fish tissue samples from the river Sava and from the aquaculture establishment. We chose muscle, liver, skin and kidney tissue samples. The results showed presence of tramadol and carbamazepine in some tissue, but the concentrations were below the LOQ.

Keywords: pharmaceuticals, fish, SPE, LC-MS/MS

Uticaj crne čokolade na karijes

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Sažetak

Karijes se javlja kao posljedica fermentacije šećera u kiseline pod uticajem bakterija, pri čemu nastala kiselina oštećuje caklinu zuba i vodi ka stvaranju šupljina. Supstance prisutne u kori kakao zrna imaju antibakterijsko djelovanje i sprečavaju nastanak plaka. Cilj rada je napraviti pregled istraživanja koja pokazuju da je ekstrakt kakaoa efikasniji od fluorida u sprečavanju karijesa. Najbolji terapijski efekat se postiže žvakanjem kakao-loma. Većini ljudi ovakva primjena nije privlačna zbog neprijatnog ukusa. Drugi najbolji izbor je crna čokolada sa sa manje od 6-8 grama šećera po serviranju – po mogućnosti iz organski proizvedena. Čokolada sadrži više od 300 supstanci, što je čini jednom od najkompleksnijih poznatih živežnih namirnica, te smatramo da mnoge od njih imaju još neotkrivene korisne efekte. Sirova čokolada je još i bolji izbor jer nije intenzivno procesirana i sadržava više sačuvanih izvorni prisutnih antioksidanasa.

Keywords: crna čokolada, karijes, šećer, plak, supstance

4-O-2

The impact of dark chocolate in tooth decay

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Abstract

Tooth decay occurs when bacteria in the mouth turn sugar into acids, which eat away at the tooth's surface and cause cavities. Compounds in the cocoa bean husk have an anti-bacterial effect and also fight against plaque. Our aim was to bring an review of research, which has even revealed that the cocoa extract is more effective than fluoride in fighting cavities. For the best therapeutic effect, it's best to chew on cacao nibs. Most will find this option unpalatable. The second best choice, is dark chocolate with less than 6-8 grams of sugar per serving – organic if possible. Chocolate has over 300 chemical compounds in it, making it one of the most complex foods we know of, and we predict that many new compounds in chocolate beneficial. Raw chocolate is even a better choice, as it it less processed, and more of the antioxidants are left intact.

Keywords: dark chocolate, decay, sugar, plaque, compounds

Određivanje antioksidativnog kapaciteta acai bobica (*Euterpe oleracea L.*)

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Sažetak

Priča o antioksidansima i njihovom velikom utjecaju na zdravlje, svima je poznata. Kroz brojna istraživanja i studije otkriven je njihov mehanizam i spektar djelovanja. Poznato je da antioksidansi djeluju tako što stupaju u reakciju sa slobodnim radikalima, oslabe ih i deaktiviraju. Na taj način štite naše stanice od oksidativnog djelovanja slobodnih radikala koji u organizmu nastaju svakodnevno. Antioksidansi su tako pronašli svoje mjesto u prevenciji i liječenju kardiovaskularnih bolesti, inflamatornih stanja kao i nekih malignih procesa. Kao bogat izvor antioksidanasa u posljednje vrijeme se navode Acai bobice (*Euterpe oleracea L.*) koje spadaju u skupinu crnog bobičastog voća, porijeklom iz Srednje i Južne Amerike. Osim snažnog antioksidativnog djelovanja, predstavljaju bogat izvor vitamina, minerala, aminokiselina i dr. spojeva. Cilj našeg rada bio je odrediti antioksidativni kapacitet komercijalnog proizvoda koji sadrži ekstrakt acai bobica. U tu svrhu urađeno je osam različitih testova, kojima su određivani sadržaj ukupnih polifenolnih spojeva (flavonoidnih i neflavonoidnih), sadržaj antocijanidina, te antioksidativni kapacitet korištenjem DPPH, FRAP i TEAC metode.

Ključne riječi: Acai, antioksidansi, polifenoli

4-O-3

Determination of the antioxidant capacity of acai berries (*Euterpe oleracea L.*)

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Abstract

Story about antioxidants and their great impact on the health is well known. Their mechanism and spectrum of activity have been discovered through numerous researchs and studies. Antioxidants react with free radicals, free radicals becoming weak and inactivate. By this way, antioxidants protect our cells from oxidative effects of free radicals, which are generated in the body on the daily base. Antioxidants have also found their place in the prevention and treatment of cardiovascular diseases, inflammatory conditions and certain malignant processes. As a rich source of antioxidants recently mentioned are Acai berries (*Euterpe oleracea L.*), which belong to the group of black berries, native to Central and South America. Except their strong antioxidant action, they represent rich source of vitamins, minerals, amino acids and others compounds. The aim of our study was to determine the antioxidant capacity of commercial products containing extract of acai berries. For this point, we did eight different tests, which determine the content of total polyphenols (flavonoids and anti-flavonoids), the content of anthocyanins and antioxidant capacity using DPPH, FRAP and TEAC methods.

Keywords: Acai, antioxidants, polyphenols

Zastupljenost nezasićenih masnih kiselina kod različitih vrsta lipida

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Sažetak

Nezasićene masne kiseline igraju važnu ulogu u ljudskoj ishrani i imaju povoljne učinke na organizam i zdravlje. Cilj ovog rada je bio odrediti udio nezasićenih masnih kiselina u lipidima biljnog i životinjskog porijekla, koji se najviše koriste u ishrani. Analizirani su uzorci tikvinog, konopljinog, lanenog, čurekotovog, maslinovog, kokosovog i suncokretovog ulja, te puter, koziji loj i svinjska mast. Korištena metoda se zasnivala na određivanju jodnog broja titracijom sa natrijum-tiosulfatom. Jodni broj predstavlja onu količinu joda koju može vezati adicijom neka mast (ulje) ili masna kiselina. Dobijeni rezultati su upoređeni sa podacima proizvođača istaknutim na pakovanju. Kod biljnih masnoća najveća vrijednost jodnog broja je bila kod suncokretovog ulja (121,8), a najmanja kod tikvinog ulja (60,9). Kada su u pitanju životinjske masnoće, jodni broj svinjske masti (121,8) je najveći, dok kod putera iznosi 35,5. Rezultati pokazuju na veću zastupljenost nezasićenih masnih kiselina kod suncokretovog, maslinovog i kokosovog ulja, te svinjske masti u odnosu na deklaracije proizvođača, dok je niži broj nezasićenih masnih kiselina uočen kod putera, tikvinog, lanenog ulja u odnosu na deklaracije. Ulje čurekota, konoplje i koziji loj su imali identičan jodni broj kao što je prikazano na deklaraciji proizvođača.

Ključne riječi: nezasićene masne kiseline, ulje, mast

4-P-1

The Content of Unsaturated Fatty Acids in Different Lipids

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Abstract

Unsaturated fatty acids play an important role in human diet and have beneficial effects on the organism and health in general. The aim of this research was to determine the unsaturated fatty acids content in fats that are used most frequently in our diet, of both vegetable and animal origin. Tested samples were from pumpkin seed oil, hemp oil, flaxseed oil, black seed oil, olive oil, coconut oil and sunflower oil, and also from butter, goat fat and lard. The used method was based on determination of iodine number by titration with sodium thiosulfate. The iodine number stands for the amount of iodine that can be bound by addition by some fat (oil) or fatty acid. The results were compared with the data from the producers' declarations and nutrition facts. The largest iodine number was in sunflower oil (121,8) and the lowest was from pumpkin seed oil (60,9) in vegetable fat. In animal fat testing, the iodine number of lard (121,8) was the largest, while butter had lowest iodine value (35,5). Results shows that sunflower, coconut, olive oil and lard had higher amount of unsaturated fatty acids in relation to declaration of the manufacturer. Lower number of unsaturated fatty acids was obtained in butter, pumpkin seed, linseed oil in relation to declaration of the manufacturer. Black cumin seed oil, hempseed oil and goat fat had similar iodine values as declared by producer.

Key words: unsaturated fatty acids, oil, fat

***In vitro* ispitivanje inhibitornog djelovanja ploda divlje borovnice sa planine Vranica na rast bakterija**

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Sažetak

Ovim istraživanjem je ispitivano inhibitorno djelovanje svježeg ploda divlje borovnice (*Vaccinium myrtillus* L.) sa planine Vranica (srednja Bosna i Hercegovina) na rast odabranih Gram-negativnih bakterijskih sojeva: *Escherichia coli* ATCC 25922 i *Salmonella enteritidis* (klinički izolat), kao i Gram-pozitivnih sojeva *Enterococcus faecalis* ATCC 29212 i meticilin-rezistentni *Staphylococcus aureus* ATCC 25923. U tu svrhu je urađena disk-difuziona metoda ispitivanja osjetljivosti bakterija. Rezultati su pokazali da pokožica ploda borovnice ima veće antibakterijsko djelovanje u odnosu na pulpu ploda. Također, evidentirano je da biološki aktivne materije ploda borovnice imaju baktericidno i bakteriostatičko djelovanje. Najosjetljivija bakterija je bila MRSA, dok se kao najotpornija pokazala *Salmonella enteritidis*. Općenito, Gram-pozitivne bakterije su u prosjeku bile osjetljivije u odnosu na Gram-negativne bakterije, što se tumači različitom građom njihovog ćelijskog zida. Na osnovu rezultata istraživanja se može zaključiti da plodovi *V. myrtillus* djeluju antibakterijski protiv ispitivanih test-mikroorganizama, koji su jedni od najčešćih uzročnika alimentarnih intoksikacija.

Ključne riječi: borovnica, bakterije, pokožica, pulpa

***In vitro* testing of inhibitory effects of wild bilberry fruit from mountain Vranica on bacterial growth**

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Abstract

This research tested inhibitory effects of fresh wild bilberry fruit (*Vaccinium myrtillus* L.) from mountain Vranica (central Bosnia and Herzegovina) on growth of selected Gram-negative bacteria: *Escherichia coli* ATCC 25922 and *Salmonella enteritidis* (clinical isolate), as well as Gram-positive bacteria: *Enterococcus faecalis* ATCC 29212 and methicillin-resistant *Staphylococcus aureus* ATCC 25923. Inhibitory effects were tested by disc diffusion method. Obtained results have shown that fruit exocarp (skin) has higher antibacterial activity than mesocarp (flesh). Also, it is recorded that biologically active compounds from bilberry fruit have bactericidal and bacteriostatic activity. Among tested bacteria, the most sensitive was MRSA, while most resistant bacteria was *Salmonella enteritidis*. Generally, Gram-positive bacteria were more sensitive than Gram-negative bacteria, which is explained by different structure of their cell wall. Based on these results, it can be concluded that *V. myrtillus* fruit has shown antibacterial effects on tested microorganisms which can cause alimentary toxic infections.

Keywords: bilberry, bacteria, exocarp, mesocarp

5. ISHRANA TOKOM ŽIVOTNOG CIKLUSA
LIFECYCLE NUTRITION

Ishrana kao faktor rizika za nastanak kardiovaskularnih bolesti

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Sažetak

Uvod Nepravilna ishrana predstavlja jedan od egzogenih (spoljašnjih) etioloških činioca za pojavu kardiovaskularnih bolesti. Uticaj ishrane tokom dužeg perioda dovodi do promjena koje se manifestiraju kao funkcionalni, a kasnije organski poremećaji ćelija, tkiva i organa.

Cilj Uočiti uzročno-posljedičnu vezu dugogodišnjih prehrambenih navika na nastanak kardiovaskularnih bolesti lica treće životne dobi. Podaci su praćeni pregledom medicinske dokumentacije pacijenata sa dijagnosticiranom kardiovaskularnom bolesti i anketnim upitnikom kvalitete života MANSA (Priebe i sur.,1999). Istraživanje je provedeno u periodu od 01.01.2015. god do 01. 05. 2016. god. pri Centru za profesionalnu zdravstvenu i palijativnu njegu Ruhama. U radu je primjenjena deskriptivno-analićka metoda.

Rezultati Ispitivanjem je obuhvaćeno 300 lica treće životne dobi. Praćene su prehrambene navike, postojanje kardiovaskularne bolesti, fizićka sposobnost, psihosocijalne karakteristike, kvaliteta života, upražnjavanje zdravih i štetnih navika. Ispitivanjem je zapažen uticaj prehrane i stilova života kao vanjskih faktora na razvoj kardiovaskularnih bolesti.

Zaključak Kardiovaskularne bolesti prema rasprostranjenosti predstavljaju najmasovnije bolesti današnjice koje prema mortalitetu zabrinjavaju tendencom rasta i pobolijevanja. Tokom istraživanja uočeno je da najveći broj bolesnika koji se kategoriziraju kao pretili imaju direktnu vezu sa obolijevanjem. Prema podacima gotovo zanemariv broj bolesnika ima idealnu tjelesnu masu (ITM), dok se analizom dokazalo da muškarci u ispitnom uzorku imaju prosjećno veći ITM, što je pokazatelj veće učestalosti pojave pretilosti kod muškog spola, dok kod ženske populacije ispitivanog uzorka, žene imaju manju učestalost ITM u granicama normalne tjelesne težine. Zaključuje se kako je pri prevenciji nastajanja koronarnih bolesti naglasak na pravilnoj prehrani i održavanju fizićke aktivnosti, koja je u korelaciji sa zadovoljstvom života.

ključne rijeći: kardiovaskularne bolesti, ishrana, zadovoljstvo životom

5-O-1

Diet as a risk factor for cardiovascular disease

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Abstract

Introduction Improper diet is one of the exogenous (external) etiological factors for cardiovascular disease. Effect of diet over a long time leads to changes that manifest themselves as functional, later organic disorders of cells, tissues and organs.

Aim Spotting causal relationship of long-term eating habits on cardiovascular disease faces the elderly. Data were monitored by reviewing medical records of patients diagnosed with cardiovascular disease and quality of life questionnaire Mans (Priebe et al., 1999). The survey was conducted in the period from 01.01.2015 - 01. 05. 2016. the Centre for professional health and palliative care of Ruhama. The paper applied descriptive-analytic method.

Results The study included 300 elderly persons. Subscriptions are eating habits, presence of cardiovascular disease, physical ability, psycho-social characteristics, quality of life, healthy exercise and unhealthy lifestyles. The study noted the impact of diet and lifestyle as well as external factors on the development of cardiovascular disease.

Conclusion Cardiovascular disease is to represent the widest distribution of diseases today that according to mortality worrying tendency of growth and morbidity. During the study it was observed that most of the patients are categorized as obese are associated with disease. According to the almost negligible number of patients have an ideal body mass (BMI), and an analysis showed that men in the test sample have an average higher BMI, indicating higher incidence of obesity in male, while the female population of the test sample, women have a lower incidence BMI within the normal body weight. The conclusion is that it is in preventing the formation of coronary disease emphasis on proper diet and maintaining physical activity, which is correlated with the satisfaction of life.

Keywords: cardiovascular disease, nutrition, life satisfaction

Znanje o ishrani i prekomjerna tjelesna masa kao značajan zdravstveni rizik

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Sažetak

Zdrava ishrana pomaže u prevenciji nastanka pothranjenosti ili prekomjerne tjelesne mase, kao i u prevenciji nastanka hroničnih nezaraznih oboljenja, kao što su: dijabetes, kardiovaskularna oboljenja, hipertenzija, moždani udar, karcinom isl.

Ciljevi ovog istraživanja odnose se na analizu znanja o ishrani pacijenata liječenih u obiteljskoj medicini Doma zdravlja Novo Sarajevo i znanja o prekomjernoj tjelesnoj masi, utvrđivanju BMI svih ispitanika, te dovođenje u vezu ishrane, prekomjerne tjelesne mase i učestalosti nezaraznih oboljenja.

Nakon sprovedenog istraživanja u rezultatima smo dobili najviše tačnih odgovora (od strane ispitanika) koji se odnose na potrebu svakodnevnog konzumiranja voća i povrća (96,33%), 94, 27% ispitanika smatra da je nepravilna ishrana uzrok mnogih nezaraznih oboljenja, a 93,18 % zna koji je obrok najvažniji. Ispitanici sa najvišim stepenom obrazovanja su pokazali najviše znanja o ishrani, što se odrazilo i na manju prosječnu vrijednost BMI. Njihov BMI je najniži (25,79) u odnosu na ostale skupine prikazane po obrazovanju, a najviši BMI imaju ispitanici koji su neobrazovani (29,6). Ispitanicima sa povišenim BMI dijagnostikovano je i neko od masovnih nezaraznih oboljenja.

Zaključeno je da znanje o ishrani i prekomjernoj tjelesnoj masi kod pacijenata liječenih u praksi obiteljske medicine ima određenih odstupanja od zadovoljavajućeg. Ispitanici sa većim nivoom obrazovanja imaju najbolje znanje o ishrani a i najnižu vrijednost BMI, a ispitanici sa povišenim vrijednostima BMI imaju neku od masovnih nezaraznih oboljenja.

Ključne riječi: ishrana, BMI, prekomjerna tjelesna masa, masovna nezarazna oboljenja

5-O-2

Nutrition knowledge and obesity as health risk

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Abstract

A healthy diet helps prevent obesity or an excess of weight, as well as the prevention of non infectious diseases like: diabetes, cardiovascular diseases, hypertension, strokes, cancers, etc.

The goals of this research refer to the analysis of patients knowledge of the family medicine in the Health center of Novo Sarajevo and the awareness of obesity by determining of the BMI of the respondents, as well as determining the connection between obesity and non infectious diseases.

The results of the research have shown that the majority of right answers that relate to the correct consumption of fruit and vegetables (96,33%), 94,27% of the respondents claim that an unhealthy diet is the cause of many uninfected diseases, and 93,18% knows which meal is the most important. The respondents with the highest degree of education have shown the uppermost knowledge about diet (nutrition), which reflected on the lower average worth of the BMI. Their BMI is the lowest (25,79) in relation to the other groups measured by their education, and respondents with the highest BMI are the uneducated ones (29,6). The respondents with high BMI have been diagnosed with some of many uninfected diseases.

It is concluded that the knowledge of the patients of the family medical practice of Novo Sarajevo have some deviations from the satisfactory results. The respondents with higher level of education have the most knowledge about diet and the lowest worth of BMI, and the respondents with the higher worth of BMI have some kind of uninfected diseases.

Keywords: diet, BMI, obesity, non infectious diseases

Savremeni stil života i ortodontske anomalije – pregled literature

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Sažetak

Evolucija i savremeni stil života su doveli do značajnog porasta ortodontskih nepravilnosti širom svijeta. Incidenca malokluzije u svijetu pokazuje indikativne varijacije u zavisnosti od rasne i etničke pripadnosti, kao i od socioekonomskih uslova. Razlog može biti u prijelaznoj ishrani koja je progredirala od čvrste i žilave, do mekane i kašaste hrane, te tako zahtijevala manju upotrebu žvačne muskulature u odnosu na našu genetsku predispoziciju. Smanjena upotreba mišića žvakača dovodi do reduciranog rasta vilica koje postaju preuske za pravilan raspored stalnih zuba. Budući da je hrana već obrađena i obogaćena sa hranljivim tvarima, posebno šećerima i fabričkim zaslađivačima, dodatna prerada u ustima je nepotrebna, što dovodi do smanjenog lučenja pljuvačke te ubrzavanja rasta bakterija i formiranja zubnog plaka.

Cilj: Cilj ovog rada je da se kroz pregled dostupne literature prikaže koliko je savremeni način života uticao na razvoj ortodontskih nepravilnosti.

Materijali i metode: Podaci za ovaj rad su prikupljeni pretraživanjem literature dostupne u Google scholar bazi podataka. Pretraživanje je bilo ograničeno na radove objavljene na engleskom jeziku. Koristili smo ključne riječi: *soft food, malocclusion, dental arch discrepancy, dental crowding*.

Rezultati: Ukupno smo pronašli 120 članaka o mekanoj hrani, malokluziji, diskrepanci dentalnih lukova i dentalnoj uskosti, od kojih je 20 izuzetno relevantnih za ovu temu.

Zaključak: Sve redovnije upotreba tehnološki obrađene hrane (mekane hrane), u kombinaciji sa savremenim uslovima života, doprinose nepravilnom razvoju kraniofacijalnog kompleksa, što za posljedicu ima sve učestaliju pojavu ortodontskih anomalija.

Ključne riječi: malokluzija, mekana hrana, dentalna uskost, prerađena hrana, savremeni način života

5-O-3

Association between modern lifestyle and orthodontic anomalies – A literature review

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Abstract

Evolution and modern lifestyle have led to a significant increase in orthodontic anomalies worldwide. Incidence of malocclusion shows indicative variations depending on racial and ethnic groups, as well as socioeconomic status. The reason may be in transitional diet which wended from hardly chewable to easily masticated and processed, therefore causing less masticatory muscle usage in the way they're genetically predisposed. This leads to reduced jaw growth which becomes too narrow for proper permanent teeth alignment. Since the food is already processed and enriched in nutrients, especially in sugars and fabricated sweeteners, additional processing in the mouth is unnecessary, leading to reduction in salivation whilst promoting bacterial growth and plaque formation.

Aim: The aim of this research was to examine the influence of modern lifestyle on development of orthodontic anomalies by reviewing available literature.

Materials and methods: Working data were collected by researching on available literature found on Google scholar's database. Search was limited to publications in English language. Key words used, were: *soft food, malocclusion, dental arch discrepancy, dental crowding*.

Results: A total of 120 articles about soft food, malocclusion, dental arch discrepancy and/or dental crowding were found, of which twenty articles were highly relevant to the topic.

Conclusion: Increase in usage of industrially processed food (soft food), combined with other modern lifestyle habits, have contributed to irregular development of the craniofacial complex, causing a higher prevalence of orthodontic anomalies.

Keywords: malocclusion, soft diet, teeth crowding, processed food, modern lifestyle

Uticaj hrane i ishrane na razvoj orofacijalnog sistema

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Sažetak

Uvod: Dominantan faktor u razvoju orofacijalnog sistema pored genetike je i način ishrane (dojenje, konzistencija hrane). Pravilan položaj jezika u toku dojenja, uticaj vakuma u usnoj šupljini na aktivaciju mišića te pravilan razvoj vilica samo su neke od prednosti u toku dojenja. Hrana koja zahtjeva žvakanje (svježe voće i povrće), u odnosu na onu koja ne zahtjeva žvakanje, doprinosi aktivaciji mišića, pravilnom razvoju vilica, samočišćenju zuba. To uslovljava skoro podjednaku razvijenost svih funkcionalnih grupa zuba, kao i dgovarajućih mišića i koštanog fundamenta.

Cilj: Utvrditi znanje i stavove ispitanika o dojenju i o vrsti, tipu i konzistenciji hrane koje konzumiraju novorođenčad i dojenčad.

Metode i materijali: Korišteni su upitnici (ankete) provedeni na 150 ispitanika; osoba ženskog spola. Upitnik sadrži 23 pitanja o stavovima (14) i znanju ispitanika (9). Obuhvaćena dobna skupina ispitanika je od 20-65.

Rezultati: Shodno rezultatima ankete, majke mlađe životne dobi pokazuju manju učestalost i stepen dojenja (dojile su do 2 godine: 20% ispitanika), za razliku od majki starije životne dobi (dojile su do 2 godine: 60% ispitanika). Ispitivanjem znanja i stava studenata o prednostima i nedostacima dojenja pokazuje da 86% ispitanika nije dovoljno upućeno o značaju dojenja i pravilne ishrane.

Zaključak: Pravilna tehnika i dovoljna dužina dojenja utiču na razvoj orofacijalnog sistema.

Veoma je važno da buduće majke budu osvještene o važnosti dojenja i da budu educirane o efektima ishrane na razvoj orofacijalnog sistema. Pravilno dojenje ima mnogo prednosti kao što su emocionalna, imunološka i nutritivna, ali i veliki uticaj na pravilan razvoj orofacijalnog sistema i sprječavanje anomalija.

5-O-4

Food influence on development of orofacial system

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Abstract

Introduction: Dominant factor in the development of orofacial system is genetics and a diet (breast-feeding, consistency of food). The proper position of the language during breastfeeding, the effect of vacuum in the oral cavity to activate the muscles and the proper development of the jaw are just some of the benefits during breastfeeding. The food that requires chewing (fresh fruits and vegetables), compared to one that does not require chewing, contributes to the activation of muscles, proper development of the jaw, self-cleaning teeth. It causes almost equal development of all the functional groups of teeth, as well as the corresponding muscle and bone base.

Goals: Determinate the knowledge and attitudes about breastfeeding and on the type and consistency of the food that newborns and infants consume.

Methods and materials: Used questionnaires (surveys) conducted on 150 respondents; female gender. The questionnaire contains 23 questions about attitudes (14) and knowledge of the respondents (9). Included in the age group of respondents of 20-65.

Results: In accordance with the results of the survey, mothers younger show a lower incidence and degree of breastfeeding (breastfed until two years: 20% of respondents), in contrast to mothers older (breastfed until two years: 60% of respondents). The study of knowledge and attitude of students about the advantages and disadvantages of breastfeeding shows that 86% of respondents did not know enough about the importance of breastfeeding and proper nutrition.

Conclusion: The correct technique and sufficient length of breastfeeding affect the development of orofacial system. It is very important that future mothers are conscious of the importance of breastfeeding and to be educated about the effects of diet on the development of orofacial system. Proper breast-feeding has many benefits such as emotional, immunological and nutritional, but also a great influence on the development of orofacial system and prevent anomalies.

Učenje o ishrani djece školskog uzrasta primjenom Projekt-metode

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Sažetak

Odlazak u školu kako za učenike tako i za roditelje, sa sobom donosi pitanje šta će dijete jesti u školi. Da bi što lakše podnijeli višesatno sjedenje u klupama i marljivo učili za školarce je i te kako važna ishrana. Svako prekomjerno ili nedovoljno unošenje hrane u organizam, kao i unošenje hrane koja s obzirom na nutritivni sastav ne udovoljava potrebama pojedinca, znatno ugrožava njegovo zdravlje. Dobre prehrambene navike koje dijete usvoji tokom djetinjstva postaviti će temelje njegove ishrane u odrasloj dobi. Cilj rada je ocijeniti značaj Projekt-metode kojom se učenicima omogućava aktivno učenje i stvaranje mogućnosti za nove spoznaje u pogledu značaja pravilne ishrane.

Nastavni predmet Moja okolina jeste središnji predmet u razrednoj nastavi kada je u pitanju planiranje. Stoga se oko sadržaja ovog predmeta i gradi projekt. Kako učenje projekt-metodom omogućava i pomaže razvijanju mentalnih navika i brojnih vještina prikazati ćemo obrađujući temu "Ishrana djece školskog uzrasta – kako jedu tako rastu." Jednako je važno, da svako dijete izađe iz škole sa sposobnošću samostalnog učenja i djelovanja, osviješteno u pogledu njihove važnosti za vlastitu budućnost. Zaključujemo da potreba prilagođavanja obrazovanja savremenim društvenim tendencijama, i osiguranje znanja koje će biti korisno i primjenjivo u svakodnevnom životu, podrazumijeva i primjenu inovativnih nastavnih strategija, a projekt-metoda je jedna od njih.

Ključne riječi: nutritivni sastav hrane, prehrambene navike, projekt-metoda, kompetencije, planiranje

5-O-5

Learning about the diet of school children by using Project-method

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Abstract

Attending school for both the students and the parents brings up the question of what the child will eat at school. To make it easier to submit long hours sitting at desks and diligent learning, nutrition is very important. Any excessive or inadequate intake of food in the body, as well as the introduction of products that due to the nutritional composition does not meet the needs of the individual, significantly endangers their health. Good eating habits of children adopted during childhood will set the foundations of their diet in adulthood. The aim is to assess the significance of project-methods which allow students actively learning and create opportunities for new insights regarding the importance of proper nutrition.

The school class, My environment is a central subject in class teaching when it comes to planning. Therefore, the contents of the case are the base for building this project. How learning project-method allows and helps develop mental habits and the many skills we will show working the theme of "Feeding school children – how they eat so they grow." It is equally important that each child leaves school with the ability of self-study and action, conscious in terms of their importance for their own future. We conclude that the need to adapt education to contemporary social trends, and providing skills that will be useful and applicable in daily life, involves the application of innovative teaching strategies, and project-method is one of them.

Keywords: nutritional composition of the food, eating habits, the project-method, competence, planning

Uloga učitelja u razvoju pravilnih prehrambenih navika kod učenika razredne nastave

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Sažetak

Prekomjerna tjelesna težina danas predstavlja sve izraženiji problem, kako u Bosni i Hercegovini, tako i u cijelom svijetu, što bitno utiče na kvalitetu života. Problem sa prekomjernom tjelesnom težinom počinje se javljati još u predškolskoj dobi djeteta što je posljedica loših prehrambenih navika učenika, kod kuće ali i u školi. Pravilna prehrana posebno je važna u periodu odrastanja djeteta. Osiguravanje uvjeta za pravilan psihofizički rast i razvoj djeteta, te zdrave prehrambene navike koje djeca steknu u ranom djetinjstvu utiču na odabir hrane i način života u kasnijem razdoblju. Ovim istraživanjem anketirani su učenici razredne nastave u cilju utvrđivanja navika konzumiranja užine u školi. Također, provedena je anketa sa učiteljima da bi se utvrdio njihov angažman u razvijanju pravilnih prehrambenih navika kod učenika. Ličnost učitelja, te pozitivan program u školi pomoći će učenicima da razviju pozitivne obaveze prema svojoj porodici, školi, zajednici, uključujući i obavezu da vode zdrav život.

Ključne riječi : učenik, razredna nastava, učitelj, pravilna prehrana, navike

5-O-6

The educators role in development of healthy eating habits of primary school pupils

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Abstract

Overweight today represents a growing problem, both in Bosnia and Herzegovina and in the world, which significantly affects the quality of life. The problem with overweight begins to emerge in the preschool age child as a result of bad eating habits of children, at home but also at school. Proper nutrition is especially important during the period of growing up the child. Ensuring conditions for proper physical and mental growth and development, and healthy eating habits that children acquire in early childhood affect the selection of food and a way of life in the future. This study surveyed children in primary school in order to establish the habit of consuming snacks at school. Also, a survey was conducted with teachers to determine their involvement in the development of proper eating habits in students. The personality of the teacher, and a positive program in the school will help students develop positive obligations to his family, school, community, including the obligation to lead a healthy life

Keywords: student, primary school teaching, teacher, proper nutrition, habits

Stavovi djece o kvalitetu jelovnika u produženom boravku

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Sažetak

Ishrana djece u produženom boravku treba se zasnivati na zdravim namirnicama i uravnoteženoj ishrani prilagođenoj uzrastu učenika. Zdrava ishrana se odnosi na pripremu gotovih jela u školskoj kuhinji, koja zadovoljava sve higijensko-sanitarne predušlove, stručnost kadra i organizacione sposobnosti.

Cilj ovog rada je ispitati stavove djece uzrasta od 6 – 10 godina o kvalitetu jelovnika u produženom boravku. Istraživanje je sprovedeno na uzorku od 77 učenika. Korišten je anketni upitnik sastavljen od 12 pitanja. Primjenom deskriptivne statistike utvrđena je brojčana i procentualna vrijednost podataka. Nakon istraživanja došlo se do sljedećih rezultata: 85% ispitanih ocjenilo je kvalitet hrane koju jedu u produženom boravku ocjenama 5 i 4; istim ocjenama 75% ispitanika su ocjenili obroke koje jedu zdravim; jedu različite namirnice (voće 22%, peciva, tjesteninu i žitarice 21%, povrće 17%, meso i ribu 17%, slatkiše 12% i mliječne proizvode 11%); 22% ispitanika smatra da bi na njihovom jelovniku trebalo biti više voća, slatkiša 18%, peciva, tjestenina i žitarica 16%, povrća 14%, mliječnih proizvoda 14%, mesa i riba 14%; 34% ispitanika se izjasnilo da im je omiljeno jelo tjestenina, 16% meso, 16% pizza, 14% voće i povrće, 8% slatkiši i 4% pita; 75% ispitanika za zdravu hranu ne misli da je uvijek neukusna; 53% ispitanika često jedu ista ili slična jela mimo produženog boravka; 39% ispitanika svaki dan jede salatu, svježe voće i povrće; 36% ispitanika svaki dan jede slatkiše i grickalice; prosječno svaki ispitanik popije u toku dana po 3,94 čaše vode i 73% ispitanika voli da jede zdravu hranu. Na osnovu analize datih odgovora možemo zaključiti da većina ispitanika ima pozitivne stavove o kvalitetu jelovnika u produženom boravku, ali ipak smatraju da bi taj jelovnik trebao biti raznovrsniji i svakodnevno ga mijenjati.

Gljučne riječi: stavovi, učenici, kvalitet jelovnika, produženi boravak

5-O-7

Children's attitudes about the quality of the day care menu

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Abstract

Children's nutrition in the day care should be based on healthy groceries and balanced nutrition adapted to students' age. Healthy nutrition refers to the preparation of ready meals in the school kitchen, which satisfies all of the hygienic and sanitary conditions, as well as professionalism of the staff and organizational skills.

The goal of this work is the analysis of opinions of children from ages 6 to 10 about the quality of the day care menu. The research is conducted on a sample of 77 students. A questionnaire made of 12 questions was used. Numerical and percentual data value was determined by applying the descriptive statistics. After the research, the following results were obtained: 85% of the examinees evaluated the quality of the food they eat in the day care with the scores 5 and 4; 75% of the examinees evaluated the meals they eat as healthy, with the same marks; they eat different kinds of groceries (22% fruit, 21% pastry and cereals, 17% vegetables, 17% meat and fish, 12% candy and 11% dairy products); 22% of the examinees consider that there should be more fruit on their menu, 18% candy, 16% pastry, pasta and cereals, 14% vegetables, 14% dairy products, 14% meat and fish; 34% of the examinees declared that their favourite meal is pastry, 16% meat, 16% pizza, 14% fruit and vegetables, 8% candy and 4% pie; 75% of the examinees do not consider that healthy food is always tasteless; 53% of the examinees often eat the same of similar meals besides the day care; 39% of the examinees every day eat salads, fresh fruit and vegetables; 36% of the examinees eat candy and snacks every day; on average every examinee drinks 3,94 cups of water daily and 73% of them likes to eat healthy food. Based on the analysis of the given answers, we can conclude that most of the examinees have positive attitudes towards the quality of the day care menu, although they consider that that menu should have more variety and should be changed every day.

Keywords: attitudes, day care, menu quality, students

Analiza jelovnika u predškolskim ustanovama

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Sažetak

Pravilna ishrana predškolske djece je neophodna za normalan rast, razvoj i aktivnost. S obzirom na vrijeme provedeno u vrtićima, obroci trebaju biti visoke prehrambene vrijednosti.

Cilj rada je procjena raznovrsnosti ishrane u predškolskim ustanovama, a temelji se na analizi mjesečnih jelovnika četiri vrtića: J.U. „Djeca Sarajeva“ (BiH), „Radost“ (Vela Luka, Hrvatska), „Nemo“ (Zagreb, Hrvatska) i „Naša radost“ (Subotica, Srbija).

Uočljivo je da ni u jednom jelovniku nije navedena vrsta korištenog hljeba. U 2016. godini u vrtiću J.U. Djeca Sarajeva je uveden četvrti obrok-voće. Jelovnik je sastavljen od raznovrsnih namirnica (mlijeko, mliječni proizvodi, faširano meso, piletina, riba samo kao namaz od tune, raznovrsno povrće, salame, paštete i hrenovke nisu zastupljene, džem i eurokrem su često izbor užine). Jelovnici su raznovrsni i u vrtiću „Radost“, s tim da se koristi više različitih namirnica nego u prethodno navedenom, gdje su džem i šunka za užinu. Vrtić „Naša radost“ nudi četiri obroka (doručak, ručak, dvije užine) i ima naveden sastav ručka. Prva užina je voće, a druga uglavnom keks ili pecivo. Prisutni su slanina, margarin, hrenovke. Jelovnik vrtića „Nemo“ je jedini od analiziranih jelovnika koji nema sedmično ponavljanje jelovnika (ponavlja se domaći kolač za užinu, ali to ne mora značiti da se radi o istom kolaču). Prema sastavu ručka očigledno se posvećuje posebna pažnja izradi jelovnika i najkvalitetnije je osmišljen, sa puno variva i bez mesnih prerađevina.

Rezultati pokazuju da je potrebno uraditi dodatne analize nutritivne i energetske vrijednosti obroka, te se posvetiti izradi prehrambenih smjernica.

Ključne riječi: ishrana djece, vrtići, jelovnici, raznovrsnost.

Menu analysis in preschools

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Abstract

Proper nutrition of preschool children is essential for normal growth, development and activity. Due to the time spent in preschools, meals should be of high nutritional value.

The aim is to estimate the diversity of food in pre-school institutions, and is based on analysis of monthly menus of four kindergartens: J.U. "Djeca Sarajeva" (B&H), "Radost" (Vela Luka, Croatia), "Nemo" (Zagreb, Croatia) and "Naša radost" (Subotica, Serbia).

None of menus listed type of used bread. In 2016, the kindergarten J.U. Djeca Sarajeva has introduced the fourth meal-fruit. The menu is composed of various foods. The menus are diverse also in kindergarten "Radost", with the use of different ingredients than in previously mentioned (jam and ham are for snack). Kindergarten "Naša radost" offers four meals (breakfast, lunch, two snacks) and has given the composition of the lunch. The first snack is fruit and the other mainly biscuits or cakes. It includes bacon, margarine and hot dogs. The menu of kindergarten "Nemo" is the only one that is not weekly repeated (homemade cake repeats, but that does not necessarily mean that it's the same cake). According to the composition of lunch, special attention is given to creating menus and those are best designed, with lots of vegetables and no meat products.

The results show that it is necessary to do additional analyzes of nutritional and energy value of meals, and to devote to developing of nutritional guidelines.

Keywords: childrens' nutrition, kindergartens, menus, diversity.

Metodički pristup pravilnoj ishrani u razrednoj nastavi

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Sažetak

Jedan od mnogobrojnih segmenata kojim se bave odgojno – obrazovne ustanove jeste i briga o zdravlju djece i omladine. U tom smislu ishrana, kao bitna odrednica zdravog života, ima svoje mjesto u nastavnom planu i programu. U ovom radu pažnja je posvećena razrednoj nastavi, sa posebnim osvrtom na predmet Moja okolina. Jedna od specifičnosti ovog predmeta jeste spiralno uzlazni raspored gradiva, gdje se obim sadržaja nastavnih jedinica iz godine u godinu postepeno širi. U programskom sadržaju Moje okoline ishrana se izučava kao zasebna nastavna jedinica te je cilj rada predstaviti realizaciju ove nastavne jedinice u odjeljenju I razreda Osnovne škole “Grbavica 1” u Sarajevu. Realizovani čas, kao i aktivnosti koje su mu prethodile, je predstavljen fotografijama i drugim relevantnim priložima. Rad sa učenicima prvog razreda zahtijeva poseban pristup pri obradi nastavnog sadržaja, koji za ovaj uzrast treba biti jednostavan i zanimljiv, uz odgovarajuću upotrebu očiglednih sredstava. Pored karakterističnog pristupa u nastavnom radu, bitno je poznavati i razumjeti biološke potrebe djece navedenog uzrasta. U tom smislu, roditelji, ali i učitelji trebaju paziti da dijete ima pravilnu izmjenu rada i odmora, te preporučeni unos razvnorsne i zdrave hrane. Kao zaključak ističe se da je najvažnije od svega da osoba koja odgaja dijete bude i sama pozitivan primjer zdravog življenja.

Ključne riječi: odgojno-obrazovne ustanove, zdravlje, ishrana, Razredna nastava, Moja okolina

5-O-9

Methodical approach to proper nutrition in The First Cycle of Elementary Education

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Abstract

One of the many segments in the work of educational institutions is the care about health of children and youth. In accordance with that, nutrition as an important determinant of healthy life, has its place in a curriculum. In this work the emphasis is on the first cycle of elementary education, with a special review of the school subject My Environment. One of the specifics of this subject is the upward spiral schedule of school curriculum, where its extent becomes wider every year. In content of the curriculum for this subject, nutrition appears as a separate unit, and in this article it is presented during the lesson realized in one of the first grades of elementary school "Grbavica 1". Lesson plan and activities that preceded, are evidently shown with photos and other relevant attachments. Work with first graders requires special approach toward interpretation of school curriculum, which for this age, has to be simplified and interesting, with corresponding use of didactic materials. It is also very important to know and understand biological needs of children of that age. According to that, parents, and teachers also, need to take care of proper placement of work and rest periods, and recommended intake of diverse and healthy food. As a conclusion, it is most important that the person, who raises the child is a positive example of a healthy lifestyle.

Keywords: Educational institutes, health, nutrition, First Cycle of Elementary Education, My Environment

Prehrambene navike karatista

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Sažetak

Pravilna ishrana utiče na zdravstveno stanje, ali i na postignute rezultate tokom takmičenja. Cilj ovog rada bio je utvrditi prehrambene navike karatista.

Istraživanje je sprovedeno na uzorku od 39 karatista i 31 roditelja. Sproveden je anketni upitnik sastavljen od 7 pitanja za djecu i 12 pitanja za roditelje. Primjenom deskriptivne statistike utvrđena je brojčana i procentualna vrijednost podataka.

Analizirajući rezultate dobivene anonimnim anketnim upitnikom uočavamo da 92% ispitanih karatista ima najmanje 3 obroka dnevno uz dodatnu užinu, dok 79% ispitanika kući najčešće jede kuhana jela. Više od pola ispitanih karatista, tj. 51% ne jede prije treninga, a 49% jede prije nego krene na trening. O zdravoj ishrani 61% ispitanika zna puno, tako da 90% ispitanika od prehrambenih proizvoda najviše vole jesti voće i povrće. Svi roditelji ispitanih karatista, tj. njih 100%, smatraju da na zdravlje djece najviše utiče pravilna ishrana i fizička aktivnost. Činjenica je da su najčešći obroci kod djece brza hrana i grickalice 58%, voće i povrće 39%, a žitarice 3%. Pokazatelji govore da 61% roditelja vode računa o ishrani svoje djece, a 97% ispitanika smatra da je djeci potrebno najmanje 3 obroka dnevno i užina. Njihova djeca 55% nose od kuće užinu koju majka spremi, 16% prima užinu u vrtiću ili školi. Kod svih karatista, njih 100% najvažniji obrok je doručak, a 97% roditelja dopušta svojoj djeci korištenje kompjutera i mobitelja 30 minuta, do sat vremena dnevno ili ga uopšte ne koriste.

Na osnovu analize datih odgovora možemo zaključiti da djeca sportisti vode računa o pravilnoj ishrani, jer na osnovu toga bolje izdržavaju zahtjeve treninga i takmičenja.

Gljučne riječi: prehrambene navike, ishrana karatista, djeca sportisti, roditelji

Karateists' nutritional habits

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Abstract

Proper nutrition affects health condition, but also the achieved results during the competitions. The goal of this work is determining the karateists' nutritional habits according to age. The research is conducted on a sample of 39 karateists and 31 parents. A questionnaire was conducted, made of 7 questions for children and 12 questions for the parents. Numerical and percentual data value was determined by applying the descriptive statistics.

Analysing the results obtained by anonymous questionnaire we notice that 92% of the examined karateists have at least 3 meals a day with additional snack, while 79% of the examinees mostly eat cooked meals at home. More than half of the examinees, 51% of them, do not eat before the training, and 49% of them do. 61% of the examinees knows a lot about healthy nutrition, so 90% of the examinees out of all the groceries mostly like fruits and vegetables. All the parents of the examined karateists, 100% of them, consider that proper nutrition and physical activity affect children's health the most. It is a fact that most frequent children's meals are fast food and snacks 58%, fruits and vegetables 39%, and cereals 3%. Indicators show that 61% of the parents take care of their children's nutrition, and 97% of the parents consider that children need at least 3 meals a day and a snack. Their children, 55% of them, carry snacks from home prepared by their mother, 16% of them has snacks at school or kindergarden. The most important meal of 100% of the karateists is breakfast, and 97% of the parents lets their children use the computer and mobile phone for 30 to 60 minutes a day or they do not use it at all.

Based on the analysis of the given answers, we can conclude that children sportsmen take care of proper nutrition, because based on that they better endure the demands of trainings and competitions.

Keywords: children sportsmen, karateists nutrition, nutritional habits, parents

Ishrana osoba treće životne dobi

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Sažetak

Starenje je prirodan fiziološki proces koji kod različitih ljudi napreduje različitom brzinom. Na kvalitet života i u starosti utiče način ishrane i potrebno ga je prilagoditi dentalnom i fizičkom zdravlju, te prehrambenim navikama.

Cilj istraživanja seminarskog rada je bila procjena kvaliteta jelovnika i zadovoljstvo kvalitetom ishrane osoba koje su korisnici jednog doma za stare i nemoćne osobe u Sarajevu. Kao metoda se koristio anketni upitnik, dizajniran spram potreba ovog istraživanja, uključio je devet pitanja i izvršena je analiza jelovnika prema grupama zastupljenih namirnica. S obzirom na prisutnu demenciju, medicinsko osoblje je dalo upute s kim se od korisnika može obaviti intervju.

Uvidom u jelovnik se može zaključiti da su prisutna tri glavna obroka dnevno uz dvije užine koje podrazumijevaju kafu i čajno pecivo, te kafu i voće. Mesne preradevine (hrenovke, salama) prisutni su u jelovniku, a nisu potrebni; različite vrste mesa su prisutne i prema konkretnom jelu se radi o faširanom mesu što i treba biti s obzirom na različito dentalno stanje u toj dobi; povrće je prisutno u nedovoljnoj količini (buranija, prasa, krompir, salata). Jelovnik je univerzalan za sve korisnike doma bez obzira na njihovo zdravstveno, dentalno, fizičko stanje.

Rezultati ankete pokazuju da je 60% ispitanika zadovoljno sa tri glavna obroka, svi su zadovoljni veličinom porcije, 70% ispitanika navodi da je jelovnik raznovrstan na sedmičnom nivou, 30% ispitanika je zadovoljno raznovrstošću namirnica, 40% bi dodali još mesa u jelovnik, 90% se slaže da je jelovnik prilagođen njihovim potrebama.

Ključne riječi: starost, ishrana, zadovoljstvo, jelovnik, dentalno zdravlje.

5-O-11

Nutrition of elderly persons

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Abstract

Aging is a natural physiological process that progresses in different people at different speed. Impact of nutrition is important also in the old age and diet has to be adapted to the dental and physical health and eating habits.

The aim of the research was to assess the quality of the menu and satisfaction with the quality of nutrition among people-users of a home for the elderly in Sarajevo.

Questionnaire, designed towards the needs of this study, included nine questions. An analysis of the menu by food groups was conducted. Because of dementia, medical personnel gave instructions with which users an interview can be conducted.

Menu includes three main meals a day with two snacks that include coffee and tea biscuits; coffee and fruit. Processed meat (hot dogs, salami) are present in the menu; different types of meat are present and according to the particular dish it is minced version of meat as it should be because of different dental condition at this age; vegetables are present insufficiently (beans, leek, potatoes, salad). The menu is universal for all users regardless of their health, dental and physical condition.

Questionnaire results show that 60% of respondents is satisfied with three main meals, all users are happy with the size portions, 70% say that the menu is diverse on a weekly basis, 30% are satisfied with the variety of foods, 40% would add more meat to the menu, 90% agree that the menu suits their needs.

Keywords: age, nutrition, satisfaction, menu, dental health.

Voda kao esencijalni nutrijent - fiziološki značaj hidratacijeMilica STANIŠIĆ,^{1*} Arzija PAŠALIĆ¹¹Univerzitet u Sarajevu, Fakultet zdravstvenih studija u Sarajevu, Studij zdravlje i ekologija, BiH

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Sažetak

Voda je neophodna za održavanje života uopšte, elementarna je potreba bez kojeg je život čovjeka nemoguć, a po kvantitativnom učešću najvažniji je sastojak čovjekovog organizma. Tjelesne potrebe za vodom zavise od nekoliko faktora: temperatura, stepen aktivnosti, funkcionalni gubici, metaboličke potrebe i dob.

Ciljevi istraživanja su da se kroz uvid u najnoviju naučnu literaturu opiše fiziologija ravnoteže vode i naglase preporuke u vezi sa vodom, da se analizira zastupljenost dehidratacije i unos vode i tečnosti kod različitih populacionih skupina.

Istraživački dio rada je oblikovan kao neeksperimentalno kvalitativno istraživanje odnosno naučni pregled literature. Istraživanje je provedeno u periodu od aprila do maja 2016. godine.

Studije iz rezultata su se bavile analiziranjem zastupljenosti dehidratacije kod populacionih skupina i ispitivanjem unosa vode i tečnosti kod različitih populacionih skupina. Studije za ispitivanje zastupljenosti dehidratacije kod populacionih skupina pokazale su da su starenjem ljudi skloni bolestima, a sve to utiče na hidrataciju tijela. Naš mehanizam osjećaja za žeđi smanjuje se sa godinama. Zbog promjenjenog sastava tkiva starijih osoba, preventivno smanjenja vode, potrebe za povećanim unosom vode su naglašene. Studije koje su se bavile ispitivanjem unosa tečnosti kod različitih populacionih skupina pokazuju da su unosi vode i tečnosti različiti i zavise od dobi ispitanika. Tako, adolescenti imaju navike da više uzimaju zaslađena pića. Trebalo bi da je obična voda glavni izvor tečnosti za sve populacione skupine.

Voda je esencijalni nutrijent bez kojeg nema života. Potrebno je što više promovisati potrošnju vode za piće s obzirom na potencijalne zdravstvene posljedice.

Ključne riječi: voda, hidratacija, dehidratacija

5-O-12

Water as an essential nutrient - the physiological basis of hydration

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Abstract

Water is essential to sustain life in general; it is a basic need without which human life is impossible and is, according to its quantitative partaking, the most important component of the human organism. The need for water in a human organism depends on several factors: temperature, level of activity, functional loss, metabolic needs and age.

The aims of this research are, through the insight into the latest scientific literature, to describe the physiology of water balance and highlight the recommendations related to water in order to analyse the presence of dehydration and the intake of water and liquids with different population groups.

The research part of this work is formed as a non-experimental qualitative research or scientific literature review. The survey was conducted between April and May of 2016.

Studies from the results dealt with analysing the representation of dehydration at population groups and testing water intake and fluids of different population groups. Studies for testing the level of dehydration at population groups have shown that with aging many people are prone to diseases, and all of that affect the hydration of the body. Our mechanism sense of thirst decreases with age. Due to the changed composition of the tissue of elderly people, primarily because the reduction of water, the need for increased intake of water is emphasized. The studies that dealt with the questioning of liquid intake in different age groups have shown that the intakes of water and liquid are different and vary according to the age of the subjects. The adolescents are prone to the intake of sweetened drinks. Water should be the main source of liquid intake for all the age groups.

Water is an essential nutrient, crucial for life. It is necessary to promote the consumption of drinking water considering the potential consequences for the health.

Keywords: water, hydration, dehydration

Ishrana fizički aktivnih studenata u odnosu na one koji se ne bave sportom

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Sažetak

Osnovni cilj bavljenja sportom (aktivno ili rekreativno) je postizanje fizičke spreme i uspješnih rezultata, prilikom čega su bitni treninzi i ishrana.

Cilj ovog rada je utvrđivanje razlika u ishrani fizički aktivnih studenata u odnosu na one koji se ne bave nijednim sportom, te procjena uticaja bavljenja sportom na održavanje normalne tjelesne mase.

U istraživanju je učestvovalo 244 studenta, od 18-27 godina. Od ukupnog broja ispitanika 132 studenta se bave nekim sportom (aktivno ili rekreativno), a 112 studenata se ne bave nijednim sportom. Korištena metoda je anketni upitnik od 18 pitanja o prehrambenim navikama i bavljenju sportom, a za procjenu stanja uhranjenosti korištena je metoda indeksa BMI. Primjenom deskriptivne statistike utvrđena je brojčana i procentualna vrijednost.

Na osnovu dobijenih rezultata ustanovljeno je da postoje razlike u ishrani fizički aktivnih studenata i onih koji se ne bave nijednim sportom. Rezultati pokazuju da fizički aktivni studenti imaju osnovna znanja i navike o zdravoj i pravilnoj ishrani, primjenjuju te principe pri odabiru hrane i ukazuju da je za održavanje normalne tjelesne mase, jedan od faktora i izbor hrane. Za razliku od onih studenata koji se ne bave nijednim sportom, fizički aktivni studenti doručuju skoro svaki dan, imaju više od tri obroka u toku dana i svakodnevno jedu voće i povrće. U organizam unose 2 do 3 litra vode dnevno, pa čak i više. Posjećuju restorane brze hrane, ali samo povremeno. Vode računa o zdravom odabiru obroka kada jedu i skoro svaki dan su fizički aktivni više od 60 minuta. 197 (81%) studenata bez obzira da li se bave fizičkom aktivnošću ili ne, smatra da fizički aktivni studenti vode više računa o pravilnoj ishrani.

Uvidom u vrijednosti indeksa tjelesne mase došlo se do zaključka da aktivno ili rekreativno bavljenje sportom utiče na normalnu uhranjenost. Od ukupno 132 (54 %) fizički aktivna studenta, 115 (87 %) je normalno uhranjenih.

Ključne riječi: pravilna ishrana, fizička aktivnost, BMI

5-O-13

Nutrition of physically active students in comparison to those who are not engaged in sport

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Abstract

The main goal of practicing sport (actively or recreatively) is achieving sports education and successful results, during which trainings and nutrition are relevant.

The goal of this work is determining the nutrition differences between physically active students in comparison to students who are not engaged by any sports, and the evaluation of the effects of practicing sport to maintaining a normal physical weight.

The research included 244 students, from 18 to 27 years old. Out of the total number of examinees, 132 of them are physically active and 112 are physically inactive students. The used method was a questionnaire of 18 questions about nutritional habits and exercising sports, and for the evaluation of the nutritional status, the method of BMI index (body mass index) was used. Numerical and percentage value was determined by using the descriptive statistics.

Based on the given results, it was determined that there are nutrition differences between physically active students and students that are not engaged by any kind of sports. The results show that physically active students have the basic knowledge and habits about healthy and proper nutrition, they apply those principles when choosing food and show that for maintaining normal weight one of the factors is choice of food. Unlike students who are not engaged by any kind of sports, physically active students have more than three meals during the day and eat fruit and vegetables daily. They drink two to three litres of water daily, or even more. They visit fast food restaurants but only from time to time. They take care of a health meal choice and they are active more than 60 minutes almost every day. 197 (81%) students, no matter if they are physically active or not, consider that physically active students take more care about proper nutrition.

With the insight to the body mass index, it was concluded that active or recreative practising sports affects normal BMI. Out of total 132 (54%) physically active students, 115 (87%) of them have a normal BMI.

Keywords: BMI, differences, physical activity, proper nutrition

Analiza ishrane studenata u Javnoj ustanovi Studentski centar Sarajevo

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Sažetak

Studenti su populacija koja je izložena svakodnevnom usvajanju novih i obimnih saznanja, a tokom ispitnog perioda su dodatno izloženi stresu. Način ishrane koji preferiraju im može pomoći, odnosno odmoći u postizanju uspješnih rezultata, naime konzumacija određenih namirnica povećava koncentraciju i pamćenje.

Cilj ovog rada je procjena kvaliteta ishrane studenata koji koriste usluge Javne ustanove Studentski centar Sarajevo, odnosno studentskog naselja Bjelave i studentskog doma Nedžarići, te njihovo zadovoljstvo ponuđenim izborom hrane.

Istraživanje je provedeno tokom mjeseca aprila 2016. godine. Korisnici su ispitani putem online ankete, a urađena je i analiza jelovnika. Analizom jelovnika se uočava da su u ponudi dva obroka (ručak i večera), da je ponuda raznovrsna, te da studenti sami biraju šta žele konzumirati za obrok. Također, u jelovnicima nisu navedni količina ni sadržaj jela, nedostaju voće, mliječni proizvodi i tečnost. Analizom ankete su dobijeni rezultati koji pokazuju da je veći procenat studenata zadovoljan izborom hrane (66,70 %); 45,1 % studenata bi uvrstilo dodatne namirnice (voće i ćevape); 86,3 % studenata nije zadovoljno veličinom porcije; 94,2 % bi uveli neku vrstu tečnosti; 76,5 % studenata konzumira dodatne obroke, 72,6 % studenata bira ista jela. Studenti su jelovnik u najvišem procentu (27,2 %) ocijenili ocjenama 7 i 8.

Unatoč raznovrsnoj ponudi jela uočljiv je deficit dvije grupe namirnica, a studenti iako pokazuju nezadovoljstvo veličinom porcije (što ne znači da porcija nije kvantitativno zadovoljavajuća) ne poštuju jedan od osnovnih principa pravilne ishrane-raznovrsnost pri odabiru jela.

Ključne riječi: studenti, studentska menza, ishrana, jelovnik.

5-O-14

Analysis of students' nutrition in Public institution Student Centre Sarajevo

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Abstract

Students are population exposed to everyday's adoption of new and extensive knowledge, and during exam period are additionally exposed to the stress. Chosen way of nutrition can help achieve or prevent the achievement of successful results, because consumption of certain foods increases the concentration and memory.

The aim of study is to assess the quality of nutrition of students-users of Public institution Student Centre Sarajevo and their satisfaction with the offered menus.

The survey was conducted during April 2016. Users are examined through an online survey and menu analysis was conducted also.

The analysis show that the menu includes two meals (lunch and dinner), food offer is diverse and students themselves choose the meal. Also, amount and the content of meal are not specified on the menu, there is lack of fruit, dairy products and liquid. Results of survey show that a greater percentage of students are satisfied with the choice of food (66.70%); 45.1% would add more foods (fruits and ćevapi); 86.3% are not satisfied with the portion size; 94.2% would introduced some kind of liquid; 76.5% consume extra meals, 72.6% choose the same meals. Students menu in the highest percentage (27.2%) is evaluated with the grades 7 and 8.

Despite the great variety of meals, there is noticeable deficit of two food groups, students showing dissatisfaction with the portion size (which does not mean that portion is not quantitatively satisfactory) are unaware of one of the the basic principles of proper nutrition-diversity.

Keywords: students, student canteen, nutrition, menu.

Ishrana, zdravlje i navike studenata Univerziteta u Sarajevu

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Sažetak

Cilj rada je bio ispitati znanje i praksu studenata Univerziteta u Sarajevu (UNSA) o ishrani i zdravlju. Ispitivanje je vršeno na 200 studenata oba spola, dobi 23-24 godine. Ispitivanje je vršeno putem ankete kreirane za ovo istraživanje, a uključivalo je studente Medicinskog fakulteta, Stomatološkog fakulteta i studente drugih fakulteta UNSA smještene u Studentskom domu Bjelave. Anketa je bila anonimna i dobrovoljna, a sadržavala je pitanja o ishrani, zdravlju i navikama studenata. Rezultati su obrađeni statističkom analizom, u smislu deskriptivne statistike.

Zaključak: Znanje o važnosti uticaja ishrane na zdravlje su na nezadovoljavajućem nivou. Praksa studenata UNSA je također nezadovoljavajuća, jer i uz postojanje određenih znanja o važnosti zdrave ishrane ipak postoje loše navike, a zdravi životni stilovi nisu česta praksa kod studentske populacije obuhvaćene ovim radom.

Ključne riječi: ishrana, zdravlje, znanje i praksa studenata, Univerzitet u Sarajevu

5-O-15

Nutrition, health and habits of students of the University of Sarajevo

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Abstract

Objective of the study was to examine the knowledge and practice of students of the University of Sarajevo (UNSA) about nutrition and health. The research was conducted on 200 students of both sexes, aged 23-24 years. The test was performed using a questionnaire designed for this study, and included students of the Faculty of Medicine, School of Dental Medicine and students from other faculties UNSA housed in the dormitory Bjelave. The survey was anonymous and voluntary, and contained questions on nutrition, health and habits of students. The results were analyzed by statistical analysis, in terms of descriptive statistics.

Conclusion: Knowledge about the importance of the effects of diet on health are unsatisfactory. The practice of students UNSA is also unsatisfactory, because even with the existence of certain knowledge about the importance of a healthy diet, however there are bad habits and healthy lifestyles are not a common practice among the student population covered by this work.

Keywords: nutrition, health, knowledge and practice of students, University of Sarajevo

Prehrambene navike studenata Farmaceutskog fakulteta u Sarajevu

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Sažetak

Uvod i ciljevi: Razvoj prehrambene industrije i savremeni način života doveli su do promjene prehrambenih navika i pojave mnogih nezaraznih bolesti u razvijenim zemljama i zemljama u razvoju. Posebna rizična kategorija su studenti, jer veliki broj istih napušta svoje domove i odlazi u druge gradove, što dovodi do promjene životnog stila i obično veće potrošnje jeftinih i zasitnih obroka niske hranjive vrijednosti.

Metode: Sprovedeno je anonimno anketno istraživanje na uzorku od 100 studenata Farmaceutskog fakulteta o njihovim navikama koje se tiču obrasca ishrane, kvaliteta ishrane, potrošnji proizvoda brze hrane i sjedilačkih navika.

Rezultati: Rezultati istraživanja pokazuju da su ispitanici dobro upoznati s pojmom brze hrane. Kao najveće prednosti brze hrane navode brzu pripremu i privlačan okus. Rezultati pokazuju da 40% studenata nema naviku redovnog doručkovanja, 36% studenata ne jede voće svaki dan te da 29% konzumira brzu hranu jednom do dva puta sedmično. Čak 72% studenata je izjavilo da su prije početka studiranja jeli manje brze hrane, što znači da se, bez obzira na vrstu studija koji pohađaju, njihova svijest o očuvanju i unaprijeđenju vlastitog zdravlja nije povećala. Naravno, moramo uzeti u obzir i faktore okoline koji u velikoj mjeri doprinose ovakvim rezultatima istraživanja.

Zaključci: Anketno istraživanje je pokazalo da studenti Farmaceutskog fakulteta u Sarajevu ne vode u potpunosti računa o svojim prehrambenim navikama, što je poražavajuće ukoliko uzmemo u obzir da se radi o budućim zdravstvenim radnicima, koji će u okviru svog radnog mjesta biti zaduženi za edukaciju stanovništva, između ostalog i o pravilnoj prehrani. Činjenica je da tempo studiranja uzima svoj danak, te da studenti zbog nedostatka vremena ili novca češće posežu za brzom hranom što u konačnici može dovesti do povećanja rizika od mnogih oboljenja.

Ključne riječi: brza hrana, studenti, potrošačke navike, životni stil

5-O-16

Dietary habits of Pharmacy students in Sarajevo

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Abstract

Background and Objectives: Development of food industry and modern lifestyle have led to changes in dietary habits and the emergence of many non-communicable diseases in developed countries as well as in developing countries. Special risk category are students, because a large number of them leave their homes and go to other cities, which leads to lifestyle changes and usually greater consumption of cheap and more filling food of low nutritional value.

Methods: An anonymous survey was conducted on the sample of 100 Pharmacy students about their habits concerning feeding pattern, diet quality, consumption of fast food products and sedentary habits.

Results: The research results show that the respondents are very familiar with the concept of fast food. As major advantages of fast food products they cite quick preparation and appealing taste. Results show that 40% of students do not have the habit of regularly having breakfast, 36% of students do not eat fruits every day, and that 29% of students consume fast food once or twice a week. Even 72% of students stated that prior to the start of the study they ate less fast food, which means, regardless of the type of study they attend, their awareness of preservation and promotion of their own health has not increased. Of course, we must take into account environmental factors that greatly contribute to these research results.

Conclusions: Survey research has shown that students of Faculty of Pharmacy in Sarajevo do not take fully into account their eating habits, which is devastating if we consider them as future health workers, who will within their job be in charge of educating population, including the proper nutrition among the other things. The fact is that the pace of study takes its toll, and that students due to the lack of time or money more often reach for fast food, which ultimately can lead to increased risk of many diseases.

Keywords: fast food, students, consumer habits, lifestyle

Korelacija prehrambenih navika i indeksa tjelesne mase studenata Medicinskog fakulteta u Tetovu

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Sažetak

Uvod: Indeks tjelesne mase (BMI) predstavlja omjer mase (kg) i kvadrata visine (m) i često se koristi za procjenu statusa uhranjenosti. Prelazak iz srednje škole na fakultet dovodi do promjene životnog stila kod mladih.

Ciljevi:

- Procijeniti distribuciju broja dnevnih obroka i BMI u studenata Medicinskog fakulteta.
- Procijeniti razlike u prehrambenim navikama i BMI između muškaraca i žena
- Ispitati da li postoji statistički značajna korelacija između broja obroka i vrste hrane sa BMI

Materijal i metode: U prospektivnoj studiji provedenoj od aprila do maja 2016. učestvovalo je 600 studenata medicine (M: 300, Ž: 300). Provedena su antropometrijska mjerenja i procijenjene prehrambene navike primjenom anketnog upitnika. Podaci su statistički obrađeni korištenjem programa SPSS.

Rezultati: Rezultati pokazuju da 20% studenata (M:68.3% i Ž:31.7%) ima više od tri obroka na dan, (46% studenata prve i druge godine). 77% studenata jede 2-3 puta dnevno, dok 3% ima samo jedan obrok na dan. Većina studenata (75%) preferira brzu hranu (fast food). Također je zabilježeno da je 31,3% studenata prekomjerno uhranjeno, 4% pothranjeno i 64,7% ima normalan BMI.

Zaključci:

- Studenti prve i druge godine većinom jedu više od tri puta na dan.
- 75% studenata preferira brzu hranu, a 25% ostale vrste hrane.
- Nije nađena statistički značajna korelacija između vrste hrane i BMI
- Postoji statistički značajna korelacija između broja dnevnih obroka i BMI.

Ključne riječi: indeks tjelesne mase, ishrana, brza hrana, studenti medicine

5-O-17

Correlation between nutritional patterns and body mass index values of students at the Medical Faculty in Tetovo

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Abstract

Introduction: Body mass index (BMI) is weight in kilograms (kg) divided by height in meters squared and is frequently used in the assessment of nutritional status. The transition from high school to college causes changes in the lifestyle of youth.

Aim of study:

- To assess the distribution of number of meals per day and BMI among students of Medical Faculty.
- To assess the differences in eating habits and BMI between females and males.
- To analyze whether there is a statistically significant correlation between the number of meals and the type of food with BMI values.

Material and methods: Prospective study was conducted from April to May 2016. 600 medical students (M: 300, F: 300) participated in the study. Anthropometric measurements were taken and the eating habits were assessed using a questionnaire. Data analysis was performed with SPSS.

Results: It was found that 20% of students (M:68.3% and F:31.7%) eat more than three meals per day (46% first and second year students). 77% of students eat 2-3 times a day, while only 3% eat only one meal per day. Fast food was preferred by the majority of students (75%). We also found that 31,3% of students are overweight, 4% underweight and 64,7% have normal BMI values.

Conclusions:

- Students of the first and second year in majority were eating more than three times a day.
- 75% prefer to eat fast food and 25% other types of food.
- There was not statistically significant correlation between the type of food and BMI.
- There is a statistically significant relation between the number of meals and BMI.

Keywords: Body mass index, nutrition, fast food, medical students

Komparacija sastava humanog mlijeka, animalnog mlijeka i mliječnih formula

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Sažetak

U današnjem vremenu, u velikoj mjeri se prakticiraju umjetni načini prehrane djece u postnatalnom periodu, odnosno novorođenčadi i dojenčadi. Iako su uočeni mnogi nedostaci ovog načina prehrane na daljni razvoj djeteta, kako fizički, tako i psihički, i dalje je trend prehrane djece u ranom postnatalnom periodu mliječnim formulama ili animalnim mlijekom u stalnom porastu.

Cilj istraživanja je uporediti sadržaj prirodnog majčinog mlijeka sa sastavom mliječnih formula i sastavom animalnog mlijeka, te na osnovu dobijenih rezultata utvrditi prednosti odnosno nedostatke prirodnog humanog mlijeka u odnosu na umjetnu prehranu.

Upoređivanjem sastava i količine određenih nutritijenata u prirodnom majčinom mlijeku preuzetih iz relevantnih podataka ranijih istraživanja sa sastavom nutritijenata u animalnom mlijeku i u mliječnoj formuli, a čije smo količine navedene na deklaraciji ovog proizvoda uzimali kao valjane, ustanovili smo da kravlje mlijeko sadrži 2,5 g proteina na 100 ml mlijeka, dok kolostrum sadrži 2,3 g/100 ml, a prijelazno majčino mlijeko 1,6 g/100 ml proteina. Mliječna formula sadrži 1,4 g proteina na 100 ml pripravka.

Majčino mlijeko sadrži manju količinu proteina od kravljeg, što je pozitivno obzirom na to da probavni sistem djeteta nije u potpunosti razvijen, sadrži veću količinu nezasićenih masnih kiselina, laktozu, vitamine i minerale koji su neophodni za razvoj djeteta, te je zbog toga u prednosti u odnosu na kravlje mlijeko.

Međutim, kod određenog broja djece javljaju i alergije i intolerancija na mlijeko kao što je intolerancija na laktozu ili galaktozemija, te je u tim slučajevima ipak poželjna konzumacija mliječnih formula koje ne sadrže laktozu u prehrani beba.

Ključne riječi: intolerancija na mlijeko, kravlje mlijeko, majčino mlijeko, mliječna formula

5-P-1

Comparison of composition of human milk, cow milk and infant formulas

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Abstract

Nowadays, many people use artificial means of nutrition for the children in a postnatal period, actually for the newborns and infants. This trend of feeding children with infant formula and animal milk in early postnatal period is in constant increase, although there have been noted many disadvantages of these means of nutrition, especially for corporal, but also in mental development of the children.

Aim of this research is to compare the content of natural woman's milk with the content of infant formula and animal milk, listed on declaration of the product, to determine advantages or disadvantages of natural milk in regard to artificial nutrition.

By comparing the composition and quantity of certain nutrients in a natural woman's milk with the composition of nutrients in animal milk and infant formula, which concentration listed on the label we taken as valid, we have found that cow's milk contains 2.5 grams of protein per 100 ml of milk, colostrum contains 2.3 g/100 ml, a transitional breast milk 1.6 g/100 ml of proteins. Infant formula contains 1.4 g protein per 100 ml of composition.

Woman's milk contains less proteins than cow's, what is positive because digestive system of the child is not completely developed. Women's milk also contains a large amount of unsaturated fatty acids, lactose, vitamins and minerals which are essential for a child's development, and is therefore in advantage compared with cow's milk.

However, in a number of children can occur allergies and milk intolerance as lactose intolerance and galactosemia, and in these cases, consumption of infant formula without lactose in baby nutrition is better.

Keywords: cow's milk, infant formula, milk intolerance, natural milk

Hrana, ishrana i dentalne erozije

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Sažetak

Dentalne erozije predstavljaju multifaktorijalno stanje koje karakterizira površinski gubitak tvrdih zubnih tkiva nastao usljed hemijskih procesa i bez prisustva bakterija. Promjenom načina života i uvođenjem novih dijetetskih navika, erozije postaju sve češći dio svakodnevnne stomatološke kazuistike. Cilj ove studije je da se prikaže kako dugotrajna konzumacija gaziranih napitaka, kisele, termički neobrađene hrane te provođenje selektivnog nutricionog režima može dovesti do demineralizacije tvrdih zubnih tkiva tokom životnog ciklusa, te da se objasne načini kako da se ove promjene na vrijeme preveniraju. U okviru ovog istraživanja putem pretraživača Google scholar i Pubmed pregledani su radovi objavljeni na navedenu temu u posljednjih 20 godina. Nakon sistematskog pregleda literature detaljno je analizirano 20 radova koji su uključivali populaciju od 12 do 20 godina. U pomenutim radovima etiološki faktori koji dovode do erozija su gazirana pića, kisela hrana, svježa i neobrađena hrana. Rezultati istraživanja su pokazali da konzumacija gaziranih pića ima veliki uticaj na pojavu erozija na cakleni. Autori, također, ispituju i koja pića imaju veći uticaj, a koja manji. Kada je u pitanju uticaj učestalosti konzumacije gaziranih pića, istraživanja pokazuju da je kritična dob od 14-18 godina, te da sa starošću, konzumacija gaziranih pića opada. Dentalne erozije moguće je prevenirati pravilnim režimom ishrane te provođenjem odgovarajućih drugih mjera, obezbjeđujući tako uslove za dugoročni opstanak i zdravlje zuba.

Ključne riječi: erozije zuba, caklen, erozivni potencijal, gazirani napitci, neobrađena hrana, sportski napitci

5-P-2

Food, diet and dental erosion

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Abstract

Dental erosion is a condition of multifactorial ethiology characterised with loss of hard tissues, as a result of chemical process and absence of bacterial influence. Lifestyle change and new dietary habits made erosion common in everyday dental casuistic. The aim of this study is to show how long time consumption of soft-drinks, acidic and non-processed food, selectional nutritional regimes can result with demineralisation of hard tissues during life cycle, and to explain how to prevent those changes. The study included research through browser Google scholar and PubMed reviewed articles on the subject were published on last 20 years. After a systematical review of literature, 20 articles which included population group from 12 to 20 years were carefully analysed. Based on these articles, soft drinks, acidic food, fresh and non-processed food and several other supplies are factors which lead to erosive tooth wear. Results showed that the affections are more than relevant. Authors were interested in side of affection which specific drinks can make. Results showed that critical population group is from 14 to 18 and with aging frequency of consumption carbonated drinks is lowering. Dental erosion is possible to prevent with right diet regime and other measures in order to make condition for long-term health of the teeth.

Keywords: dental erosion, carbonated drinks, dental enamel, erosive potential, non processed food, sport drinks

Ishrana u studentskom domu

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Sažetak

Pravilna ishrana predstavlja osnovni faktor optimalnog rasta i razvoja ljudskog organizma. Direktno utiče na njegovu radnu sposobnost i dužinu života. Ishrana treba da bude raznovrsna i uravnotežena. Zbog brzog načina života studenti često štede na hrani, smanjuju unos vitamina i minerala, konzumiraju kafu i druge kofeinske proizvode u prevelikim količinama, a konzumiranje brze hrane za studente postaje rutina. U toku studiranja značajan broj studenata se hrani u studentskom domu. Studentski dom je ustanova koja pruža smještaj i ishranu studentima. Stanari studentskog doma imaju obezbjeđen ručak i večeru. Za dodatni dio svoje ishrane svaki student odgovara ponaosob.

Cilj rada je analizirati ishranu studenata, te odgovoriti na sljedeća pitanja: kakvi su stavovi studenata o ishrani u studentskim domovima, kolika je učestalost doručkovanja, kolika je učestalost dodatne kupovine hrane izvan doma i koji su prijedlozi studenata za uvođenje određenih namirnica u jelovnik studentske menze.

Da bi se ustanovilo kako se studenti hrane u studentskom restoranu i koliko su oni zadovoljni uslugama koje im se pružaju, 2014. i 2016. godine praćen je sadržaj jelovnika, pregledana je knjiga zapažanja, te je urađena anketa. U anketi je učestvovalo 200 ispitanika, ispitanici su bili studenti studentskog doma Nedžarići. U 2014. godini ustanovljeno je da je svaki dan izbor hrane isti. Iako doručak predstavlja najvažniji obrok u toku dana, pokreće metabolizam i daje tijelu dovoljno energije za dnevne potrebe, više od 70% studenata potvrdilo je da ne doručkuju i da nisu zadovoljni sa hranom koju konzumiraju u domu. U 2016. godini došlo je do određenih poboljšanja kao što je uvođenje 15 bonova mjesečno koje studenti mogu iskoristiti u kafeteriji doma za kafu ili čaj.

Uvođenje doručka i voća u jelovnik studentske menze omogućilo bi kvalitetniju ishranu studenata.

Ključne riječi: ishrana, studentski dom, student, anketa.

Food environments in university dorms

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Abstract

Proper nutrition is basic factor of optimal growth and development of the human organism. It directly affects it's functioning ability, and length of life as well. The diet should be rich and varied but balanced. Due to the fast lifestyle, students often spend on food sparingly, take reduced amounts of mineraly and vitamyns, consume excessive amounts of coffee and other caffeinated beverages, consumption of junk food becomes daily routine. During studying a significant number of students have their meals in dorms. Student dormitory is an institution responsible for providing accomodation and food for students. Residents of dormitory are provided with lunch and supper (dinner). Any additional part of nutrition students have to provide on their own.

The aim is to analyze food for the students and answer the following questions: what are students stances on diet in dormitory, how frequent is the breakfast, how often are additional purchases of food outside of dormitory, and last, what are students suggestions for implementing certain groceries to dormitory's canteen menu. To determine quality of nutrition in dormitory's restaurant, and how satisfied are students with services provided to them during 2014 and 2016 menu contents were closely followed, book of observations was reviewed, and the poll was made. 200 examinees participated in a poll, examinees were students of Nedžarići dorm. For 2014 it was noted that every day choice of food was exactly the same. Even though breakfast is most important daily meal, keeps metabolism running and providing body with energy for all day needs, more than 70% of students confirmed that they almost never have breakfast, and that they are not satisfied with food provided to them in student's dormitory. In 2016 there was some progress made, mostly noted are 15 certificates students can spend in dormitory's cafeteria to buy coffee or tea.

Implementation of breakfast and fruits would drastically improve student's diet.

Keywords: nutrition, diet, student dormitory, student, poll

Proteini – esencijalni nutrijenti i zdravlje kostiju

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Sažetak

Uvod: Proteini su gradivne i u manjoj mjeri energetske materije koje ubrajamo u makronutrijente. Sastoje se od aminokiselina. Neke od aminokiselina organizam ne može sintetizirati pa ih nazivamo esencijalnim te ih moramo unositi hranom. Pored kalcijuma u prisustvu adekvatne količine vitamina D, dijetetski proteini predstavljaju ključne nutrijente za zdravlje kosti i učestvuju u prevenciji osteoporoze. Osteoporoza je sistemska bolest koštanog sistema koja se manifestuje smanjenjem gustine kostiju i pogoršanja mikroarhitekture koštanog tkiva, koja prouzrokuje manju čvrstinu kostiju, i može dovesti do preloma. Osteoporoza najčešće pogađa žene poslije menopauze, starije od 70 godina, iako se mogućnost preloma kostiju usljed osteoporoze povećava poslije 50-te godine života.

Cilj istraživanja je da se kroz pregled naučne literature prikaže i analizira uticaj unosa proteina na mineralnu gutoću kostiju.

Rezultati su kodirani po zajedničkim varijablama i najčešća ispitivana populaciona skupina su osobe treće životne dobi. Veći broj studija je pokazao da pravilan unos proteina (od 0,8 - 1g/kg na dan) dobro korelira sa mineralnom gustinom kostiju, tako unos visokokvalitetnih proteina ima pozitivan efekat na poboljšanje mineralne gustine kostiju. Randomizirane studije pokazuju da proteini imaju pozitivan efekat na zdravlje kostiju, ukoliko je unos kalcijuma adekvatan. Ukoliko se proteini unose u odgovarajućoj količini imaju pozitivan efekat na mineralnu gustoću kostiju, povećanje mišićne mase, apsorbciju kalcijuma i smanjeno lučenje paratireoidnog hormona.

Zaključak: Adekvatan unos proteina kod većine starijih osoba poboljšava funkcionalni status i sprečava rizik od preloma, te pozitivno kolerira sa mineralnom gustinom.

Ključne riječi: proteini, kalcij, zdravlje kostiju

5-P-4

Proteins – essential nutrients and bone health

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Abstract

Introduction: Proteins are building blocks, and to a lesser extent an energy source, which belong to a group of macronutrients. They contain amino acids and we refer to them as essential macronutrients; they cannot be synthesized by organism, but must be taken with food. Alongside with calcium, in the presence of adequate amount of vitamin D, dietary proteins are essential nutrients for the bone health and they participate in the prevention of Osteoporosis. Osteoporosis is a systemic disease of bone tissue characterized by the curtailment of bone density and deterioration of microarchitecture of bone tissue, which makes bones weak and fragile and prone to fracture. Osteoporosis usually affects women after menopause, population older than 70 years, although the possibility of fractures is getting higher after the age of 50.

Purpose: The main purpose of the research is to analyze the impact of protein intake on bone mineral density by the review of the scientific literature.

Results: The results are encoded by the common variables and most frequently tested population groups are the elderly. A large number of studies have shown that adequate protein intake (0,8-1g/kg per day) correlates well correlate with bone mineral density. So, the intake of high quality protein has a positive effect on improvement of bone mineral density. Randomized studies have shown that proteins have a positive effect on the bone health, only if calcium intake is adequate. Proteins that are ingested in an appropriate amount have a positive effect on bone mineral density, the amplification of muscle mass, absorption of calcium and reduction of secretion of parathyroid hormone.

Conclusion: In the majority of older people, proper protein intake helps to improve the functional status, prevents the risk of fractures, and positively correlates with mineral density.

Keywords: proteins, calcium, bone health.

6. DIJETOTERAPIJA
DIETOTHERAPY

Dodaci prehrani u tretmanu anksioznosti

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Sažetak

Anksiozni poremećaji imaju veliku učestalost i značajno utiču na način života pojedinaca koji od njih boluju. Simptomi anksioznih poremećaja uključuju: strah, tjeskobu, odbrambeno ponašanje, uznemirenost, mučninu, znojenje, bol u grudima, tahikardiju i dr. Često i osobe koje nemaju dijagnosticiran anksiozni poremećaj, osjete slične simptome u stresnim situacijama. Iz ovih razloga anksiolitici su među najčešće propisivanim lijekovima, koje redovno koristi preko 10% populacije razvijenih zemalja. Pored konvencionalne terapije lijekovima sve češće se koriste alternativne metode liječenja. Pacijenti oklijevaju da koriste lijekove na recept zbog nedovoljnog poznavanja njihovog efekta ili loših iskustava. Jedna vrsta preparata koje pacijenti često uzimaju su dodaci ishrani. Oni se često smatraju sigurnijim u odnosu na propisane lijekove ili se smatraju prirodnijom alternativom. U ovom radu su opisani najčešće korišteni dodaci ishrani koji se koriste u tretmanu anksioznosti, njihova potencijalna učinkovitost i nedostaci. Neki od suplemenata koji su istraženi su sadržavali: kavu (*Piper methysticum G. Forst*), odoljen (*Valeriana officinalis L.*), kantarion (*Hypericum perforatum L.*), pasifloru (*Passiflora incarnata L.*), 5-hidroksitriptamin, inozitol i omega-3 masne kiseline. Na osnovu kliničkih studija, za neke dodatke ishrani ne postoji dovoljno dokaza o učinkovitosti, dok za druge učinkovitost varira zavisno od vrste poremećaja. Bolje poznavanje podataka ishrani pomaže zdravstvenim radnicima u radu sa pacijentima i u odluci da li pacijentu preporučiti neki dodatak prehrani.

Ključne riječi: dodaci ishrani, anksioznost, kliničke studije

6-O-1

Dietary Supplements for Treatment of Anxiety

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Abstract

Anxiety disorders are amongst the most occurring mental disorders and have a significant effect on the lives of individuals suffering from them. They include symptoms such as: fear, anxiety, defensive behavior, irritability, nausea, sweating, chest pain, tachycardia and others. Even people who aren't diagnosed with anxiety disorders can experience these symptoms during stressful events. Because of this, anxiolytics are amongst the most prescribed medication and are regularly used by over 10% of population in developed countries. Alongside conventional therapy which includes prescription medication, patients are more often choosing alternative methods. Patients hesitate to take prescription medication because they don't know enough about their effects of they have had bad experiences. One of the methods of alternative treatment is the use of dietary supplements. In this article are described the supplements most often used for anxiety, their potential effectiveness and their deficiencies. Some of the supplements described are: kava (*Piper methysticum G. Forst*), valerian (*Valeriana officinalis L.*), St. John's Wort (*Hypericum perforatum L.*), passion flower (*Passiflora incarnata L.*), 5-hydroxytryptamine, inositol and omega-3 fatty acids. On the basis of clinical studies, for some supplements there isn't enough information about their effectiveness, while for other their effects vary from the type of disorder. Better understanding of dietary supplements can help healthcare professionals guide their patient's decisions about taking dietary supplements.

Keywords: dietary supplements, anxiety, clinical trial

Interakcije između hrane i lijekova

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Sažetak

Poznate su međusobne interakcije lijekova, međutim pojedini sastojci hrane također mogu bitno uticati na djelovanje lijekova što za posljedicu ima neadekvatan odgovor na terapiju. Ovo je naročito važno kod hroničnih bolesnika koji uzimaju više lijekova istovremeno te je dužnost medicinskih i farmaceutskih stručnjaka da upoznaju pacijente sa istima. Dat je pregled najvažnijih interakcije između hrane i lijekova kao i mehanizmi djelovanja i uticaj na farmakološke odgovore.

Ključne riječi: interakcija, hrana, lijek,

6-O-2

Food drug interactions

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Abstract

Drug-drug interactions are very well known but there are also very important interactions between food ingredients and drugs which may result in changed patients response to drug. This is very important for chronic patients who take more than one drug at a same time. Physicians and pharmacist have a duty to warn their patients about these interactions and insure best healthcare possible. Most popular interactions between drugs and food are presented as well as their mechanism of actions and influence on the pharmacological response.

Keywords: food, drug, interaction

Dizajn, razvoj i marketing funkcionalne hrane - od ideje do gotovog proizvoda

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Sažetak

U današnje vrijeme sve veći trend postaje funkcionalna hrana te promoviranje zdravlja kroz pravilnu ishranu. Baš iz tog razloga pokušali smo istražiti stanje tržišta funkcionalne hrane na teritoriji Bosne i Hercegovine i razumijeti faktore koji utječu na cjelokupan proces "od ideje do gotovog proizvoda" koji predstavljaju dizajn, razvoj i marketing funkcionalnih proizvoda. Navedene faktore ispitali smo na proizvodu sa domaćeg tržišta. Pored teorijske obrade odabranog proizvoda, sproveli smo anketu koja je formulisana na taj način da nam daje jasniju sliku o prihvaćenosti funkcionalne hrane na tržištu Bosne i Hercegovine. Izabrali smo heterogenu grupu ispitanika u odnosu na dob, spol i životni standard kako bi podaci bili reprezentativni. Rezultati su pokazali nedovoljnu osviještenost o pojmu funkcionalne hrane kod većine ispitanika, ali i nerazumijevanje deklaracija i nutritivnih vrijednosti pojedinih sastojaka na ambalaži prehrambenog proizvoda. U svrhu promjene ovakvog stanja, koje u velikoj mjeri zavisi od kupovne moći potrošača i marketinga proizvođača, kompanije koje se bave plasiranjem takvih proizvoda na tržište trebalo bi da prilagode cijene tržištu i/ili bolje prezentiraju korist za potrošača. Također, veliki problem predstavlja i slab marketing u odnosu na konkurentne firme junk food-a, pa bi se unapređivanjem ovog segmenta napravio veliki korak naprijed u smjeru zdrave ishrane.

Ključne riječi: funkcionalna hrana, dizajn, marketing, BiH

6-O-3

Design, development and marketing of functional food - From idea to finished product

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Abstract

Nowdays, promoting health through proper nutrition and functional food is becoming an increasing trend. For this reason we investigated the market of functional foods in the territory of Bosnia and Herzegovina in order to understand the factors that affect the whole process "from idea to finished product" that represent the design, development and marketing of functional products. We examined these factors on a product from the domestic market. Besides the review of the selected product, we conducted a survey which to assess the acceptance of functional foods on the market of Bosnia and Herzegovina. We chose a heterogeneous group of consumers in regard to their age, sex and standard of living so the data we gather would be representative. The results showed a lack of knowledge on the concept of functional foods by the majority of consumers, but also the lack of understanding of the declaration and nutritional value of individual ingredients on the packaging of food products. In order to change this situation, which largely depends on consumer's standards of living and marketing by the manufacturers, companies engaged in placing such products on the market should be more aware of standard of living and / or better present benefits of these products to the consumer. Also, a big problem is that "junk foods" have better marketing in comparison to functional food, so enhancing this segment would mean a big step towards healthier nutrition.

Keywords: functional food, design, marketing, B&H

Riziko faktori za nastanak šećerne bolesti tipa II

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Sažetak

Diabetes mellitus opisuje metabolički poremećaj multiple etiologije kojeg karakteriše hronična hiperglikemija sa poremećajem u metabolizmu ugljikohidrata, masti i proteina uzrokovano defektom inzulinske sekrecije, djelotvornosti inzulina ili kombinacijom oba ova uzroka. Brojni riziko faktori doprinose nastanku diabetesa tip 2: genetski faktori (na koje ne možemo uticati), preobilna ishrana, gojaznost, tjelesna neaktivnost, psihogeni stres, hipertenzija i mnogi drugi. **Ciljevi istraživanja** su ispitati i analizirati faktore rizika za nastanak šećerne bolesti tipa 2, te predložiti mogući promotivno-preventivni program u okviru zdravstvene njege.

Materijal i metode: Provedena je presječna studija u periodu od prvog do 31. maja u ambulanti porodične/obiteljske medicine „Švrakino Selo“. Ispitanici su osobe starosne dobi između 25 i 64 godine, oba spola. Instrumenti istraživanja su standardizirani upitnik i antropometrijska mjerenja.

Rezultati: Istraživanje je pokazalo da 63% ispitanika imaju povećan indeks tjelesne mase, 28% muških i 48% ženskih pacijenata imaju povećan obim struka I i II rizika, 31% ispitanika su fizički neaktivni i u svojoj svakodnevnoj prehrani ne koriste voće, povrće ili zrnevlje, 20% je onih koji koriste antihipertenzive i 41% pacijenata ima genetsku predispoziciju za nastanak diabetesa.

Zaključak: Visok procenat ispitanika ima rizik za nastajanje šećerne bolesti tipa 2: 28% lako povišen, 13% umjeren, 19% visok i 3% veoma visok rizik. Edukacija pacijenata, naročito u primarnoj zdravstvenoj zaštiti, ima veliki značaj u prevenciji nastanka diabetesa. Diplomirana medicinska sestra je kompetentna da samostalno kreira i provodi promotivno-preventivne programe.

Ključne riječi: šećerna bolest, riziko faktori, genetska predispozicija

6-O-4

Risk factors for the development of diabetes mellitus type II

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Abstract

Diabetes mellitus describes a metabolic disorder of multiple etiology characterized by chronic hyperglycemia with disturbances in the metabolism of carbohydrates, fats and proteins by a defect in insulin secretion, insulin or a combination of the efficiency of both of these causes. A number of risk factors in the etiology of diabetes type 2: genetic factors (which we can not influence), nutrition, obesity, physical inactivity, psychogenic stress, hypertension and many others. The research objectives are to examine and analyze the risk factors for type 2 diabetes, and propose possible promotional and prevention program in the context of health care.

Materials and Methods: We conducted a cross-sectional study in the period from the first to the 31 May in family practice medicine "Švrakino Selo". The respondents were people aged between 25 and 64 years, of both sexes. Survey instruments are standardized questionnaire and anthropometric measurements.

Results: The study showed that 63% of respondents have an increased body mass index, 28% male and 48% female patients have an increased waist circumference and second risk, 31% of respondents were physically inactive in their daily diet does not use the fruits, vegetables or grains, 20% of those using antihypertensives and 41% of patients have a genetic predisposition for the development of diabetes.

Conclusion: A high percentage of patients at risk for the occurrence of type 2 diabetes: 28% easily elevated, 13% moderate, 19% high and 3% very high risk. Patient education, especially in primary care, is of great importance in the prevention of diabetes. Registered nurse is competent to independently create and implement promotional and preventive programs.

Keywords: diabetes mellitus, risk factors, genetic predisposition

BMI indeks i upotreba dodataka ishrani u odnosu na tip Diabetes mellitusa

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Sažetak

Uvod: Glavni oblici šećerne bolesti, Diabetes mellitus-a (DM), su podijeljeni na one nastale zbog nedostatka sekrecije inzulina, odnosno zbog insuficijencije β -ćelija pankreasa (tip I), i one nastale zbog inzulinske rezitencije na nivou skeletnih mišića, jetre i adipocita, sa različitim stepenom oštećenja β -ćelija pankreasa (tip II). Index tjelesne mase (eng. Body mass index (BMI)) je pokazatelj pretilosti na osnovu visine i težine ispitanika u zavisnosti od spola (prekomjerna tjelesna težina = 25–29.9 kg / m², gojaznost = BMI 30 kg / m² i više). **Cilj:** Prikaz vrijednosti BMI indexa u odnosu na tip DM, te prikaz upotrebe dodataka ishrani u odnosu na tip DM. **Materijal i metode:** Istraživanje je imalo analitički i reterospektivni karakter, te je uključilo dvije grupe pacijenata. Prva grupa su bili pacijenti sa dijagnozom DM tip I (n=6), a druga, pacijenti sa dijagnozom DM tip II (n=58). Podaci su prikupljeni na nivou primarne zdravstvene zaštite (Dom zdravlja Breza, Bosna i Hercegovina). **Results:** Od ukupnog broja pacijenata sa DM tip I, 16% je imalo BMI 25-29,9 kg/m² u odnosu na 46,5% (p<0,005) pacijenata sa dijagnozom DM tip II. U grupi sa DM tip II, 15,5% pacijenata je imalo BMI> 30 kg/m², dok kod pacijenata sa DM tip I nije bilo pomenutih vrijednosti. Upotreba ekstrakta cimeta u prvoj grupi pacijenata nije zabilježena u svakodnevnoj ishrani, u odnosu na drugu grupu, u kojoj je 18.9% pacijenata koristilo ekstrakt cimeta. Alfa-lipoičnu kiselinu, u formi tableta za oralnu upotrebu, u prvoj grupi je koristio jedan pacijent, a u drugoj grupi njih 19 (32.7%) (p<0,005). **Zaključak:** BMI 25- 29.9 kg / m² i BMI> 30 kg / m², kao i upotreba dodataka ishrani (ekstrakt cimeta, alfa-lipoična kiselina) su signifikantno prisutniji kod pacijenata sa dijagnozom Diabetes Mellitus-a tip II.

Ključne riječi: Diabetes Mellitus, index tjelesne mase, dodaci ishrani

6-O-5

BMI index and food supplements in correlation to Diabetes Mellitus type

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Abstract

Introduction: The main forms of diabetes mellitus (DM) are divided into those caused by lack of insulin secretion, due to damage of β -cells of the pancreas (type I), and those that are a consequence of insulin resistance that occurs at the level of skeletal muscles, liver and adipose tissue, with varying degrees of β -cells damage (type II). Body mass index (BMI) is a measure of body fat based on height and weight that applies to adult men and women (overweight = 25–29.9 kg / m², obesity = BMI of 30 kg / m² or greater). **Aim:** To show relation between BMI and diabetes mellitus type, and to show usage of food supplements in correlation to diabetes mellitus type. **Material and methods:** Paper has analytical and retrospective character, and includes two groups of patients, group I includes patients with DM type I (n=6) and other group includes patients with DM type II (n=58)- data from Healthcare Center Breza (primary healthcare). **Results:** 16% of patients with DM type I had BMI 25-29,9 kg/m², and 46,5% of patients from group II (p<0,005). 15,5% of patients from group II had BMI> 30 kg/m², and none from group I. The extract of cinnamon in the first group is not used as a dietary supplement by any of the patients, and in the second group 18.9% of them use it. Alpha lipoic acid, in the form of oral preparation is used in the first group by 1 patient, and in the second group by 19 (32.7%) of them (p<0,005). **Conclusion:** BMI 25- 29.9 kg / m² and BMI> 30 kg / m² is significantly more prevalent in the second group of patients, and food supplements (extract of cinnamon, alpha lipoic acid) are also significantly more used by patients in the second group (DM type II patients).

Keywords: diabetes mellitus, body mass index, food supplements

Mikronutrijenti i diabetes

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Sažetak

Diabetes mellitus tipa 2 je metabolički poremećaj koji karakteriše povišen nivo glukoze u krvi, deficit inzulina, kao i inzulinska rezistencija. Prema podacima Interantional Diabetes Federation diabetesom je pogođeno 382 miliona ljudi širom svijeta, a u BiH 2006. godine stopa incidence je iznosila 32,3/100 000 stanovnika. Simptomi diabetes mellitusa tipa 2 su: povećana žeđ i glad, učestalo mokrenje, zamor, zamagljen vid, usporeno zarastanje rana i česte infekcije. Faktori rizika za nastanak diabetesa su povećana tjelesna težina, distribucija masti, fizička neaktivnost, pozitivna porodična anamneza, godine, sindrom policističnih jajnika itd. Potencijalne komplikacije koje se mogu javiti kod diabetesa su: kardiovaskularna oboljenja, neuropatije, nefropatije, dijabetičko stopalo, promjene na koži itd. Terapija diabetesa uključuje i nefarmakološke agense za snižavanje glukoze u krvi. Mikronutrijenti se ističu kao nefarmakološki agensi, koji se koriste zajedno sa terapijom za diabetes. Cilj rada je prikazati utjecaj mikronutrijenata i njihovog statusa kod diabetes mellitusa tipa 2. U izradi ovog rada korištena je baza podataka PubMed. Predstavljeni su podaci iz randomiziranih studija i meta-analiza. Magnezij može reducirati nivoe glukoze u plazmi, povećati nivoe lipoproteina visoke gustine, te reducirati inzulinsku rezistenciju i poboljšati osjetljivost na inzulin. Željezo također može reducirati inzulinsku rezistenciju. Cink i hrom mogu utjecati na kontrolu glikemije i održavanje lipidnih parametara. Vanadij može sniziti nivoe glukoze, međutim zbog nedovoljnog broja dokaza on se ne može koristiti u liječenju. Suplementacija selenom ne prevenira tip 2 diabetesa, već može povećati rizik od nastanka bolesti. Neki od ovih mikronutrijenata imaju izraženu antioksidativnu aktivnost, te u njihovom deficitu mogu nastati različite komplikacije. Osobe koje su oboljele od diabetesa trebaju poznavati važnost dnevne potrebe mikronutrijenata iz hrane.

Ključne riječi: Diabetes mellitus, glukoza, inzulin, mikronutrijenti, minerali

6-O-6

Micronutrients in diabetes

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Abstract

Diabetes mellitus type 2 is a group of metabolic diseases characterized by high blood sugar levels, insulin deficiency and insulin resistance. According to International Diabetes Federation, an estimated 382 million people have diabetes, and in BiH in 2006 incidence was 32.3/100 000 people. Symptoms of diabetes type 2 are: increased hunger and thirst, frequent urination, fatigue, blurred vision, slow healing sores and infections. Risk factors for diabetes are overweight, distribution of fat, physical inactivity, family history, age, polycystic ovarian syndrome etc. Potential complications of diabetes include: cardiovascular diseases, neuropathy, nephropathy, diabetic foot, skin conditions etc. Therapy for diabetes also includes non pharmacological agents. Micronutrients are non pharmacological agents that can be used with therapy for diabetes. The aim of this study is to show status of micronutrients and their effect on diabetes mellitus type 2. This review was based on data found in PubMed database. We included randomized trials and meta-analysis. Magnesium may be effective in reducing plasma glucose levels, raising high-density lipoproteins, reducing insulin resistance and improves insulin sensitivity. Iron also can lower insulin resistance. Zinc and chromium have beneficial effect on glycaemic control and promotes healthy lipid parameters. Vanadium can lower glucose levels, but there is insufficient evidence to support the use of the vanadium in treatment. Selenium supplementation doesn't prevent type 2 diabetes, and it may increase risk of the disease. Some of these micronutrients have strong antioxidant activity and different complications may occur in their deficit. People who are suffering from diabetes should be familiar with daily requirement of micronutrients from food.

Keywords: Diabetes mellitus, glucose, insulin, micronutrients, minerals

Alfa lipoična kiselina kao dijetetski suplement: molekularni mehanizam i terapijski potencijal

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Sažetak

Povećana količina slobodnih radikala u organizmu dovodi do oksidacijskog stresa, koji je uzročnik oštećenja i smrti ćelija, kao i prijevremenog starenja i bolesti. Alfa lipoična kiselina ili 1,2-ditiolan-3-pentanska kiselina je prirodni ditiolski spoj. Predstavlja visokoefikasni antioksidans koji se normalno proizvodi u našem organizmu i neophodna je za važne metaboličke funkcije ćelija. Idealna je zbog svojih osobina jer lako neutralizira slobodne radikale, helira teške metale, posjeduje amfifilni karakter, te stupa u reakcije sa drugim antioksidansima i regenerira ih. Veliki broj eksperimentalnih i kliničkih studija dokazuju benefite korištenja alfa lipoične kiseline kao adjuvantne terapije kod dijabetesa i njegovih komplikacija, kod tretmana gojaznosti, neurodegenerativnih bolesti i kardiovaskularnih oboljenja. Kod osoba koji boluju od dijabetesa melitusa tipa 2 povećava osjetljivost perifernih tkiva na inzulin te potiče bolje korištenje glukoze u mišićima. Bitni rezultati su dobiveni u tretmanu dijabetičke neuropatije koji su dokazali da alfa lipoična kiselina može značajno da pomogne u ublažavanju simptoma i da uspori dalje napredovanje bolesti. Alfa lipoična kiselina se pokazala efikasnom i kod tretmana gojaznih pacijenata, a zahvaljujući lakom prolasku krvno-moždane barijere, spriječava i progresiju degenerativnih hroničnih bolesti. Ne smije se koristiti kao zamjena za terapiju. Primjenjuje se kao dodatak ishrani, pri čemu su studije dokazale da je u dozi od 600mg najefikasnija i najsigurnija.

Ključne riječi: alfa lipoična kiselina, antioksidans, dijabetes, dijabetička neuropatija, dijetetski suplement

6-O-7

Alpha lipoic acid as a dietary supplement: molecular mechanisms and therapeutic potential

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Abstract

Increased amounts of free radicals in the body leads to oxidative stress, which is the cause of damage and cell death, as well as premature aging and disease. Alpha lipoic acid or 1,2-dithiolane-3-pentanoic acid is a natural dithiol compound. It represents a highly efficient antioxidant that is normally produced in the body and is necessary for important metabolic functions of cells. It is ideal because of its ability to easily neutralize free radicals, chelates heavy metals, has amphiphilic characteristics, and reacts with other antioxidants and regenerates them. A large number of clinical studies demonstrate the benefits of using alpha lipoic acids as adjuvant therapy in diabetes and its complications, in the treatment of obesity, neurodegenerative diseases and cardiovascular diseases. In people suffering from type 2 diabetes mellitus, it increases the sensitivity of peripheral tissues to insulin and encourages better use of glucose in the muscles. Important results have been obtained in the treatment of diabetic neuropathy, the results have proven that alpha lipoic acids can significantly reduce symptoms and slow down further progression of the disease. Alpha lipoic acid had proven to be effective in the treatment of obese patients, and thanks to easy passage of the blood-brain barrier, prevents the progression of degenerative chronic diseases. It should not be used as a substitute for therapy. It is used as a dietary supplement, where studies have demonstrated that a dose of 600mg is most efficient and safest.

Keywords: alpha lipoic acid, antioxidant, diabetes, diabetic neuropathy, dietary supplement

Ispitivanje antibakterijskog svojstva ploda divlje brusnice sa planine VraniceLamija ALIHODŽIĆ,^{1*} Anesa JERKOVIĆ-MUJKIĆ¹¹ Univerzitet u Sarajevu, Prirodno-matematički fakultet, Odsjek za biologiju, BiH

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Sažetak

Brusnica ima dugu historiju upotrebe u ishrani i medicini. Brojna istraživanja pokazuju da određeni hemijski spojevi iz brusnica imaju, pored ostalog, i antibakterijska svojstva. Cilj ovog istraživanja je ispitivanje antibakterijskih svojstava ploda divlje brusnice (*Vaccinium vitis-idaea* L.) u sirovom stanju prikupljene na planini Vranica (centralna Bosna i Hercegovina). Antibakterijsko djelovanje brusnice je testirano pomoću *Kirby-Baureovog* disk-difuzionog postupka, a rezultati antibiograma su očitani na osnovu izmjerenih zona inhibicije. U istraživanju su korištene sljedeće vrste bakterija: *Staphylococcus aureus* ATCC 25923 - MRSA, *Enterococcus faecalis* ATCC 29212, *Escherichia coli* ATCC 25922 i klinički izolat *Salmonella enteritidis*. Dobiveni rezultati su pokazali da egzokarp ploda planinske brusnice ima izraženo antibakterijsko djelovanje na sve testirane bakterijske vrste sa približno jednakim intenzitetom.

Ključne riječi: brusnica, plod, antibakterijska svojstva

6-P-1

Investigation of antibacterial activity of fruit of wild lingonberry from the mountain Vranica

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Abstract

Cranberries have a long history of nutritive and medical use. Many researches show that certain chemical compounds from cranberries have, among the others, antibacterial effects. The main objective of this research was to investigate antibacterial activity of fruit exocarp of wild lingonberries (*Vaccinium vitis-idaea* L.) in raw condition collected from the mountain Vranica (central Bosnia and Herzegovina). Antibacterial activity was tested with Kirby-Bauer disk-diffusion test, and results of antibiograms are obtained from measured inhibition zones. Bacteria used in this research were: *Staphylococcus aureus* ATCC 25923 - MRSA, *Enterococcus faecalis* ATCC 29212, *Escherichia coli* ATCC 25922, and a clinical isolate of *Salmonella enteritidis*. Results showed that exocarp of the fruit of lingonberries has expressed antibacterial activity on all tested bacterial species with approximately equal intensity.

Keywords: lingonberry, cranberry, fruit, antibacterial activity

Fitoterapija – stari i savremeni način liječenja

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Sažetak

Fitoterapija je prvi način liječenja koji je čovjek poznao i prenosio usmenim putem.

Prvi pisani podaci o upotrebi prirodnih ljekovitih sirovina govore o upotrebi ljekovitih biljnih materijala i potiču iz *Kine* iz perioda od 3.000 godina prije naše ere.

Naziv *fitoterapija* uveo je francuski ljekar *Henri Leclerc* (1870-1955.) umjesto naziva "*biljna medicina*". Ljekoviti pripravci i lijekovi koji se izrađuju za potrebe fitoterapije označeni su izrazom *fitofarmaci* ili *fitoterapeutici*.

Osnovu primjene raznih biljnih materijala kao prirodnih ljekovitih sirovina ili lijekova prirodnog porijekla predstavljaju različite hemijski definisane supstance i produkti koji ispoljavaju cijeli niz farmakoloških učinaka na ljudski organizam.

Počeci primjene ljekovitih biljnih materijala ili droga biljnog porijekla su vezani za tradiciju njihova upoznavanja i prenošenja mogućnosti i načina liječenja raznih oboljenja i bolesnih stanja..

Razvoj nauke i tehnologije omogućio je naučno istraživački pristup analizi prisustva različitih hemijskih supstanci u biljnim materijalima kao i ispitivanje ljekovitih djelovanja tih supstanci. Njemački apotekar *Wilhelm Selinger* je u 19. vijeku izolirao *morfin* iz opijuma. Ovo se smatra početkom razvoja *farmakognozije*, nauke o prirodnim ljekovitim sirovinama i lijekovima prirodnog porijekla.

U radu će se prezentirati osnovni principi fitoterapije i fitoterapeutika kroz pregled najvažnijih hemijskih supstanci i produkata prisutnih u biljnim materijalima koji se koriste u fitoterapiji.

6-P-2

Phytotherapy - the old and the modern method of healing

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Abstract

Phytotherapy is the first method of healing known to the mankind and transferred orally. The first written information on the use of natural medicinal resources, mostly on the use of medicinal plant materials originate from China from the period of 3,000 years BC.

The term *phytotherapy* was introduced by the French *Henri Leclerc* (1870-1955.) instead of the term "*herbal medicine*". Remedies and medications that are made for the purpose of herbal medicine are marked by term *phytopharmacies* or *phytotherapeutics*.

The basis of the application of a variety of plant materials as natural medicinal raw materials and medicines of natural origin represent different chemically defined substances and products that exhibit the full range of pharmacological effects on the human body

The beginnings of the application of medicinal plant materials or drugs of plant origin are linked to the tradition of their introduction and transfer of possibilities and ways of treating various diseases and illnesses .

The development of science and technology has enabled the scientific research approach to the analysis of the presence of various chemical substances in plant material and testing of medicinal effects of these substances. German pharmacist *Wilhelm Salinger* in the 19th century isolated morphine from opium. This is considered the beginning of the development of Pharmacognosy, the science of natural healing raw materials and medicines of natural origin

This paper will present the basic principles of phytotherapy and phytotherapeutic through review of the most important chemical substances and products present in the plant material used in phytotherapy.

7. **ORGANSKA I TRADICIONALNA HRANA**
 ORGANIC AND TRADITIONAL FOOD

Utjecaj magarećeg mlijeka na zdravlje ljudi

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Sažetak

Magareće mlijeko je ekonomski jako zanimljiv proizvod. U posljednjih nekoliko godina ova vrsta mlijeka budi interes kako istraživača tako i potrošača. Funkcionalni učinci su zapravo potrošačima interesantniji od same nutritivne vrijednosti mlijeka kao namirnice. Odlike i nutritivna vrijednost magarećeg mlijeka dijelom su istražene uz određene nedoumice o biološkom učinku pojedinih komponenata. Neke komponente magaraćeg mlijeka imaju jedinstvene karakteristike kao što su baktericidna svojstva što ovo mlijeko razlikuje od mlijeka drugih vrsta sisara. Magareće mlijeko je zbog svog nutritivnog sastava, između ostalog savršena zamjena u ishrani doječandi i osoba sa oslabljenim imunološkim sustavom. Ova vrsta mlijeka je sve popularnija u Europi i naširoko se primjenjuje po preporuci pedijataru u liječenju bronhitisa, astme, suhog kašlja i dermatitisa. Stoga je cilj ovoga rada ukazati na mnogostruka korisna djelovanja magarećeg mlijeka po ljudsko zdravlje. Dokazi o djelovanju magarećeg mlijeka odnose se više na laboratorijska istraživanja koja istražuju sastav i svojstva te ga uspoređuju s mlijekom drugih životinja. Studije rađene na usporedbi djelovanja kozijeg i magarećeg mlijeka kod djece sa poremećajem preosjetljivosti na kravlje mlijeko pokazale su da magareće mlijeko u većini slučajeva nije izazvalo alergijsku reakciju za razliku od kozijeg mlijeka. U pogledu ostalih aspekata zdravlja ovo mlijeko u budućnosti ima perspektivu u prevenciji i/ili liječenju mnogih kroničnih degenerativnih bolesti.

Cljučne riječi: magaraće mlijeko, nutritivni sastav, zdravlje

7-O-1

The impact of donkey's milk on man's health

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Abstract

Donkey's milk is economically interesting product. In the last few decades it has great influence on both researchers and consumers. Consumers themselves are actually more interested on functional impacts then nutritive value of donkey's of as diary product. Distinctive features and nutritive value of donkey's milk are partly researched with some doubts about biological impact of some components, as antimicrobial characteristic that make unique distinction from the milk of other mammals. However, donkey's milk with its nutritive value is a perfect substitute in infant feeding and those people with lowered immunological system. Furthermore, this kind of milk is even more popular in Europe as a pediatrician recommend for bronchitis, asthma, dry cough and dermatitis. The main point of this study is to show vast range of useful impact this laboratory research done on characteristic and composition and compared with milk of other animals. Studies done on comparing impact of goat's and donkey's milk on children with cow's protein allergy shows that donkey's milk didn't have allergic reaction as goat's milk did. As a metter of fact this milk has great perspective in future in prevention and/or treatment many chronic degenerative diseases.

Keywords: donkey's milk, nutritive value, health

Komparacija nutritivnih vrijednosti Travničkog i Livanjskog sira

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Sažetak

U Bosni i Hercegovini sve je značajnija proizvodnja i prerada ovčjeg mlijeka, te proizvodnja autohtonih ovčjih sireva naročito Travničkog i Livanjskog. Proizvodnja i potrošnja ovih sireva dobrim dijelom odvija se u malim seoskim gazdinstvima. Sirevi su se proizvodili iz potrebe da se sačuva višak proizvedenog mlijeka, jer se proizvedeni sir mogao uskladištiti i čuvati duži vremenski period. Kvalitet ovih sireva ogleda se u njihovoj nutritivnoj vrijednosti koja ovisi o vrsti sira i mlijeka od kojeg su napravljeni. Naime, djelovanjem mikroorganizama i njihovih enzima tokom procesa zrenja dolazi do povećanja probavljivosti i nutritivne vrijednosti sira. Polazeći od poznate činjenice da se hranljiva vrijednost mliječnih proizvoda bazira na kvalitetu polazne sirovine, ne smije se izgubiti iz vida i uticaj tehnologije proizvodnje, vrste proizvoda i koncentracije pojedinih sastojaka mlijeka u tehnološkim procesima. Cilj ovoga rada je komparacije nutritivnih vrijednosti Livanjskog i Travničkog sira obzirom na različitosti u tehnologiji proizvodnje, specifičnost biljnog pokrivača i klimatskim prilikama. Potrebno je promovisati autohtone proizvode kao što su sirevi, te tako popularizirati kupovinu i potrošnju istih. Na taj način bi se povećala potreba kako za proizvodnjom sirovina za spomenute proizvode, tako i za uzgojem autohtonih pasmina ovaca.

Ključne riječi: sir, autohtonost, tradicija, kvalitet

7-O-2

Comparison of the nutritional value of Travnicki and Livanjski cheese

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Abstract

In Bosnia and Herzegovina the production and processing of sheep's milk, and production of native cheese especially Travnicki and Livanjski becomes more and more important. Production and consumption of these cheeses mostly takes place in small rural households. Cheeses were produced from the need to preserve excess of produced milk, because the manufactured cheese could be stored and kept for a long period of time. The quality of these cheeses is reflected in their nutritional value which depends from the type of cheese and milk from which they are made. Particularly, the influence of micro-organisms and their enzymes during the process of ripening increases the digestibility and nutritional value of cheese. Starting from the known fact that the nutritional value of dairy products is based on the quality of raw material, one should bear in mind the impact of production technology, product types and concentrations of individual components of milk in technological processes. The purpose of this work is to compare the nutritional value of the Livanjski and Travnicki cheese, considering the differences in production technology, specific plant cover and climate conditions. It is necessary to promote native products such as cheese, and on that way popularize the shopping and consumption of cheeses. This would increase the need for both the production of raw materials for these products and the breeding of indigenous breeds of sheep.

Key words: cheese, native, tradition, quality

**Uticaj roka sjetve na kvantitativne i kvalitativne osobine spelte
(*Triticum spelta* L.)**

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Sažetak

Spelta (*Triticum spelta* L.) je prastara, pljevičasta vrsta pšenice, koja se, zahvaljujući ekspanziji organske poljoprivredne proizvodnje, ponovo sije na poljima poljoprivrednih proizvođača u svijetu, ali i kod nas. Zrno ove vrste žita u idealnom odnosu sadrži bjelančevine, ugljene hidrate, masti, mineralne materije, vitamine i celulozu. Prilagođena je poljoprivredi sa nižim ulaganjima, otpornija je na bolesti i štetočine od obične pšenice, što je u uslovima održivih sistema poljoprivredne proizvodnje promoviše kao vrlo pogodan usjev. Cilj ovoga rada bio ispitati kvalitativne i kvantitativne osobine tri strane sorte spelte u našim agroekološkim uslovima u dva roka sjetve. Na eksperimentalnom polju Poljoprivredno-prehrambenog fakulteta u Sarajevu tokom 2013/2014. godine realiziran je eksperiment sa tri sorte spelte, dvije porijeklom iz Švicarske i jedne iz Njemačke. Ogled je postavljen po randomiziranom blok sistemu u četiri ponavljanja. Prinos, apsolutna masa sjemena, hektolitarka masa, sadržaj proteina, skroba, vlažnog ljepka i pepela su parametri praćeni u ovom istraživanju. Sve tri sorte su u oba roka sjetve dale zadovoljavajući prinos (4,16-5,21 t ha⁻¹), a razlike na nivou statističke značajnosti pojavile su se samo kod apsolutne mase i vlažnog glutena. Shodno dobivenim rezultatima sve tri sorte se mogu preporučiti za naše agroekološke uslove.

Ključne riječi: spelta, organska proizvodnja, sorta, rok sjetve

7-O-3

**Effect of sowing time on qualitative and quantitative characteristics of spelt
(*Triticum spelta* L.)**

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Abstract

Spelt is ancient, hulled wheat, which is, thanks to the expansion of organic farming, being re-sown in the fields of agricultural producers of the world, as well as in our country. A grain of this wheat in its ideal state contains proteins, carbohydrates, fats, minerals, vitamins and cellulose. Wheat is adapted to farming with low investment, more resistant to diseases and pests compared to common wheat, which, in conditions of sustainable agricultural production makes it as a very reliable crop. The main goal of this paper is to examine the qualitative and quantitative characteristics of three foreign varieties of spelt in our agro-ecological conditions in two sowing periods. Experiment has been conducted in experimental field of Faculty of Agriculture and Food Sciences of University of Sarajevo during 2013/2014, including testing 3 varieties of spelt, two origin from Switzerland and one from Germany. Experiment has been conducted in randomized block system with four replications. The yield, 1000 grain weight, test weight, protein content, starch content and wet gluten and ash content were measured in this research. All three varieties gave satisfactory yield (4.16-5.21 t ha⁻¹) in both sowing times, and the differences in the level of statistical significance have appeared only in 1000 grain weight and wet gluten. In accordance with the results of all three varieties can be recommended to our environmental conditions.

Keywords: spelt, organic production, variety, sowing time.

Zablude o organskoj hrani

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Sažetak

Kultura organske hrane i samog njenog uzgoja u BiH nije razvijena, stoga se često pojam organske hrane pogrešno interpretira. Pojam uzgoja organske hrane se isključivo odnosi na norme propisane zakonom vezane za uzgoj, proizvodnju, tehnološku obradu i skladištenje iste, dok norme o nutritivnom kvalitetu organske hrane nisu različite od onih za konvencionalno uzgojenu hranu.

S ciljem ispitivanja shvatanja termina „organska hrana“ provedeno je ispitivanje među studentima III godine Farmaceutskog fakulteta Univerziteta u Sarajevu. U istraživanju je učestvovalo ukupno trideset i dva ispitanika od čega četiri ispitanika muškog spola i dvadest i osam ispitanika ženskog spola, starosne dobi od 21-27. godina. Ispitanici su trebali da napišu prvu asocijaciju na termin organska hrana, ispitanicima sada nisu imali stručna predavanja iz predmeta Bromatologija. Najveću repetitivnost su imali pojmovi „zdrava“ (šest odgovora) i dijetalna“ (tri odgovora).

Iz istraživanja je zaključeno da ispitanici nemaju jasnu predstavu o značenju termina organska, bio hrana, te da je ispitanici smatraju superiornijom u odnosu na hranu koja je dobivena konvencionalnim uzgojem. Smjernice za uzgoj organske hrane izdaju tačne propise o načinu dobijanja ove hrane, počevši od pripreme samog zemljišta pa do skladištenja ove hrane, potrebno je zadovoljiti čitav niz uslova da bi jedan proizvod dobio etiketu bio proizvoda. Međutim, do danas ne postoji jednoznačan naučno potvrđen dokaz da je hrana dobivena organskim uzgojem superiornija od hrane dobivene konvencionalnim uzgojem. Rezultati sugerišu potrebu za edukacijom i boljim informisanjem potrošača o značenju deklariranih karakteristika hrane.

Cljučne riječi: organska hrana, bio proizvod, uzgoj, anketa

Misconceptions about organic food

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Abstract

Knowledge about organic food and its very culture in BiH is not developed, so the concept of organic food is often misinterpreted. The concept of organic farming exclusively refers to the norms, prescribed by the law, related to the cultivation, manufacture, technological processing and storage of organic food, while the standard of nutritional quality of organic food are not different from those of conventionally grown food.

With the aim of testing understanding of the term "organic food" survey was conducted among students of III year of Faculty of Pharmacy, University of Sarajevo. The study included a total of thirty-two subjects of which four respondents are male and twenty-eight of female respondents, aged 21-27. years. Subjects were asked to write the first association to the term organic food, respondents did not have lectures in the subject Bromatology. The highest repetition had the terms "healthy" (six answers) and „diet"(three answers).

From the research, it was concluded that the respondents do not have a clear idea of the meaning of the term organic, bio food, and that the respondents consider it superior to the food that is produced by conventional breeding. Guidelines for organic farming issue have exact regulations about obtaining this food, starting with the preparation of land to the storage of food, it is necessary to accomplish a series of requirements so product could be labeled as organic- bio product. However, there is no unambiguous scientific evidence confirmed that the food produced by organic farming is superior to food produced by conventional breeding. The results suggest the need for education and better informing consumers about the meaning of declared characteristics of food.

Keywords: organic food, bio product, growing, survey

Ponašanje potrošača pri kupovini organskih proizvoda; primjer grada KonyeSumedina SPAHIĆ,^{1*} Mithat DIREK²

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Sažetak

Posljednjih nekoliko godina zabilježena je snažna industrijalizacija tradicionalnih i organskih proizvoda, a isti privlače sve više pažnje. Razlog tome je što industrijska – intenzivna proizvodnja na tržištu zauzima sve više mjesta. Međutim svjesni potrošači sada sve više preferiraju modele proizvodnje koji nisu štetni po ljudsko zdravlje, a samim tim imaju i prijateljski uticaj na okolinu. Zbog toga je za budućnost organske proizvodnje veoma važno otkriti trendove potrošnje organskih proizvoda. Cilj ovog istraživanja je bio ispitati ponašanje potrošača pri kupovini organskih proizvoda, te u skladu sa tim dati preporuke za razvoj prodajne politike na tržištu organskih proizvoda. U ovom istraživanju korišten je metod anketiranja, gdje su ispitane jedinice bila domaćinstva grada Konye. Kreiran je anketni upitnik čijom su primjenom urađeni intervjui licem u lice sa 115 potrošača rangiranih prema njihovim prihodima u različitim stambenim područjima Konye. Prema istraživanju, potrošači iako su svjesni koristi i značaja organske poljoprivrede oni su suzdržani od potrošnje organskih proizvoda zbog visoke cijene te nedostaka dovoljnog broja prodajnih mjesta istih. U Konyi organska potrošnja ne bilježi značajan rast jer su još uvijek prisutni ograničavajući faktori koji potrošače sprečavaju na njihovu veću potrošnju. Budući da organska proizvodnja u posljednjih nekoliko godina bilježi značajan rast u skladu sa tim neophodno je i tržište organskih proizvoda u Konyi prilagoditi potrošačkim potrebama a sve u svrhu postizanja obostrane koristi kako potrošača tako i njihovih proizvođača.

Ključne riječi: organska proizvodnja, prodajne politike, stavovi potrošača

7-O-5

Consumer behavior when purchasing organic products; example of the city of Konya

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Abstract

In the last few years there was a strong industrialization of traditional and organic products and the same are attracting more attention. This is because the material - intensive production in the market occupies all over the place. However conscious consumers now increasingly prefer models of production that are not harmful to human health, and therefore have a friendly impact on the environment. It is therefore for the future of organic farming is very important to detect trends in consumption of organic products. The aim of this study was to examine the behaviour of consumers when buying organic products, and accordingly make recommendations for the development of sales policy in the market of organic products. In this study used survey methods, which have been tested units of households was the city of Konya. Created the questionnaire whose application are done face to face interviews with 115 consumers ranked according to their income in different residential areas of Konya. According to the survey, consumers are even aware of the benefits and importance of organic agriculture they abstain from the consumption of organic products because of the high cost and lack of a sufficient number of outlets of the same. In Konya organic consumption not grown significantly since they still present limiting factors that prevent consumers to their higher consumption. Since organic farming in recent years has grown significantly in accordance with this essential and organic market in Konya adapt to consumer needs with the purpose of achieving mutual benefit to both consumers and their producers.

Keywords: organic farming, sales policy, consumer attitudes

**Autohtone pasmine Bosne i Hercegovine, budućnost organske proizvodnje
mesa i mlijeka**

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Sažetak

Brzi razvoj tehnologije i porast broja stanovništva doveo nas je do nezdravog načina ishrane, samim tim i do nezdravog načina proizvodnje hrane koju konzumiramo. Zbog toga je potrebno pokretanje organske proizvodnje namirnica biljnog i animalnog porijekla. Da bi došli do toga potrebna nam je edukacija stanovništva, potpora vlasti, te strateški plan za razvoj ove grane privrede u budućnosti. Organska proizvodnja pored toga što može biti uspješna grana u primarnom sektoru, takođe ima svoje mjesto i u eko turizmu, kojemu se sve više pridodaje na važnosti. Autohtone pasmine imaju poseban značaj za ovaj tip proizvodnje, jer su se kroz višestoljetni uzgoj prilagodili našem podneblju i na taj način ostvarili svoj puni genetski potencijal u proizvodnji mesa i mlijeka bez uplitanja ljudskog faktora. Bosna i Hercegovina je na početku procesa organiziranja proizvodnje namiranica animalnog porijekla koja će sigurno biti okosnica seoskog i eko turizma.

Ključne riječi: organska proizvodnja, autohtone pasmine, meso, mlijeko

7-P-1

Indigenous breeds of Bosnian and Herzegovinan, future organic production of meat and milk

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Abstract

The rapid development of technology and population growth has led to unhealthy dietary habits, and therefore an unhealthy way of producing the food that we consume. It is therefore necessary to start the production of organic food products from plant and animal origin. To attain that we need education of the population, support from the Government, and a strategic plan for future development of this branch in the economy. In addition, organic production can not only be a successful branch in the primary sector but also have a place in an increasingly important eco-tourism sector. Indigenous breeds are of particular importance for this type of production, as through centuries-old breed practices they have adapted to our climate. In this way they have achieved their full genetic potential in the production of meat and milk without interference from human factors. Bosnia and Herzegovina is at the beginning of the process of organizing and implementing the production of natural food supplies from animal origins. This will surely be the backbone of rural and eco-tourism.

Keywords: organic production, indigenous breeds, meat, milk

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