



II Studentski Kongres

„HRANA-ISHRANA-ZDRAVLJE“

sa međunarodnim učešćem

KNJIGA SAŽETAKA

Sarajevo, juli 2017.

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međunarodnim učešćem**

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**2nd Students Congress „Food-Nutrition-Health“
with international participation**

BOOK OF ABSTRACTS

Sarajevo, 2017

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Univerzitet u Sarajevu, Fakultet zdravstvenih studija, Sarajevo, BiH
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05.-07. juli 2017. godine

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Organizovanjem drugog kongresa „HRANA-ISHRANA-ZDRAVLJE“ studenti medicinske, biotehničke i humanističke grupacije Univerziteta u Sarajevu, skupa sa svojim nastavnicima osiguravaju kontinuitet u održavanju ove multidisciplinarne konferencije. Time je pokazana svijest naše akademske zajednice o izuzetnom značaju teme hrana i ishrana, jednom od najvećih izazova 21. stoljeća, u kojem bilježimo kontinuirani rast populacije i paralelno smanjenje raspoloživih prirodnih resursa. Multidisciplinarni karakter kongresa je u skladu sa realno nužnim pristupom za adekvatan odgovor na izazove u domenu hrane, ishrane i zdravlja, kao i sa savremenim trendom „evropske nacije,“ u iznalaženju najracionalnijih odgovora na mnoga pitanja u svim sferama društvenog života i djelovanja.

Za 2. Kongres „HRANA-ISHRANA-ZDRAVLJE“ Organizacioni odbor je odabrao 5 tematskih cjelina: **1. Primarna proizvodnja i prerada hrane; 2.. Toksikologija i sigurnost hrane; 3. Ishrana tokom životnog ciklusa, 4. Dijetoterapija i 5. Savremena dijagnostika i analitika hrane.** Na kongresu će biti predstavljeno 59 studentskih radova koji su prošli recenziju Naučnog odbora i čije sažetke donosimo u ovoj Knjizi sažetaka. Ocjena i naučna verifikacija iznijetih tvrdnji i rezultata je prepuštena učesnicima Kongresa i široj naučnoj i stručnoj javnosti. Tekstovi rukopisa kratkih sadržaja nisu lektorisani.

U organizaciji i realizaciji 2. Kongresa uzeli su učešće studenti Poljoprivredno-prehrambenog, Farmaceutskog, Veterinarskog, Pedagoškog, Stomatološkog fakulteta sa klinikama i Fakulteta zdravstvenih studija Univerziteta u Sarajevu. To potvrđuje opredjeljenje naših studenata za težnjom ka usvajanju novih znanja i vještina i nastojanjem da u ovim složenim vremenima budu društveno korisni. 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. Ovo je i prilika da se zahvalimo svim učesnicima Kongresa koji su svojim učešćem, dobronamjernim sugestijama i prijedlozima pomogli da se ovaj Kongres uspješno realizira.

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

Prof.dr. Faruk Čaklovića, predsjednik Koordinacionog odbora

FOREWORD

By organizing the second congress "FOOD-NUTRITION-HEALTH", students of medical, biotechnical and humanistic studies of the University of Sarajevo, together with their teachers ensure continuity of this multidisciplinary conference. This clearly shows the awareness of our academic community on the extraordinary significance of the food and nutrition issue, one of the greatest challenges of the 21st century characterized by the continuous population growth in parallel with decrease in natural resources availability. The multidisciplinary character of the congress is in line with the approach necessary to adequately respond to challenges in this field, as well as with the modern trends of the "European nation" in finding the most rational solutions to many issues in all areas of social life.

The Organizing Committee selected four sections for the 2nd Congress "FOOD-NUTRITION-HEALTH": 1. Primary production and processing of food; 2. Toxicology and food safety; 3. Nutrition through the life cycle, 4. Dietotherapy and 5. Modern food diagnostics and analysis. Upon the review of the Scientific Committee 59 students' works were approved for presentation and their abstracts are published in this Book of abstracts. Evaluation and scientific verification of the statements and results are left to the participants of Congress and to a scientific and professional public. The English translations of the abstracts are not proofread.

Students of the Faculty of Agriculture and Food Sciences, Faculty of Pharmacy, Veterinary Faculty, Faculty of Educational Sciences, Faculty of Health Sciences and Faculty of Dentistry with Clinics of the University of Sarajevo took part in the organization and realization of the congress. This confirms the commitment of our students to acquire new knowledge and skills and strive to be socially active members of our community. We hope that more conceptually similar student conferences will be organized in the future and that it will become a tradition in the student activities of the University of Sarajevo. We take this opportunity to thank all the participants of the Congress who gave their efforts to make this congress successful.

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

Prof.dr. Faruk Čaklovića, Chairman of the Coordinating Committee

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

Uzgoj puževa za ishranu ljudi

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Sažetak

Vodeći se idejom da kvalitetna ishrana obuhvata raznovrsnost posvetili smo istraživanje jednom rastućem obliku nekonvencionalne animalne proizvodnje – uzgoju i upotrebi mesa puževa u ishrani ljudi. Istraživanje je obuhvatilo utvrđivanje činjeničnog stanja o informiranosti stanovništva o mogućnosti upotrebe ovog animalnog proteina, kao i zastupljenosti istog.

Anketirano je 79 osoba sa područja građa Sarajevo i 33 osobe na području Općine Kakanj, dobi 15-59 godina. Dobiveni podaci su nas usmjerili na istraživanje potencijalnog tržišta i mogućnost bavljenja ovim oblikom animalne proizvodnje. Cilj je prvobitno bio prepoznati potencijal spomenute proizvodnje, dok je naš konačni cilj postao informirati javnost o velikom potencijalu maloparcelnog uzgoja mekušaca, niskim ulagačkim potrebama i minimalnim radnim kapacitetima poredeći sa drugim oblicima animalne proizvodnje. Također, ukazali smo na nutritivnu vrijednost i razlog zašto je ovakvo meso delikatesa u mnogim zemljama.

Rezultati istraživanja su pokazali da nizak stepen informiranosti stanovništva o ovom uzgoju. Od ukupnog broja ispitanih (112) 72 ispitanika (64,3%) vjeruju da se u Bosni i Hercegovini organizirano ne uzgajaju puževi, dok 110 ispitanika (98,2%) nikad nije i ne želi probati meso puževa. Zaključak autora na osnovu ovih i ostalih obrađenih informacija je da vlada neopravdano nepovjerenje u ovaj vid animalne proizvodnje.

Ključne riječi: puževi, nekonvencionalna animalna proizvodnja, organska proizvodnja

Breeding snails for human consumption

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Abstract

Starting from the idea that quality diet includes, among other things, diversity, we have devoted our paper to researching a growing form of unconventional animal production - farming and use of snails in human consumption.

We started by establishing the facts about awareness of the populace about the possibility of using this animal protein, as well as its presence. 79 persons living in the City of Sarajevo and 33 persons living in the Municipality of Kakanj, aged 15-59, were surveyed. Based on the data obtained, we have focused on researching the potential market and the possibility of engaging in this type of animal production.

The initial objective was to recognize the potential of said production, whereas the final objective was to inform the public about the great potential of parcel cultivation of mollusks, low investment needs and minimum working capacities in comparison to other types of animal production. Furthermore, we have pointed out the nutrition value and the objective reason why this meat is considered a delicacy in many countries.

Out of the total number of respondents (112), 72 respondents (64.3%) believe that snails are not produced in Bosnia and Herzegovina, while 110 respondents (98.2%) never and do not want to try snail meat. The author's conclusion on the basis of these and other information processed is that prevails disbelief in this aspect of animal production.

Keywords: *snails, unconventional animal production, organic production*

Konvencionalna proizvodnja piletine bez antibiotika

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Sažetak

Usljed izraženog rada na stvaranju i unaprjeđenju postojećih brojlerskih hibrida, došlo je do značajnog smanjenja njihove otpornosti na različite mikrobiološke uzročnike. Da bi se kompenzovao pad otpornosti životinja na bolesti uzrokovane mikroorganizmima, pedesetih godina prošlog stoljeća, počelo se sa upotrebom antibiotika u preventivne svrhe. Pored prevencije bolesti, antibiotici su bili široko korišteni u tovu brojlera kao promotori rasta, sve do stupanja na snagu direktive Europske Unije 1831/2003/EC. Prve znakove resistencije koliformnih bakterija na primjenu streptomicina kod peradi primijetili su Starr i sar. 1951. Već tada je postojala bojazan od razvoja mikroorganizama otpornih na djelovanje antibiotika. Uprkos svim navedenim istraživanjima, u državama koje su veliki svjetski proizvođači pilećeg mesa kao što je SAD, zabrana upotrebe antibiotika nije zaživjela. Direktivom EU iz 2005. 1831/2003/EC zabranjena je upotreba antibiotika kao promotora rasta i u preventivne svrhe. To se interpretira tako da se ne smiju nalaziti u stočnoj hrani. Tako je voda koja čini i do 2/3 dnevnog obroka, "preuzela" ulogu medija putem kojeg su se nastavili aplicirati antibiotici. Glavni cilj ovog rada je prezentovati mogućnosti i prednosti proizvodnje piletine bez antibiotika.

Ključne riječi: piletina bez antibiotika, rezistencija mikroorganizama na antibiotike, davanje antibiotika putem vode za piće

1-O-2

Conventional production of broiler meat without antibiotics

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Abstract

Because so much work has done on making new and improving existing broiler hybrids, their resistance against different microorganisms is significantly decreased. In order to compensate reduction of resistance of animals against diseases caused by microorganisms, during the 19 fifties the use of antibiotics for prevention begun. Along with prevention of diseases, antibiotics were used as growth promoters in broiler production, until EU directive 1831/2003/EC entered into force. First signs of resistance of coliform bacteria to streptomycin in poultry was notified by Starr at al. 1951. Even than there was a dose of fear from development of antibiotic resistant microorganisms. Despite mentioned researches, countries that are worlds biggest producers of broiler meat, continued with usage of antibiotics. Directive EU from 2005 1831/2003/EC, prohibited using antibiotics as growth promoters and for prophylaxis. That was interpretet that food for animals mustn't contain antibiotics. Because of that, water which makes up to 2/3 of daily food consumption, have taken „role“ of medium for application of antibiotics. Main goal of this work is to present opportunities and benefits of production broiler meat without antibiotics.

Keywords: antibiotic free chicken, antibiotic resistant microorganisms, application of antibiotics through drinking water

Značaj heljde (*Fagopyrum esculentum Moench*) u ishrani ljudi

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Sažetak

Cilj rada bio je opisati glavne karakteristike heljde, njenu nutritivnu vrijednost i značaj u ishrani kao biljke budućnosti. Heljda (*Fagopyrum esculentum Moench*) je vrlo stara biljka porijeklom iz planinskih predjela centralne i sjeveroistočne Azije, koju su u Evropu donijeli Mongoli krajem 14. vijeka. Heljda je zeljasta biljka koja pripada porodici *Polygonaceae*, ali zbog načina upotrebe i hemijskog sastava ona se svrstava u žitarice, te se u novije vrijeme za nju sve više upotrebljava termin „pseudožitarica“. Heljda je poznata odavno, ali u posljednje vrijeme sve više dobija na značaju. Bogata je hranjivim materijama. Sadrži sve esencijalne aminokiseline posebno lizin i arginin koji joj daju superiornost u odnosu na žitarice. Različite frakcije mljevenja mogu sadržavati različite minerale i proteine, tamna brašna su generalno bogatija nego svijetla. U pogledu minerala dobar je izvor kalija i fosfora, i također ima značajan sadržaj vitamina grupe B, posebno B3 i B5. Visok sadržaj antioksidanasa i fenolnih materija daje heljdi veliki značaj. Tatarska heljda (*Fagopyrum tataricum*) je predmet mnogih istraživanja zbog povoljnih antioksidativnih svojstava i značajno većeg sadržaja bioaktivnih komponenti u odnosu na običnu heljdu. Antioksidativni potencijal heljde u poređenju sa antioksidativnom aktivnošću najčešće korištenih žitarica, znatno je viši zbog visokog sadržaja antioksidativnih polifenolnih jedinjenja heljde, prije svega rutina. Tatarska heljda je gorka, ali sadrži više rutina nego obična heljda. Također, sadrži i kvercitrin. Tatarska heljda ekstahovana sa metanolom sadrži više rutina (8-17 mg/g SM) od uobičajene heljde (0,1 mg/g SM). Konzumiranje heljde omogućava zadovoljenje organizma za mnogim vitaminima i mineralima, a pored toga karakteriše je dobra probavljivost. Heljda je odličan izvor dijetalnih vlakana, i sadrži manje probavljiv škob koji može imati djelovanje kao dijetalna vlakna što pozitivno utiče na krivu glikemijske reakcije. Heljda ima nizak glikemijski indeks te je pogodna za dijabetičare s obzirom da konzumiranje heljde ne uzrokuje brzi porast glukoze u krvi. Heljda spada u „gluten free“ namirnice te je pogodna za

osobe koje su oboljele od celijakije. S obzirom na mnoge značajne prednosti heljde je našla široku primjenu. U pekarskoj industriji koristi se za obogaćivanje pekarskih i pekarsko-konditorskih proizvoda, te za proizvodnju tjestenine i kiselih tijesta. Koristi se za proizvodnju meda jer je vrlo dobra medonosna biljka.

Ključne riječi: heljda, ishrana, hranjivost, proizvodi

1-O-3

The significance of buckwheat (*Fagopyrum esculentum* Moench) in human's diet

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Abstract

The aim of this paper was to describe the main characteristics of buckwheat, its nutritional value and significance in human's diet as a plant of the future. Buckwheat (*Fagopyrum esculentum* Moench) is a very old plant that originates from the mountain areas of Central and North East Asia that was brought to Europe by Mongols in the end of the 14th century. The buckwheat is an herbaceous plant and belongs to a family of *Polygonaceae*, but due to its way of usage and a chemical composition it is classified as a cereal. Therefore, in recent times, the most frequently used term is a "pseudocereal". The buckwheat had been known for a long time but recently it became very popular. It is rich in nutrients. It contains all essential amino acids especially lysine and arginine which give a superiority among the other cereals. Different milling fractions may contain different minerals and proteins, dark flours being generally richer than the light ones. In terms of minerals, it is a good source of potassium and phosphorus, and also has a significant amount of vitamin B, especially B3 and B5. A high amount of antioxidants and phenolic substances gives a huge importance to the buckwheat. Recently tatar buckwheat (*Fagopyrum tataricum*) has been a subject of many researches due to its antioxidative properties and significantly higher amount of bioactive components when compared to ordinary buckwheat. The antioxidative potential of the buckwheat when compared to an antioxidative activity of the most commonly used cereals, is significantly higher due to a high amount of polyphenol compounds, first of all, the rutin. Tatar buckwheat is bitterer, but contains more rutin than common buckwheat. It also contains quercitrin. The extracted tatar buckwheat with methanol contains more rutin (8-17 mg/g d.m.) than the ordinary buckwheat (0,1 mg/g d.m.). The consumption of the buckwheat supplies an organism with necessary vitamins and minerals, and it is characterized by a digestibility. Buckwheat is an excellent source of dietary fiber, and it contains a less digestible starch that can act as a dietary fiber that has a positive effect on the glycaemic response curve. The buckwheat has a low glycemic index therefore it is suitable for diabetics considering the fact that its consumption does not cause a rapid rise in blood glucose. It is a "gluten free" and it is suitable for people who suffer from coeliac disease. It is used in many different ways, such as in baking industry for enrichment of bakery and confectionery products, for production of pasta and a sourdough. It is used for the production of honey because it is a honeysuckle plant.

Keywords: buckwheat, diet, nourishment, products

1-0-4

Utjecaj dodatka pogače buče na svojstva kukuruznih snack proizvoda

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Sažetak

Kukuruzni snack proizvodi spadaju u proizvode dobivene ekstruzijom. Ekstruzija (ekstruzijsko kuhanje) je važan tehnološki proces u prehrambenoj industriji. Cilj ovoga rada je bio ispitati utjecaj dodatka pogače buče na svojstva kukuruznih snack proizvoda u omjerima buča:krupica (97:3, 94:6, 91:9). Korištena je pogača buče, dodatno odmašćena na ručno izrađenom ekstraktoru sa superkritičnim CO₂. Smjese kukuruzne krupice i pogače buče, te kontrolni uzorak kukuruzne krupice pripremljeni na 15 % vlage uz dodatak 1 % pektina u zamjes s pogačom, spremljene su u plastične vrećice te ostavljene preko noći u hladnjaku pri temperaturi 4 °C. Nakon toga smjese su ekstrudirane u jednopužnom laboratorijskom ekstruderu. Dobivenim ekstrudatima ispitana su fizikalna svojstva: ekspanzijski omjer, nasipna masa, boja, indeks topljivosti u vodi i indeks apsorpcije vode.

Utvrđeno je da je došlo do smanjenja ekspanzijskog omjera, što je udio pogače buče bio veći. Pektin je djelovao sa proteinima i vlaknima da ne utječu negativno na ekspanziju ekstrudata, te je došlo do poboljšanja ekspanzije. Nasipna masa se ne mjenja značajno u sva tri omjera, relativno se povećala u odnosu na čistu kukuruznu krupicu, s obzirom da se radi o visokim temperaturama. Dodatak pogače buče i utjecaj ekstruzije imali su značajan utjecaj na promjenu boje, te je došlo do potamnijavanja zamjesa. Proces ekstruzije je imao značajan utjecaj na povećanje indeksa topljivosti u vodi i indeksa apsorpcije vode.

Ključne riječi: ekstruzija, kukuruzna krupica, buča

Effect of pumpkin flour addition on the properties of corn snack extrudates

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Abstract

Corn snack products are products obtained by extrusion. Extrusion (extrusion cooking) is an important technological process in the food industry. The aim of this paper was to analyze the effect of the addition pumpkin flour to the properties of corn snack products (ratio corn grits : pumpkin flour = 97:3, 94:6, 91:9). We use pumpkin flour and it was additionally degreased on a hand-made supercritical CO₂ extruder. Mixtures of corn grits and flour pumpkin, and a control sample of corn grits prepared at 15% moisture with the addition of 1% pectin in a grout, stored in plastic bags and left overnight in a cooler at 4 [deg.] C. After that, the mixtures were extruded in a single laboratory extruder . The obtained extrudates tested physical properties: expansion ratio, bulk density, water solubility index, water absorption index and color.

Results showed a reduce in expansion ratio, which the addition of pumpkin was higher. Pectin was reacting with proteins and fibers to prevent negative effect to expansion od extrudate. The bulk density does not change significantly in all ratios, it is relative increase opposite corn grits, because there are very high temperature. Addition pumpkin flour and effect extrusion had significantly effect of color change, there were darken mixtures. Extrusion significantly increased water absorption and water solubility index.

Key words: extrusion, corn grits, pumpkin flour

1-0-5

Fizičko – hemijski kvalitet sirovog mlijeka u mljekari „Poljorad“

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Sažetak

Higijenska ispravnost i ocjena kvaliteta mlijeka imaju jako važnu ulogu u ishrani i zaštiti svakog potrošača. Održavanje određenog higijenskog nivoa, te svakodnevna kontrola kvalitativnih sastojaka svježeg mlijeka, omogućava stvaranje proizvoda visokog kvaliteta, i što je najvažnije proizvoda sa visokim nivoom očuvanosti, njegovih bioloških vrijednosti. Najčešći uzroci nedostaka kvaliteta mlijeka, su upravo oni propusti koji se mogu dogoditi na putu od proizvođača do prerađivača, pa je neminovna stalna kontrola i laboratorijska analiza mlijeka, da bi se dobio kvalitetan proizvod odgovarajućih i željenih karakteristika. Ovaj rad je imao za cilj ispitati fizičko – hemijski kvalitet sirovog mlijeka u mljekari „Poljorad“, sa četiri otkupna područja, u periodu mjeseca februara i marta, 2015 godine, te odrediti da li postoji statistički značajna razlika između dobijenih rezultata za ispitivana otkupna područja.

Dobijeni rezultati su pokazali da postoji statistički značajna razlika između sadržaja mliječne masti, između četiri otkupne stanice. Sadržaj proteina se nalazi na samoj granici nivoa statističke značajnosti, dok sadržaj suhe materije nema statistički značajne razlike. Daljnja istraživanja su dovela do zaključka, da postoji statistički značajna razlika u udjelu mliječne masti između otkupnih stanica Goleš i Radojčići i otkupnih stanica Goleš i Oborci. Također korištenjem istog testa, istraga je pokazala da postoji značajna statistički razlika u udjelu proteina u mlijeku, između otkupnih stanica Goleš i Mudrike. Istraživanja pokazuju da u sadržaju suhe materije, nema statistički značajne razlike između otkupnih područja.

Ključne riječi : kvalitet, higijenska ispravnost, zaštita zdravlja konzumenta

1-O-5

Physical – chemical quality of raw milk in the dairy industry „Poljorad“

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Abstract

The hygienic safety and rating of the quality of milk have a very important role in nutrition and protection of every consumer. Maintaining a specific level of hygiene and daily controlling of the qualitative ingredients of fresh milk enable the production of high quality products and most importantly, products with a high level of its biological value preservation. The most frequent causes of milk quality are exactly those failed that can occur on the way from the producer to the processor, so constant control and laboratory analysis of milk is necessary in order to obtain a high-quality product of appropriate and desired characteristics. This work aimed to investigate the physical - chemical quality of raw milk at the dairy industry "Poljorad", within four buyout areas, during the period between February and March 2015, and determine whether there is a statistically significant difference between the results obtained for tested purchase areas.

The results have shown a statistically significant difference between the content of milk fat, between the four buyout areas. The value of protein content is located right on the border level of statistical significance, while the values of contents of dry matter showed no statistically significant difference. Further research has led to the conclusion that there is a statistically significant difference in the proportion of fat content between buyout stations Goleš and Radojčići and buyout stations Goleš and Oborci. Also, using the same research method, it has been shown that there is a statistically significant difference in the proportion of protein in milk between buyout stations Goleš and Mudrike. Research has shown that the values of content of dry matter between four buyout stations have no statistically significant difference between delivery regions.

Keywords: quality, hygienic safety, health protection of consumers

1-O-6

Precizna poljoprivreda upotrebom senzora

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Sažetak

Danas živi više od 7 milijardi ljudi na svijetu, a predviđa se da će ta brojka dostići 9.7 milijardi do 2050. godine. Ukoliko se ova predviđanja pokažu istinitim svjetska proizvodnja hrane se mora udvostručiti u relativno kratkom vremenskom periodu. IBM, UN (FAO) i drugi procjenjuju da se poljoprivredna proizvodnja mora povećati za 70% do 2050. godine da zadovolji svjetske potrebe.

Dobre vijesti su da nova digitalna tehnologija omogućuje da se prikupe i iskoriste velike količine kritičnih podataka za minimalnu cijenu – što obezbjeđuje poljoprivrednicima znatno veće poznavanje sastava zemljišta što u konačnici dovodi do veće efikasnosti i produktivnosti. Precizna poljoprivreda ima za cilj da optimizuje prinos po poljoprivrednoj jedinici koristeći moderna sredstva na način koji je kontinuirano održiv. Imajući u vidu iznesene probleme tradicionalne poljoprivrede, sistem koji bi poboljšao stanje poljoprivrede i koji se može koristiti za sve poljoprivredne grane je jako težak i kompleksan za razviti, jer je teško da se razvije rješenje tako široke perspektive. Međutim, moguće je napraviti idejno rješenje korištenja elektromagnetnih, optičkih, mehaničkih, elektrohemijskih i termalnih senzora, gdje će biti prikazana svrha, razlog i šta se može očekivati primjenom svakog od ovih senzora.

ICT bazirani sistemi odlučivanja će omogućiti podatke u stvarnom vremenu i dodatno pružiti informacije u vezi sa svim aspektima poljoprivrede na granularnom nivou koji prije nije bio moguć. Ovo ne zamjenjuje znanje poljoprivrednika, nego pruža mogućnost donošenja boljih odluka, rezultirajući sa manje gubitaka, maksimalnom efikasnošću operacija, smanjenjem primjene sredstava za zaštitu bilja i tačnim vremenom za žetvu.

Ključne riječi: precizna poljoprivreda, senzori, sigurnost prinosa, ušteda

1-O-6

Use of sensors in precision agriculture

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Abstract

Today, there are more than 7 billion people on the planet, a figure that's expected to reach 9.7 billion by 2050. If these numbers hold, overall food production will need to double in a relatively short period of time. IBM, UN (FAO), and others estimate that agricultural production will have to increase by 70% by 2050 to satisfy the expected demands for food and feed.

The good news is that new digital technologies now make it possible to collect and leverage huge amounts of critical data at minimal costs—thus making a farm's field operations more insight driven, and potentially more productive and efficient. Precision agriculture aims to optimize the yield per unit of farming land by using the most modern means in a continuously sustainable way, to achieve best in terms of quality, quantity, and financial return. Considering the above problems, designing a system to improve the state of agriculture that can be used in multiple contexts is a challenging task and is too complex of a problem to address in such a broad perspective. However, it is possible to develop a working solution of using electromagnetic, optical, mechanical, thermal and electrochemical sensors in precision agriculture to show purpose, reason and what can be expected by applying each of these sensors.

ICT-based decision support systems, backed up by real time data, can additionally provide information concerning all aspects of farming at a level of granularity not previously possible. This enables better decision to be made, resulting in less waste and maximum efficiency in operations.

Keywords: precision agriculture, sensors, security of return, savings

1-0-7

Sadržaj vitamina C u organski i konvencionalno uzgojenom krompiru

Sažetak

Vitamini su organski spojevi, različite hemijske strukture. Neophodni su u malim količinama za pravilan rast, razvoj, reprodukciju i održavanje zdravlja. Prema topljivosti dijele se na liposolubilne i hidrosolubilne vitamine. Vitamin C ili L-askorbinska kiselina je hidrosolubilni vitamin. Ljudi ne mogu sintetizirati vitamin C i moraju ga unositi putem hrane. Vitamin C je neophodan u biosintezi kolagena, L-karnitina, kao i u pretvaranju dopamina u norepinefrin, te učestvuje u metabolizmu proteina, djeluje kao antioksidans i dokazano je da može obnoviti druge antioksidanse prisutne u organizmu. Vitamin C ima važnu ulogu u funkciji imunog sistema i omogućava apsorpciju nonhem željeza.

Organska hrana je hrana proizvedena na način koji ne uključuje primjenu pesticida, hemijskih đubriva, tretiranje zračenjem, industrijskim rastvaračima ili hemijskim prehrambenim aditivima i ne sadrži genetski modificirane organizme. Obzirom da deklarisanje proizvoda s oznakom organsko nije u vezi sa boljim nutritivnim sastavom, nego isključivo s načinom proizvodnje s ciljem očuvanja okoliša i smanjenja sadržaja rezidua i aditiva u hrani, interesuje nas da li organski proizvedena hrana ima i bolji nutritivni sastav u odnosu na konvencionalnu. Stoga je cilj ovog rada bio odrediti sadržaj vitamina C u organskom i konvencionalnom krompiru, kao namirnici koja je vrlo često zastupljena na jelovniku stanovništva BiH, a relativno bogata vitaminom C.

Metoda koja je korištena za određivanje sadržaja vitamina C, kao markera nutritivne vrijednosti, jeste standardna jodometrijska metoda.

Nađeni sadržaj vitamina C (aritmetička sredina) u uzorcima je bio u intervalu od $\pm 10\%$ u odnosu na literaturni podatak, bez značajne razlike sadržaja u konvencionalnom i organskom krompiru.

Ključne riječi: vitamin C, organska hrana, organska proizvodnja, konvencionalna hrana, krompir

1-O-7

The Content of Vitamin C in Organically and Conventionally Grown Potatoes

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Abstract

Vitamins are organic compounds with different chemical structures. Humans need vitamins in small amounts for proper growth, reproduction and for maintenance of health. Vitamins are classified as either fat-soluble or water-soluble. Vitamin C, also known as ascorbic acid, is water-soluble vitamin. Humans don't have ability to synthesize vitamin C and they must obtain it from diet. Vitamin C is required for the biosynthesis of collagen, L- carnitine and for conversion of dopamine into norepinephrine. It is also involved in protein metabolism. Vitamin C is important as antioxidant and it has been shown to regenerate other antioxidants in the body, plays important role in immune functions and helps the absorption of nonheme iron.

Organic food is produced in a way which does not include pesticide, chemical fertilizer, radiation, industrial solvents, food additives or GMOs. In contrast to the frequently reported consumers opinion, the „organic“ food labelling is not related to higher nutrients content, but the production process that should result in lower levels of (potentially) harmful chemicals in both food and the environment. Thus, we were interested to find out if the nutritive value of organic food is better than that of conventional food. So the aim of this work was to compare the content of vitamin C in organically and conventionally grown potatoes. We chose potato as sample food since it is a good source of vitamin C, frequently consumed in Bosnia and Herzegovina.

Method used for the determination of content of vitamin C, as the marker of nutritive value, was standard iodometric titration.

The mean vitamin C contents in the samples of organically and conventionally grown potatoes were in the range of $\pm 10\%$ of the literature data and did not differ significantly.

Keywords: vitamin C, organic food, organic farming, conventional food, potato

Mogućnosti i benefiti organske proizvodnje hrane u Bosni i Hercegovini

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Sažetak

Cilj rada je bio da se istraže mogućnosti i benefiti proizvodnje organske hrane u Bosni i Hercegovini i njenom plasmanu kako na domaćem tako i na inostranom tržištu.

U intenzivnoj proizvodnji hrane prinosi su evidentni u masi, ali veoma često opterećeni reziduama zaštitnih i biostimulativnih sredstava kako u primarnoj proizvodnji, tako i u preradi. Zbog navedenih problema svjetska struka i nauka želi pronaći i alternativne mogućnosti proizvodnje hrane i učiniti je dostupnom širim narodnim masama. Pokret organske poljoprivrede, poznat pod nazivom Zelena revolucija, nastao je 1940. godine kao odgovor na industrijalizaciju poljoprivrede. EU je usvojila regulativu EEC 2092/91 o organskoj poljoprivredi, a od 1996. godine u BiH započinju aktivnosti na razvoju ove djelatnosti. U zemljama EU proizvodnja i potrošnja organske hrane je povećana za tri puta. Organsku hranu potrošači kupuju iz zdravstvenih razloga (46%), a zbog boljeg okusa (40%) u odnosu na konvencionalnu. Naša zemlja raspolaže značajnim resursima za uspješnu proizvodnju organske hrane. Uz posjedovanje vlastitih resursa i aktuelnosti u ovoj oblasti, Bosna i Hercegovina može postati značajan proizvođač organske hrane i plasirati je kako na domaće tako i na inostrano tržište.

Rezultati su višestruki, ekonomski i zdravstveni, a prije svega vezani su za uspješniji privredni razvoj zemlje i socijalnu sigurnost građana.

Ključne riječi: organska proizvodnja, organska hrana, resursi u BiH za organsku proizvodnju, ekonomski i zdravstveni aspekt

1-O-8

Possibilities and benefits of organic industry of Bosnia and Herzegovina

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Abstract

The aim of this presentation was to explore the possibilities of organic food production in Bosnia and Herzegovina and its placement on domestic and international markets.

In intensive food production profit is evident in quantity, but food is usually very burdened with residues of protective and biostimulative compounds used both in primary production and in food processing. Because of these problems worldwide experts and scientists want to find alternative possibilities of food production, and to make it more accessible to consumers.

Movement of organic agriculture, known as Green revolution, began in 1940 as a response to the industrialization of agriculture. European Union has adopted regulation 2092/91 about organic agriculture, and activities of organic food production in Bosnia and Herzegovina started in 1996. In the countries of the European Union production and consumption of organic food increased three times. Consumers are buying organic food for health reasons (46%), and because of better taste (40%) compared to the conventional food. Our country has significant resources for successful production of organic food.

By using their own resources and following current trends in this field, Bosnia and Herzegovina may become a significant producer of organic food and place it on both the domestic and international market.

Benefits are multiple, economic and health, and are primarily related to economic development and social security of citizens.

Keywords: organic production, organic food, resources in Bosnia and Herzegovina for organic food production, economic and health aspects

1-P-1

Uticaj podešavanja lednih prskalica na biosigurnost u proizvodnji maline

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Sažetak

U Bosni i Hercegovini trenutno su zastupljeni mali posjedi proizvodnje maline, otprilike 50 000 - 60 000. Polazeći od činjenice da se malo zna o pravilnom rukovanju i podešavanju lednih prskalica, ovim radom skrećemo pozornost javnosti na ovu problematiku. Proizvođači maline bi trebali prije svega da vode računa o vlastitoj sigurnosti a potom i o sigurnosti krajnjih potrošača te očuvanju čovjekove okoline. S obzirom da je u proizvodnji maline zastupljeno više tretiranja, čak i najmanja pogreška može prouzrokovati velike štete, kako u pogledu sigurnosti hrane tako i u pogledu zaštite čovjekove okoline. Najveći broj lednih prskalica na sebi nema brzinomjer i manometar. Pritisak i brzina kretanja se tokom prskanja najčešće određuje iskustvenom normom farmera. Također, osim ispravnosti opreme, značajnu ulogu ima educiranost proizvođača o praviljenju rastvora tačne koncentracije. Ovim radom dajemo teoretske pokazatelje posljedica upotrebe nepravilno podešenih lednih prskalica.

Ključne riječi: sigurnost hrane, sigurnost proizvođača, sigurnost potrošača, ledna prskalica

1-P-1

The effect of setting back sprayers on biosafety in raspberry production

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Abstract

In Bosnia and Herzegovina, there are a lot of small estates covered with raspberry, cca. 50000-60000. The fact is that there is insufficient knowledge about the proper handling and adjustment of the knapsack sprayer, through this paperwork we are trying to pay attention to this problem. First of all, raspberry producers should pay attention to their own safety, to the safety of consumers, and the safety of the environment as well. Because of the fact that in the raspberry production there are a few treatments by pesticides, even the small mistake can cause huge damage in the food safety as well as in the environment protection. These knapsack sprayers are mostly made without speedometer and manometer which are very important. Pressure and speed are mostly determined by the farmers experience. Beside the correctness of the equipment, very important is the farmers education about preparing a solution of a certain concentration. Through this paperwork, we are trying to show the theoretical indicators about the consequences of using incorrectly configured knapsack sprayers.

Keywords: food safety, farmers safety, consumers safety, knapsack sprayer

2. TOKSIKOLOGIJA I SIGURNOST HRANE
FOOD SAFETY AND TOXICOLOGY

Mikrobiološka pretraga mesa i mesnih prerađevina prema Pravilniku o mikrobiološkim kriterijima za hranu

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Sažetak

Meso i mesne prerađevine se u toku primarne proizvodnje, prerade, skladištenja i prometa mogu kontaminirati određenim vrstama i skupinama mikroorganizama. Najčešće se radi o tri skupine bakterija. Prva je korisna, koja dovodi do formiranja pozitivnih/poželjnih organoleptičkih svojstava, druga su izazivači kvarenja hrane, koji svojim rastom i enzimskim reakcijama mijenjaju ukus hrane kroz degradaciju arome, teksture ili boje, i treća su patogeni, koji mogu izazvati različita oboljenja kod ljudi. Da bi prevenirali sve nepoželjne promjene i zaštitili zdravlje ljudi zakonodavci su odredili putem odgovarajućih normativa, koje se vrste i skupine mikroorganizama moraju ispitivati u sirovom mesu, mesnim prerađevinama kao i drugim namirnicama animalnog i biljnog porijekla Prema Pravilniku o mikrobiološkim kriterijima za hranu (**sl. glasnik BiH 11/13 i 79/16**) u mesu i mesnim prerađevinama obavezno se vrše pretrage na sljedeće vrste i skupine bakterija: *Salmonella spp.*, *Listeria monocytogenes*, *Enterobacteriaceae*, Sulfitreducirajuće klostridije, Koagulaza pozitivni stafilokoki/*Staphylococcus aureus*, Aerobne mezofilne bakterije, *Escherichia coli*. Navedene vrste i skupine bakterija u akreditiranim laboratorijama dokazuju se odgovarajućim metodama i postupcima, po EU standardima (BAS EN ISO 6579: 2005; BAS EN ISO11290-

1/A1: 2005 (37°C); BAS EN ISO 21528-2: 2013 (37°C); BAS EN ISO 6888-1: 2005 (37°C); BAS EN ISO 21527-2; 2009; BAS EN ISO 4833-1: 2014.), a prosuđivanje mikrobiološke ispravnosti ispitivanih uzoraka mesa i mesnih prerađevina vrši se u skladu sa aktualnim normativima: (Pravilnik o mikrobiološkim kriterijima za hranu; Pravilnik o izmjenama i dopuni pravilnika o mikrobiološkim kriterijima za hranu **sl. glasnik BiH 11/13 i 79/16** i Smjernice za mikrobiološke kriterije za hranu **Agencija za sigurnost hrane BiH-2013**).

2-O-1

Microbiological tests of meat and meat products according to the Rules on microbiological criteria for foodstuffs

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Abstract

Meat and meat products can get contaminated with certain types or groups of microorganisms in the primary production, during processing, storage, and traffic. Contamination is usually caused by three groups of bacteria. First group is useful because it leads to formation of positive/desirable organoleptic properties. Food spoilage is caused by the second group. They change food taste with its growth and enzymatic reactions, through degradation of food aroma, texture and color. Third group of bacteria are pathogens, which can cause various diseases in humans. In order to prevent any undesirable change and to protect the health of people, lawmakers specified types and groups of microorganisms that have to be examined in raw meat, meat products and other food types of animal and plant origin, using appropriate standards. According to the rules of microbiological criteria for foodstuffs (**Official Gazette of Bosnia and Herzegovina 11/13 and 79/16**), examinations carried out on meat and meat products have to include examination of the following groups of bacteria: *Salmonella* spp., *Listeria monocytogenes*, *Enterobacteriaceae*, sulfite-reducing clostridia, coagulase-positive *Staphylococci*/*Staphylococcus aureus*, aerobic mesophilic bacteria, *Escherichia coli*. Presence of listed bacteria is being confirmed in the accredited laboratories using appropriate methods and procedures-according to EU standards (BAS EN ISO 6579:2005; BAS EN ISO 11290-1/A1:2005 (37 °C); BAS EN ISO 21528-2:2013 (37 °C); BAS EN ISO 6888-1:2005 (37 °C); BAS EN ISO 21527-2; 2009; BAS EN ISO 4833-1:2014.). Deciding about the microbiological accuracy of the examined samples of meat and meat products is performed in accordance with actual standards (Regulation on microbiological criteria for foodstuffs (Official Gazette of BiH, 11/13), Rulebook on modifications and amendments to the regulation on microbiological criteria for foodstuffs (Official Gazette of BiH, 79/16) and Guidelines for microbiological criteria for food (Food Safety Agency of BiH 2013).

Parazitarne zoonoze prenosive hranom u Bosni i Hercegovini

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Sažetak

Zaštita zdravlja ljudi, životinja i biljaka u svakoj fazi postupka proizvodnje hrane trebao bi biti ključni prioritet javnog zdravlja i gospodarstva. Svrha politike sigurnosti hrane Europske Unije (EU) jeste osiguranje zdravih proizvoda i zaštita zdravlja u svakom dijelu postupka proizvodnje hrane, od uzgoja do konzumacije, sprječavanjem kontaminacije i promicanjem higijene hrane, informiranja o hrani, zdravlja biljaka te zdravlja i dobrobiti životinja. Nažalost, u Bosni Hercegovini (BiH) nema jasne strategije i pristupa kada je u pitanju sigurnost hrane iako je BiH u fazi prihvatanja i provedbe procesa stabilizacije i pridruživanja EUi treba provoditi usklađivanje BiH propisa sa zakonodavstvom EU. Trenutni sistem monitoringa i nadzora za parazitske i druge bolesti koje se prenose hranom, u BiH nije učinkovit u ostvarivanju elemenata javno-zdravstvene namjene i zahtjeva EU.

FAO/WHO ekspertna skupina je obavila rangiranje parazitarne zoonoze koje se prenose hranom, od liste sa 95 potencijalnih uzročnika formirana je lista sa 24 najvažnije, od kojih su neke veoma zastupljene u BiH. Paraziti kao što su *Trichinella spiralis*, *Toxoplasma gondii*, *Giardia duodenalis* druge, mogu se prenositi između životinja i ljudi kroz potrošnju kontaminirane hrane ili pitke vode, uzrokujući blage nelagode, bolesti i moguće smrti.

Autori će prezentirati podatke za najvažnije parazitarne zoonoze u BiH, sa posebnim osvrtom na dijagnostičke sposobnosti i aktualna pitanja vezana za kontrolu parazitskih bolesti uzrokovanih hranom u BiH i dati relevantne informacije vezane za sistem nadzora u BiH u komparaciji sa sistemom u EU.

Ključne riječi: Europska Unija, Bosna i Hercegovina, hrana, paraziti, zoonoze.

2-O-2

Parasitic zoonoses transmitted by food in Bosnia and Herzegovina

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Abstract

The protection of humans, animals and plants at every stage of the food production process should be a key priority for public health and the economy. The purpose of EU food safety policy is to ensure healthy products and health protection in every part of the process of food production, from breeding to consumption, preventing contamination and promoting food hygiene, food information, plant health and animal health, and well-being. Unfortunately, Bosnia and Herzegovina (B&H) has no clear strategies and approaches when it comes to food safety. Although B&H is in the phase of accepting and implementing the EU Stabilization and Association process, B&H should implement harmonization of B&H legislation with EU legislation. The system of monitoring and surveillance for parasitic and other food-borne diseases in B&H is not effective in achieving elements of public health and EU requirements.

The FAO/WHO Expert Group has performed the ranking of parasitic zoonotic foods, from the list of 95 potential agents, the list of 24 most important was formed, some of which are well represented in B&H. Parasites such as *Trichinella spiralis*,

Toxoplasma gondii, *Giardia duodenalis* and others, can be transmitted between animals and humans through the consumption of contaminated food or water, causing mild discomfort, illness and possible death.

The authors will present the data for the most important parasitic zoonoses in B&H with a special focus on diagnostic abilities and current issues related to control of food-borne parasitic diseases in B&H. Furthermore, the authors will provide relevant information regarding the surveillance system in B&H in comparison with the EU system.

Key words: European Union, Bosnia and Herzegovina, food, parasites, zoonoses

2-O-3

***Shigella* spp. – transmisija i prevencija**

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Sažetak

Uvod: Šigeloza je akutna infekcija crijeva koju uzrokuje *Shigella* spp, uz inkubaciju od dva dana i karakterističnu kliničku sliku (visoka temperatura, abdominalna kolika, enterekolitis). Uzročnik se potvrđuje koprokulturom, a terapija je suportivna i antibiotska.

Cilj rada: Prikaz smjernica za zaštitu od infekcije *Shigella* spp.

Materijal i metode. Rad ima deskriptivni karakter, te obuhvata sistemski pregled literature.

Rezultati: Fekalno-oralna kontaminacija (izvor je feces zaraženih osoba ili oporavljenih kliconoša) je tipična za *Shigella* bakteriju. Da bi se izbegle infekcije *Shigella* vrstama potrebno je hranu kontrolisati, ali i adekvatno pripremati i čuvati. *Shigella* vrste se uništavaju pri temperaturi od 60°C u trajanju od 30 minuta (osjetljive su i na alkalije i kiseline). Kliconoštvo je do 1 godinu (nema hroniciteta). Vakcina postoji (tip specifična). Kod bolesnika i nosilaca treba poduzeti odgovarajuće mjere izolacije. Pažnja treba biti usmjerena najprije na zaštitu tokom perioda rasta u smislu izbjegavanja korištenja ljudskog gnojiva. Potrebna je i adekvatna higijena na mjestima prodaje namirnica, tokom pripreme za konzumiranje u restoranima i domaćinstvima te čuvanje u adekvatnim uslovima nakon pripreme. Svaka država ima legislativu koja definiira adekvatne mjere za pripremu hrane te zaštitu od ovog agensa. Sukladno tome, a i opasnosti koju potencijalno ovaj agens može donijeti i šteti koju može prouzrokovati, krovne organizacije poput WHO i CDC-a izdale su smjernice i savjete koji pomažu prilikom kontrole epidemije.

Zaključak: Neophodno je donijeti legislative koje definiraju adekvatnu mjeru pripreme hrane, i zaštite od nastanka epidemije šigeloze, na nivou teritorije Bosne i Hercegovine.

Ključne riječi: Shigella spp, infekcija, prevencija.

2-O-3

***Shigella* spp. – transmission, prevention**

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Abstract

Introduction: Shigellosis is an acute infection of the intestine caused by *Shigella* spp, with incubation of two days, with characteristic symptoms (high temperature, abdominal colic, enterocolitis). The cause is verified by stool culture, and therapy is supportive and pharmacological (antibiotics).

Aim: To present guidelines for protection against infection of *Shigella* spp.

Material and methods: Article is descriptive and present systematic review of literature.

Results: Fecal-oral contamination (source is feces of infected people or recovered carrier) is typical for *Shigella*. In order to avoid infection of *Shigella* species it is necessary to control the food, but also to adequately prepare and keep it. *Shigella* species are destroyed at temperature of 60 °C for 30 minutes (and are sensitive to alkalis and acids). Carrier state is up to 1 year (no chronicity). There is a vaccine (type specific). Patients and carriers should take appropriate isolation measures. Attention should be focused first on protection during the period of growth in terms of avoiding the use of human waste as fertilizer. It is necessary to have adequate hygiene in the places where is food prepared for consumption and keeping it in adequate conditions after preparation. Each state has legislation defining adequate

measures for food preparation and protection of the agents. Accordingly, with the danger that potentially this agent can bring and the damage they can cause, organizations like WHO and the CDC have issued guidelines and advices to assist in controlling outbreaks of *Shigella*.

Conclusion: It is necessary to adopt legislation that define adequate measures for food preparation, and protection from *Shigela* spp. pandemia on the territory of Bosnia and Herzegovina.

Keywords: Shigella spp, infection, prevention.

2-O-4

Salmoneloza kao javno – zdravstveni problem

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Sažetak

Cilj rada je bio da se istraži uticaj ishrane namirnicama animalnog porijekla na učestalost pojave salmoneloze ljudi.

U savremeno doba su postale posebno aktuelne brojne latentne i inaparentne infekcije životinja zoonotskog karaktera. Njihovoj pojavi i širenju pogoduje uski kontakt većeg broja životinja na ograničenom prostoru uz ishranu industrijskim

krmnim smjesama. Među tim zoonozama najveće značenje još uvijek ima salmoneloza, po učestalosti pojave i po potencijalnim opasnostima po zdravlje ljudi.

Uz klasične izvore salmoneloza ljudi, izazvane mesom i mesnim prerađevinama, jajima i prerađevinama od jaja, registruju se često i alimentarne infekcije i intoksikacije salmonelama iz mlijeka i mliječnih proizvoda. Ovo ukazuje da salmoneloza ostaje trajni i zdravstveni i ekonomski problem.

Radi kontrole salmoneloze kao bolesti zoonotskog karaktera neophodno je stalno praćenje i proučavanje, odnosno, naučna obrada prikupljenih podataka s ciljem određivanja uspješnih mjera suzbijanja i prevencije njihovog nastanka i širenja.

Ključne riječi: salmoneloza, animalne namirnice, veterinarsko-zdravstveni nadzor, javno zdravstvo

2-O-4

Salmonellosis as a major public-health problem

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Abstract

The goal of the project was to research the effect of food intake of products of animal origin with respect to salmonellosis.

In modern time, numerous latent and inapparent infections of animals zoonotic type, have become particularly frequent. Close contact between large number of animals, in a confined space and fed up with industrial feed mixture, is extremely suitable environment for occurrence and expansion of the infections. Among all these zoonoses, salmonellosis has the highest significance by its frequent appearance and potential dangers to human's health.

Besides classical sources of salmonellosis in human's, caused by consuming of meat and meat products, eggs and egg products, also very often registered are alimentary infections and intoxication by salmonellosis in milk and milk products. This is an indication that salmonellosis remains a permanent health and economic issue.

In order to monitor salmonellosis as a disease of a zoonotic character, it is necessary to insure constant gathering and processing of scientific data to order to determine successful measures of their prevention.

Key words: salmonellosis, animal foods, veterinary-health control, public healthcare

Kontrola spongiformne encefalopatije goveda (BSE) u cilju zaštite ljudskog zdravlja

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Sažetak

Cilj ovog rada je da upozorimo na mogućnost prijenosa spongiformne encefalopatije goveda na ljude, i o potrebama za strogim i kontinuiranim kontrolama zaklanih goveda, kao i stočne hrane koja se koristi u ishrani preživara.

U Bosni i Hercegovini do sada nije zabilježen nijedan pozitivan slučaj na BSE kod goveda, dok u zemljama Zapadne Europe se bilježi oko 460 000 do 480 000 oboljelih životinja godišnje.

Goveda se zaraze ovom bolesti, ukoliko se hrane meso-koštanim brašnom, koje je proizvedeno od dijelova tijela zaraženih životinja sa BSE. Bolest se proširila po cijelom svijetu zahvaljujući uvozu zaraženog koštanog brašna iz Velike Britanije, koja je ujedno najveći proizvođač i izvoznik navedenog brašna. Najveći broj prijavljenih slučajeva dolazi iz raznih zemalja kao što su Brazil, SAD, Kanada, Skandinavske zemlje i veliki broj zemalja Zapadne Europe.

Kod ljudi koji konzumiraju proizvode zaraženih goveda razvija se spongiformna encefalopatija poznatija kao Creutzfeldt-Jakobova bolest.

Prema EU legislativi i legislativi Bosne i Hercegovine obavezan je pregled, zaklanih goveda namijenjenih za ishranu ljudi, na BSE. Ovo je regulisano Pravilnikom kojim se utvrđuju mjere za spriječavanje, kontrolu i iskorijenjivanje transmisibilnih spongiformnih encefalopatija (Službeni glasnik BiH, 25/11,20/13).

Zbog navedenih razloga neophodno je kontrolisati porijeklo stočne hrane kao i obavezno vršiti pregled odgovarajućeg tkiva svih zaklanih goveda na BSE, radi

zaštite zdravlja ljudi i redovno obavještavati odgovarajuće centre u zemlji i inostranstvu radi praćenja pojave ove bolesti.

Ključne riječi: spongiformna encefalopatija goveda, zaraza, Creutzfeldt-Jakobova bolest, mesno-koštano brašno, legislativa

2-O-5

Control of bovine spongiform encephalopathy in the purpose for the protection of human health

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Abstract

In this paper we presented the dangers of the possibility for transmission the bovine spongiform encephalopathy on humans, and about the needs for strict and continuous checking points for the slaughtered cattle, and as for meat and bone meals, often used for feeding ruminants.

To this time, in Bosnia and Herzegovina, there has been no reported positive cases of infected cattle with BSE, while in the countries of Western Europe, there are approximately between 460 000 and 480 000 infected animals reported per year.

The cattle gets infected if they consume meat and bone meals, which is made from body parts of the BSE infected animals. The disease has spread throughout the world because of the import of infected meat and bone meals from United Kingdom, who is, at the same time, the biggest manufacturer and exporter of infected meals. The majority of reported case came from various number of countries, such as Brasil, USA, Canada, Scandinavian countries and many more in Western Europe.

Humans, who consume products of infected animals, develop Creutzfeldt-Jakob disease.

According to the legislations of both EU and BiH, examination of slaughtered cattle on BSE, that is intended for human consumption, is obligatory. This is regulated with a Guideline, which establishes measures for preventing, eradicating and controlling transmissible spongiform encephalopathies (Official messenger for Bosnia and Herzegovina, 25/11, 20/13).

Because of these reasons, it is necessary to control the origins of coarse food and to have regular checkups for appropriate tissue of all slaughtered cattle on BSE, for the protection of the human health and to inform, on a regular basis, appropriate centers both abroad and in the home country, for the purpose of observing the appearance of this disease.

Keywords: the bovine spongiform encephalopathy, disease, Creutzfeldt- Jakob disease, meat and bone meals, legislation

Procjena efikasnosti različitih načina prečišćavanja vode

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Sažetak

Pročišćavanje vode je proces uklanjanja nepoželjnih hemikalija, bioloških kontaminanata, suspendirane tvari i gasova iz onečišćene vode sa ciljem da se dobije voda adekvatna za određenu svrhu. Većina voda prečišćava se za ljudsku potrošnju (voda za piće) i za razne druge svrhe, uključujući medicinske, farmakološke, hemijske i industrijske primjene. Najčešći način prečišćavanja vode u kućnoj radinosti je korištenje raznih bokala sa filterima, te prokuhavanje vode.

Iz problematike pročišćavanja vode proistekao je i cilj ovog rada, a to je uvidjeti efikasnost različitih načina pročišćavanja vode, te ocijeniti da li zaista mogu pročistiti vodu za piće do adekvatne mjere ili možda uklanjaju i ione koji su potrebni organizmu za život poput kalcija i magnezija.

U istraživačkom radu su korištena tri načina prečišćavanja vode: filter u bokalima dostupnom na tržištu, kuhanje vode i aktivni ugalj sa filter papirom.

Rezultati istraživanja su pokazali da svaki način prečišćavanja vode uzrokuje neke od promjena u ispitivanim parametrima različitih uzoraka vode: sadržaj hlorida, suhe materije, provodljivosti, redoks-potencijala, pH, te odabranih metala.

Ključne riječi: voda, prečišćavanje, filter, kuhanje, aktivni ugalj

2-O-6

Evaluation of the efficiency of different method for purifying water

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Abstract

The water purification is a process of removing unwanted chemicals, biological contaminants, suspended solids and gases from the contaminated water in order to

give adequate water for a particular purpose. Most water is purified for human consumption (drinking water) and for various other purposes, including medical, pharmacological, chemical and industrial applications. The most common method of water purification in the home is the use of various pitchers with filters, and boiling of water.

The problem of water purification derived the aim of this investigation, and it is to understand the effectiveness of different ways of purifying water, and assess whether it can really purify drinking water until adequate measures or perhaps remove ions that are needed by the body for life such as calcium and magnesium.

In the research three ways of purifying water are used: filter in the jug available in the market, boiling of water and activated carbon with a filter paper.

The results showed that each method of purifying water causes some changes in the studied parameters of various samples of water: free chloride content, total dissolved solids, conductivity, redox potential, pH and the concentration selected metals.

Keywords: water, purification, filter, boiling, metals

Rezidue i kontaminanti u namirnicama animalnog porijekla

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Sažetak

Rezidue predstavljaju ostatke lijekova i njihovih metabolita u jestivim tkivima i organima životinja za klanje, kao i proizvodima od njih. Upotreba lijekova kao što su promotori rasta direktno je vezana sa globalnim rastom populacije, ali i željom za zaradom. Pri tome je zaboravljeno osnovno načelo „prije svega ne naškoditi,, - što je jedan od zadataka medicinske struke. Često se lijekovi apliciraju životinji kada to i nije indicirano, bez poštovanja karence. Rezidue mogu imati sljedeće zdravstvene implikacije po čovjeka-teratogeno, mutageno, genotoksično djelovanje, a nerijetko i kancer. Toksičnost lijekova zavisi od načina aplikacije, brzine i stepena resorpcije, distribucije u tkivima, eliminacije i sl. Ostatke lijekova možemo naći u svim namirnicama animalnog porijekla-mlijeko, meso, jaja, med. Pored rezidua u hrani animalnog porijekla nerijetko se nalaze i kontaminanti-teški metali, mikotoksini i sl. Kontaminanti mogu dospjeti putem lanca prehrane – hrana za životinje – npr .silaza-životinje-namirnica-čovjek. Posebna je opasnost ako se kontaminanti nađu u ekosistemu kada ih apsorbuje živi svijet, a posljedično tome i čovjek kao krajnji konzument. Toksični metali mogu izazvati nepovoljne efekte kao i rezidue lijekova. Stoga se u EU ovoj oblasti pridaje poseban značaj što je regulisano brojnim zakonima i pravilnicima.

2-O-7

Residues and contaminants in food of animal origin

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Abstract

Residues in food represent drugs residues and their metabolites in edible tissues and organs of animals for slaughter, and their products. Drug use in animal production such as growth promoters is directly related to the global population growth and the desire for profit. Consequently basic principle „above all, do no harm,, is forgotten which is one of the tasks of medical profession. Often drugs are administered to animals even it is not indicated, without respect of their withdrawal period. Residues may have the following health implications for man: teratogenic, mutagenic,

genotoxic effects and often cancer. Drug toxicity depends on the mode of administration, the speed and degree of absorption, tissue distribution, and elimination. The residues can be found in all foods of animal origin, such as - milk, meat, eggs and honey. Beside of drug residues in food of animal origin, other contaminants, such as heavy metals, and mycotoxins can be frequently detected in food. Contaminants can be transferred through the food chain, for instance from silage via animal to human. Contaminants found in the ecosystem present a particular concern , since they are absorbed by the living world and consequently human as the ultimate consumer. Heavy metals, as well as drug residues can cause adverse harmful health effects. Therefore, this issue is of a great concern in the EU, and particular attention is paid by the EU legislation.

2-O-8

Prednosti i nedostaci standarda ISO 22000

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Sažetak

"Standard ISO 22000 je standard ISO organizacije koji je specijalno namjenjen za potrebe prehrambene industrije. Kako se sastoji iz HACCP sistema, ISO 9001 i ISO 14001, očekuje se da je to sveobuhvatan standard na polju prehrambene industrije i da donosi višestruku korist, kako poslodavcima, tako i kupcima, državi i svim drugim zainteresiranim stranama.

Očekivane koristi koje ima kupac od uvođenja ovog standarda u firme je povećana sigurnost proizvoda, te uniformnost, tj. jednak kvalitet proizvoda.

Sigurnost proizvoda je najvažnija, pa je to najveća prednost ovog standarda sa aspekta promatranja svih zainteresovanih strana.

Poslodavci pored toga dobivaju organizovan cjelokupan proces poslovanja, veću mogućnost plasiranja na inostrana tržišta, bolje odnose sa saradnicima, a pri tome nailaze na najveći nedostatak ovog standarda, a to su visoki troškovi pri uvođenju standarda i nesmanjenje troškova poslovanja nakon uvođenja zbog nedovoljne popularnosti ovog standarda. Poslodavci naglašavaju kako je velika zahtjevnost/odgovornost svih zaposlenih pri uvođenju ovog standarda, a posebno veliki zahtjevi za znanjem i spretnošću menadžera, te to izdvajaju kao vodeći nedostatak. Međutim, to nije nedostatak, već izazov koji moramo promatrati kao prednost, jer menadžere tjera da izađu iz zone komfora, a to i jeste osnovno obilježje uspjeha. To samo govori o tome da menadžeri i drugi zaposleni ne shvaćaju važnost napredovanja, izučavanja i stalnog analiziranja kao jednog od najvažnijih aspekata uspjeha.

Država dobiva prednosti kroz veće mogućnosti plasiranja proizvoda na inostrano tržište, samim tim veću mogućnost za zaposlenjem, što daje veću ekonomsku korist, a kroz sigurnost hrane dobiva i manje oboljelih radnika.

U konačnici, sumirana istraživanja su pokazala da prednosti ISO 22000 daleko nadilaze nedostatke ovog standarda i da ovaj standard predstavlja ne samo sadašnjost, već i budućnost prehrambene industrije.

Ključne riječi: ISO 22000, sigurnost, koristi, prednosti, nedostaci

2-O-8

Advantages and disadvantages of the standard ISO 22000

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Abstract

ISO 22000 is the standard of ISO organization that is specially designed for the food industry. As it compiles the HACCP system, ISO 9001 and ISO 14001, it is expected that this comprehensive standard in the field of food industry brings multiple benefits, to employers, and customers, the state and all other interested parties.

The expected benefits for buyer is the increase in the product safety, the uniformity and standardized product quality.

Product safety is the most important, and it is the biggest advantage of this standard from the point of view of all interested parties.

The benefits to the company are organization of the entire process of business, increase in the possibility of product placement on the foreign markets and better

relationships with collaborators, while the high costs of standard implementation and stable operating costs after the introduction because of the lack of popularity of this standard are considered as the drawbacks. Employers emphasize that the great demands/responsibility of all employees in the implementation of this standard, and especially high knowledge and skills requirements for managers, are the leading drawback. However, this is not a defect, but a challenge that should be accepted as an advantage, since it makes managers to get out of the comfort zone, which will lead to success. This only shows that managers and other employers do not realize the importance of the promotion, study and continuous analysis as one of the most important aspects of success .

Country gets benefits through greater opportunities for product placement on foreign markets, thereby increasing the possibility for employment, which gives a greater economic benefit, as well as less morbidity due to alimentary infections..

Ultimately, summarized studies have shown that the benefits of ISO 22000 far exceed disadvantages of this standard and that this standard is not only representing the current situation but also the future of the food industry.

Keywords: ISO 22000, safety, benefits, advantages, disadvantages

2-O-9

Uticaj kiselih prehrambenih proizvoda na tvrda zubna tkiva

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Sažetak

Kiseli prehrambeni proizvodi, a naročito napici, su u savremenom svijetu jako zastupljeni u svakodnevnoj prehrani. Ovi proizvodi imaju značajan uticaj na tvrda zubna tkiva (caklinu, dentin) i mogu ugroziti njihovo zdravlje. Preduslov očuvanja zdravlja jeste poznavanje uticaja ovih proizvoda na zubna tkiva kao i poznavanje

kako umanjiti štetan uticaj ovih proizvoda. Kiselost većine proizvoda na tržištu je ispod kritične pH vrijednosti za demineralizaciju tvrdih zubnih tkiva (pH 4.5-5.5) što uzrokuje nastanak erozija na tkivima. Rad je prikaz kliničkih manifestacija uticaja pomenutih proizvoda na tvrda zubna tkiva. Ujedno su date i preporuke kako bi se smanjila incidenca i obimnost destrukcije tvrdih zubnih tkiva uslovljena kiselim hranom i pićima.

Ključne riječi: tvrda zubna tkiva, kiseli proizvodi, demineralizacija, erozije

2-O-9

The Impact of Acid Food Products on Hard Tooth Tissues

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Abstract

Acid food products, especially drinks, are widely represented in modern world. These products have a huge and significant impact on hard tooth tissues (enamel, dentine) and they are able to cause damage to these tissues. Prerequisite of maintaining a healthy life is to be familiar with the possible impact of these products on hard tooth tissues in order to make this bad impact as low as possible. Acidity of most of these products is lower than critical pH needed for demineralization of hard tooth tissues (pH 4.5-5.5) and that is the main reason for occurrence of erosions on teeth. The aim of this work is to show clinical manifestations of the impact of acid food products on teeth. There are also recommendations on how to reduce both the incidence of this phenomenon and the potential damage caused by acid food products.

Keywords: hard tooth tissues, acid food, demineralization, erosions

2-O-10

**Odnos potrošača Kantona Sarajevo prema deklarisanom roku prehrambenih
proizvoda**

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Sažetak

Rok upotrebe hrane je datum do kojeg hrana zadržava svoja specifična svojstva, ako je uskladištena i čuvana na odgovarajući način. Minimalni rok trajanja hrane označava se riječima: "najbolje upotrijebiti do" i "upotrijebiti do". U ovom radu istražili smo koliko potrošači u Sarajevu obraćaju pažnju i kako razumijevaju deklarirani rok trajanja prehrambenih proizvoda. Istraživanje je provedeno anketiranjem 100 potrošača. Anketa je bila anonimna a sadržavala je 6 zatvorenih pitanja. Rezultati su upoređeni sa rezultatima drugih sličnih istraživanja.

Oznake na deklaraciji su dobro shvaćene kod potrošača Kantona Sarajevo te su vrlo korisne pri odabiru i kupovini prehrambenih proizvoda. Potrošači prehrambenih proizvoda obraćaju pažnju na cijene ali je rok trajanja namirnica i njihov kvalitet ipak na prvom mjestu. U velikoj mjeri potrošači kupuju hranu čiji je rok pred istek trajanja ali prate da je utrošena na vrijeme. Ukoliko je hrana ispravna, konzumirana je i nakon isteka roka.

Na ova dva načina potrošači Kantona Sarajevo doprinose smanjenju bacanja ispravne hrane koji je u svijetu poznat kao "food waste" te predstavlja veliki problem globalnom zagađenju i ekonomiji.

Ključne riječi: rok upotrebe, deklaracija, upotrijebiti do, najbolje upotrijebiti do, kvalitet

2-O-10

The consumer's attitude towards the date of minimum durability declared within mandatory food product declaration in Sarajevo Canton

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Abstract

Expiration date is the recommended time for which products can be stored, during which the defined quality of a specified proportion of the goods remains acceptable under expected conditions of distribution, storage and display. Date of minimum durability of food may be signed by "Best if used by" date or the "Best by" date.

This research was conducted in Sarajevo Canton to establish food products consumer's opinion about the date of minimum durability declared within mandatory food information on products throughout questionnaire which included 100 consumers. The questionnaire was anonymous, containing 6 questions. Results were compared to results of other similar researches.

Expiration date labels on food products declarations are very well understood by consumers of Sarajevo Canton. They are useful for selection and purchase of food products. The price of product is very important but the quality of the product is crucial. A large number of consumers buy food whose label date is near expiration but they tend to use it by the indicated date. The product may still be good to eat after the "best by" date if the quality of the product remain the same.

These are the two ways consumers of Sarajevo Canton contribute reduction of food waste, which became worldwide problem for economy and global pollution.

Keywords: expiration date, declaration of product, best if used by, best by, quality

2-O-11

Antimikrobna rezistencija kao globalna prijetnja javnom zdravstvu

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Sažetak

Antimikrobna rezistencija predstavlja veliki problem u veterinarskoj i humanoj medicini. Ona ugrožava tretman i preventivu sve većeg broja infekcija izazvanih bakterijama, parazitima, virusima i gljivicama. Razvoj antimikrobne rezistencije je prirodan fenomen, ali ipak određeni ljudski postupci ubrzavaju njenu pojavu i širenje.

Dolaženjem do saznanja da dodavanje malih količina antimikrobnih lijekova vrlo povoljno djeluje na prirast životinja, na konverziju hrane i da smanjuju pojavljivanje bolesti koje u uzgoju mogu nastati zbog pojedinih tehnoloških grešaka, oni nalaze široku upotrebu u intenzivnom uzgoju životinja, što je bio idealan način da se za ljude proizvede dovoljna količina hrane animalnog porijekala.

Međutim, brzo se došlo do saznanja da antimikrobna rezistencija kod životinja koje se koriste u ishrani može ugroziti život ljudi, na način da mikroorganizmi ne reaguju na terapiju te se samim tim nalaze u hrani i predstavljaju rizik za konzumenta.

Antimikrobna rezistencija kod životinja koje se koriste za ljudsku ishranu, može se posmatrati i sa ekonomskog aspekta. Zbog ne reagovanja na standardne tretmane liječenja, životinje mogu podlijegati skupljim tretmanima ili čak liječenje može biti ne efikasno pa mogu nastati veliki gubici stočnih fondova zbog smrtnih ishoda, što direktno može uticati na poskupljenje hrane animalnog porijekla.

Antimikrobnoj rezistenciji se danas pridaje sve veći značaj, tako da Svjetska zdravstvena organizacija (SZO) već blisko surađuje sa Svjetskom organizacijom za zdravlje životinja (OIE) i organizacijom za hranu i poljoprivredu Ujedinjenih nacije (FAO) u promovisanju najbolje prakse da se izbjegnu pojava i širenje antimikrobne rezistencije kod ljudi i životinja.

Ključne riječi: antimikrobna rezistencija, veterinarska medicina, infekcija, bakterije, virusi, paraziti, gljivice, hrana, liječenje, SZO, OIE, FAO

Antimicrobial resistance as a global threat to public health

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Abstract

Antimicrobial resistance is a major problem in veterinary and human medicine. It jeopardizes the treatment and prevention of an increasing number of infections caused by bacteria, parasites, viruses and fungus. The progression of antimicrobial resistance is a natural phenomenon, but certain human processes accelerate its occurrence and spread. By getting to know that the addition of small amounts of antimicrobial drugs has a beneficial effect on animal growth, conversion of food, and reduction of the occurrence of diseases that can occur in breeding due to certain technological errors, people widely used antimicrobial drugs in intensive animal husbandry, which was an ideal way for them to produce enough food of animal origin.

However, it has quickly become known that antimicrobial resistance in animals used in nutrition can endanger people's lives. More precisely, microorganisms do not respond to therapy and are transferred in the food, hence posing a risk to the consumer. Antimicrobial resistance in animals used for human consumption can be seen from an economic point of view as well. Because of non-responsiveness to standardized treatments, animals may be subject to more expensive treatments or even treatment may be ineffective, thus resulting in large losses of stock funds due to deaths, which can directly affect the price of food of animal origin.

Antimicrobial resistance is nowadays increasingly important issue, so the World Health Organization (WHO) is already closely cooperating with the World Organization for Animal Health (OIE) and the United Nations Food and Agriculture Organization (FAO) in promoting best practices to avoid occurrence and spread of antimicrobial resistance in humans and animals.

Key words: antimicrobial resistance, veterinary medicine, infections, bacteria, viruses, parasites, fungi, food, treatment, WHO, OIE, FAO

2-O-12

Problem prisustva teških metala u namirnicama animalnog porijekla i njihov uticaj na higijenski status

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Sažetak

Cilj rada je bio da se istraži prisustvo teških metala kao kontaminanata namirnica animalnog porijekla te upotrebi u ljudskoj ishrani i učinku na ljudsko zdravlje.

Emisija teških metala u prirodi se dešava putem različitih procesa i puteva uključujući zrak, površinske vode i tlo. Prirodni i antropogeni izvori, pored industrijskih emisija uključuju i primjenu gnojiva u poljoprivredi koja mogu dovesti do kontaminacije tla te povećati nivo teških metala u biljkama.

Predilekcionni organi akumulacije i taloženja ovih metala kod životinja su primarno bubrezi, potom jetra, skeletni mišići, srčani mišić te kod cervida kosti, zubi i rogovlje. Potkožno i bubrežno masno tkivo je također jako dobar akumulator toksičnih metala. Najčešće se u mesu mogu naći olovo, živa, kadmij, cink i bakar koje ćemo spomenuti u okviru istraživanja njihove koncentracije u mišićnom tkivu pastrva i škobalja.

Jako je bitno spomenuti i toksičnost teških metala te njihovu zastupljenost u mesu divljači koja je izložena povećanim koncentracijama ovih kontaminanata, koji putem lanca ishrane ulaze u njihov organizam i talože se u različitim tkivima, što u konačnici ima uticaj na kvalitet mesa i zdravlje samog čovjeka. Osvrnućemo se i na procjenu rizika od unosa hranom ostataka teških metala iz konzervi sardina koje su se u prošlosti koristile u ljudskoj ishrani, te na usporedbu hemijskog sastava i količine teških metala u mesu lubina i komarče iz uzgoja i slobodnog ulova. Veliki broj prirodnih otrova i kontaminanta se može nalaziti u hrani, a samo dobra edukacija je efikasna preventivna zaštita od posljedica.

Ključne riječi: teški metali, kontaminacija, predilekcionni organi akumulacije teških metala, industrijski pogon, namirnice animalnog porijekla

The problem of the presence of heavy metals in food products of animal origin and their effect on the hygienic status

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Abstract

The aim of this study was to investigate the presence of heavy metals as contaminants of food of animal origin and its use in human nutrition and impact on human health.

Heavy metal emissions in nature occurs through different processes and pathways including air, surface water, and soil. In addition to industrial emissions, natural and anthropogenic sources include the application of fertilizers in agriculture, which can lead to contamination of the soil and increase the levels of heavy metals in plants.

Preferential organs of accumulation and deposition of these metals in animals are primarily kidneys, followed by the liver, skeletal muscles and cardiac muscle, and in cervides those are: bones, teeth and horns. Subcutaneous adipose tissue and kidney is also a very good battery of toxic metals. Most commonly, in meat you may find: lead, mercury, cadmium, zinc and copper, which will be mentioned in the context of investigation of their concentrations in the muscle tissue of trout and nases.

It is important to note the toxicity of heavy metals and their representation in the meat of game, that is exposed to increasing concentrations of these contaminants, which by way of the food chain are entering their body and depositing in a various tissues, which ultimately has an impact on the quality of meat and human health. We will also look back on risk assessment by food intake of heavy metal residues from a sardine conserves, which have been used in the past in human diet, as well as a comparison of the chemical composition and quantity of heavy metals in meat of sea bass and sea bream from fish farming and free catches. A large number of natural toxins and contaminants may be present in food, but only a good education is an effective preventive protection from the consequences.

Keywords: heavy metals, contamination, preferential organs of accumulation of heavy metals, industrial facility, animal food

2-P-1

Kvalitet proizvoda od ribljeg mesa na području Sarajevskog kantona

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Sažetak

U ovom radu ispitivan je kvalitet proizvoda od ribljeg mesa (konzerve) kupljenih na području Sarajevskog kantona. Za gore pomenuta ispitivanja uzeto je 30 uzoraka ribljih konzervi različitih proizvođača. Ovaj eksperiment je dizajniran tako da se ispituju senzorne i hemijske kvalitete konzervi tunjevine i sardine uzetih sa polica tržišnih centara u kantonu Sarajevo. Za ispitivanja su uzete konzerve tunjevine i sardine poznatih proizvođača i konzerve robnih marki „K+“ i „M“. Ispitivanja su zasnovana na hipotezi da bi robne marke mogle biti nešto slabijeg kvaliteta nego konzerve poznatih proizvođača.

Ispitivane konzerve sardine i tune su pokazale različitosti u senzornim svojstvima i svom hemijskom sastavu. Sardine „Eva“ su dobile najviše bodova pri senzornoj

ocjeni dok su sardine robnih marki „K+“ i „M“ dobile manje bodova. Dobijeni rezultati hemijske analize konzervi sardine su pokazali da se sastav po određenim sastojcima kretao: Vlaga 64,80%; Mast 11,60%; Proteini 20,47% i Pepeo 3,35%. Konzerve tunjevine „La Perla“ su imale neujednačene ocjene senzoričke dok su konzerve tunjevine robnih marki „K+“ i „M“ imale ujednačenije ocjene panelista. Hemijski sastav konzervi tunjevine se kretao: Vlaga 62,12%; Mast 15,87%; Proteini 20,06% i Pepeo 2,03%.

Ključne riječi: konzerve ribe, tunjevina, sardina, analize, Sarajevo

2-P-1

Product quality of the fish meat in the Sarajevo Canton

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Abstract

In this paper is tested the quality of the product from fish meat (canned) purchased in the Sarajevo Canton. For the above-mentioned tests were taken 30 samples of canned fish from different manufacturers. This experiment is designed to investigate the sensory and chemical quality of canned tuna and sardines taken from the shelves of shopping centers in the Canton of Sarajevo. For the tests are taken a cans of tuna and sardine cans from known manufacturers and brands "K +" and "M". The tests are based on the hypothesis that the brand could be somewhat lower quality than canned of known manufacturers.

The tested canned sardines and tuna have shown differences in sensory properties and its chemical composition. Sardines "Eva" received the highest score in sensory evaluation, while sardine brands "K +" and "M" received less points. The results of chemical analysis of sardines have shown that the composition of certain ingredients ranged: Humidity 64.80%; 11.60% Fat; Protein 20.47% and Ash 3.35%. A can of tuna "La Perla" had mixed ratings sensors while canned tuna brands "K +" and "M" had a uniform rating of panelists. The chemical composition of canned tuna was as follows: Humidity 62.12%; 15.87% Fat; Protein 20.06% and Ash 2.03%.

Keywords: canned fish, tuna, sardines, analysis, Sarajevo

Uslovna upotrebljivost mesa preživara kod bolesti plavog jezika

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Sažetak

Bolest plavog jezika je virusno oboljenje preživara, posebno ovaca, koje se prenosi putem odrasle ženske jedinke insekata iz roda *Culicoides*. Virus plavog jezika je u Bosni i Hercegovini prvi put potvrđen u augustu 2002. godine, u Kalesiji u blizini granice sa Srbijom.

Najmarkantniji simptom bolesti plavog jezika, po kojem je ova bolest i dobila ime jeste tamno plava ili modra boja jezika koja je posljedica edema. Ovce koje imaju bolest plavog jezika imaju kombinaciju simptoma kao što su povišena temperatura, krvarenja iz nosa sa krastama oko nosnica, otežano disanje, plućne edeme, oralne erozije i čireve, hromost sa hiperemijom u papcima i slabost zbog nekroze mišića. Kod goveda klinički znaci uglavnom izostaju, ili su slični onim opisanim kod ovaca.

U posljednjih par godina bolest plavog jezika je bila prisutna u regionu i izazvala je zabrinuost u javnosti. Zbog činjenice da bolest može izazvati velike ekonomske gubitke jer ima varijabilnu stopu smrtnosti željeli smo istražiti da li je meso oboljelih životinja od bolesti plavog jezika sigurno za ljudsku konzumaciju. U Bosni i Hercegovini ne postoji zvanični stav o sigurnosti mesa kod bolesti plavog jezika za konzumaciju mesa životinja oboljelih od bolesti plavog jezika. Međutim, zbog toga što virus plavog jezika ne izaziva oboljenje kod ljudi i ne prenosi se putem zraka ili kontakta ne postoji opasnost za ljude prilikom konzumacije mesa oboljelih ili vakcinisanih životinja na virus plavog jezika. U budućnosti bi se trebalo više pažnje posvetiti ovom problemu zbog učestalijih epizootija bolesti plavog jezika kao i edukaciji građana prvenstveno držaoca stoke.

Ključne riječi: plavi jezik, meso, konzumacija, preživari

2-P-2

The conditional usability of meat in the case of the bluetongue in ruminants

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Abstract

Bluetongue is a viral disease of ruminans, especially of sheep, which is transmitted via adult female insects from genus *Culicoides*. The bluetongue virus was first confirmed in Bosnia and Herzegovina in August 2002, in Kalesija near the border with Serbia.

The most striking symptom of bluetongue, from which the disease derives its name, is the dark blue coloration of the tongue which is the result of numerous edema. Sheep with bluetongue have a combination of symptoms such as fever, serous bloody nasal discharge with crusting around the nares, difficult breathing, pulmonary edema, oral erosion and ulcers, hernia with hyperemia in the hooves and

weakness due to muscle necrosis. In cattle, clinical signs are largely absent, or are similar to those described in sheep.

In last few years bluetongue was present in the region and it raised concerns in public. Due to the fact that the disease can cause great economic losses, as there is a variable mortality, we wanted to investigate whether the meat of infected animals with is safe for consumption. In Bosnia and Herzegovina, there is no official statement on meat safety of animals with bluetongue. However, because the bluetongue virus does not cause a disease in humans and it is not transmitted by air or contact, there are no risks for people to consume meat from infected or vaccinated animals. In the future more attention should be paid to this issue due to the more frequent epizooty of bluetongue and to educating citizens, primarily the cattle holders.

Keywords: bluetongue, meat, consumption, ruminants

3. ISHRANA TOKOM ŽIVOTNOG CIKLUSA
LIFECYCLE NUTRITION

Prehrambene navike i fizička aktivnost studenata tokom vremena provedenog na fakultetu

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Sažetak

Ubrzano tempo života, studente dovodi do toga da se hrane neadekvatno. Vrijeme koje provedu na fakultetu je i po nekoliko sati i zbog toga često jedu izvan kuće. Studenti za vrijeme boravka na fakultetu posežu za nezdravom hranom i pićem.

Cilj ovog rada bio je uvrstiti prehrambene navike i fizičku aktivnost studenata tokom vremena provedenog na fakultetu.

U istraživanju je učestvovalo 80 studenata od 18-30 godina. Korištena metoda je anketni upitnik, koji je osim personalnih podataka sadržavao 18 pitanja o tome šta studenti konzumiraju tokom boravka na fakultetu, te na koji način sagorijevaju kalorije koje unesu u organizam. Većina ispitanih studenata, njih 61% rijetko doručkuje kod kuće prije polaska na fakultet. Kako njih 64% od kuće ne ponese svoju užinu, kupuju je u pekari ili obližnjem fast food-u. Ono što najčešće kupuju su: sendviči, hamburgeri, lisnato tijesto sa hrenovkom i slično. 65% studenata navodi da pored svojih fakulteta nemaju prodavnice u kojima bi se mogli pravilno hraniti. 54% studenata konzumira vodu tokom boravka na fakultetu, dok manji broj njih ipak poseže za gaziranim sokovima. 45% ispitanih studenata se rekreativno bavi nekom vrstom sporta. Unesene kalorije studenti sagorijevaju trčanjem, šetanjem, obavljanjem kućanskih poslova ili nekom vrstom sporta. Ispitanici koji se ne bave nekom vrstom sporta aktivno ili rekreativno navode sljedeće razloge za to: nedovoljno vremena, nedostatak volje, kao i prevelike obaveze na fakultetu.

Bavljenje bilo kojom vrstom sporta aktivno ili rekreativno bi trebalo da traje minimalno 30 minuta dnevno, odnosno 150 minuta sedmično, kako bi ta aktivnost pozitivno utjecala na zdravlje kao i na sagorijevanje unesenih kalorija u organizam.

Ključne riječi: ishrana, studenti, fizička aktivnost

3-O-1

Food habits and physical activities during the time spent at the faculty

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Abstract

Accelerated pace of life brings students to decisions to feed inadequately. The amount of time they spend at school is more than few hours and because of that they don't often eat in their homes. During school hours, students have a tendency for unhealthy food and drinks.

The goal of this work was to determine feeding habits and physical activities of students during their time spent at school. Eighty students aged 18-30 participated in this research. We were using a questionnaire method which contained 18 questions (besides personal questions) about what students eat during their time spent at school and how are those calories burnt. Most students (61%) rarely have breakfast at home before going to school. 64% of students don't bring lunch from home, instead they buy it in local fast-food restaurants. 65% of students say that they don't have any shops/restaurants near their school where they could eat healthy. 54% of students consume water during their time at school, while small number of them goes for carbonated drinks. 45% of questioned students engage in sports activities. They burn their calories by walking, running, doing household chores or

some type of sport. Questioned students that don't engage in any sports quote following reasons: lack of time/will or too many obligations at school. Engaging at any type of sport (active or recreative) should last minimally 30 minutes a day, relatively 150 minutes a week so that the activity could positively affect your health as well as burning calories which entered the organism.

Keywords: nutrition, physical activites, students

3-O-2

Procjena znanja studenata o pravilnoj ishrani

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Sažetak

Pravilna ishrana je važan faktor za unapređenje i očuvanje zdravlja. Savremeni način života koji karakteriše neredovan unos hrane, unos bar jednog obroka u toku dana van kuće, doveli su do porasta broja zdravstvenih

problema u čijoj osnovi je nepravilna ishrana. Ishrana bi trebala da bude raznovrsna, a obroci moraju biti pravilno raspoređeni. Potrebno je jesti što više svježih namirnica, te znati koja namirnica sadrži koje vitamine kako bi svom tijelu osigurali adekvatan unos svih potrebnih mikronutrijenata. Cilj ovog istraživanja je bio procijeniti znanje studenata o pravilnoj ishrani. U istraživanju je učestvovalo 84 studenta. Korišten je anketni upitnik, koji je sadržavao 10 pitanja o tome šta treba konzumirati, te koje vitamine sadrže određene namirnice. Na osnovu dobijenih rezultata ustanovljeno je da 64% ispitanika zna u kojim namirnicama mogu pronaći vitamin C. Tačne odgovore su dali i kada su u pitanju namirnice bogate kalcijem i željezom. Polovina ispitanika 50% navodi da dnevni unos vode treba biti veći od 2l, dok ostali ispitanici smatraju da dnevni unos vode treba da bude manji. Kada je u pitanju unos hljeba 57% ispitanika navodi da je ražev hljeb najzdraviji, 38% ispitanika navodi da je najzdraviji crni hljeb, 4% ispitanika navodi da su podjednako zdravi i crni i ražev hljeb, a samo 1% ispitanika navodi da je najzdraviji bijeli hljeb. Manje od polovine ispitanika, njih 45% navodi da cink najviše možemo pronaći u orašastim plodovima, 30% ispitanika navodi da cink najviše možemo pronaći u morskim plodovima, 23% ispitanika navodi da cink najviše možemo pronaći u žitaricama, dok 2% ispitanika navodi da cink možemo pronaći u morskim i orašastim plodovima, kao i u žitaricama. Možemo zaključiti da znanje studenata o pravilnoj ishrani nije zadovoljavajuće.

Ključne riječi: pravilna ishrana, znanja studenata

3-O-2

Assessment of students knowledge of proper nutrition

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Abstract

Proper nutrition is an important factor for improving and preserving health. A modern way of life that is characterized by irregular food intakes, intake of at least one meal during the day outside the home, has led to an increase in the number of health problems on the basis of poor nutrition. The diet should be varied and the meals should be properly arranged. It is necessary to eat as much fresh food as possible, and to know which food contains vitamins to ensure adequate supply of all necessary micronutrients your body needs. The aim of this study was to estimate students' knowledge of proper nutrition. 84 students participated in the research. A questionnaire was used, which contained 10 questions on what to eat, and which food contains certain vitamins. Based on the obtained results, it was found that 64% of respondents knew in which food they could find vitamin C. They also provided accurate answers when it comes to foods rich in calcium and iron. Half of the respondents say that the daily water intake should be greater than 2l, while other respondents believe that the daily water intake should be smaller. When it comes to bread intake, 57% of the respondents state that the rye bread is the healthiest, 38% of the respondents state that the healthiest is black bread, 4% of respondents state that the black and rye bread are equally healthy, and only 1% of respondents state that the healthiest is white bread. Less than half of the respondents, 45% of them, say that zinc can be most found in nuts, 30% of respondents say that zinc can be found most in seafood, 23% of respondents state that zinc can be most found in cereals, while 2% of respondents state that we can find zinc in seafood and nuts, as well as in grains. We can conclude that students' knowledge of proper nutrition is unsatisfactory.

Kay words: proper nutritions, students' knowledge

Promocija oralnog zdravlja kod djece u vrtićima JU Djeca Sarajeva

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Sažetak:

Očuvanje oralnog zdravlja ima važnost od najranije dobi. Predškolski uzrast predstavlja prvi važan period u psihofizičkom statusu djeteta za djelovanje stomatologa u svakom pogledu. U očuvanju oralnog zdravlja djece ključnu ulogu imaju njihovi roditelji. Preventivni programi u ovom uzrastu su efikasan način očuvanja i unaprijeđenja oralnog zdravlja.

Cilj rada je bio da kroz preventivni program izvršimo promociju oralnog zdravlja, kao i metode za njegovo očuvanje (dobra oralna higijena i pravilan način ishrane) kod djece u vrtićima JU „Djeca Sarajeva“.

METODOLOGIJA

Studenti Stomatološkog fakulteta učestvovali su u projektu “Sprovedenje preventivnog programa kod djece“ u vrtićima JU „Djeca Sarajeva“. U toku 3 mjeseca obišeno je 20 vrtića na području Kantona Sarajevo u kojima je bilo ukupno 639 djece uzrasta od četiri do šest godina. Primarni cilj nam je bio da se obišu svi vrtići na području Kantona Sarajevo (ukupno 30 vrtića), ali zbog

nedostatka vremena i nedostatka osoba koje bi posjećivale vrtiće zaustavili smo se na broju 20. Posjete su podrazumijevale prezentacije djeci o oralnom zdravlju, te radionice kako bi se djeca upoznala sa pravilnim održavanjem higijene i primjenom dijetetskih mjera.

U šest vrtića podijelili smo ankete za roditelje, kako bismo evaluirali način očuvanja oralnog zdravlja kod njihove djece, a u dva vrtića smo održali roditeljske sastanke. Ankete koje smo dijelili roditeljima sačinjavale su informirani pristanak za sudjelovanje u anketiranju i anketni upitnik oralno – higijenskih, dijetetskih i drugih navika.

REZULTATI I ZAKLJUČAK:

Rezultati anketa, kao i roditeljskih sastanaka pokazuju da pojedini roditelji nemaju razvijenu svijest o važnosti oralnog zdravlja kod njihove djece, te da ne pridaju veliku važnost saradnji sa stomatologom.

KLJUČNE RIJEČI: *djeca, vrtići, oralno zdravlje, roditelji, prehrambene navike.*

3-O-3

Promotion of oral health among children in kindergartens JU „Djeca Sarajeva“

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Abstract

The preservation of oral health is important from an early age. Preschool period is the first important period in the mental and physical status of the child, in which dentist can act in every aspect. In preserving the oral health of children, their parents have a crucial role. Preventive programs at this age are effective way to preserve and improve oral health

Aim was to do a promotion of oral health and methods to preserve it (good oral hygiene and proper diet) among children in kindergartens of JU „Djeca Sarajeva“.

METHODOLOGY

Dentistry students, participated in the project "Implementation of preventive program among children in kindergartens of JU „Djeca Sarajeva". During 3 months period, 20 kindergartens were visited in Kanton Sarajevo in which there were 639 children, age between four and six. Primary aim was to visit all kindergartens in Kanton Sarajevo (30 kindergartens), but due to lack of time and people who would visit kindergartens, we stopped at the number of 20 kindergartens. Visits included presentations about oral health, as well as workshops to introduce children with the proper oral hygiene and dietetic measures.

In six kindergartens we did the survey with parents, so we could get full picture of preservation of oral health among their children, and we held meetings with parents in two kindergartens. Surveys that we gave to parents had informed consent to participate in the survey and questionnaire about oral - hygiene, dietary and other habits.

RESULTS AND CONCLUSION:

The results of the survey, as well as meetings with parents, indicate that some parents are not aware of the importance of oral health of their children, and don't give enough importance to cooperation with the dentist.

KEY WORDS: children, kindergarten, oral health, parents, dietary habits

Znanje i stav studenata o eroziji zuba

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Sažetak

Cilj ovog istraživanja je procijeniti znanje i stavove studenata Sarajevskog univerziteta o dentalnoj eroziji, te utvrditi u kolikoj mjeri ova populacija prepoznaje simptome erozije na svojim zubima i unosi hranu i pića koji su glavni uzročnik ovog oboljenja. Podaci su prikupljeni putem elektronskih anketa koje su podijeljene studentima Stomatološkog fakulteta, drugim fakultetima medicinske grupacije i fakultetima nemedicinske grupacije koji nisu imali prilike se susresti s pojmom erozije zuba tokom dodiplomske nastave. Poslano je ukupno 108 anketa, od toga je odgovorilo 90 studenata a 60 anketa (55,65%) je kompletno koje su uzete za analizu. Ovaj rad je pokazao da studenti često unose kiselu hranu i imaju simptome koji se mogu povezati sa dentalnom erozijom. Studenti UNSA nisu dovoljno upoznati sa pojmom erozije zuba i njenim nastankom, što ukazuje na potrebu za boljom zdravstvenom edukacijom u ovom važnom području oralnog zdravlja.

Ključne riječi: erozija zuba, studenti, anketa

3-O-4

Students' knowledge and stance about erosion

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Abstract

Goal of this research is to assess knowledge and stance of students at Sarajevo University about dental erosion, and ascertain in which measure this population recognizes symptoms of erosion occurring on their own teeth by consuming food and drinks that are main reason for this disease. Data is gathered by an online questionnaire distributed to students of Dental Faculty, other Medical Faculties, as well as non-Medical Faculties that didn't have a chance to come in close contact with the term of dental erosion during their undergraduate studies. Overall, 108 questionnaires have been distributed, with 90 students that responded to them, resulting in 60 questionnaires (55,65%) being completed and taken in the account for further analysis. This research showed that students often consume food rich in acid, resulting in symptoms connected to dental erosion. UNSA (University of Sarajevo) students are not familiar enough with the term of dental erosion and how it starts, as this fact points to the need for better health education in this important part of oral hygiene.

Keywords: dental erosion, students, questionnaire

Značaj dijetetskih suplemenata u ishrani sportista

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Sažetak

Radi postizanja boljih performansi, sportisti konzumiraju različite supstance i dijetetske suplemente. Cilj ovog rada je analiza prednosti, nedostataka i potencijalnih zdravstvenih rizika izazvanih njihovom primjenom.

Suplementi pokazuju korisne efekte kod povećane potrošnje nutrijenata tokom treninga, ograničenog unosa i izbora hrane. Način čuvanja i priprema hrane mogu imati utjecaj na sadržaj i količinu esencijalnih nutrijenata. Najčešće se koriste proteini, vitamini, minerali, BCAA (aminokiseline razgranatog lanca), kreatin i ergogena sredstva. Pospješuju oporavak tkiva, preveniraju nastanak slobodnih radikala, povećavaju mišićnu masu, snagu i izdržljivost i štede rezerve glikogena u mišićima.

Ako se primjenjuju bez jasnih indikacija i razumijevanja utjecaja na sportsku sposobnost, mogu izazvati neželjene efekte. Prekomjerna konzumacija kofeina ima štetan diuretski efekat i kratkotrajno povećava krvni pritisak, disbalansiran unos vitamina i minerala uzrokuje hiper ili hipovitaminozu što dalje uzrokuje teže posljedice, nedovoljan unos vode prilikom primjene kreatina može oštetiti bubrege. Suplementi se zakonski tretiraju kao hrana i prolaze samo ispitivanja zdravstvene ispravnosti, koja podrazumijevaju određivanje ograničenog broja toksikanata i zato često ne pokazuju željene efekte i ne odgovaraju deklarisanom sastavu što može rezultirati pojavom alergijskih reakcija i pozitivnih doping testova.

Primjena odgovarajućih i provjerenih suplemenata doprinosi poboljšanju performansi i ubrza oporavak tkiva, ali također nosi brojne rizike i nedostatke zbog njihovog upitnog porijekla i kvaliteta te ne može nikako biti zamjena za adekvatnu i raznovrsnu prehranu.

Ključne riječi: hrana, sportisti, dijetetski suplementi

3-0-5

3-0-5

Significance of dietary supplements in athlete's diet

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Abstract

In order to perform better, athletes often consume various substances and dietary supplements. The aim of this paper is the presentation of benefits, disadvantages and potential risks of using these supplements.

Supplements show beneficial effects when used in times of increased nutrient consumption during training, limited food supply and food choices. A way of food preservation and preparation may have an impact on the quantity and content of the essential nutrients. The most often used supplements are proteins, vitamins, minerals, branched amino acids, creatine and ergogenic aids. They help with tissue regeneration, prevent the formation of free radicals, increase muscle mass, strength, endurance and preserve glycogen.

If they're used without clear indications and understanding of their influence on athlete's abilities, they can cause negative side effects. Excessive use of caffeine has a harmful diuretic effect, overuse of vitamins and minerals can cause various disorders and insufficient water intake during creatine use can damage the kidneys. Legally supplements are considered as food and only go through food safety testing, which means determining whether certain toxic substances are present. Because of this supplements often don't show desired effects and don't match the declared ingredient list, which can result with allergic reactions and positive doping tests.

The use of suitable and verified supplements can improve overall health and performance, but also carries a number of risks and drawbacks because of their questionable source and quality, so it certainly can not be considered as a substitute for a balanced and diverse diet.

Keywords: food, athletes, dietary supplements

Znanje, praksa i stavovi o oralnom zdravlju i prehrambene navike studenata Univerziteta u Sarajevu

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Sažetak

UVOD: Poznato je da oralno zdravlje i pravilne prehrambene navike reflektiraju se na ukupan kvalitet života pojedinca. Životni stilovi studentske populacije koji podrazumijevaju veliki broj obaveza i manjak vremena usmjerenog ka načinu ishrane i njenoj raznovrsnosti dovodi do kompromitovanja oralnog i općeg zdravlja. Cilj ovog istraživanja je bio prikupiti podatke na osnovu kreiranih upitnika o znanju, praksi i stavovima ispitanika o prehrambenim navikama, oralnom zdravlju, te utvrditi da li postoji korelacija u znanju, praksi i stavovima u odnosu na grupacije fakulteta, napraviti prijedlog okvirnog programa za unapređenje oralnog zdravlja i prehrambenih navika studenata.

ISPITANICI I METODE: Istraživanje je izvršeno na studentima Univerziteta u Sarajevu na tri fakulteta, Arhitektonski fakultet, Medicinski fakultet i Stomatološki fakultet sa klinikama u Sarajevu. Korišteni su anketni upitnici o

oralno-higijenskim i prehrambeno/dijetetskim navikama. Anektne upitnike su ispunjavali lično studenti. Anketirano je ukupno 600 studenata, po 200 studenata na svakom fakultetu, te su podijeljeni na dvije grupe studenata, studenti medicinskih i nemedicinskih grupacija fakulteta.

REZULTATI: Analizom odgovora koje su pružili ispitanici dobili smo uvid u znanje, stavove i praksu oralnog zdravlja i prehrambenih navika studenata navedenih fakulteta. Rezultati pokazuju razlike u odgovorima, a u ovisnosti da li pripadaju grupi medicinskih ili nemedicinskih grupacija fakulteta. Rezultati ukazuju na učestalo korištenje „nezdrave hrane“ (slatkiši, grickalice, fast food i dr.).

ZAKLJUČAK: Neophodno je izvršiti planiranje i provođenje programa prevencije oralnog zdravlja, edukacije u cilju formiranja zdravih navika u ishrani studenata kako bi se promijenila pojedinačna i društvena svijest o značaju pravilne ishrane i oralnog zdravlja.

Ključne riječi: oralno zdravlje, prehrambene navike, stav, studenti

3-O-6

Knowledge, practice and attitude about oral health and nutritional habits of students of the University of Sarajevo

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Abstract

BACKGROUND: It is well known that oral health and proper eating habits reflect the overall quality of life of an individual. Lifestyles of the student population, which imply a large number of obligations and a lack of time focused on nutrition and its diversity, leads to compromising oral and general health. The goal of this study was to collect data on the basis of created questionnaires on the knowledge, practices and attitudes of respondents on nutritional habits, oral health, and to determine whether there is a correlation in knowledge, practice and attitudes in relation to faculty groups, to make a proposal for a framework program for improving oral health and nutrition habits of students.

MATERIAL AND METHODS:The research was conducted among the students of the University of Sarajevo at three faculties, the Faculty of Architecture, the Faculty of Medicine and the Faculty of Dentistry with clinics in Sarajevo. Questionnaires on oral-hygienic and nutritional/dietetic habits were used. Questionnaires were filled by students themselves. A total of 600 students, 200 students at each faculty were surveyed, and were divided into two groups of students, students of medical and non-medical grouping faculties.

RESULTS: By analyzing the answers, we got insights into the knowledge, attitudes and practice of oral health and nutritional habits of the students of the mentioned faculties. The results show differences in responses, depending on whether they are assigned to groups of medical or non-medical faculty groups. The results indicate that students frequently use "unhealthy food" (sweets, snacks, fast food, etc.).

CONCLUSIONS: It is necessary to plan and implement an oral health prevention program, educate students in order to create healthy dietary habits, in order to change the individual and social awareness of the importance of proper nutrition and oral health.

Keywords: oral health, nutritional habits, attitude, students

Utjecaj marketinga na potrošnju bezglutenske hrane

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Sažetak

Prehrana bez luten je jedna od najpopularnijih dijeta današnjice. U posljednjih nekoliko godina proizvodi bez luten su osim u specijaliziranim trgovinama i trgovinama zdrave hrane dostupni i u supermarketima. Povećana dostupnost je nastala kao posljedica povećane potrošnje bezglutenskih proizvoda u općoj populaciji i trenutnih marketinških trendova. Kako bi se uvidio utjecaj marketinga na porast potrošnje bezglutenskih namirnica potrebno je odvojeno posmatrati dvije skupine ljudi. Prvu skupinu čine osobe kod kojih bezglutenska prehrana predstavlja terapijski tretman jer gluten uzrokuje gastrointestinalne i ekstraintestinalne simptome. Oni nastaju zbog imunološki posredovane bolesti, celijakije, koja se najčešće javlja u genetski predisponiranih osoba. Drugu skupinu čine osobe koje slijede samopropisanu prehranu bez glutena koja nije indicirana zdravstvenim problemima koji nastaju nakon njegovog unosa. Najčešći motivi za primjenu bezglutenske prehrane su redukcija tjelesne mase, poboljšanje kvaliteta ishrane i općeg zdravlja. Iako se broj oboljelih od celijakije nije značajno promijenio, broj ljudi koji slijede bezglutensku prehranu se trostruko povećao. Mnogi svjetski proizvođači slijedeći trend uvode i proizvodnju bezglutenskih proizvoda te na taj način zadovoljavaju potrebe potrošača i značajno profitiraju. Uzimajući u obzir da je cijena bezglutenskih proizvoda mnogo veća u odnosu na konvencionalne proizvode bitno je evaluirati odnos između dobrobiti samopropisane bezglutenske dijeta i finansijskih ulaganja. U ovom radu uporedili smo cijene pojedinih bezglutenskih proizvoda u sarajevskim trgovinama sa konvencionalnim proizvodima. Na osnovu toga je zaključeno da osobe koje slijede bezglutensku prehranu izdvajaju značajno veću količinu novca za istu grupu namirnica u odnosu na osobe koje koriste konvencionalne namirnice.

Ključne riječi: bezglutenska prehrana, celijakija, marketinški trendovi

3-O-7

Marketing influence on consumption of gluten-free products

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Abstract

Diet without gluten is one of the most popular diets today. In recent years gluten-free products became available in supermarkets, and not just in health food stores. An increased availability is consequence of increased consumption of gluten-free products in the general population and current marketing trends. In order to analyze these marketing trends and its influence we have to identify two different groups of consumers. The first group consists of people with celiac disease. Gluten-free diet is a therapeutic treatment for them because gluten causes the gastrointestinal and extraintestinal symptoms. Its arise due to immune-mediated disease which usually occurs in genetically predisposed. A second group consists of people who follow gluten-free diet, but it is not prescribed by a profesional. The most common motives for following gluten-free diet in this group of people are weight reduction, healthier lifestyle etc. Though the number of people with celiac disease was not significantly changed, the number of people who follow gluten-free diet is threefold increased. Many global providers expand line of food products without gluten and thus satisfy the needs of users with their significant benefit. Considering that the cost of gluten-free products is much higher than conventional products it is important to evaluate the cost-benefit of following gluten-free diet among people without patohistological diagnosis of celiac sprue. In this paper we compared prices of individual

gluten-free products in Sarajevo shops with conventional products. Based on this analysis we can conclude that consumers of gluten-free diet spend more money compared to consumers of conventional products.

Keywords: gluten-free diet, celiac disease, marketing trends

3-O-8

Vegetarijanska prehrana: stav nauke

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Sažetak

Vegetarijanska prehrana- vegetarijanstvo je pokret u ishrani koji promovira ishranu zasnovanu na namirnicama biljnog porijekla. Danas postoje različiti podtipovi vegeterijanstva koji mogu uključivati određene proizvode životinjskog porijekla u manjim količinama. Razlozi zbog kojih se pojedinci odlučuju na ovaj režim ishrane mogu uključivati zdravstvene, ekonomski, socijalne, etičke, religijske i druge. Kako je ishrana u najužoj vezi sa zdravljem, to vegeterijanstvo također jedan od interesa za praćenje i nadzor od strane stručnjaka iz oblasti nutricionije i medicine. Zdravstveni stručnjaci se slažu da, zbog prirode ove vrste prehrane, moraju biti potrebno posvetiti posebnu pažnju sprječavanju deficita pojedinih nutrijenata u prehrani kroz adekvatnu suplementaciju. Obzirom da je interes javnosti za vegeterijanstvo u posljednjih decenija značajno porastao, provedena su brojna istraživanja različitih aspekata, prvom redu zdravstvene opravdanosti koncepta vegeterijanstva. U skladu s tim, primarni interes ovog rada je da prezentuje rezultate nekih od zvaničnih studija koje se odnose na najčešće proučene parametre zdravlja u općoj populaciji (krvni pritisak, nivo lipida u krvi, indeks tjelesne mase), te određene specifične efekte vegeterijanske ishrane na zdravlje pojedinca. Ovaj pregled studija pokazao je da koncept vegeterijanstva, generalno kazano, može imati blagotvorne efekte na svoje sljedbenike u pogledu navedenih parametara. Također postoje naučna mišljenja da ovaj vid prehrane može u određenim slučajevima čak biti i u terapiji za određene grupe pacijenata, ako se imaju na umu dokazani benefiti vegeterijanske prehrane. Zbog toga, ovaj kontekst istraživanja kojim se bavi nutricionistička nauka smatran posebnom interesantnim

Ključne riječi: vegetarijanstvo, namirnice biljnog porijekla, prehrana, zdravstvena opravdanost

3-O-8

Vegetarian nutrition: scientific approach

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Abstract

Vegetarian nutrition- vegetarianism is a movement in nutrition which promotes nutrition based on food of plant origin. Nowadays there are several types of vegetarian diets which may include consuming some kinds of animal products in little amounts. Reasons for starting vegetarian nutrition may include health, economic, social, religious or other reasons. Since nutrition is closely connected to health, this topic is of interest for researchers in the field of nutrition and medicine. Health professionals agree that it might be necessary, regarding many specifics of this sort of nutrition, to pay special attention and prevent deficiency of some of key nutrients through adequate supplementation. Because the public interest for vegetarianism has grown greatly in the last few decades, more researches have been conducted to explore different aspects of this specific nutrition, primarily its health acceptability. That is to reveal the primary aim of this paper, which is to present the conclusions of some of the studies that researched the effects of vegetarian nutrition on main parameters of health in public population (blood pressure, blood lipid level, body mass index) and maybe some of its specific impacts on health of an individual. This studies review has shown that vegetarian diet, generally speaking, does have positive implications on health of its followers, and can even be prescribed for some patients as a sort of therapy, if we have in mind its proven health benefits. Because of that, this aspect of research in nutritional science is very interesting.

Key words: vegetarianism, plants, nutrition, health effects

Hrana-Ishrana-Zdravlje u curriculumu fakulteta koji educiraju odgajatelje i učitelje

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Sažetak

Škole i predškolske ustanove su dokazano najbolja sredina za promociju zdravog življenja/pravilnog ponašanja, a odgajatelji, učitelji i nastavnici trebaju prenijeti znanja dobijena tokom studija o zdravim prehrambenim navikama u kontekstu očuvanja zdravlja.

Cilj rada je procjena i poređenje curriculuma fakulteta koji educiraju buduće odgajatelje, učitelje, nastavnike u BiH sa akcentom na predmete koji obuhvataju hranu, ishranu, zdravlje kao pojmove zdravog življenja. Analizirani su curriculumi: Pedagoškog fakulteta (4 odsjeka) Univerziteta u Sarajevu, Nastavničkog fakulteta Univerziteta Džemal Bijedić u Mostaru (2 odsjeka), Filozofskog fakulteta Univerziteta u Tuzli (2 odsjeka) i Pedagoškog fakulteta Univerziteta u Bijaću (2 odsjeka). Navedeni fakulteti su analizirani jer je curriculum bio dostupan na web stranicama fakulteta. Curriculum Pedagoškog fakulteta u Sarajevu sadrži najveći broj predmeta koji promovišu zdrave životne stilove kroz sve segmente: hranu-ishranu-zdravlje. Međutim, ovaj fakultet ima odsjek koji je posvećen upravo promociji zdravih životnih

stilova: Kulturu življenja i tehnički odgoj, dok drugi fakulteti koji educiraju odgojno-obrazovni kadar nemaju navedeni odsjek, te stoga nemaju ni pokrivene sve segmente. Na ostalim radom obuhvaćenim fakultetima postoje odsjeci za razrednu nastavu i predškolski odgoj i u curriculumu imaju predmete vezano za sport, okolinu i metodike nastave tjelesne i zdravstvene kulture i okoline. Pedagoški fakultet u Sarajevu ima najadekvatniji plan i program za edukaciju o zdravom življenju, s tim da najveći broj predmeta nije zastupljen na odsjecima za razrednu nastavu i predškolski odgoj kao što je slučaj i sa drugim radom obuhvaćenim fakultetima.

Ključne riječi: curriculum, fakulteti, hrana, ishrana, zdravlje.

3-O-9

Food-Nutrition-Health in curricula of faculties educating care-givers and teachers

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Abstract

Schools and pre-school institutions are proven to be the best environment for promotion of healthy lifestyle/proper behavior and care-givers and teachers

should transfer knowledge gained throughout the study about healthy food habits in context of maintenance of health.

The aim of the work is evaluation and curricula comparison of faculties educating future care-givers and teachers in B&H with an accent on the subjects involving food, nutrition, health as terms of healthy lifestyle. Analysed curricula are from: Faculty of Educational Sciences (4 departments) of University of Sarajevo, Educational Faculty of University Džemal Bijedić in Mostar (2 departments), Faculty of Philosophy University of Tuzla (2 departments) and Pedagogical faculty University of Bihać (2 departments). Mentioned faculties were analysed because curricula could be downloaded from the web sites. Curricula of the Faculty of Educational Sciences in Sarajevo has largest number of subjects promoting healthy lifestyles through all the segments: food-nutrition-health. But only this faculty has department actually promoting healthy lifestyle: Culture of living and Technical Education, while other faculties educating care-givers and teachers don't have it and therefore don't have covered all segments. Other faculties have departments for classroom teaching and pre-school education and have subjects linked with sport, environment and methodics of sport education and environment. Faculty of Educational Sciences in Sarajevo has the most appropriate curricula for education of healthy lifestyle but most of the subjects are not present at the departments for classroom teaching and pre-school education. The same as on other faculties.

Key words: curriculum, faculties, food, nutrition, health.

Znanje učenika mlađeg školskog uzrsta o važnosti doručka

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Sažetak

Problem pretilosti učenika kako u Kantonu Sarajevo tako i u cijeloj BiH sve je izraženiji. Razlog pretilosti učenika pored fizičke neaktivnosti svakako je u velikoj mjeri i neadekvatna ishrana. Učenici su podložni da u velikoj mjeri konzumiraju nezdravu hranu. Neredovni obroci su također jedan od faktora koji negativno djeluju na zdravlje učenika. Neredovni obroci utječu na promjenu raspoloženja, a nakon dužeg vremena to se odražava i na rad unutrašnjih organa. Doručak je za djecu važniji nego za odrasle i to iz više razloga. Prvi razlog je taj jer im on pomaže da održe koncentraciju i pažnju do užine. Također, mnoga istraživanja pokazuju povezanost između ove zdrave jutarnje navike i dobrih rezultata na testovima. Budući da je doručak najvažniji obrok u danu i da ga ne bismo trebali izostavljati, odlučili smo istražiti znanja učenika 3. I 4. Razreda o važnosti doručka, te njihove prehrambene navike. Istraživanje smo proveli u osnovnim školama „Isak Samokovlija“ i „Skender Kulenović“. Ukupan broj anketiranih učenika iznosi 150, a rezultati istraživanja će biti prezentirani u radu.

Ključne riječi: učenici razredne nastave, doručak, navika, pretilost

3-O-10

How much do the students in early school age know about the importance of breakfast

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Abstract

The problem of obesity students, both in the Canton of Sarajevo, as well as in Bosnia and Herzegovina has significantly increased. The reason for obesity students, in addition to physical inactivity, is certainly inadequate nutrition. Students consume a lot of junk food. Irregular meals are also one of the factors that negatively affect the health of students. Irregular meals impact on change of mood, and after a long time they affect the operation of the internal organs. Breakfast is more important to children than to adults. There are several reasons why. The first reason is that it helps them to maintain concentration and attention to snacks. Also, many researches show a connection between this healthy morning habit and good results on tests. Since the breakfast is the most important meal of the day and that we should not exclude it, we decided to explore the knowledge of students in the third and fourth class about the importance of breakfast, and their eating habits. The research was conducted in PRIMARY SCHOOLS "Isak Samokovlija" and "Skender Kulenovic". The total number of surveyed students is 150, the research results will be presented in the work.

Keywords: students of classroom teaching, breakfast, habits, obesity

3-O-11

**Navike u pogledu konzumiranja količine vode i drugih napitaka učenika
razredne nastave**

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Sažetak

Za zdravlje svakog čovjeka iznimno je važan dovoljan unos tečnosti u organizam, u cilju što boljeg funkcioniranja tijela u cjelosti. Ovoj problematici treba posvetiti posebnu pažnju kada su u pitanju djeca. Osim konzumiranja vode za piće, djeca u organizam unose i tečnosti poput prirodnih sokova, osvježavajućih bezalkoholnih pića i gaziranih sokova, čajeva i mlijeka. Ciljevi ovog ispitivanja su ispitati kakve su navike učenika razredne nastave kada je u pitanju unos tečnosti poput vode i ostalih napitaka u organizam i ukazati na negativan zdravstveni uticaj gaziranih sokova, te promovirati unos vode za piće. U cilju ovog istraživanja sprovedi smo anketu među 150 učenika četvrtih i petih razreda, osnovnih škola u Sarajevu, gdje se pokazalo da većina ispitanika dnevno konzumira najmanje 5 čaša vode a oko 70% njih izjasnilo se da vole piti gazirane sokove. Na osnovu dobijenih rezultata ankete možemo zaključiti da učenici često konzumiraju gazirana pića različitih proizvođača o čemu ćemo detaljnije govoriti u prezentaciji istraživanja.

Gljučne riječi: učenici razredne nastave, navike, voda, gazirani sokovi

Habits regarding the consumption amounts of water and other beverages primary school students

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Abstract

For the health of every human being is extremely important adequate intake of fluids in the body, in order to better functioning of the body as a whole. This issue should be given special attention when it comes to children. Except consumption of drinking water children intake into the body other fluids such as natural juices, soft drinks and carbonated soft drinks, tea and milk. The objectives of this study were to examine what are the habits of primary school students when it comes to fluids such as water and other beverages in the organism and to point out the negative health impact of soda, and promote the intake of drinking water. For the purpose of this research we have conducted a survey among 150 students of fourth and fifth grade of primary school in Sarajevo, where it was shown that most of the respondents consumed daily at least 5 glasses of water and about 70% of them said they like to drink soda. Based on the survey results, we can conclude that students often consume sodas different manufacturers about which we will talk in more detail in the presentation of research.

Keywords: students of classroom teaching, habits, water, soft drinks

Uloga hurmi u ishrani trudnica

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Sažetak

Raznovrsna i pravilno izbalansirana ishrana se direktno reflektira na zdravlje čovjeka, te brojna istraživanja ukazuju na signifikantan uticaj pravilnog načina života i prehrane na cjelokupno zdravlje čovjeka. Trudnoća predstavlja posebno razdoblje u životu žene, te se pravilnoj ishrani u ovom periodu dodatno pridodaje naročita pažnja. Naime, ishrana trudnice treba da osigura pravilan rast i razvoj ploda i sačuva dobro zdravlje majke. Stoga, u ishrani trudnica trebaju biti zastupljene nutritivno bogate namirnice, a vrijedan izvor mnogih (ne)nutrijenata čine hurme. Hurme imaju širok spektar zdravstvenih i nutritivnih vrijednosti zbog kojeg se smatraju najzdravijim voćem na svijetu jer su izuzetno bogate vlaknima, mineralima i antioksidansima. Navedeno voće obiluje u sadržaju kalcija i željeza (100g hurmi sadrži 65mg kalcija i 2,1mg željeza) koji su neophodni za razvoj ploda jer sudjeluju u formiranju koštane srži. Nadalje, konzumiranje hurmi u trudnoći smanjuje porođajne bolove i krvarenje. Naime, serotonin, tanin i kalcij doprinose kontakcijama mišića maternice. U prilog navedenom svjedoče istraživanja provedena na Univerzitetu za nauku i kulturu u Jordanu, a koja su pokazala da konzumiranje hurmi četiri sedmice prije porođaja majkama može da olakša porođajne bolove i smanji postporođajno krvarenje. Nadalje, hranjiva vlakna u hurmama imaju laksativni učinak, što je važno i za

trudnice, jer vlakna doprinose lakšoj probavi. Hurme također smanjuju osjećaj gladi. Imajući u vidu navedeno, cilj rada je pobliže predstaviti dobrobiti konzumacije hurmi, te rezime istraživanja značaja hurmi u ishrani trudnica.

Ključne riječi: Ishrana, trudnoća, hurme

3-O-12

Dates in the diet of pregnant women

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Abstract

Diverse and well balanced diet significantly affects on overall human health, which is evident in numerous scientific studies. Pregnancy represents important period in woman's life, thus the special attention is ascribed to woman's diet. The proper diet of pregnant woman should provide regular growth and development of fetus, and to preserve mother's health. Therefore, food rich in nutritional compounds should be dominant in the diet of pregnant women. One of the valuable sources of these compounds are dates. Dates are considered as the most healthful fruit which possesses various health effects

due to the high fibers, minerals and antioxidants content. Particularly, dates have high calcium and iron content (65 mg of calcium and 2,1 mg of iron in 100 g of fruit). These minerals are important for fetus development because they are included in formation of bone marrow. Moreover, dates consumption in pregnancy period decreases birth pain and bleeding. Serotonin, tannin and calcium in date fruit contribute to the contraction of smooth muscles of the uterus. Studies conducted at University for science and culture in Jordan have shown that dates consumption four weeks prior to labor can ease labor pains and to decrease post-birth bleeding. Furthermore, fibers from dates have laxative effect, which is very important for pregnant woman, dates are easily digested, absorption and decrease hunger. Thus, the aim of this study is to present all known benefits of dates consumption and to provide a summary of scientific evidences for dates intake during the pregnancy as well.

Key words: Diet, pregnancy, dates

3-O-13

Magnezij (Mg) u ishrani

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Sažetak

Značaj magnezija kao esencijalnog elementa za organizam čovjeka u svim fazama života je neosporan. Magnezij je važan za brojne esencijalne metaboličke procese, za zdrave kosti i zube, pravilan rast i razvoj, pamćenje, a sudjeluje u borbi protiv depresije i umora. RDA se kreće od 360 mg (žene) do 410 mg (muškarci). Fitati i oksalati ometaju apsorpciju magnezija. Kalcij i fosfor, mogu ometati apsorpciju magnezija, a apsorpciju poboljšavaju fruktoza, laktoza i vitamin D. Paratiroidni hormon povećava apsorpciju magnezija, smanjuje njegovo izlučivanje i pojačava njegovu resorpciju iz kostiju, čime se povećavaju koncentracije magnezija u plazmi.

Današnja ishrana, posebno nekih kategorija, kao npr. adolescenata se temelji na „brzoj hrani“, industrijski prerađenoj hrani i zaslađenim napicima, koja vrlo rijetko sadrži dovoljne količine magnezija. Najnoviji podaci pokazuju da povećani unos magnezija, čiji je odličan izvor tamno lisnato povrće, može poboljšati pamćenje. Pored navedenog, najbogatiji izvori magnezija su sjemenke, orašasti proizvodi, žitarice i sitna plava riba. Crveno meso i mlijeko su srednje bogati izvori magnezija. Povećanu potrebu za magnezijem imaju osobe koje su u periodu intenzivnog rasta i razvoja, oni koji su pod povećanim stresom (učenici, studenti, osobe čiji je posao stresan), a zatim svi oni kod kojih je zbog različitih razloga povećan gubitak magnezija iz organizma ili oslabljena njegova apsorpcija (konzumacija lijekova, crijevne bolesti, neki operativni zahvati, alkoholizam). U tim slučajevima osim konzumiranja namirnica bogatih magnezijem potrebno je njegova suplementacija.

Ključne riječi: magnezij, RDA, apsorpcija, stres, pamćenje.

3-O-13

Magnesium (Mg) in Nutrition

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Abstract

The significance of magnesium as an essential element for a human organism at all stages of life is indisputable. Magnesium is important for numerous essential metabolic processes, for healthy bones and teeth, proper growth and development, memory, and participates in the fight against depression and fatigue. RDA ranges from 360 mg (women) to 410 mg (men). Phytates and oxalates interfere with the absorption of magnesium. Calcium and phosphorus can interfere with absorption of magnesium and absorption is improved by fructose, lactose and vitamin D. Parathyroid hormone increases magnesium absorption, decreases its excretion and boosts its bone resorption, thereby increasing magnesium concentrations in plasma.

Today's diet, especially of some categories, such as adolescents, is based on "fast food", industrial processed food and sweetened drinks, which rarely contains enough magnesium. Recent data shows that increased magnesium intake, of which green leafy vegetables are an excellent source, can improve memory. In addition, magnesium richest sources include seeds, nuts, grains, and tiny blue fish. Red meat and milk are medium-rich sources of magnesium. Increased magnesium needs have individuals in the period of intense growth and development, those with increased stress (pupils, students, people whose work is stressful) and then all those who have, for various reasons, increased magnesium loss or weakened absorption (drug

consumption, intestinal disease, some surgery, alcoholism). In these cases, besides consuming magnesium rich foods, its supplementation is needed.

Keywords: magnesium, RDA, absorption, stress, memory.

3-O-14

Učestalost konzumiranja polinezasićenih masnih kiselina kod studentske populacije

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Sažetak

Uvod: Masti imaju jako važnu ulogu u našoj ishrani, a masne kiseline koje ulaze u sastav masti imaju značajnu ulogu u pravilnom razvoju i funkcionisanju organizma. Nezasićene masne kiseline su podijeljene u dvije kategorije: mononezasićene i polinezasićene masne kiseline. Najznačajnije polinezasićene masne kiseline su linolna i alfa linoleinska. Obje ove masne kiseline su esencijalne za naš organizam, i moramo ih unositi hranom. Polinezasićene masne kiseline treba da obezbijede oko 7% dnevnog

energetskog unosa, a najviše do 10 %. Cilj istraživanja je utvrditi učestalost konzumiranja polinezasićenih masnih kiselina kod studentske populacije.

Ispitanici i metode: U istraživanju je učestvovalo 100 studenata Fakulteta zdravstvenih studija, u dobi od 19 do 25 godina. Istraživanje je presječno, deskriptivno analitička metoda, kao instrument istraživanja korišten je anketni upitnik.

Rezultati: Najveći broj studenata, 87% je upoznat sa važnošću omega-3 masnih kiselina u ishrani. Najviše informacija o značaju omega-3 masnih kiselina dobijaju putem medija 46%, zatim u toku studija 37%. Najzastupljenija u ishrani je morska riba 66,32% (skuša, sardina i losos), zatim riječna riba 33,68% (pastrmka). Najveći broj ispitanika, njih 39% konzumira ribu jednom sedmično, 26% jednom mjesečno, a 4% uopšte ne jede ribu. Kada su druge namirnice u pitanju, njih 29% konzumira orahe jednom mjesečno, a samo 8% konzumira lanene sjemenke jednom mjesečno.

Zaključak: Većina ispitanika je upoznata sa važnošću omega-3 masnih kiselina u ishrani, ali ih ne unose u dovoljnoj količini.

Ključne riječi: ishrana, masti, polinezasićene masne kiseline

3-O-14

Frequency of consumption of polyunsaturated fatty acids in the student population

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Abstract

Introduction: Fats have a very important role in our diet, and fatty acids that form part of fat have a significant role in the proper development and functioning of the organism. Unsaturated fatty acids are divided into two categories: monounsaturated and polyunsaturated fatty acids. The most important polyunsaturated fatty acids are linoleic and alpha linoleic. Both of these fatty acids are essential for our organism, and we have to feed them. Low-fat fatty acids should provide about 7% of the daily energy input, and at most 10%. The aim of the study is to determine the frequency of consumption of polyunsaturated fatty acids in the student population.

Respondents and methods: 100 students of the Faculty of Health Studies took part in the research, aged 19 to 25 years. The research is a transient, descriptive analytical method; the survey questionnaire was used as a research instrument.

Results: The largest number of students, 87% are familiar with the importance of omega-3 fatty acids in the diet. The most information about the importance of omega-3 fatty acids is obtained by means of the media 46%, then during the study 37%. The most frequent in the diet is sea fish, 66.32% (mackerel, sardines and salmon), then river fish 33.68% (trout). The largest number of respondents, 39% of them consume fish once a week, 26% once a month, and 4% do not eat fish at all. When other foods are concerned, 29% of them consume nuts once a month, and only 8% consume flax seeds once a month.

Conclusion: Most respondents are familiar with the importance of omega-3 fatty acids in the diet, but do not enter them in sufficient quantities.

Keywords: nutrition, fat, polyunsaturated fatty acids

Prehrambene navike mladih sportista u borilačkim sportovima

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Sažetak

Ishrana sportista se, po važnosti, stavlja odmah iza talenta i treninga. Pravilna ishrana sportista podrazumijeva konzumiranje kvalitetnih obroka, čije planiranje zavisi od sporta kojim se pojedinac bavi, fizičkih predispozicija (starosti, tjelesne visine, tjelesne mase, postotka tjelesne masti), intenziteta napora kojima je sportista izložen (vrsta treninga i rang natjecanja). Osim toga, obavezno se uzimaju u obzir i neki biohemijski parametri (šećer u krvi, trigliceridi, holesterol i dr.), kao i neki klinički pokazatelji (umor, nedostatak snage ili slab imunitet). Cilj ovog istraživanja je bio ispitati prehrambene navike mladih sportista koji treniraju borilačke sportove.

Ispitanici: U istraživanju je učestvovalo 135 ispitanika, u dobi od 6-18 godina, koji su podijeljeni u tri starosne skupine (6-10, 10-14, 14-18 godina). Kao instrument istraživanja korišten je anketni upitnik.

Rezultati: Skoro polovina ispitanika ima najčešće tri obroka dnevno, njih 45.2%, međutim više od polovine ispitanika druge starosne skupine (56.8%) ima naviku da poveća broj obroka na dan treninga. Najveći procenat sportista, 50.9 % prve dobne skupine, 45.5 % sportista druge dobne skupine i 37.5 % treće dobne skupine konzumira svoj obrok dva sata prije treninga. Kada je pitanju obrok poslije treninga, većina sportista obrok uzima sat nakon treninga 64.9% djece prve dobne grupe, 43.2 % djece druge dobne grupe i 50% treće dobne skupine. Ispitanici (73.2 %) najčešće konzumiraju vodu, a posmatrano u odnosu na starosne grupe, naviku da konzumiraju gazirane napitke najčešće imaju ispitanici druge starosne grupe, njih 37.2 %.

Zaključak: Prehrambene navike sportista se mijenjaju sa dobi, tako da najbolje navike imaju najmlađi sportisti.

3-O-15

Eating habits of young athletes in martial arts

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Abstract

Athlete's diet is, by importance, classified right after talent and training. Correct diet of an athlete implies quality meal consummation, whose planning depends on the individual's sport; physical predisposition (age, body height, body mass, percentage of body fat), the intensity of the effort the athlete is exposed to (type of training and competition rank). Besides that, necessarily taken in consideration are some biochemical parameters (blood sugar, triglycerides, cholesterol, etc.), as well as some clinical indicators (fatigue, lack of strength or weak immunity). The goal of this research was to look into the eating habits of young athletes which train martial arts.

Respondents: Within the research 135 respondents have taken part, between 6-18 years of age, which have been classified into three age groups (6-10, 10-14, 14-18). Survey questionnaire served as research instrument.

Results: Almost half of the respondents has about three meals a day, 45.2% of them, however more than half of the respondents of the second age group (56.8%) has a habit of increasing the number of their meals during training day. Largest percentage of athletes, 50.9% of the first age group, 45.5% athletes of the second age group and 37.5% of the third, consumes their meal two hours prior to training. When it comes to the matter of after-training meal, most athletes have their meals one hour after training, 64.9% children of the first age group, 43.2% of the second age group and 50% of the third. Respondents (73.2%) most commonly consume water, and looking in the matter of age groups, habit of consuming soda or fizzy drinks is mostly present in the second age group, 37.2% of them.

Conclusion: Eating habits of athletes vary with age, so the optimal habits are present with the youngest of athletes.

3-O-16

Metode ocjene stanja uhranjenosti i njihova primjena

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Sažetak

Za ocjenu stanja uhranjenosti koriste se antropometrijske metode koje djelimo na primarne- mjerenje tjelesne mase, tjelesne visine, obima nadlaktice, natkoljenice, struka i bokova, mjerenje debljine kožnih nabora i izvedene - Index Tjelesne Mase, postotak tjelesne masti. Osim što se koriste za kategorizaciju stanja uhranjenosti, njima se mogu identifikovati rizici po zdravlje određenih populacionih skupina, u cilju sprječavanja i liječenja oboljenja uzrokovanih nepravilnom ishranom. Stoga je cilj ovog istraživanja bio ispitati najčešće korištene metode ocjene stanja uhranjenosti i analizirati njihovu efikasnost kod određenih populacionih skupina. Metoda istraživanja je kvalitativna i deskriptivna, a uključivala je pregled ukupno 18 naučnih radova. Rezultati pregledanih radova su sistematizovani prema najčešće korištenim metodama za ocjenu stanja uhranjenosti prema populacionim skupinama. Najbolji pokazatelji stanja uhranjenosti su tjelesna masa i tjelesna visina u djece i adolescenata u periodu rane adolescencije, percentilni indeks tjelesne mase (%ITM) za djecu, a Index tjelesne mase (ITM) za period kasne adolescencije i za trudnice. ITM je izvedena metoda koja je najpovoljnija za ocjenjivanje stanja uhranjenosti velikog broja ispitanika za kratko vrijeme, dajući podatke o broju pothranjenih, kao i o broju pretilih i stepenu pretilosti. Mjerenja obima tijela i debljine kožnih nabora pogodna su za klinička ispitivanja i za lica treće životne dobi. DXA metoda je najpreciznija metoda za mjerenje sastava tijela. Izbor i efikasnost metoda ocjene stanja uhranjenosti se razlikuju za određene populacione skupine.

Ključne riječi: ocjena stanja uhranjenosti, antropometrijska mjerenja, populacione skupine

3-O-16

Methods of assessment of nutritional status and their application

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Abstract

Anthropometric methods are used for the assessment of nutritional status, which we divide into primary methods- body weight, body height, upper arm and upper leg circumference, waist and hips circumference, measurement of skin folds and derived methods (Body Mass Index, body fat percentage). Besides being used for categorization of nutritional status, they can also be used for identify the health risks of certain population groups in order to prevent and treat illnesses caused by improper diet. Therefore, the aim of this research was to examine the most frequently used methods for assessing nutritional status and to analyze their efficacy in certain populations. The research method is qualitative and descriptive, and it was examined a total of 18 scientific articles. The results of the reviewed articles are systematized according to the most commonly used methods for the assessment of nutritional status according to population groups. The best indicators of nutrition status are body weight and body height measurements for children and prepubertal adolescents, Body Mass Index percentiles (%BMI) for children while Body Mass Index (BMI) for postpubertal adolescents and for pregnant women. The BMI is derived method and the most convenient one for assessing nutritional status of a large number of subjects for a short time, giving information of the number of malnourished, as well as the number of obese and the degree of obesity. Measurements of body volume and skin folds are suitable for clinical examinations and for elderly. The DXA method is the most precision used method for measuring body composition. The choice and efficiency of the methods for assessment of nutritional status differ for certain population groups.

Key words: assessment of nutritional status, anthropometric measurements, population groups

3-O-17

Ishrana i zdravlje kod pacijenata sa rascjepom usne i nepca

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Sažetak

Uvod: Orofacijalni rascjepi su česte malformacije usne i /ili nepca koje utiču na kvalitet života kako individue tako i porodice. Rascjepi remete morfologiju lica, mimiku, govor, gutanje i disanje.

Cilj: Cilj ovog istraživanja je istražiti navike i poteškoće u hranjenju pacijenata sa rascjepom usne i/ili nepca.

Materijal i metode: Istraživanje je provedeno na Katedri za ortodontiju Stomatološkog fakulteta Univerziteta u Sarajevu. Dvadeset pacijenata je ispitano putem upitnika koji je sadržavao pitanja o dojenju, konzumaciji

čvrste hranje te pića, poteškoćama i korištenim pomagalima za hranjenje, te najčešćim zdravstvenim problemima kod ovih pacijenata. Kroz upitnik je ispitano znanje i praksa roditelja o ishrani pacijenata sa rascjepima.

Rezultati: Pacijenti (12 dječaka i 8 djevojčica) su bili starosti 6-20 godina. Svi pacijenti su imali poteškoće pri dojenju i konzumaciji čvrste hrane. Osamdeset posto pacijenata je koristilo posebne bočice za hranjenje. Pacijenti sa rascjepima su imali česte respiratorne i infekcije uha. Svi pacijenti su imali smanjenu tjelesnu težinu u prvoj godini života. Roditelji su pokazali nedovoljno znanje o ishrani djece sa rascjepima usne i/ili nepca.

Zaključak: Poteškoće u hranjenju djece sa rascjepima su ogromne i ograničavajuće za roditelja, te utiču na zdravlje djece. Znanje i praksa roditelja je nezadovoljavajuća te je potrebno educirati roditelje da bi se zdravlje djece podiglo na viši nivo.

Ključne riječi: rascjep usne i nepca, ishrana, zdravlje

3-O-17

Nutrition and health in patients with cleft and lip palate

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Abstract

Introduction : Orofacial clefts are common congenital malformations of lip, palate or both, that affect the quality of life of the individual and the family of the patient. Cleft disturbs the face morphology, mime, speech, swallowing, breathing.

Aim: The aim of this study was to investigate the habits and difficulty in feeding of patients with cleft lip and /or palate.

Material and methods: The survey was conducted at the clinic for Orthodontics of the Faculty of Dentistry in Sarajevo. Twenty patients were examined through a questionnaire. It contained questions about breastfeeding and the consumption of solid food and beverages, difficulty in feeding, aids in feeding and health problems with which they are most commonly encountered and knowledge and practice of parents about feeding patients with clefts.

Results: The patients (12 boys and 8 girls) were 6- 20 years old. All patients had difficulty in breastfeeding and eating solid food. Eighty percent of patients used special bottles for feeding. Patients with cleft lip and palate had often respiratory and ear infections. All patients had a reduced body weight the first year. Parents have shown a lack of knowledge about nutrition of children with clefts.

Conclusion: Difficulties in feeding of children with clefts are large and restrictive for parents, and they are affecting the health of children. Knowledge and practice of parents is unsatisfactory, and it is necessary to educate parents to raise children's health to a higher level.

Keywords: cleft lip and palate, nutrition, health

Navike i učestalost konzumiranja bezalkoholnih pića kod školske djece

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Sažetak

Cilj našeg istraživanja je bio analizirati navike i utvrditi učestalost konzumiranja bezalkoholnih pića kod školske djece. Istraživanje je provedeno u Osnovnoj školi „Ivan Goran Kovačić“ Gojevići (ruralna)–Fojnica (urbana sredina). U istraživanje su uključena školska djeca oba spola, od petog do osmog razreda u dobi od 11-15 godina. Period u kojem se obavilo istraživanje je od početka travnja do kraja travnja mjeseca. Dizajn istraživanja je bio presječna deskriptivna studija. Kao instrument istraživanja koristila se anketa. Kada je u pitanju učestalost konzumiranja bezalkoholnih pića, prema ovom istraživanju, školska djeca bezalkoholna pića najčešće konzumiraju jednom dnevno, kako u ruralnoj (32%), tako i u urbanoj sredini (30%). Manji je postotak djece koja konzumiraju bezalkoholna pića više od triput dnevno. Oko 95% djece u ruralnoj i urbanoj sredini ima razvijenu svijest o negativnom utjecaju konzumacije bezalkoholnih pića, što je dobro s obzirom da danas djeca imaju više mogućnosti i izbora raznih napitaka koji su za njih privlačni.

Zaključci su slijedeći: Školska djeca u urbanoj i ruralnoj sredini imaju navike u pogledu konzumiranja bezalkoholnih pića. Djeca najčešće konzumiraju bezalkoholna pića jednom dnevno kako u urbanoj, tako i u ruralnoj sredini, a prema dobivenim rezultatima, količina bezalkoholnih pića koju djeca konzumiraju se smanjuje u ruralnoj sredini, dok se u urbanoj povećava.

Ključne riječi: navike, učestalost, konzumiranje, bezalkoholna pića

3-O-18

The habits and frequency of soft drinks consumption in school-aged children

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Abstract

The goal of our research was to analyze the habits and determine the frequency of soft drinks consumption of school-aged children. The research study was conducted in the primary school “Ivan Goran Kovacic” Gojevici (rural area) – Fojnica (urban area). The research included school-aged children of both sexes, attending fifth to eighth grade, aged 11 to 15 years. The data were collected in April. This was descriptive, cross-sectional questionnaire study. The research showed that school-aged children most often consume soft drinks once a day, both in rural (32%) and urban (30%) area. There is a smaller percentage of children who consume soft drinks more than three times a day. About 95% of children in both rural and urban areas are aware of the negative influence of soft drinks consumption, which is positive since children today have different choices regarding the beverages that are attractive to them.

The conclusion is as follows: School-aged children in urban and rural areas have certain habits regarding soft drinks consumption. Children mostly consume soft drinks once a day, both in urban and in rural areas. The data

collected in this study show that the amounts of soft drinks consumed by children decrease in rural area, while they increase in urban area.

Keywords: habits, frequency, consumption, soft drinks

3-P-1

Alkoholna pića kao etiološki faktor u nastanku dentalnih erozija

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Sažetak

Prema podacima WHO (Svjetske zdravstvene organizacije) postoji gotovo dva miliona ljudi širom svijeta koji redovno konzumiraju alkohol, a u Bosni i Hercegovini se godišnje popije 12,3l čistog alkohola po glavi stanovnika. Pretjerana konzumacija alkohola povezana je s nastankom različitih oralnih bolesti.

Cilj ovog rada je objasniti proces nastanka dentalnih erozija, koje se javljaju kao posljedica konzumiranja alkoholnih pića. Proces erozije zuba podrazumijeva razlaganje/otapanje minerala cakline i dentina, usljed djelovanja kiselina. Visoka koncentracija organskih i anorganskih kiselina i navika zadržavanja alkoholnog pića u ustima dovode do promjena pH vrijednosti usne šupljine, što može uzrokovati nastanak dentalne erozije.

Nepovratni gubitak tvrdih zubnih tkiva koji nastaje kada pH vrijednost u usnoj šupljini padne na "kritični nivo" ispod 5,5 što dovodi do demineralizacije površine zuba. U radu su prikazane pH vrijednosti pojedinih često konzumiranih alkoholnih pića kao potencijalnih etioloških faktora za nastanak erozivnih promjena zuba.

Ključne riječi: alkohol, oralna oboljenja, dentalne erozije, pH vrijednost

3-P-1

Alcoholic beverages as the ethylic factor in the emergence of dental erosion

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Abstract

According to data from the WHO (World Health Organization) there are almost two million people around the world who regularly consume alcohol. In Bosnia and Herzegovina approximately per year is consumed 12,3 l of pure alcohol per capita. Excessive alcohol consumption is associated with the emergence of different oral diseases.

The aim of this paper is to explain the process of occurrence of dental erosion, which occur as a result of the consumption of alcoholic beverages. The process of erosion of the teeth implies dissolution minerals enamel and dentin, due to the acidic action. A high concentration of organic and inorganic acids as well as retention of alcoholic beverages in the mouth, leads to the change of pH value of the oral cavity, which can cause the formation of dental erosion.

Irreversible loss of hard dental tissues that occurs when the pH value in oral cavity falls to the "critical level" below 5, 5 which leads to tooth surface demineralization. The paper presents the pH values of certain frequently consumed alcoholic beverages as potential etiological factors for the erosive changes of the teeth.

Keywords: alcohol, oral diseases, dental erosion, pH value

Ekstrinzične diskoloracije zuba

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Ekstrinzične diskoloracije se ispoljavaju na vanjskoj površini cakline i predstavljaju estetski problem. Predisponirajući faktori za nastanak diskoloracija su mikroskopske jamice i fisure na površini cakline, naslage kamenca, plaka i ostaci hrane. Najčešći uzročnici ekstrinzičnih diskoloracija su duhan, žvakanje duhana, pušenje cigarete, marihuana, čaj, kafa, crveno vino, hrana, neki metali, hromogene bakterije, loša oralna higijena, ali i vodice za ispiranje usta sa hlorhexidinom koje nakon duže upotrebe, mogu uzrokovati pojavu crnih i smeđih mrlja na zubima. Klinička slika diskoloracija je varijabilna. Taloženje tanina koji su prisutni u čaju, kafi, i drugim pićima uzrokuje smeđe mrlje na vestibularnim (bukalne, labijalne) i oralnim (lingvalnim, palatinalnim) površinama zuba. Duhan iz cigarete, lule i duhan za žvakanje mogu uzrokovati tamno smeđe i crne mrlje koje pokrivaju cervikalnu trećinu do jednu polovinu krune zuba. Joni bakra, ako su prisutni u vodi, također mogu uzrokovati diskoloracije. Kod radnika u industriji bakra i nikla na zubima mogu se pojaviti zelene mrlje. Kod djece sa lošom oralnom higijenom kao rezultat aktivnosti hromatogenih bakterija pojavljuju se smeđe, zelene i narandžaste mrlje, ali se mogu javiti i kod djece sa dobrom oralnom higijenom. U radu su prikazani etiološki faktori za nastanak ekstrinzičnih diskoloracija, kao i klinička slika istih.

Ključne riječi: ekstrinzične diskoloracije, klinička slika, zub, hrana, piće

3-P-2

Extrinsic discoloration of tooth

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Abstract

Extrinsic discoloration are manifested on the outer surface of enamel and represent an aesthetic problem. Predisposing factors for the occurrence of discoloration are microscopic pits and fissures on the enamel surface, scaling, plaque and food remains. The most common causes of extrinsic discoloration are tobacco, chewing tobacco, smoking cigarettes, marijuana, tea, coffee, red wine, food, some metals, chromogenic bacteria, poor oral hygiene, and mouthwash with chlorhexidine that after prolonged use can introduce black and brown spots on the teeth. The clinical picture is variable discoloration. Deposition of tannin present in tea, coffee, and other beverages causes brown spots on the vestibular (buccal, labial) and oral (lingual, palatal) surfaces of

teeth. Tobacco from cigarettes, pipes and chewing tobacco can cause dark brown and black spots covering the cervical third to one half of the tooth crown. Copper ions, if present in the water can also cause discoloration. For workers in the industry of copper and nickel in the teeth may appear green stains. In children with poor oral hygiene as a result of chromogenic bacteria appear as brown, green and orange spots, but can occur in children with good oral hygiene. The paper presents the etiological factors for the development extrinsic discoloration, as well as the clinical picture of the same.

3-P-3

Sportska ishrana

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Sadržaj

Sportska ishrana je svakako tema koja bi trebala biti fokus svakog sportiste ili osobe koja bi u budućnosti željela da se bavi nekim sportom. Planiranje ishrane se radi za svaku osobu zasebno u zavisnosti od njenih dnevnih potreba. Unos energije utiče na izgradnju mišićne mase i nivoa masti koji su od izuzetnog značaja za postizanje visokog nivoa spremnosti kao i na funkciju hormonskog i imunog sistema. Ishrana se prilagođava ovisno o sportu kojim se sportista bavi, i broj obroka se usklađuje sa dnevnim individualnim potrebama sportiste. Obavezno je usklađivanje omjera unesenih ugljikohidrata, masti, proteina, minerala i vitamina u organizam, i s obzirom na sport kojim se sportista bavi, pravilan raspored unošenja navedenih supstanci postaje jedan od ključnih faktora za uspjeh i pozitivne rezultate. Ishrana mora biti izbalansirana u pogledu pravilnog odnosa hranljivih materija (55 – 70% ugljenih hidrata, 15% proteina, 15 – 30% masti), i u pogledu pravilne periodizacije u odnosu na vrijeme treninga, takmičenja ili rekreacije. Takođe je vrlo važno naglasiti da sportista, poslije fizičke aktivnosti, treba da izvrši i adekvatnu mineralnu nadoknadu. Hidratacija organizma ključni je faktor ne samo za zdravlje općenito već i za postizanje sportskih rezultata. Organizmu su tokom dana potrebne 1,5-2 litre tečnosti, ali i više ako je izlučivanje tečnosti pojačano (veće fizičke aktivnosti, znojenje). Pravilna hidratacija sportistima omogućuje regulisanje tjelesne temperature, podmazivanje zglobova, jačanje mišića, prijenos hranjivih tvari, brži oporavak nakon intenzivnih napora te gubitak eventualne neželjene težine.

Ključne riječi: sport, zdravlje, ishrana

3-P-3

Sports nutrition

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Abstract

Sports nutrition is subject that every sportsman, or sportsman in making, should be focused on. Nutrition represents base not just for health condition but for goals to accomplish by a sportsman. Planned diet is performed for every person and it mostly depends on his/her daily needs and/or necessities. Energy intake impacts the development of a muscle mass as well as a level of fat which are of a great importance for achievement of a higher level of readiness, as well as the function of hormonal and immune systems. Nutrition is modified depending on the sport that athletes engage in. It's important to coordinate the amount of entered carbohydrates, fats, proteins, minerals and vitamins in the body, and with regard to the sport that athletes practice, the correct or the right way of intake of mentioned substances is crucial for the success and positive results. Nutrition must be balanced in terms of the proper relationship of nutrients (55-70% carbohydrates, 15% protein, 15-30% fat), and in terms of the proper periodization compared to duration of training, competition or recreation. It is also very important to point out that athletes, after physical activity, needs to perform an adequate compensation of minerals. Hydration of the body is a key factor not only for health in general but also for the achievement of sports results. Body during the day needed 1.5-2 liters of fluid, or even more if the secretion of fluid is increased (greater physical activities, sweating). Proper hydration enables athletes to regulate body temperature, lubrication of joints, muscle strengthening, transfer of nutrients, faster recovery after intensive efforts and eventual loss of unwanted weight.

Keywords: sports, health, nutrition

3-P-4

Učestalost unosa zaslađenih napitaka i slatkiša kod djece

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Sažetak

Uvod: Pretpostavka da šećer ima neželjene efekte na zdravlje prisutna je već nekoliko decenija. Smatra se da visok unos šećera može pojačati rizik od bolesti kao što su stomatološka oboljenja, pretilost, kardiovaskularne bolesti, dijabetes, bolesti jetre.

Prema izvještaju Svjetske zdravstvene organizacije (SZO) pretilost u svijetu je dva puta povećana od 1980. Godine. U 2014. Godini, 41 milion djece ispod 5 godina je bilo pretilo.

SZO preporučuje da unos dodatih šećera bude manji od 10% ukupnog unosa energije.

Cilj: Ova studija ima za cilj utvrditi učestalost unosa zaslađenih napitaka i slatkiša kod djece, te osvjешtenost roditelja o upotrebi istih.

Metodologija: Urađena je anketa u kojoj je učestvovalo 53 roditelja sa područja Bosne i Hercegovine, čija su djeca starosti od 8 mjeseci do 13 godina.

Rezultati:

Pokazano je da 18,9 % djece konzumira zaslađene napitke jednom dnevno, 9,4% 2 puta dnevno, 13,2% više od dva puta dnevno, 32,1% jednom sedmično, dok 26,4% ne konzumira zaslađene napitke.

45,3% ispitanika je izjavilo da njihova djeca konzumiraju slatkiše jednom dnevno, 22,6% jednom sedmično, 22,6% više puta dnevno, dok 9,4% ne konzumira slatkiše.

Pri kupovini zaslađenih napitaka 38,8% roditelja provjerava sadržaj dodatnog šećera na ambalaži, isti procenat ne provjerava sadržaj dodatnog šećera na ambalaži, a 28,3% ponekad provjerava.

88,7% roditelja je izjavilo da je upoznato sa rizikom unosa dodatnog šećera po zdravlje, dok 11,3% nije upoznato sa ovim rizikom.

Kao zamjenu za zaslađene gotove napitke 75,5% roditelja ponekad prave svježe voćne sokove za djecu, 18,9% roditelja to radi svaki put, dok 5,7% roditelja to ne rade nikada.

Rezultati pokazuju da je konzumacija proizvoda s dodatim šećerima u djece prisutna u dosta visokom procentu, te da zdravstveni rizik dodatnih šećera nije poznat svim roditeljima.

Ključne riječi: dodati šećer, djeca, deklaracija prehrambenog proizvoda

3-P-4

Frequency of sweetened beverages and sweets consumption in children

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Abstrakt

Introduction: For decades, sugar is considered to have negative health effects. High sugar intake increase the risk of health condition such as dental diseases, obesity, cardiovascular diseases, diabetes, liver disease.

Acording to the WHO worldwide obesity has more than doubled since 1980, and 41 million children under the age of 5 were overweight or obese in 2014.

WHO recommendation is that added sugar intake should be less than 10% of total energy intake.

Aim: The aim of this study was to determine the frequency of intake of sweetened beverages and sweets by children, and parents' awareness of this intake.

Methods: A questionnaire survey was conducted among parents whose children aged 8 months to 13 years. The sample size was 53.

Results: The results show that 18.9% of children consume sweetened beverages once a day, 9.4% twice a day, 13.2% more than twice a day, 32.1% once a week, while 26.4% do not consume sweetened beverages.

Most of respondents (45.3%) stated that their children consumed sweets once a day, 22.6% once a week, 22.6% more than once a day, while 9.4% do not consume sweets.

When purchasing sweetened beverages, 38.8% of parents check the contents of added sugar on the label, the same percentage don't check the content of added sugar on the label, and 28.3% sometimes checks the label.

In respect to possible health risk of added sugars, 11.3% of parents stated that they were unaware of this risk.

As a substitute for sweetened bevareges 75.5% of parents sometimes make fresh fruit juices for children, 18.9% make it each time, while 5.7% never make fresh fruit juices for children.

The results show relatively high consumption of added sugars in children, as well as unawareness of the added sugars health risk in some parents.

Key words: Added sugar, children, food label

4. DIJETOTERAPIJA
DIETOTHERAPY

Ženska sportska trijada - nefarmakološki i farmakološki tretman

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Sažetak

Ženska dostupnost se smatra temeljnim uzrokom ženske sportske trijade, jer njena prisutnost postepeno dovodi do nastanka preostalih navedenih komponenti trijade, što vodi u negativnom smjeru po zdravlje sportašice, te nam to nameće zaključak da medicinsko društvo mora poraditi prvenstveno na prevenciji oboljenja, kroz adekvatnu edukaciju, a potom na samom tretmanu. U tome se sportska trijada predstavlja poremećaj modernog doba i odlikuje se kompleksnim skupom simptoma koji objedinjuje tri stanja, dostupnost energije, menstrualni status i mineralnu gustoću kostiju. Takvi simptomi vode različitim negativnim kliničkim manifestacijama koje podrazumijevaju nisku energetska dostupnost, sa ili bez poremećaja u prehrani, funkcionalnu hipotalamičku amenoreju i osteoporozi. Poremećaji takve vrste predstavljaju aktuelan problem kod sportašica koje su uključene u sportove poput gimnastike, umjetničkog klizanja, plivanja, trčanja i sl., a koje povezuje naglasak na tjelesnoj kompoziciji sportašice, gdje se iste forsiraju u smjeru postizanja idealne tjelesne mase, ili optimalne količine tjelesne masti što je često osnovni uzrok ženske sportske trijade, a nerijetko se nastanak veže za nedovoljno posvećivanje pažnje samom uzroku. Niska energetska ogleda cilj izrade ovog rada. Glavni fokus smo usmjerili na sumiranje nefarmakoloških i farmakoloških mjera, poput prevencije u vidu edukacije i administracije suplemenata, u slučajevima koji to zahtijevaju, te farmakološkog tretmana kroz upotrebu antidepresiva, nadomjesne hormonske terapije, rekombinantnih faktora, bisfosfonata i drugih potencijalnih farmakoloških tvari, a sve u cilju doprinosa vidnom smanjenju prevalence ovog poremećaja.

Ključne riječi: ženska sportska trijada, niska energetska dostupnost, menstrualni status, mineralna gustoća kostiju, tretman trijade

4-O-1

Women's running triad - non-drug and drug treatment

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Abstract

The female athlete triad (Triad) is a medical condition of the modern age and it is defined as a complex set of symptoms that combine three different conditions, energy availability, menstrual status and bone mineral density. Such symptoms lead to various and negative clinical manifestations that imply low energy availability, with or without eating disorders, functional hypotalamic amenorrhea and osteoporosis. This condition is observed most commonly among athletes participating in leanness sports such as gymnastics, art skating, swimming, running etc., which are linked with the emphasis on the physical composition of the female athletes, where they are forced in the direction of achieving the ideal body weight, which is often the main cause of a Triad, and frequently the cause is linked with deficient attention to the cause itself. Low energy availability is considered to be the underlying cause od a female athlete triad, because its presence gradually leads to the incidence od the remaining components of the Triad, which leads in the negative direction to the athlete`s health and makes us conclude that the medical society must primarily deal with the prevention of illness through adequate education and treatment itself. Key goal of this research is based on these facts. The main focus was on the summation of nonpharmacological and pharmacological interventions, such as the prevention of the education and administration of supplements, in cases requiring it, and pharmacological treatment by the use of antidepressants, substitute hormone therapy, recombinant factors, bisphosphonates and other potential pharmacological agents, due to contribute to a visible reduction in the prevalence of this disorder.

Keywords: the female athlete triad, low energy availability, menstrual status, bone mineral density, treatment of the triad

4-O-2

Pravilna prehrana kao vid prevencije oralnih oboljenja u dječijoj stomatologiji

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Sažetak

Zubni karijes je najraširenija hronična infektivna bolest čovječanstva. Uzrokuju je mikroorganizmi među kojima je najučestaliji *Streptococcus mutans*. Iako je nastanak karijesa vezan za mnoge uzroke, jedan od najvažnijih su prehrambene navike. Najkasniji period u kojem preventivne dijetetske mjere još uvijek mogu imati efekta u smislu nepojavljivanja, odnosno saniranja i sprječavanja progrediranja oboljenja tvrdih zubnih tkiva na stalnu denticiju je predškolski uzrast. U cilju dokazivanja i istraživanja važnosti i učinka pravilne prehrane kod djece predškolskog uzrasta, anketirali smo roditelje o prehrambenim navikama njihove djece, te uz stomatološki pregled dječije usne šupljine, utvrđivali povezanost načina ishrane sa kvalitetom njihovog oralnog zdravlja. Anketiranje roditelja uz njihov informirani pristanak i pregledi predškolske djece sprovedeni su na Stomatološkom fakultetu Univerziteta u Sarajevu, na Katedri za preventivnu stomatologiju i pedodontiju. Rezultati su pokazali povezanost i učinak načina ishrane na zdravlje usne šupljine u smislu utjecaja kariogenih namirnica na prisustvo oralnih oboljenja, odnosno pravilne prehrane na njihovo odsustvo. Na osnovu navedenog se može zaključiti da način ishrane može preventivno djelovati tako što se konzumacijom namirnica s visokom koncentracijom vitamina i minerala, a niskom koncentracijom šećera, već od najranije dječije dobi poboljšava kvalitet kako oralnog, tako i općeg zdravlja.

Ključne riječi: karijes, oralno zdravlje, ishrana, preventivne mjere, anketiranje

4-O-2

Proper nutrition as the way of prevention of oral diseases at pre-school age

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Abstract

Dental caries is the biggest chronic infective disease of the population. It is caused by microorganisms of which the most common is *Streptococcus mutans*. Even though the origin of caries is linked to many causes, one of the most important are dietary habits. The latest period in which preventive dietary measures can still have an effect when we talk about absence, rehabilitation and suppression of progression of the diseases of hard tooth tissues on permanent dentition is the pre-school period. In terms of proving and exploring importance and the effect of the right diet for pre-schoolers, we questioned parents about the dietary habits of their children and with the dental examination of children oral cavity we linked the way of diet with the quality of their oral health.

Questioning of parents with their informed consent and the examination of the pre-school children were done at the Faculty of Dentistry of University of Sarajevo, at Department of Preventive Dentistry and Paediatric Dentistry. The results showed connection and effect on the diet and oral health in the way that cariogenic food can cause many diseases and the proper nutrition can prevent it. We can conclude that the way of diet can be preventive measure in the way that consumption of food with high level of vitamins and minerals, and the low level of sugar, can improve the quality of oral and general health since the youngest age.

Key words: caries, oral health, diet, preventive measures, questioning

4-O-3

Uticaj anemije na oralne sluznice

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Sažetak

Cilj rada: Prikazati uticaj deficitarnih anemija na oralne sluznice

Sideropenična anemija je najčešći oblik deficitarnih anemija. Osnovni razlog njenog nastanka je nedovoljno saturiranje eritrocita željezom. Opće stanje karakteriše zamor, lupanje srca, blijedilo kože. Blijedilo sluznica i konjunktiva je još očiglednije. Oboljenja koja se mogu javiti na oralnim sluznicama su: infekcija *Candida albicans*, glossitis, angularni heilitis, sa subjektivnim smetnjama kao što je gubitak okusa. Megaloblastične anemije nastaju usljed avitaminoze/hipovitaminoze vitamina B12 ili folne kiseline. Perniciozna anemija nastaje usljed deficita vitamina B12. U oralnom nalazu vidimo blijedilo svih sluznica, anemičnu gingivu, Moller-Hunterov glossitis, *Lingua plicata*, a subjektivno se javlja poremećaj okusa, suhoća usta, stomatodinije. Za prevenciju nastanka oboljenja potrebno je jesti raznovrsnu hranu i u svoju ishranu uvrstiti namirnice bogate željezom i vitaminom C, vitaminom B12 i folnom kiselinom.

Ključne riječi: anemija, nastanak, deficit, oralni nalaz, terapija, prevencija, ishrana

4-O-3

The impact of anemia on the oral mucosa

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Abstract

Aim: To show the impact of deficient anemia on the oral mucosa

Iron deficiency anemia is the most common form of deficient anemia. The main reason for its occurrence is insufficient saturation of red blood cells in iron. General condition is characterized by fatigue, palpitations and pale skin. Pale mucous membranes and conjunctiva are even more apparent. Diseases that may occur on the oral mucosa are: Candida Albicans infections, glossitis, angular cheilitis with the subjective symptoms such as loss of taste. Megaloblastic anemia occurs due to avitaminosis / vitamin deficiency of vitamin B12 or folic acid. Pernicious anemia occurs due to B12 deficiency. The oral report shows paleness of the mucous membranes, gingival anemic, Moller-Hunter glossitis, lingua plicata. The subjective symptoms are taste disturbance, dry mouth and stomatodynia. For the prevention of this disease it is necessary to eat a variety of foods and to include foods rich in iron and vitamin C, vitamin B12 and folic acid in your diet.

Keywords: anemia, occurrence, deficit, oral report, therapy, prevention, diet

Štetni efekti zloupotrebe lijekova u svrhu redukcije tjelesne težine-opis slučaja

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Sažetak

Jedna od većih javnozdravstvenih problema današnjice je gojaznost. Bombardovani smo velikim brojem nefiltriranih informacija koje predlažu širok dijapazon dijeta, savjeta prehrane, fitness programa, te tako i suplemenata koji pomažu kod smanjenja tjelesne težine. Za postizanje boljih rezultata mršavljenja nerijetko se koriste i lijekovi koji nisu namijenjeni za mršavljenje, već imaju neke druge indikacije. U ovom slučaju obrađeni su oksandrolon kao oralni anabolički steroidi i klenbuterol kao simpatomimetik, ronhodilatator poznat u terapiji astme.

Klenbuterol je lijek koji je namijenjen u veterinarske svrhe u EU, a van EU se koristi i u medicinske svrhe. Kod ljudi se prvi put počeo koristiti kao zamijenski steroid koji u povećanim dozama može uzrokovati povećan rast mišića što je uvijek poželjno kod bodybuildera. Sličan efekt može uzrokovati i kod ljudi koje se ne bave bodybuildingom nego žele smršaviti, jer u pravim dozama uzrokuje naglo mršavljenje i gubitak masnoće iz tijela.

Oksandrolon je sintetički, oralni anabolički-androgeni steroid (AAS), čije su indikacije: Turner sindrom, dugotrajno liječenje kortikosteroidima, teške opekline, hirurške ili opće traume, osteoporoza, anemija, nasljedni angioedem, i mnoge druge, a bodybuilderi u svrhu izgradnje mišića.

Cilj ovog rada je skrenuti pažnju na ozbiljne štetne neželjene efekte ovih lijekova posebno kod zloupotrebe kroz opis slučaja.

4-O-4

The adverse effects of drug abuse in the purpose of reduction of body weight-case study

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Abstract

Today, one of the major public health problems is obesity. We were bombed with a large number of unfiltered information to propose a wide range of diet, diet tips, fitness programs, and so and supplements that help in reducing weight. The medications which primarily have some other indications and are not intended to help reducing weight are often used to increase the weight-loss results. In this case, the processed are clenbuterol and oxandrolone. Oxandrolone as oral anabolic steroid and clenbuterol as a sympathomimetic, bronchodilator used therapy of asthma.

Clenbuterol is a drug which is used for veterinary purposes in the EU and outside the EU is used for medical purposes. First, people have started using it as a replacement steroid that, in increased doses, can cause increased muscle growth, and that is the reason why bodybuilders use it so much. A similar effect could be seen with people who are not so active in bodybuilding but they want to lose weight, because in the right doses they can cause rapid weight loss and fat loss from the body.

Oxandrolone is a synthetic oral anabolic-androgenic steroid (AAS), which the researchers and medical professionals used to treat various diseases such as: Turner syndrome, long term treatment with corticosteroids, severe burns, surgical or general trauma, osteoporosis, anemia, hereditary angioedema, and many others, and bodybuilders in order to build muscle.

The main aim of this case study is to describe serious side effects caused by misusing of these drugs.

Prednosti i nedostaci upotrebe zamjenskih sladila u hrani

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Sažetak

Šećeri su neizostavan dio ishrane modernog doba, i predstavljaju jedan od najzastupljenih sastojaka u prerađenoj hrani. Sa sve većom konzumacijom šećera, naročito u dječijoj populaciji, raste i broj upozorenja o štetnosti prekomjerne konzumacije. Prekomjena konzumacija može dovesti do gojaznosti, dijabetesa melitusa tipa 2, metaboličkog sindroma, karijesa, kardiovaskularnih oboljenja i drugih zdravstvenih problema. Da bi zadržali sladak okus proizvoda, a smanjili energetske vrijednosti, proizvođači hrane se sve više okreću zamjenskim sladilima. Zamjensko sladilo je aditiv u hrani koji joj daje sladak ukus kao i šećer, ali obično ima manju energetske vrijednosti. Ove zamjene za šećer mogu biti prirodnog i vještačkog porijekla, a pored svojih prednosti imaju i određene nedostatke, te se sve više preispituje njihova sigurnost i efekti na zdravlje. Brojne studije su donijele različite zaključake, od toga da su neka od sladila potpuno sigurna za upotrebu u svim uslovima do toga da ih treba zabraniti u hrani. Ovaj rad ima za cilj da predstavi dobre i loše strane zamjenskih sladila, kao i uslove u kojima bi se oni mogli naći u upotrebi. Dostupnost različitih zaslađivača sigurnih za upotrebu je velika prednost za konzumente jer omogućava proizvođačima hrane da formulišu široku paletu ukusnih i slatkih namirnica koji su predstavljaju manji rizik po zdravlje od hrane sa šećerom.

Ključne riječi: zamjenska sladila, šećeri, zdravstveni rizici

4-O-5

Positive and Negative Effects of Sugar Substitutes in Food

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Abstract

Sugar is big part of modern food and is one of the most common ingredients in processed foods. With the growing consumption of sugar, especially in children, also grows the number of warnings of the negative sides of sugar overconsumption. The overconsumption of sugar can lead to obesity, diabetes type 2, metabolic syndrome, cardiovascular problems, cavities and other health issues. In order to keep the sweet taste of products, food manufacturers turn to sugar substitutes. A sugar substitute is a food additive which provides a sweet taste with a lower calorie intake. These additives can have natural or artificial origin and beside their benefits can have certain drawbacks, therefore their safety and effects on health are being questioned. Numerous studies have made different conclusions, from those that these sweeteners are safe to use in all circumstances to that they should be banned in food. This paper has the objective to present the positive and negative sides of sugar substitutes and under which conditions that should be used. The availability of a wide range of safe sugar substitutes is a great benefit for consumers because it allows the production of sweet and tasty food which poses a smaller health risk than sugar-filled food.

Keywords: sugar substitutes, sugar, health risks

Uloga farmaceuta u savjetovanju pacijenata s celijakijom

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Sažetak

Doživotna autoimuna bolest tankog crijeva uzrokovana glutenom, naziva se celijakija. Celijakija se javlja u Evropi sa prevalencom od 1%. Ona utiče značajno na kvalitet života oboljelih pacijenata, a često im se javljaju i brojne komplikacije čiji nastanak u većini slučajeva može spriječiti bezglutenska prehrana. Celijakija je često udružena sa određenim bolestima autoimunog karaktera kao što je diabetes mellitus tip 1, bolestima štitne žlijezde, a osim njih i sa psorijazom, gastritisom, bilijarnom cirozom, alopecijom, Down sindromom, Turner sindromom i sa karcinomima. Sumnja na celijakiju treba biti prisutna kod osoba koje imaju neko od navedenih stanja. Takve pacijente korisno je usmjeriti na serološki skrining test. U novije vrijeme dostupni su brzi skrining testovi (POCT – point of care test) za testiranje na celijakiju, međutim obzirom na mogućnost lažno-pozitivnih i lažno-negativnih rezultata, rezultati navedenog testa mogu se koristiti samo za detektovanje pacijenata koje bi trebalo uputiti na kliničku dijagnostiku, a nikako za dijagnosticiranje oboljenja, koje zahtijeva biopsiju crijevne sluznice. Farmaceuti su zdravstveni radnici koji mogu predstavljati relevantan izvor informacija za pacijente s celijakijom, savjetovati ih o prehrani, lijekovima i suplementima koji su za njih neophodni i sigurni. Istraživanjem se došlo do podataka o dobroj apotekarskoj praksi u pojedinim dijelovima Evrope u kojima je bezglutensko brašno dostupno na recept, a farmaceutska briga o pacijentima je na visokom nivou.

Ključne riječi: celijakija, farmaceuti, apoteka, bezglutenska prehrana, bezglutenski lijekovi, dijetetski suplement

4-O-6

The role of a pharmacist in consulting patients with celiac disease

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Abstract

Lifetime autoimmune disease of the small intestine caused by gluten is called celiac disease. Celiac disease occurs in Europe at a rate of 1%. It significantly affects the quality of life of affected patients, and often they occur many complications whose occurrence in most cases can be suppressed gluten-free diet. Celiac disease is often associated with certain diseases of the autoimmune character such as diabetes mellitus type 1, diseases of the thyroid gland, and apart from them with psoriasis, gastritis, biliary cirrhosis, alopecia, Down syndrome, Turner's syndrome and cancers. Suspicion of celiac disease should be present in individuals who have any of these conditions. For this patients, is useful to focus on a serological screening test. Recently, rapid screening test (POCT - point of care test) is available to test for celiac disease, however, given the possibility of false-positive and false-negative results, the results of this test can be used to detect patients who should be referred to a clinical diagnostic purposes, not to diagnose the disease, which requires a biopsy of the intestinal mucosa. Pharmacists are health professionals who can represent a relevant source of information for patients with celiac disease, advise them about diet, medication and supplements that are safe and essential for them. The study provided the data on good pharmacy practice in some parts of Europe in which gluten-free flour is available on prescription, and the pharmaceutical care of patients is at a high level.

Keywords: celiac disease, pharmacists, pharmacy, gluten-free diet, gluten-free medicines, dietary supplement

Nutritivna terapija kod Sindroma policističnih ovarija

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Sažetak

Uvod: Sindrom policističnih ovarija (PCOS) predstavlja najčešći metaboličko-reproduktivni poremećaj kod žena reproduktivne dobi. Patofiziologija sindroma još uvijek nije u potpunosti razjašnjena, međutim dosadašnji rezultati istraživanja pokazuju da je uzrok poremećaja visok nivo inzulina u krvi i inzulinska rezistencija. Signal za lučenje inzulina jeste visok nivo glukoze u krvi. Pravilnom dijetom je moguće kontrolisati nivo glukoze u krvi, te posljedično dovesti do pada inzulina i poboljšanja simptoma sindroma.

Cilj: Predstaviti detaljan pregled ishrane, suplemenata i herbalne potpore koja ima naučno dokazan pozitivan učinak na bilo koji segment sindroma policističnih ovarija i prevenciju razvoja njegovih komplikacija.

Materijali i metode: Za realizaciju rada kao izvor podataka koristili su se rezultati i zaključci ranije objavljenih naučnih i stručnih radova i studija sa sličnom tematikom, medicinske i stručne knjige, biomedicinske baze podataka te web stranice relevantnih stručnih tijela.

Rezultati: Poremećaj metabolizma glukoze se smatra okidačem drugih metaboličkih poremećaja kod žena sa PCOS. Za održavanje niskih nivoa glukoze u krvi ženama sa PCOS se preporučuje ishrana sa niskim glikemijskim indeksom (GI), uz eliminaciju unosa šećera i rafiniranih ugljikohidrata. Prilikom formiranja režima ishrane, neophodno je eliminisati mliječne proizvode. Preporučuje se povećana konzumacija povrća i mahunarki, te korištenje suplemenata poput hroma, magnezija, vitamina C, E i D za koje se pokazalo da imaju pozitivan učinak na simptome sindroma. Herbalna terapija sa *Agnus castus* i *Actaea racemosa* se pokazala korisnom kod žena sa PCOS.

Zaključak: Na osnovu naučno zasnovanih činjenica i provedenih studija, adekvatnim nefarmakološkim pristupom, tj. promjenama u nutritivnim

navikama i životnom stilu može se postići značajno poboljšanje simptoma kod žena sa PCOS.

Ključne riječi: Sindrom policističnih ovarija, inzulinska rezistencija, nutritivna rješenja

4-O-7

Nutritional Therapy in Polycystic Ovarian Syndrome

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Abstract

Introduction: Polycystic ovary syndrome (PCOS) is the most common metabolic-reproductive disorder in women of reproductive age. Pathophysiology of the syndrome has not yet been fully understood, however the results of previous research shows that the cause of the disorder is high level of blood insulin and insulin resistance. Signal for insulin secretion are the high level of blood glucose. Proper diet is possible to control the level of glucose in the blood, and consequently lead to the fall of insulin and the improvement of symptoms of the syndrome.

Objective: To present a detailed review of diet, supplements and herbal support that have scientifically proven positive effect on any segment of PCOS and prevent the development of its complications.

Materials and Methods: For the realization of literature review as a source of data are used the results and conclusions of previously published scientific papers and studies with similar themes, medical and professional books, biomedical databases and websites of relevant professional authorities.

Results: The disorder of glucose metabolism is considered to trigger other metabolic disorders in women with PCOS. To maintain low levels of glucose in the blood of women with PCOS is recommended diet with a low glycemic index (GI), with the elimination of sugar and refined carbohydrates. During the formation of diet, it is necessary to eliminate dairy products. It is

recommended to increase consumption of vegetables and legumes, and to start using supplements such as chromium, magnesium, vitamin C, D and E for which was shown to have a positive effect on the symptoms of the syndrome. Herbal therapy with *Agnus castus* and *Actaea racemosa* proved to be useful in women with PCOS.

Conclusion: On the basis of scientifically based facts and undertaken studies, with adequate non-pharmacological approach, which means changing nutritional habits and lifestyle can be achieved significant improvement of symptoms in women with PCOS.

Key words: PCOS, insulin resistance, nutritional solutions

4-O-8

Ergogeno djelovanje kofeina i njegov uticaj na zdravlje

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Sažetak

Uvod: Kofein je alkaloid, koji se prirodno nalazi u različitim količinama u lišću i plodovima više od 60 biljaka. Dokazano je da djeluje ergogeno kod sportista što znači da omogućava veće tjelesno naprezanje, veću izdržljivost, brzinu i veću snagu. Također, može da djeluje na kardiovaskularni, centralni nervni sistem i diurezu. Na globalnom nivou, unos kofeina iznosi 75 mg/dnevno po glavi stanovnika, a najveći unos je u skandinavskim zemljama od 320-400 mg, dok je normalna terapijska količina kofeina od 100-300 mg. Cilj ovog istraživanja je bio analizirati ergogeno djelovanje kofeina i njegov uticaj na zdravlje različitih populacionih skupina.

Metod: korišten je kvalitativni metod istraživanja zasnovan na pregledu naučne literature.

Rezultati: Od 15 studija, 8 je dokazalo da kod svih populacionih skupina unos kofeina u količini od 3 mg/kg tjelesne mase djeluje ergogeno. Kod adolescenata više povećava sistolni u odnosu na dijastolni krvni pritisak i centralni u odnosu na periferni krvni pritisak. Kod odraslih u manjoj mjeri utiče na diurezu, ali ne može dovesti do dehidracije, naročito ako se unosi prije fizičke aktivnosti. Kod sportista djeluje ergogeno povećavajući oksidaciju masnih kiselina i otpuštanje Ca^{+2} iz sarkoplazmatskog retikuluma uz smanjenje upotrebe mišićnog glikogena. Nuspojave tokom apstinencije su glavobolja, umor, emocionalnost, anksioznost, pospanost, a kod unosa količine veće od preporučene mogu se javiti nuspojave kao što su nesаница, mučnina, grčenje mišića.

Zaključak: Kofein u preporučenim količinama poboljšava kognitivne funkcije, povećava krvni pritisak i diurezu, a kod sportista povećava izdržljivost za vrijeme fizičke aktivnosti.

Ključne riječi: kofein, izdržljivost, uticaj na zdravlje

4-O-8

Ergogenic effect of caffeine and impact on health

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Abstract

Introduction: Caffeine is an alkaloid, naturally found in various volumes in leaves and fruits of more than 60 plants. It has been proved to be ergogenic to athletes, which means that it allows for greater physical strain, greater stamina, speed and strength. Also, it can influence on cardiovascular, central nervous system and diuresis. At a global level, caffeine intake is 75 mg / day per capita and the highest is in Scandinavian countries 320-400 mg, while the normal therapeutic amount of caffeine ranges from 100 to 300 mg. The aim of this study was to analyze the ergogenic effect of caffeine and impact on health different populations.

Method: It is used a qualitative research methodology was used based on scientific literature review.

Results: From the 15 studies, 8 of them showed that in all population groups receiving caffeine in the amount of 3 mg/kg of body mass had ergogenic effects. In adolescents increase in systolic more than the diastolic blood pressure and in central more than peripheral blood pressure was recorded. In adults, to a lesser extent, it affects diuresis, but cannot cause dehydration, especially if taken before physical activity. For athletes, it affects ergogenic and increase oxidation fatty acid and release of Ca^{+2} from sarcoplasmic reticulum, reduces use of muscle glycogen. Side effects during abstinence include headache, fatigue, emotionality, anxiety, sleepiness and side effects such as insomnia, nausea and muscle cramping. Intake of amounts greater than recommended may occur side effects such as insomnia, nausea, and muscle spasms.

Conclusion: Caffeine in recommended amounts improves cognitive function, increases blood pressure and diuresis, while in athletes it increases endurance during physical activity.

Keywords: caffeine, endurance, impact on health

4-O-9

Uloga resveratrola u prevenciji oboljenja

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Sažetak

Uvod: Resveratrol je stilbenoid, tip prirodnog fenola, i fitoaleksin koji proizvodi edi biljaka kada su napadnute patogenima kao što su bakterije ili gljive. Biljni ekstrakt koji sadrži resveratrol koristio se u japanskoj tradicionalnoj edicine za liječenje gljivičnih infekcija, kožnih oboljenja, bolesti jetre. Dokazano je da je resveratrol snažan antioksidans i kao takav

ispoljava kardioprotektivno, antikancerogeno i antidijabetično djelovanje i utiče na prevenciju gojaznosti. Resveratrol se nalazi u grožđu, vinu, kikirikiju i bobičastom voću, dudu, mahunarkama, rabarbari i eukaliptusu. Cilj ovog istraživanja je bio analizirati djelovanje resveratrola na prevenciju kardiovaskularnih oboljenja, kancera i dijabetes melitusa.

Metod: korišten je kvalitativni metod istraživanja zasnovan na pregledu naučne literature.

Rezultati: Od 15 studija, na temelju *in vitro* istraživanja i istraživanja na životinjama, 5 je dokazalo da resveratrol ispoljava kardioprotektivno djelovanje tako što vrši inhibiciju ekspresije vaskularnih adhezijskih molekula, inhibiciju proliferacije vaskularnih stanica glatkih mišića, potiče aktivnosti endotelne sinteze azotnog oksida, inhibiciju agregacije trombocita i inhibiciju peroksidacije LDL-a. Dokazano je antikancerogeno djelovanje resveratrola tako što utiče na sve tri faze nastanka raka (inicijaciju, promociju i progresiju) modulacijom signala puteva koji kontrolišu deobu ćelija i rast, apoptozu, upale, angiogenezu i metastaze. Istraživanja su pokazala da je resveratrol je efikasan u prevenciji dijabetes melitusa, smanjuje otpornost na inzulin, štiti ćelije pankreasa, poboljšava lučenje inzulina i poboljšava metaboličke poremećaje.

Zaključak: Resveratrol u preporučenim količinama od 450 mg kao sigurna svakodnevna doza sprječava nastanak ateroskleroze, inhibira metaboličku aktivaciju kancerogena, smanjuje otpornost na inzulin i štiti ćelije pankreasa.

Cljučne riječi: resveratrol, kardiovaskularna oboljenja, kancer, dijabetes melitus, prevencija

4-O-9

The role of resveratrol in the prevention of diseases

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Abstract

Introduction: Resveratrol is stilbenoid, type of natural phenol and phytoalexin produced by several plants when under attack by pathogens such as bacteria or fungi. The plant extract containing resveratrol used in Japanese traditional medicine for treating fungal infections, skin diseases, liver diseases. It has been shown that resveratrol is a powerful antioxidant and as such exerts cardioprotective, anticancer and antidiabetic efficacy and impact on obesity prevention. Resveratrol is found in grapes, wine, peanuts and berries, mulberry, beans, rhubarb and eucalyptus. The aim of this study was to analyze the effect of resveratrol in the prevention of cardiovascular diseases, cancers and diabetes mellitus.

Methods: Qualitative research methods based on a review of scientific literature.

Results: Fifteen studies, based on *in vitro* studies and animal studies, five proved that resveratrol exerts a cardioprotective effect by the inhibiting the expression of vascular adhesion molecules, inhibition of proliferation of vascular smooth muscle cells, stimulates endothelial synthesis of nitric oxide, platelet inhibition of thrombocytes and inhibiting the peroxidation of LDL. It has been proven anticancer activity of resveratrol by affecting all three stages of cancer (initiation, promotion, and progression) modulation signal pathways that control cell division and growth, apoptosis, inflammation, angiogenesis and metastasis. Studies have shown that resveratrol was effective in pedagogical prevention of diabetes mellitus, reducing insulin resistance, protecting pancreatic cells, improve insulin secretion and improves metabolic disorders.

Conclusion: Resveratrol at recommended amounts of 450 mg as a safe daily dose prevents atherosclerosis, metabolic activation of carcinogens inhibits, reduces insulin resistance and protects the cells of the pancreas.

Keywords: resveratrol, cardiovascular disease, cancer, diabetes mellitus, prevention

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

Određivanje sadržaja SO₂ u različitim sortama bijelog vina

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Sažetak

Sumporni dioksid (SO₂) je najčešće korišten konzervans prilikom proizvodnje vina. Ima fungicidno i bakteriostatsko djelovanje, te negativne posljedice u previsokim koncentracijama: negativno djeluje na okus i miris vina, pri određenim pH vrijednostima onemogućava transformaciju jabučne u mliječnu kiselinu te se negativno se odražava na ljudski organizam. SO₂ se nalazi u slobodnom i vezanom obliku, te se veže sa aldehydima, šećerima i polifenolima. Preporučljivo je da za bijela vina sadržaj slobodnog SO₂ bude 20-25 mg/l. Cilj ovog istraživanja bio je utvrditi sadržaj slobodnog, ukupnog i vezanog SO₂ u različitim vrstama vina proizvedenih u Bosni i Hercegovini, Srbiji i Grčkoj. Metoda određivanja se temelji na titraciji sa 0,01 N jodom, što dovodi do pojave plavog obojenja. Rezultati su pokazali da je najveća koncentracija SO₂ bila u hercegovačkoj sorti Žilavka (51,2 mg/l) ukupnog SO₂, a najmanje u grčkoj sorti Retsina (15,36 mg/l) ukupnog SO₂. Također, Žilavka je imala najnižu koncentraciju slobodnog SO₂ (1,28 mg/l), dok je Retsina imala najveću koncentraciju (14,08 mg/l).

Ključne riječi: Sumporni dioksid, vino, Žilavka, Retsina

5-P-1

Content of SO₂ in different types of white wine

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Abstract

Sulphur dioxide (SO₂) is the most common preservative used in winemaking. It has fungicidal and bacteriostatic activity, but also negative effects when it is added in excessive concentrations: it negatively affects the taste and smell of wine, at certain Ph values it prevents the transformation of malic acid in lactic acid. In addition, it has negative effects on the human body as well. SO₂ can be found in free and bounded form, and it can bind to aldehydes, sugars and polyphenols. Recommended concentration of free SO₂ for white wine is 20-25 mg/l. The aim of this research was to determinate content of free, total and bounded SO₂ in different varieties of wine produced in Bosnia and Herzegovina, Serbia and Greece. The method for determination is based on titration with a 0.01 N iodine which led to the blue coloration. The results indicated that the highest concentration of SO₂ was in the Hercegovinian white wine variety Žilavka (51.2 mg/L) of total SO₂, and least in the Greek wine variety Retsina (15.36 mg/L) of total SO₂ amount. Žilavka wine variety had the lowest concentration of free SO₂ (1,28 mg/L), while Retsina had the highest concentration (14.08 mg/L).

Keywords: sulphur dioxide, wine, Žilavka, Retsina

Koncentracija albumina i ukupnih proteina u različitim sortama mlijeka biljnog i životinjskog porijekla

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Sažetak

Mlijeko možemo definirati kao bjeličastu tečnost koja se proizvodi u mliječnim žlijezdama, nakon rođenja mladunčeta s ciljem prehranjivanja istog. Mlijeko je značajan izvor hranjivih materija kao što su proteini, voda, masnoće i laktoza. Različite vrste mlijeka sadrže različitu koncentraciju proteina. Proteini mlijeka sadrže svih devet esencijalnih aminokiselina potrebnih organizmu čovjeka. Pod mlijekom biljnog porijekla ovdje podrazumijevamo napitke dobivena iz sjemena badema, soje, riže ili zobi miješanjem sa vodom, vitaminima i mineralima. Ukupna koncentraciju proteina iz uzorka određena je Biruet spektrofotometrijskom metodom, dok je koncentracija albumina određena u reakciji sa bromokresol zelenom i mjerena spektrofotometrijom. Svrha istraživanja je bila da se izmjeri koncentracija albumina i ukupnih proteina u mlijeku različitog porijekla. Najviša koncentracija albumina je zabilježena u domaćem kravljem mlijeku (3,47 g/L). Kokosovo mlijeko je imalo najnižu vrijednost koncentracija albumina (0,54 g/L). Rezultati su pokazali najvišu koncentraciju ukupnih proteina u bademovom mlijeku (61,67 g/L), zatim u kozijem (45,32 g/L) a najniže vrijednosti zabilježene su u rižinom mlijeku (12,29 g/L).

Ključne riječi: albumini, proteini, mlijeko, spektrofotometrija

5-P-2

Concentration of albumines and total proteins in different types of milk and plant-based milks

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Abstract

We could define milk as a whitish fluid secreted by mammary glands of females after childbirth which serves as food for their young. Milk is significant source of many substances like proteins, water, fat and lactose. Different types of milk have different amount of proteins. Milk proteins contain all nine essential amino acids and elements required by humans. Plant-based milk refers to non-dairy beverages which are made from plants, such as almond, soy, rice and oat milk. They are made by blending seeds, nuts or grains with water with addition of vitamins and minerals. Total proteins in samples was determined by Biuret spectrophotometric method, while albumines were determined in reaction with bromocresolgreen and than measured spectrophotometrically. The purpose of research was to measure concentration of albumines and total proteins in different types of milk. Total proteins and albumin concentration were determined using spectrophotometric methods. Highest concentration of albumines was in homemade cow milk (3,47 g/L). Coconut milk had the lowest concentration of albumines (0,54 g/L). The results indicated that the highest concentration of total proteins had almond milk (61,67 g/L). The next highest measured concentrations were in goats milk (45,32 g/L) and lowest concentration of total proteins was measured in rice milk (12,29 g/L).

Keywords: albumines, proteins, milk, spectrophotometry

Detekcija nedeklarisane soje u proizvodima na području Kantona Sarajevo

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Sažetak

Osnovna intencija ovog rada bila je ispitati stanje tržišta Kantona Sarajevo kada je u pitanju prisustvo soje (*Glycine max*, L.) u određenim grupama proizvoda na kojima nije naznačeno njeno prisustvo. Bilo je u cilju provjeriti da li na osnovu dobijenih rezultata imamo osnovu proširiti istraživanje, te isto sprovest na većem broju uzoraka. Također, htjelo se ustanoviti u kojoj se mjeri poštuju zakoni koji važe u BiH, te kakva je kontrola proizvoda koji pristižu na tržište Kantona Sarajevo. Obzirom da se radilo o izradi diplomskog rada, te da su resursi, kao i vrijeme ograničeni, istraživanje se vršilo na 14 uzoraka, što je u tom trenutku procijenjeno kao dovoljan broj uzoraka. Soja ima alergena svojstva i stoga mora biti deklarirana. U tom smislu vršena je analiza deklariranih sastojaka na ukupno 14 proizvoda tipa gotove supe, puding i šlag, od 6 različitih proizvođača, koji se mogu naći na tržištu Kantona Sarajevo te je izvršen i odabir proizvoda za DNK analizu, kao i molekularno-genetičku analizu DNK izolovane iz odabranih proizvoda sa ciljem detekcije DNK sekvence specifične za soju. Odabrani su proizvođači čiji proizvodi su veoma česti u Kantonu Sarajevo, a koji u svojoj ponudi imaju proizvode koji sigurno sadrže sojino brašno. Za detekciju DNK, u ovom radu, korišteni su end-point PCR i RealTimePCR metode. Svi uzorci (označeni brojevima od 1 do 14), osim uzorka broj 8, bili su negativni na prisustvo sojine DNK. U uzorku broj 8 (krem povrtna juha) soja je detektovana početkom 38 ciklusa (38,1698). To ukazuje na činjenicu da dati proizvod nije prošao adekvatnu kontrolu prije samog pristizanja na tržište. Na osnovu dobivenih rezultata može se zaključiti da je kontrola proizvoda na tržištu KS veoma dobra, te da se u većini slučajeva poštuju svi navedeni zakoni koji važe u BiH. Međutim, smatramo da je jedan uzorak pozitivan na prisustvo soje dovoljna osnova da se sprovede obimnije istraživanje, na većem broju uzoraka, koje će biti iznad nivoa diplomskog rada.

Ključne riječi: Soja, nedeklarisana soja, alergen, deklaracija, detekcija DNK

5-P-3

Detection of undeclared soy in products found on market of Sarajevo Canton

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Abstract

The main objective of this study was to examine the market state of Sarajevo Canton when it comes to the presence of soy (*Glycine max*, L.) in certain groups of products in which its presence is not indicated. We wanted to verify, according to obtained results, do we have the foundation to expand our research, and conduct it on bigger number of samples. Also, we wanted to establish the extent to which the current laws in Bosnia and Herzegovina are respected, and what kind of control of arriving products on the market is currently active. Since this research was for the purpose of bachelor thesis, and in accordance with that, time and resources were limited, we conducted our research on 14 samples. In that moment, we evaluated, that 14 samples is satisfactory for bachelor thesis purposes. Soy has allergenic properties and therefore must be declared. In this regard, we conducted the analysis of declared ingredients on a total of 14 products like instant soups, pudding and whipped cream, of 6 different manufacturers, which can be found in the market of Sarajevo Canton. We also executed a product selection for DNA analysis and molecular genetic analysis of DNA isolated from selected products with the aim to detect the soybean specific DNA sequences. Manufacturers selected are very common on the Sarajevo Canton market and their products contain soy flour. For DNA detection, in this paper, we used end-point PCR and RealTimePCR methods. All samples (numbered 1 to 14), except for sample number 8, were negative for the presence of soybean DNA. In sample number 8 (cream instant vegetable soup) strain was detected at the beginning of cycle 38 (38.1689). This result points to the fact that this product did not go through proper control before its arrival on the market. Based on the results it was concluded that the product control in the Sarajevo

Canton area is very good, and in the most of the cases all current laws are being respected. However, we consider that one sample positive on soy presence is a base for expansion of our research, which will be conducted on bigger number of samples, and above the level of bachelor thesis.

Key words: soy, undeclared soy, allergen, declaration, DNA detection

5-P-4

Komparativna analiza zastupljenosti proteina albumena u jajima različitih vrsta peradi

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Sažetak

Proteini su esencijalni sastojci hrane i nakon vode glavi su konstituenti organizma čovjeka. Proteini jaja imaju veliku energetska vrijednost s obzirom da su građeni od esencijalnih aminokiselina. Cilj ovog rada bio je odrediti koncentraciju proteina bjelanceta u jajima različitih vrsta peradi i uporediti dobijene rezultate. Testirani su uzorci jaja domaće kokoši, kupovnih kokošnjih jaja, pačjih jaja, guščjih jaja i prepeličjih jaja. Koncentracija proteina je određena Biuret metodom, koja se zasniva na obojenoj reakciji sa biuret reagensom. Rezultati su pokazali da je najveća koncentracija proteina u bjelancetu guščjih jaja (75,39 g/l), dok su jaja iz komercijalne proizvodnje imala najmanju koncentraciju proteina albumena (28,51 g/l). Jaja domaćih kokošaka su imala veću koncentraciju proteina bjelanceta (31,79 g/l) od kupovnih kokošnjih jaja (28,51 g/l). Dobijeni rezultati su u skladu sa literaturnim podacima.

Ključne riječi: Biuret metod, proteini, jaja, perad

5-P-4

Comparative analysis of albumen protein content in different poultry species

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Abstract

Proteins are an essential part of food and after water they are the main constituent of human body. Egg proteins have high energetic value since they are composed of all essential amino acids. The aim of this research was to determine the albumen protein concentration in eggs of different poultry species and to compare obtained results. Tested samples were domestic hen eggs, commercial hen eggs, duck eggs, goose eggs and quail eggs. The protein concentration was determined by Biuret method, based on the color reaction with the biuret reagent. Results showed that the goose eggs have the greatest concentration of proteins in albumen (75,39 g/l), while commercial eggs have the lowest protein concentration (28,51 g/l). Eggs from domestic hen had greater protein content in albumen (31,79 g/l) than commercial eggs (28,51 g/l). Obtained results are in accordance with the literature data.

Keywords: Biuret method, proteins, eggs, poultry

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