

Konferenca Vivus

**8. mednarodna
konferenca**

**s področja kmetijstva
in podeželja,
naravovarstva,
hortikulture in floristike
ter živilstva in
prehrane**

**»Zdravo
okolje – naša
prihodnost«**

**ZZBORNİK
IZVLEČKOV**

Strahinj, 21. november 2024

Vivus Conference

**8th International
Conference**

**on Agriculture
and Countryside,
Environmentalism,
Horticulture, Floristics, Food
Production and Processing
and Nutrition**

**»Healthy
Environment –
Our Future«**

**COLLECTION OF
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Listeria monocytogenes environmental sampling in food industry: practice and experiences

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Abstract

Listeria monocytogenes poses a major food safety concern due to its severe illness with frequent death and its typical persistence in food processing environments, posing a major risk for food contamination. Preventive measures through good manufacturing practices and environmental sampling to verify these good practices are essential to control the pathogen in the food industry. Good manufacturing practices include risk evaluation, control of raw materials, good structure and infrastructure, technical maintenance, hygiene, cleaning and disinfection, ... Environmental sampling plans need to be risk based and target both food-contact and non-food-contact surfaces, using correct swabbing protocols. Sampling needs to be focussed during processing, with additional sampling after cleaning and disinfection. To tackle persistent contamination molecular characterization of bacterial isolates is needed. Current sampling practices are quite often poorly executed, lack frequency and structure. Practical experiences clearly show that *L. monocytogenes* control is in some cases a long and difficult process which needs sufficient time and resources.

Key words: *Listeria monocytogenes*, environmental sampling, risk-based sampling plans, pathogen control

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Identifying ways for the reduction of free asparagine levels in cereal cultivars

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Abstract

Acrylamide is a carcinogenic chemical compound that can form during high-temperature processing of particularly carbohydrate-rich foods such as frying, roasting and baking as a result of the Maillard reaction. It is considered a potential health hazard. The amino acid asparagine is necessary for the formation of acrylamide. Nowadays the challenge is to establish a multi-disciplinary research to reduce acrylamide formation in cereal foods: a) Plant breeding and genetic tools - low asparagine grains selection which means choose grains that are naturally lower in asparagine, an amino acid that react with sugars to form acrylamide during cooking; b) Assessing diversity of asparagine in cereal species and cultivars c) Cereal production and/or field management (farming) practices - N2 application, resistance to biotic & abiotic stress, organic low-input, conventional systems; d) Minimize reducing sugars, as they react with asparagine to form acrylamide; e) Monitoring and Quality Control - screening free asparagine level in cereal grains and cereal products for acrylamide levels to ensure they remain within acceptable limits. Strategies for lowering acrylamide levels in cereal products need to reduce asparagine in cereal cultivars. Improvement and update processing methods based on the latest research and providing recommendations for farmers and industry to further reduce free asparagine and consequently acrylamide levels in breakfast cereals is an important topic for future.

Key words: Acrylamide, Asparagine, Cereal breeding, Field management practices

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Proizvodnja gob in glivnih zdravilnih učinkovin na organskih odpadkih

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Izvleček

Najrazličnejše organske odpadke je možno uporabiti kot sestavine gojitvenih substratov za gojenje gob. V postopku gojenja se razgradijo, s čimer se zmanjša njihov negativen vpliv na okolje, obenem pa pridela jedilne gobe, ki najpogosteje vsebujejo širok spekter zdravilnih učinkovin z imunomodulatornim, antikarcionagenim, antibakterijskim, antivirusnim, antiinflamatornim ter drugimi delovanji. Za gojenje gob so najprimernejši lignocelulozni materiali, kot so slama in žagovina, uporabimo pa lahko tudi najrazličnejše luščine, ostanke od kuhanja kave, pleve, tropine oljnic, pivovarske tropine, celo odpaden papir, karton, bombaž itd. Na takih substratih lahko gojimo ostrigarje (*Pleurotus spp*), šitake (*Lentinula edodes*), svetlikave pološčenke (*Ganoderma lucidum*), topolovke (*Agrocybe aegerita*), velike zraščenke (*Grifola frondosa*) in druge. Optimalen delež odpadka v gojitvenem substratu je odvisen predvsem od njegove kemijske sestave ter sposobnosti zadrževanja vode. Pri finančni konstrukciji gojenja ključno vlogo igrajo postopek obdelave (kemijske ali termične) substrata, časovni potek obrodov gob ter končna biološka učinkovitost gojenja. Pri gojenju na odpadkih je potrebno preprečiti bioakumulacijo določenih toksičnih snovi predvsem težkih kovin.

Ključne besede: gojenje gob, organski odpadki

Production of mushrooms and fungal medicinal compounds on organic waste materials

Abstract

A wide variety of organic waste can be used as components of growing substrates for mushroom cultivation. During the cultivation process, these materials are decomposed, which reduces their negative impact on the environment, and at the same time edible mushrooms are produced, which most often contain a wide range of medicinal substances with immunomodulatory, anticarcinogenic, antibacterial, antiviral, anti-inflammatory and other effects. For growing mushrooms, lignocellulosic materials such as straw and sawdust are the most suitable, but we can also use a wide variety of husks, coffee grounds, chaff, oilseeds, brewery grounds, even waste paper, cardboard, cotton, etc. On such substrates, we can grow oyster mushrooms (*Pleurotus spp*), shiitake (*Lentinula edodes*), reishi or ganoderma (*Ganoderma lucidum*), poplar mushrooms (*Agrocybe aegerita*), hen of the woods (*Grifola frondosa*) and others. The optimal proportion of waste in the growing substrate depends primarily on its chemical composition and water retention capacity. The process of (chemical or thermal) substrate, time course of mushroom fructification and the final biological efficiency of cultivation play a key role in the financial construction of the cultivation process. When cultivating mushrooms using organic waste, it is necessary to prevent the bioaccumulation of certain toxic substances, especially heavy metals.

Key words: mushroom cultivation, organic waste

Odprti kurikulum v srednješolskem programu – možnost nenehnega razvoja izobraževalnega programa

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Izvleček

V prispevku je predstavljen odprti kurikulum kot del izobraževalnega programa, ki omogoča hitrejši odziv poklicnega in strokovnega izobraževanja na aktualne in razvojne strokovne tematike. Odprtost programa je povezana z interesi in potrebami okolja, izbiro učnih virov, oblik in metod dela ter preverjanjem in ocenjevanjem znanja. Predstavljena je umestitev odprtega kurikula v srednješolski izobraževalni program in možnosti ter priložnosti, ki šolam in šolajočim omogočajo osebni in karierni razvoj na biotehniških področjih. Odprti kurikulum poleg avtonomije šolam prinaša tudi odgovornost, zato je nujna evalvacija in izboljševanje odprtega kurikula. V prispevku sta kot primer 20 % odprtega kurikula predstavljena dva programa: srednji poklicni program Gospodar na podeželju in srednji strokovni program Kmetijsko podjetniški tehnik. Za oba izbrana izobraževalna programa je predstavljen proces priprave, načrtovanja, izvedbe, spremljanja in evalviranja ter izboljševanja 20 % izobraževalnega programa.

Ključne besede: srednješolsko izobraževanje, odprti kurikulum, obvezni moduli, izbirni moduli

Open curriculum in secondary education – possibility of continuous development of the educational programme

Abstract

This paper presents an open curriculum as part of an educational programme that allows vocational and professional education to respond more quickly to current and developing professional issues. The openness of the programme is linked to the interests and needs of the environment, the choice of learning resources, forms and methods of work, and the testing and assessment of knowledge. The positioning of the open curriculum in the secondary education curriculum is presented, as well as the possibilities and opportunities for schools and learners to develop their personal and career development in the biotechnical fields. In addition to autonomy, the open curriculum also brings responsibility to schools, and therefore evaluation and improvement of the open curriculum is necessary. Open curricula are also a key element of the curriculum. In this paper, two programmes are presented as examples of 20% open curricula: the secondary vocational programme Qualified Farmer and the professional technical education Agricultural and Entrepreneurship. For the two selected programmes, the process of designing, planning, implementing, monitoring, evaluating, and improving the 20% curriculum is presented.

Key words: Secondary education, open curriculum, compulsory modules, optional modules

Be brave, ring your queen

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Abstract

Biotechnical methods aimed at more sustainable control of the ectoparasite *Varroa destructor* in honey bee colonies are becoming popular and attractive among the beekeepers. Currently, beekeepers have several biotechnical methods at their disposal, such as drone culling, mesh bottom boards, induced brood interruption (brood removal, trapping comb or queen caging), etc. Recently, a new method to induce brood interruption called Queen Ringing was presented, which seems to add even more flexibility to the already existing methods. The method involves using a plastic ring mounted on the queen's abdomen to prevent oviposition, thus inducing a brood interruption at a suitable time of the year. When honey bee colonies become broodless, *Varroa* mites are forced on the bees, which is the so-called mite's dispersal phase, which enables efficient use of acaricides on such exposed mites. In addition, the prolonged dispersal phase of *Varroa* may significantly affect its reproductive ability in the subsequent brood cycles. The method originates from China, where beekeepers have been using it successfully for a few decades. To our knowledge, studies have been developed for the first time outside of China to investigate and compare their applicability. Five partner countries were included in this study: China (N=20 colonies), Italy (N=20), Croatia (N=32), Germany (N=16) and Macedonia (N=28). At six apiaries, a total of 116 honey bee colonies of *A. m. ligustica*, *A. m. carnica* and *A. m. macedonica* were involved, divided into a group with ringed queens, a group of colonies with caged queens and a control group whose queens were not prevented from oviposition by any means. The prime interest was to study and compare the applicability of queen ringing for winter brood interruption. Five parameters were followed: monthly food consumption overwinter, varroa infestation, the spring pollen foraging activity, spring colony development, 'queen's vitality and performance. Our preliminary results show a promising perspective for this alternative technique, which will soon be explored in a global study (approx. 500 colonies from 13 countries) within the COLOSS *Varroa* Control task force framework.

Keywords: biotechnical methods, *Varroa destructor*, queen ringing, brood interruption

Women beekeepers as drivers of positive changes in North Macedonia

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Abstract

North Macedonia is experiencing increased emigration from rural parts of the country to cities. Women in rural areas are rarely included in the public sphere. There is a high probability that they will emigrate due to the lack of new economic and employment opportunities. New employment opportunities in agriculture are crucial for improving the status of women and motivation for their significant integration into the public sphere in the field of agriculture. North Macedonia has favorable conditions for the development of beekeeping. On the one hand, beekeeping, although traditionally a "male" job, offers an opportunity for women with limited or lack of financial resources to make a profit with a low additional workload. By promoting sustainable production, preserving and creating pastures for bees, biodiversity is preserved and climate change is mitigated.

For the first time in North Macedonia a three-year beekeeping development project with the emphasis on females has been designed and started. Project "Women beekeepers as drivers of positive change in North Macedonia" goals are empowered beekeeping families in the field of beekeeping with an emphasis on the involvement of women and young people. The target group is women and young people who live in rural areas where agriculture dominates as an industry in the Vardar and North-East regions of North Macedonia with a high level of emigration to cities.

Results expected are in two main areas: education of gender inequality through women's empowerment and promotion and development of the countryside by promoting natural organic beekeeping and local marketing bee products.

Keywords: women, emigration, beekeepers, gender, North Macedonia

Quinoa As a Possible Alternative Crop: Supplemental Irrigation Necessity under Climatic Conditions of Hungary

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Abstract

Quinoa is gaining more importance worldwide as an alternative crop for the less fertile soils and under the unfavorable climatic conditions. However, it is still poorly experimented in Central Europe. Quinoa is rich in protein and fiber, in addition to zinc and iron, among other elements. It can tolerate drought episodes, but whether supplemental irrigation can improve the morpho-physiology and, hence, the yield and/or seed quality under the climatic conditions of Hungary is not reported. Two quinoa varieties; 'Vikinga' and 'Titicaca' were sown in the experimental farm of the Faculty of Agricultural and Food Sciences and Environmental Management of the University of Debrecen in 2024 in a randomized complete block design with 4 replications. The plants were either grown under rainfed conditions or they received certain supplemental irrigation doses, monitored by the daily meteorological data collected on site. Our results show that supplemental irrigation significantly increased above-ground biomass of both varieties. However, the seed yield increased only in 'Titicaca'. Moreover, no significant differences in either chlorophyll-a, chlorophyll-b or total carotenoid content were found between the two irrigation treatments in either variety. It could be initially concluded that supplemental irrigation might be unnecessary under the local climatic conditions in Debrecen. However, more research should be conducted in the long term, as the climatic data collected during the past few years on the experimental site shows noticeable fluctuations.

Keywords: biomass, *Chenopodium quinoa* Willd, pigment content, seed yield, water requirements.

Prevalence of exposure to bovine herpesvirus type 1 in Irish beef herds

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Abstract

Infectious bovine rhinotracheitis (IBR), caused by bovine herpesvirus-1 (BoHV-1), is a highly contagious disease with significant economic impacts on the cattle industry. This study aimed to assess the prevalence associated with BoHV-1 infection in Irish beef herds. Conducted under the National Beef Welfare Scheme (NBWS), the study involved testing 10,650 beef breeding herds, representing approximately 20% of the national beef herd population. A total of 189,404 animals were tested. Using a 'snapshot' test strategy, herd-level IBR status was determined based on the presence of antibodies to the gE protein in randomly selected animals, preferably over 9 months of age. Results indicated an animal-level apparent prevalence of 11.4% and a herd-level apparent prevalence based on positive snapshots of 48.8%. Previous studies had indicated a herd level prevalence of up to 80%. The findings from this survey, although showing that IBR is still endemic in Irish beef herds, provide updated prevalence figures which are considerably lower, indicating that a higher number of farms would be in a position to pursue freedom from IBR.

Keywords: IBR, prevalence, BoHV-1, eradication

The beneficial effect of cholic acid on the reduction of oxidative stress in potatoes infected with *Pectobacterium brasiliense*

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Abstract

Three-week-old potato seedlings were treated with four concentrations of cholic acid (sodium salt, NaCh): 20, 40, 60 and 80 mg/L, and every second day the content of malondialdehyde – MDA, as a parameter of oxidative stress, was measured in the leaves and roots for seven days. During this time, it was shown that lower concentrations of NaCh (20 and 40 mg/L), initially caused moderate oxidative stress and then reduced it, so they were selected for a second experiment, for the treatment of potato seedlings that were subsequently (24 h after start of the treatment) infected with *Pectobacterium brasiliense*. As soon as the first symptoms appeared, fresh leaves and roots of seedlings were sampled to measure MDA content. The aim of the experiment was to determine whether NaCh can contribute to the reduction of oxidative stress in potato seedlings attacked by this pathogen. The results showed that in potato leaves, the treatment with 40 mg/L of NaCh before the *P. brasiliense* attack, significantly reduced the content of MDA compared to the inoculated control, while the treatment with 20 mg/L of NaCh, significantly increased it.

Key words: sodium cholate, MDA, infection prevention, *Pectobacterium brasiliense*, potato

Sodobna vzgoja za varno delo v kmetijstvu - primeri dobre prakse

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Izvlaček

To delo raziskuje različne vidike tveganja in varnostnih ukrepov v kmetijski dejavnosti. Izobraževanje za sodobno kmetijstvo vključuje tudi izobraževanje s področja varnosti in zdravja pri delu, srednje kmetijske šole pa imajo ključno vlogo pri izobraževanju bodočih strokovnjakov. Praktično delo pri predmetu dijakom omogoča pridobitev uporabnih znanj, nepogrešljivih za uspešno delo v kmetijstvu, ter prepoznavanje in izdelavo načrtov sistematičnega obvladovanja tveganj. V prispevku je predstavljena Kmetijska šola z dijaškim domom Futog kot primer dobre prakse za izboljšanje varnosti in zdravja v kmetijstvu.

Ključne besede: kmetijstvo, tveganja, varnost, preventivni in zaščitni ukrepi, izobraževanje, digitalno kmetijstvo.

Modern education for safe work in agriculture - examples of good practice

Abstract

This paper deals with the topic of safety in education and work in modern agriculture. Secondary agricultural schools play a key role in the education of future professionals in agriculture. Practical work within the classroom enables students to apply the skills and experience necessary for successful work in the agricultural sector. However, working with machinery, chemicals and animals also carries certain risks. Therefore, it is crucial to implement both existing and new security measures in order to protect students, teachers and staff. As an example of good practice, the paper presents the Agricultural School with the student dormitory Futog (footnote info about the agricultural school), which also started educating students on the safe use of drones in agriculture this school year.

Key words: safety in agriculture, education in agricultural schools, digital agriculture, new protection measures.

Podeželje – moja prihodnost

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Izvleček

Mladi so v današnjem času vse preveč pod vplivom potrošništva, živijo v prepričanju, da se da vse stvari v neomejenih količinah kupiti v trgovini. Zato smo se z razredom 4.BD v času projektnih dni posvetili tematiki pridelovanja hrane, predelovanja viškov hrane ter ozaveščanja o hrani nasploh. Pripravili smo anketo o nakupovalnih navadah prehranskih izdelkov, obiskali smo samooskrbno kmetijo, ogledali smo si film o prehrani višjih slojev v preteklosti ter s pomočjo staršev in starih staršev ter literature in gradiva na spletu iskali primere različnih načinov konzerviranja in pasteriziranja viškov hrane.

Ključne besede: lokalno pridelana hrana, prehranske navade, samooskrba

The countryside – my future

Abstract

The younger generations are overly influenced by consumerism, under the belief, that they can buy anything in a store in unlimited amounts. That is why for our project during project week, we, the class 4.BD, have chosen to take a look at food production, processing of surplus food, and, general food awareness. We have prepared a questionnaire about food product shopping habits, had a visit to a subsistence farm, watched a movie about food and nutrition in higher classes in the past, and with the help of our parents, grandparents, literature and online sources, researched different ways of preserving excess food.

Key words: locally sourced food, nutritional habits, self-care

Early detection of sweet corn (*Zea mays var. rugosa*) nutrient deficiencies

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Abstract

Early recognition and detection of nutrient deficiency in plants is an important challenge from both crop safety and economic perspectives. An early indicator of a nutrient deficiency can be the examination of free-type, N-linked glycans in plants, and the detection of changes in their quality and quantity.

In the experiment described in this study, we aimed to investigate the nutrient supply of young corn plants using traditional biological method, as well as the N-glycan profile of the sap of these plants using matrix-assisted laser desorption, ionization mass spectrometry (MALDI-MS) method.

We wanted to prove that in the early phenophase of plants, a state of nutrient deficiency, which cannot yet be detected by traditional methods, induces a change in the quality and quantity of free N-glycans in plant sap.

In our experiment, corn (*Zea mays var. rugosa*) plants with different nutrient supply (3 treatments) were grown for 45 days from emergence. For laboratory tests plant samples were taken on the 45th day after the plants emerged.

The dry weight of the plant samples and their N-, P-, K-, Ca- and Mg content were measured.

The N-glycan profile of the plant juices was also examined using the matrix-assisted laser desorption ionization mass spectrometry (MALDI-MS) method.

According to the results of our experiment, in this early phenophase of the plants (45 days), we did not experience statistically proven differences in the element content measured in the dry matter depending on the nutrients supply.

Analysis of the N-glycan profile of plant juices by matrix-assisted laser desorption/ionization mass spectrometry (MALDI-MS) showed significant differences between the amount of some N-glycans and the treatments. With this method, the plants of the T1, T2 and T3 treatments can be separated, nutrient deficiency can be detected even in such an early phenophase.

Key words: corn, nutrient deficiency, nutrient concentration

STAY, a project to boost agrotourism in Europe

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Abstract

In Europe, the accommodation of travellers on farms dates to the beginning of the 20th century, in areas such as the Tyrol, the German Alps and Bavaria, or the English countryside. From the 1960s onwards, it spread to Belgium, the Netherlands, Luxembourg, France and Italy. With the 1980s and massive European funding, we can speak of agrotourism as a remedy to the crisis of European family farming.

Over the years, the model has evolved. In some territories, it has even blurred into a much broader rural tourism, where the farming activity and the rural culture are no longer the main reason for travelling.

STAY is the short name of the Erasmus+ project "Still Tourism Around Yard", which is a 36-month Vocational Education and Training project on agrotourism running from November 2022 in Slovenia, Spain, Italy, Portugal and the Czech Republic, led by BC Naklo.

STAY is not a project aimed at tourists, but at training farmers to start and manage their own agrotourism businesses, as a complement to agricultural income, with an offer linked to the territory and its resources.

This professional paper describes the project's progress to date and its future challenges.

Key words: STAY, agrotourism, farmers, training, Erasmus+.

Projektno raziskovalno delo in gospodarjenje v Medpodjetniškem izobraževalnem centru

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Izvleček

Medpodjetniški izobraževalni center (MIC) Biotehniškega centra Naklo ima vlogo medpodjetniškega povezovanja pri izobraževanju in usposabljanju procesov na področju kmetijstva, hortikulture, živilstva in prehrane, naravovarstva ter drugih področij in tržnih storitev za razvoj podeželja. Izobraževalni poligoni so različno tehnološko opremljeni, omogočajo različne učne oblike in metode.

V prispevku smo pripravili izhodišča za izvajanje kakovostnega izobraževalnega dela in gospodarjenja v MIC-u. V matričnem modelu PRDG2024 smo iz desetih oddelkov MIC, določenih v organizacijski strukturi enote, oblikovali pet horizontalno delujočih središč, ki so vertikalno povezana s podpornimi skupnimi upravljaljskimi funkcijami na nivoju centra.

Kot model za definiranje priložnosti nadaljnjega projektno raziskovalnega dela in gospodarjenja v MIC smo uporabili večparametrne metode, ki poleg opazovanja in medsebojnega primerjanja omogočajo tudi vrednotenje alternativ, in sicer z metodo Kepner-Tregoe za zmerno zahteven odločitveni problem, z DEX pa za najzahtevnejše odločitvene procese z večjim poudarkom na subjektivni presoji z uporabo simboličnih parametrov in funkcijami koristnosti. Zgrajeni model po metodi DEX realiziramo z računalniškim programom za večparametrsko modeliranje DEXi. Pet področij MIC za prenos znanja na zaokroženih specifičnih področjih ocenjujemo z vidika infrastrukture, strokovnega in pedagoškega procesa in gospodarjenja, s pomočjo definiranja parametrov na treh nivojih.

Ključne besede: medpodjetniški izobraževalni center, usposabljanje, razvoj, večkriterijska analiza, metoda Kepner-Tregoe, DEXi

Project research and management at the Inter-enterprise Training Centre

Abstract

The Inter-enterprise Training Centre (MIC) of the Naklo Biotechnical Centre plays the role of an inter-enterprise network for the education and training of processes in the fields of agriculture, horticulture, food and nutrition, nature conservation and other areas and market services for rural development. The educational polygons are equipped with different technological equipment and offer a variety of learning formats and methods.

In this paper, we have prepared a starting point for the implementation of quality educational work and management in the MIC. In the PRDG2024 matrix model, we have created five horizontally operating centres from the ten MIC departments defined in the unit's organisational structure, which are vertically linked by supporting common management functions at the centre level.

As a model for defining opportunities for further project research and management in the MIC, we used multi-parametric methods that, in addition to observation and inter-comparison, also allow for the evaluation of alternatives, namely the Kepner-Tregoe method for a moderately complex decision problem, and the DEX method for the most complex decision processes with a greater emphasis on subjective judgement, using symbolic parameters and utility functions for the most complex decision-making processes using the Kepner-Tregoe method for a moderately complex decision problem. The DEX model is implemented using the DEXi multi-parameter modelling software. The five MIC knowledge transfer areas in the rounded specific areas are assessed in terms of infrastructure, professional and pedagogical process and management, by defining parameters at three levels.

Key words: inter-company training centre, training, development, multicriteria analysis, Kepner-Tregoe method, DEXi

Znanje regije, vir konkurenčnosti in visoke dodane vrednosti

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Izvleček

Znanje je danes pomembna tema debat, povezanih z regionalnim razvojem. Razpravlja se o visoki tehnologiji, industrijskem razvoju, ki zahteva posebne veščine in inovativne pristope, ter o ekonomiji znanja. Znanje je gospodarski dejavnik, razpravljamo pa o tem, ali Gorenjska regija zagotavlja ustrezen ekosistem, ki omogoča na znanju temelječ gospodarski razvoj. Za regionalni razvoj so značilne različne vrste znanja, ki temeljijo na znanosti, tradiciji, kulturi, gospodarski uporabi itd. Veliko znanja lahko izvira iz lokalnega okolja, nekaj iz sosednjih regij drugih zunanjih virov, drugo pa je treba zgraditi tako, da se zagotovi ustrezna nova baza znanja za konkurenčno gospodarstvo z visoko dodano vrednostjo.

V članku je podan pregled, kaj se dogaja na Gorenjskem, kakšna je strategija razvoja regije in Slovenije, podana je tudi primerjava s sosednjimi regijami ter pobuda za prevzemanje naslednjih korakov za vzpostavitev znanstvenega raziskovalnega središča Gorenjske regije, ki bo povezovala vire znanja z gospodarstvom.

Ključne besede: gorenjska regija, znanje in veščine, konkurenčnost, razvoj

Knowledge of the region, a source of competitiveness and high added value

Abstract

Knowledge is an important topic in regional development debates today. High technology, industrial development requiring specific skills and innovative approaches, and the knowledge economy are discussed. Knowledge is an economic factor, and the debate is about whether the Gorenjska region provides an appropriate ecosystem to enable knowledge-based economic development. Regional development is characterised by different types of knowledge, based on science, tradition, culture, economic application, etc. Much of the knowledge may come from the local environment, some from neighbouring regions and other external sources, but other knowledge must be built up in such a way as to ensure an appropriate new knowledge base for a competitive economy with high added value.

Key words: Gorenjska region, knowledge and skills, competitiveness, development

Nekdanja živila, kot krmila za prašiče in perutnino

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Izvleček

Nekdanja živila (NŽ), živila, ki niso več namenjena prehrani ljudi, lahko z določenimi omejitvami uporabimo v prehrani živali. Nekdanja živila lahko imajo glede na izvor zelo različno sestavo, tako po vsebnosti hranil in energije, različna je tudi njihova izkoristljivost in prebava, lahko pa vsebujejo tudi nezaželene snovi ali potencialno ugodno delujoče bioaktivne snovi. Kot krmila za živali lahko na primer uporabimo: kruh in peciva ter druge pekovske izdelke (vir energije zaradi visoke vsebnosti ogljikovih hidratov), ostanke sadja in zelenjave (lahko uporabimo sveže ali posušene); mlečne izdelke ali stranske proizvode predelave mleka (vsebujejo beljakovine, maščobe), pivske tropine (vir beljakovin in vlaknin), kot primer uporabe stranskih proizvodov. Pri tem je pomembna hranilna vrednost, ki smo jo nekaterim NŽ določili v okviru CRP projekta (V4-2210). Načini in možnosti uporabe živil, kot alternativnih krmil za rejne in družne živali, so različni. Predvsem v manjših rejah lahko nekdanja živila s pridom uporabimo tako v prehrani prašičev kot perutnine, v intenzivnih rejah pa le-ta lahko vključujemo v krmne mešanice, pri čemer upoštevamo možnosti učinkov nezaželenih snovi pri določenih živalskih vrstah, kar seveda vpliva na primernost krmil oz. nekdanjih živil za krmljenje. Z uporabo nekdanjih živil lahko pomembno prispevamo k zmanjševanju odpadne hrane in zmanjšamo lahko tudi stroške krme za živali.

Ključne besede: nekdanja živila, alternativna hranila, prehrana prašičev in perutnine

Former food as feed for pigs and poultry

Abstract

Former foods are foods that are no longer intended for human consumption but can be used in animal nutrition under certain restrictions. Depending on their origin, these foods can vary greatly in their composition, nutrient and energy content and digestibility. They may also contain undesirable substances or potentially useful bioactive compounds. Examples of former foods used in animal nutrition include bread, pastries and other bakery products that provide energy due to their high carbohydrate content, fruit and vegetable waste that can be fed fresh or dried, dairy products or by-products from milk processing that are rich in proteins and fats, and spent grains, that are valuable sources of protein and fiber. The most important aspect is the nutritional value, which we have determined for some feed materials as part of the CRP project (V4-2210). There are many possibilities to use former food as alternative feed for livestock and pets. Some of these feeds are suitable for feeding pigs and poultry on smaller farms. In intensive livestock farming, they can be incorporated into feed mixtures, whereby attention must be paid to undesirable substances that could affect certain animal species and thus influence the suitability of these foods for feeding purposes. By utilising former foodstuffs, we can significantly reduce food waste and potentially lower the cost of animal feed.

Key words: former food, alternative nutrients, nutrition of pigs and poultry

Vodenje računovodstva v kmetijski dejavnosti

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Izvelek

Namen računovodskih izkazov je dajati informacije o finančnem položaju, uspešnosti in spremembah finančnega položaja poslovanja. Na tej osnovi morajo biti računovodske informacije bistvene, zanesljive in primerljive. Vodenje računovodstva v kmetijstvu in metodologija knjigovodstva na kmetijah je evropski sistem vzorčnih raziskovanj, ki zbira strukturne in računovodske podatke o kmetijskem gospodarstvu. Namen prispevka je predstaviti obdavčitve poslovanja na kmetiji glede za različne sisteme, vodenje davčnih blagajn ter gotovinskega poslovanja in pomen letnega popisa sredstev in njihovih virov financiranja.

Predstavljena bo metodologija FADN, ki je osnova vodenja računovodstva ter spremljanje prihodkov, stroškov in poslovnih dejavnosti kmetijskih gospodarstev, ki je podlaga za pridobivanje podlag za oceno vplivov skupne kmetijske politike EU.

Ključne besede: knjigovodstvo, računovodski izkazi, kmetije, načrtovanje, davki

Management of accounting in agricultural activity

Abstract

The purpose of financial statements is to provide information on the financial position, performance and changes in the financial position of the business. On this basis, accounting information must be essential, reliable and comparable. Accounting management in agriculture and the methodology of bookkeeping on farms is a European system of sample surveys that collects structural and accounting data on the agricultural economy. The purpose of the paper is to present the taxation of farm operations according to different systems, the management of tax cash registers and cash operations, and the importance of the annual inventory of assets and their sources of financing.

The FADN methodology will be presented, which is the basis of accounting management and the monitoring of income, costs and business activities of agricultural holdings, which is the basis for obtaining the basis for assessing the impacts of the EU's common agricultural policy.

Key words: bookkeeping, financial statements, farms, planning, taxes

Raziskovanje in ohranjanje tehniške dediščine proizvodnje turbin Gottlieb Franz Schneider

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Izvleček

V prvoobdobje uvajanja elektrogospodarstva na današnjem slovenskem ozemlju sega tudi ustanovitev podjetja Strojne tovarne in livarne Ljubljana. Obrat je v sodelovanju z upraviteljem Auerspergovih fužin Filipom Dobnerjem leta 1871 ustanovil Gustav Tönnies. Vodilna mesta v novonastalem podjetju so zasedali zlasti tujci, med njimi Švicar Gottlieb Franz Schneider. Strokovno usposobljen na področju izdelovanja vodnih turbin je z letom 1914 prevzel mesto vodilnega razvojnega inženirja v ljubljanskih strojnih tovarnah. Že leta 1922 pa se je z družino preselil v Škofjo Loko, kjer je kupil gospodarsko poslopje in ustanovil lastno podjetje za izdelavo vodnih turbin. Z analizo arhivskih in časopisnih virov prispevek pogloblja dosedanja znanja in vedenja o švicarskem inženirju G. F. Schneiderju in pri tem odgovarja na vprašanje, kdo so bili vodilni akterji v razvoju slovenske proizvodnje turbin v prvih desetletjih 20. stoletja. Raziskovanje tehniške dediščine proizvodnje turbin je prispevek k osvetlitvi industrializacije in elektrifikacije, ki sta pripomogli k razvoju podeželja na Slovenskem. Ohranjanje tehniške dediščine je vrednota, ki jo je potrebno širiti in vključevati v profesionalno preučevanje zgodovine, v kulturno-turistično ponudbo lokalnega okolja ter v prenos znanja na mlade generacije.

Ključne besede: elektrogospodarstvo, strojna industrija, proizvodnja turbin, inženir Gottlieb Franz Schneider, elektrarna, ohranjanje tehniške dediščine

Research and preservation of the technical heritage of Gottlieb Franz Schneider turbine production

Abstract

The establishment of 'Strojne tovarne in livarna' in Ljubljana dates back to the first period of the introduction of the electricity industry in the territory of present-day Slovenia. The company was founded in 1871 by Gustav Tönnies in cooperation with the operator of the Auersperg ironworks, Filip Dobner. The leading positions in the newly founded company were mainly filled by foreigners, including the Swiss Gottlieb Franz Schneider. Trained in the production of water turbines, he took over the position of chief development engineer at the aforementioned company in Ljubljana in 1914. In 1922, Schneider moved with his family to Škofja Loka, where he bought an outbuilding and founded his own company for the production of water turbines. Through the analysis of archival and newspaper sources, the article deepens the existing knowledge and understanding of the Swiss engineer Schneider and answers the question of who the leading players in the development of Slovenian turbine production in the first decades of the 20th century were. Researching the technical heritage of turbine production is a new contribution to the topic of industrialization and electrification which contributed to the development of rural areas in Slovenia. The preservation of technical heritage is a value that needs to be disseminated and integrated into professional historical studies in state institutions, technical heritage and cultural-touristic activities in the local environment and the transfer of knowledge about historical facts as a message to younger generations.

Key words: electricity industry, machine industry, turbine production, engineer Gottlieb Franz Schneider, power plant, preservation of technical heritage

Odziv sladkega krompirja (*Ipomoea batatas* Lam.) na gojenje v inertnih substratih

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Izvleček

V raziskavo so bile vključene tri slovenske sorte sladkega krompirja (*Ipomoea batatas* Lam.) z različno barvo kože/mesa ('Lučka', 'Janja' in 'Martina'). Polipropilenska korita (20 cm globoka in 40 cm široka) smo napolnili z glinoporom, perlitom, vermikulitom in vrtno zemljo kot kontrolo. Poskus, ki je trajal 126 dni (po presajanju potaknjencev), je potekal v plastenjaku na laboratorijskem polju v Ljubljani. Pri obdelavi podatkov smo primerjali povprečno vrednost za posamezne ponovitve pri različnih substratih in sortah. Ocenjevali smo naslednje agronomske lastnosti: dolžino glavne vreže, število stranskih vrež, maso nadzemnega dela, število listov, število gomoljev in maso gomoljev na rastlino. Med glavnimi biokemijskimi lastnostmi smo določili antioksidativni potencial, vsebnost skupnih fenolov in vsebnost vitamina C v območju: od 0,32 do 0,58 mg na g (izraženega z ekvivalentom Trolox), od 0,28 do 0,54 mg na 100 g (izraženega z ekvivalentom galne kisline) in od 18,4 do 28,2 mg na 100 g sveže snovi.

Ključne besede: substrati, sladki krompir, *Ipomoea batatas*, sorte, lastnosti

The response of sweet potato (*Ipomoea batatas* Lam.) to cultivation in inert substrates

Abstract

The study included three Slovenian varieties of sweet potatoes (*Ipomoea batatas* Lam.) with different skin/flesh colors ('Lučka', 'Janja' in 'Martina'). The polypropylene troughs (20 cm in depth and 40 cm width) were filled with expanded clay pellets, perlite, vermiculite and garden soil as a control. The trial lasted 126 days (after cutting transplanted) in plastic greenhouse in Ljubljana. Average values for each repetition were compared in terms of respective substrates and cultivars. The following agronomic traits were evaluated: main vine length, number of branches, weight of above ground, number of leaves, number of tubers and tubers weight per plant. Among main biochemical traits antioxidant potential, phenolic content and vitamin C content were determined in the range: 0.32 to 0.58 mg Trolox equivalents per g, 0.28 to 0.54 mg gallic acid equivalent per 100 g and 18.4 to 28.2 mg per 100 g FW.

Key words: substrates, sweet potato, *Ipomoea batatas*, cultivars, traits

Vpliv namakanja na izpiranje nitratov in sposobnost tal za zadrževanje vode

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Izvleček

Z intenzifikacijo kmetijskih dejavnosti in s tem gnojenja ter namakanja, se povečuje tudi možnost izpiranja dušičnih hranil in s tem onesnaževanje okolja. Eden od ciljev projekta EIP VODE, ki je potekal v obdobju 2018 – 2022, je bil opazovanje izpiranja hranil na namakani in nenamakani pridelovalni površini. Namen opazovanja je bil dokazati pozitiven vpliv strokovno pravičnega namakanja na izpiranje nitrata v podzemne vode. Za ta namen smo vzpostavili testno zelenjadarsko kmetijsko površino na območju Ljubljanskega polja v Klečah. Na polovici pridelovalne površine se je izvajal ukrep namakanja, na drugi ne. Za pomoč pri strokovno pravilnem namakanju je pridelovalec uporabljal sistem SPON. Meritve smo izvajali z uporabo lizimetrov za zajem izcedne vode in merilnikov vsebnosti vode v tleh. Po vzorčenju talne raztopine v sredini septembra 2022 je bila po pričakovanjih koncentracija izpranega NO_3 na nenamakani površini (178,33 mg/l) večja v primerjavi z namakano (12,11 mg/l). Meritve vsebnosti vode v tleh so se izvajale tudi po koncu projekta. V prispevku bomo predstavili posodobljene rezultate meritev in komentirali in situ meritve vodozadrževalnih lastnosti tal ter vpliv namakanja na stanje/količino vode v tleh v daljšem časovnem obdobju.

Ključne besede: Namakanje, izpiranje nitratov, SPON, vsebnost vode v tleh,

Effect of irrigation on nitrate leaching and soil water holding capacity

Abstract

The intensification of agricultural activities also increases fertilization and irrigation, consequently raising the potential for nitrogen nutrient leaching and thus environmental pollution. One of the objectives of the EIP VODE project, which ran from 2018 to 2022, was to monitor nutrient leaching on irrigated and non-irrigated cropland. The aim of the observation was to demonstrate the positive impact of professionally managed irrigation on nitrate leaching to groundwater. For this purpose, a vegetable test plot was established in the area of Ljubljansko polje in Kleče. Half of the cultivated area was irrigated, while the other half was not. The grower used SPON to assist in irrigating correctly. Measurements were carried out using leachate lysimeters and soil water content meters. After sampling the soil solution in mid-September 2022, the concentration of leached NO_3 was expected to be several times higher in the non-irrigated (178,33 mg/l) area compared to the irrigated area (12,11 mg/l). Soil water content measurements were also conducted after the end of the project. In this paper, we will present the updated measurement results and comment on the in situ measurements of soil water retention properties and the impact of irrigation on soil water status and quantity over time.

Key words: Irrigation, nitrate leaching, SPON, soil water content

Teaching Educational Pathways for an AI-enhanced weather simulations

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Abstract

Climate change education is essential to prepare young generations to address and mitigate environmental impacts. Integrating artificial intelligence and new technologies into the school curriculum can enhance student understanding by providing advanced tools for analyzing and visualizing climate data. Artificial intelligence (AI) is transforming climate modeling through advanced simulations that use machine learning algorithms to improve the accuracy and resolution of existing climate models. These models, traditionally limited by computational power, have struggled to represent key processes such as convection and cloud formation. AI overcomes these limitations by learning from observational data and high-fidelity simulations, reducing bias and increasing confidence in climate forecasts. AI also accelerates climate forecasting through emulators that rapidly reproduce model outputs.

Key words: Climate change education, climate modeling, simulation data, Geographic Information Systems, hybrid learning environments, ID model

Role of rain gardens in stormwater management (Kecskemét, Hungary)

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Abstract

Today, urban climate adaptation is unthinkable without green and blue infrastructure. This includes the development of an urban stormwater management system, one element of which is rain garden. In our work, we investigated the potential of rain gardens in Kecskemét, one of Hungary's most populous cities, which is particularly vulnerable to drought. These low impact developments can help to effectively counter the negative effects of climate change, such as urban flash floods. We have developed an experimental rain garden which can collect rainwater from the roof of a family house. We planted it with some plants with different tolerances to prevent run-off. We also selected a critical point in the city of Kecskemét, where flash flooding during heavy rainfall is a problem. We examined the possibility of converting available green spaces into rain gardens to retain rainwater collected at the lowest point of the area as efficiently as possible. To do this, we used the QGIS (Quantum Geographic Information System) to analyze the different sectors, the topography and slope, and the typical runoff direction. The aim of our study was to determine how much amount of the rainfall could be retained and stored temporarily by converting the green areas of the sample area into rain gardens.

Key words: climate adaptation, Hungary, Kecskemét, rain garden, stormwater management

Insect hotel - a solution for the conservation of wild pollinators

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Abstract

The intense “building fever” and urbanization of the city of Skopje through the demolition of old buildings made of earthen bricks, mud bricks, wooden structures and ceramic roofs and the construction of modern buildings made of concrete, steel structures, lots of glass and synthetic materials, significantly reduces access to the natural habitats of wild pollinators thus endangering their survival. Fortunately, in response to this situation, several actions have been taken to raise awareness among citizens for the protection and sustainability of wild pollinators in the urban environment, and for the first time in Skopje, pioneering activities for the construction of insect hotels have been implemented. The activities are realized through cooperation between students and professors from the Faculty of Agricultural Sciences and Food in Skopje, private companies and citizens' associations. Two pollinator hotels have been set up in two different locations in Skopje (Avtokomanda and Kozle). The locations are in two municipalities that are considered to be some of the largest “construction sites” among the municipalities in the city. When placing the hotels, attention was paid to choosing a location for their placement in the mixed shade with the sun. The materials from which the hotels are made are selected to be natural, and protected by organic means. Insect hotels provide shelter and nesting sites to native and migratory solitary insects, so care was taken to ensure that the “furniture” of the “hotel rooms” is collected from the surrounding nature and the materials are preferred by the insects themselves (reeds, bamboos, pieces of wood with perforated nesting holes of different diameters (4, 6 and 8 mm) (Hamroud et al., 2022), perforated unbaked mud bricks, clay bricks, straw, etc.), and during the design of the hotels were intended to be accessible to several species of insects with different body dimensions. Plants as food resources were planted and seeded around the hotels, with an emphasis on native and local plants, which aim to serve as a source of food for wild pollinators, while also emphasizing the landscape. Hotels will be regularly repaired and maintained. Apart from their basic function, housing insects, they will be used for research purposes and education of the general public.

Key words: insect, nature materials, housing

Effects of degradation on vegetation composition in the Bugac steppe

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Abstract

The Bugac steppe, part of the Kiskunság region, has been subject to various environmental and anthropogenic pressures, resulting in degradation of its grasslands. This study aims to analyze how disturbances such as grazing and trampling affect the composition and diversity of vegetation in this area. Data were collected from 1997 to 2022 using the Braun-Blanquet method, focusing on three zones with varying disturbance intensities. Results indicate that invasive species have increased in recent years, particularly in areas of higher disturbance near paddocks. The study also highlights the significant role that medium disturbance plays in maintaining biodiversity. Our findings emphasize the importance of appropriate land management strategies to preserve the ecological balance and natural values of the region.

Key words: pasture, coenological examination, ecological factor, occurring species, invasive species

Možnost postavitve bioplinarne v občini Bled

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Izveleček

V Sloveniji se kot edine smiselne velikosti bioplinarn kažejo mikro (< 50 kW) ali majhne (50 kW-100 kW) bioplinarne na kmetiji ali v skupnosti več kmetij. V raziskavi smo z interaktivnim modelom GIS iskali primerljivo lokacijo za postavitev mikrobioplinarne v občini Bled. Iskanje smo izvedli na podlagi razpoložljivih kvantitativnih in prostorskih podatkov o kmetijah in prehranskih odpadkih. Primarni vhodni substrati so bili goveji gnoj, prehranski odpadki in odpadno prehransko olje. Za izdelavo modela smo uporabili odprtokodni program QGIS in podatke iz leta 2019. Združevanje kmetij v skupke je potekalo na razdalji 1000 m, združevanje prehranskih obratov pa smo izvedli na treh razdaljah 500 m, 800 m in 1000 metrov. Na vseh treh razdaljah smo preverili ekonomsko upravičenost investicije. Na vseh treh razdaljah je NSV pozitivna, kar kaže na upravičenost naložbe. Na razdalji 1000 m za prehranske obrate je neto sedanja vrednost najvišja (145.033,85 €), ob tem je interna stopnja donosnosti 15,5 % in diskontirana doba vračanja 15 let.

Ključne besede: ekonomika bioplinarne, prehranski odpadki, mapiranje GIS, mikro bioplinarne

Possibility of installing a biogas plant in the municipality of Bled

Abstract

In Slovenia, the only reasonable sizes of biogas plants are micro (< 50 kW) or small (50 kW-100 kW) biogas plants on a farm or in a community of several farms. In this study, we used an interactive GIS model to search for a suitable location for a micro-biogas plant in the Municipality of Bled. The search was carried out on the basis of available quantitative and spatial data on farms and food waste. The primary input substrates were cattle manure, food waste and waste cooking oil. We used the open-source QGIS software and data from 2019. Clustering of farms was performed at a distance of 1000 m, and clustering of food processing establishments was performed at three distances of 500 m, 800 m and 1000 m. At all three distances, the economic viability of the investment was verified. At a distance of 1000 m for food establishments, the net present value is the highest (€ 145,033.85), with an internal rate of return of 15.5% and a discounted payback period of 15 years.

Keywords: biogas plant economics, food waste, GIS mapping, micro biogas plants

Vpliv temperature zraka na umrljivost in obolevnost za boleznimi srca in ožilja

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Izvleček

Pojav tople grede in globalno segrevanje s predvidenim naraščanjem temperatur ozračja je že vrsto let najbolj izpostavljen okoljski problem. Med problematičnimi posledicami temperaturnih sprememb je veliko pozornosti namenjeno njihovim škodljivim vplivom na zdravje. Med boleznimi, ki predstavljajo glavni vzrok umrljivosti v mnogih državah vključno z državami Evropske unije, so bolezni srca in ožilja. Pričujoči prispevek prinaša krajši literaturni pregled raziskav o vplivu temperature zunanjega zraka na umrljivost in obolevnost zaradi bolezni srca in ožilja. Predvsem so za pojav bolezni in življenje ogrožajočih zapletov nevarni temperaturni ekstremi, tako zelo visoke kot tudi nizke temperature, se pravi tako vročinski valovi kot obdobja izrazito hladnega vremena. Za mlade in zdrave ljudi temperaturni ekstremi in spremembe temperatur ne predstavljajo posebnega tveganja, so pa ogroženi starejši in ljudje, ki že imajo težave z določenimi obolenji (srčno-žilne bolezni, diabetes itd.). Zato je pomembno prepoznati možne škodljive vplive temperaturnih sprememb in temperaturnih ekstremov ter izvesti ustrezne zaščitne ukrepe, s katerimi se zmanjša možnost nastanka srčno-žilnih zapletov.

Ključne besede: Globalno segrevanje, Temperatura zraka, Bolezni srca in ožilja, Umrljivost, Obolevnost.

Effect of Air Temperature on Cardiovascular Mortality and Morbidity

Abstract

The greenhouse effect and global warming, with higher temperatures predicted, have been one of the most pressing environmental problems for many years. Among the problematic consequences of temperature change, much attention has been paid to its harmful effects on health. Cardiovascular diseases are the leading cause of mortality in many countries, including those in the European Union. This article reviews the literature on the impact of outdoor air temperature on the cardiovascular mortality and morbidity. Temperature extremes – heat waves and periods of severe cold - are particularly dangerous for cardiovascular complications. In the case of young and healthy people temperature extremes and great temperature changes do not present a noteworthy risk. However, the situation is very different for older people or those with certain health conditions such as cardiovascular diseases, diabetes etc. It is therefore important to recognize possible adverse effects and take measures to prevent complications.

Key words: Global warming, Air temperature, Cardiovascular diseases, Mortality, Morbidity.

Samooskrbna sončna elektrarna – izbrana tehnologija trajnostnega bivanja

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Izvleček

V Sloveniji je po nekajletnem zatišju leta 2016, s sprejetjem Uredbe o samooskrbo z električno energijo iz obnovljivih virov energije, začelo naraščati zanimanje za izgradnjo sončnih elektrarn v gospodinjstvih. V osmih letih je bilo zgrajeno 44.333 sončnih elektrarn za samooskrbo z močjo 858.802 kW. V Sloveniji je bilo konec leta 2023 skupno 48.021 sončnih elektrarn s skupno močjo 1.121.720 kW. Letna proizvedena električna energija iz sončnih elektrarn je bila 598 GWh ali 4,1 % od vse proizvedene električne energije v Sloveniji. Z letom 2024 se zaključuje shema za samooskrbo, ki je omogočala letni obračun (Net-metering) za elektrarne, ki so pridobile soglasje v letu 2023 in bodo zgrajene do konca decembra 2024; od leta 2025 pa bo obračun mesečni. Prav zaključek sheme in mednarodna politična situacija, je vzpodbudila zanimanje odjemalcev električne energije po namestitvi lastne sončne elektrarne. Za stanovanjsko hišo z dvema gospodinjstvom in ogrevanjem s toplotno črpalko moči 14 kW je bila izdelana analiza energijskih tokov porabe električne energije. Pri odločanju za investicijo za sončno elektrarno je bila izdelana analiza lege objekta in analiza sončnega sevanja na kar vpliva vreme. S sodobno sončno elektrarno izberemo tehnologijo trajnostnega bivanja. Opisan je postopek tehničnega dimenzioniranja sončne elektrarne moči 12,18 kW, izgradnja, priklop na distribucijsko omrežje ter pridobivanja subvencije Borzena. Uporabljene so bile ekonomske metode investicije v normalnem stanju in pri različnih tveganjih zaradi neidealne lege postavitve elektrarne, manjšega sončnega obsevanja zaradi podnebnih sprememb in regulatornih tveganj zaradi uveljavitve novega tarifnega sistema omrežnine električne energije.

Ključne besede: sončna elektrarna, statistična analiza, ekonomska analiza, Cost Benefit analiza, analiza tveganj

Self-sustaining solar power plant – selected sustainable living technology

Abstract

In Slovenia, after a lull of several years, interest in building solar power plants in households started to grow in 2016 with the adoption of the Regulation on self-supply of electricity from renewable energy sources. In eight years, 44,333 solar power plants have been built for self-supply, with a capacity of 858,802 kW. At the end of 2023, there were a total of 48,021 solar power plants in Slovenia, with a total capacity of 1,121,720 kW. The annual electricity produced from solar power plants was 598 GWh, or 4.1% of the total electricity produced in Slovenia. As of 2004, the self-supply scheme, which allowed annual net-metering for power plants that received consent in 2023 and will be built by the end of December 2024, is coming to an end; from 2025, net-metering will be monthly. It is the closure of the scheme and the international political situation that has stimulated the interest of electricity consumers to install their own solar power plant. An energy flow analysis of electricity consumption was carried out for a two-household house heated by a 14 kW heat pump. When deciding to invest in a solar power plant, an analysis of the location of the building and an analysis of the solar radiation influenced by the weather was carried out. With a modern solar power plant, we choose sustainable living technology. The procedure for the technical dimensioning of a 12.18 kW solar power plant, its construction, connection to the distribution grid and obtaining a subsidy from Borzen is described. Economic investment methods were applied under normal conditions and under different risks due to the non-ideal location of the plant, the reduced solar irradiation due to climate change and the regulatory risks due to the implementation of the new electricity grid tariff system.

Key words: solar power plant, statistical analysis, economic analysis, cost benefit analysis, risk analysis

Criteria for evaluating Best Practices in Ecosystem-Based Adaptation and Ecosystem Disaster Risk Reduction

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Abstract

For the adaptation of human communities and ecosystems to climate change, nature-based solutions (NbS), such as Ecosystem-based Adaptation (EbA) and Ecosystem-based Disaster Risk Reduction (Eco-DRR), are becoming increasingly favored over more traditional approaches. This work examines the criteria for evaluating good practices in EbA and Eco-DRR through an analysis of the technical and scientific literature and case studies, highlighting the need for clear and understandable quality criteria to ensure ease of use and replicability. The criteria proposed by literature are categorized into key areas: vulnerability reduction, social benefits, ecosystem health, equitable governance. To these, the “long-term perspective” section was added by us, as with an objective such as adaptation, the temporal and monitoring component is crucial both to guarantee the effectiveness of the intervention and to know its long-term sustainability and outcomes. These criteria were used within the Interreg Italy-Slovenia ECO2SMART project to identify good practices for the adaptation of coastal communities to climate change in the Northern Adriatic coastal areas.

Key words: Ecosystem-based Adaptation, Ecosystem disaster-risk reduction, Nature-based Solutions, Climate Change, Best Practices

Zamenjava izolacijskega plina SF₆ v elektroenergetiki z nadomestnimi plini

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Izvleček

V članku je najprej predstavljen plin SF₆. Zbrane in analizirane so lastnosti izolacijskega plina SF₆. Vzrok, zakaj EU prepoveduje SF₆ plin, je njegova velika zmožnost globalnega segrevanja ozračja GWP, ki je 23.000-krat večja od CO₂. Elektroenergetska podjetja so danes kaznovana z emisijskimi kuponi, saj jim iz elektroenergetskih postrojev uide 0,5 % izolacijskega plina. V članku so prikazani tudi zakoni, uredbe in časovni roki, predstavljena so področja uporabe izolacijskega plina v elektroenergetiki, kjer prevladujejo odklopniki SN in VN ter 110 kV GIS plinsko polnjena stikališča, ter podjetja po svetu, ki razvijajo nove izolacijske pline. Nove rešitve so vakuum, plini brez fluora, čisti zrak (Clean Blue), ki jih ponuja Siemens, ter fluorovi plini FMP (mešanica fluoronitrila in fluorometana), ki jih razvija skupina podjetij okrog GE in Hitachi (ABB). Analizirane so fizikalne, kemične in ekonomske lastnosti, prikazana je primerjava in vrednotenje lastnosti glavnih novih izolacijskih plinov v primerjavi SF₆. Na koncu je sinteza ključnih ugotovitev in utemeljen smisel razvoja teh plinov v rezultatih.

Ključne besede: SF₆, vakuum, izolacijski plini, G³, 3M Novec 4710, FMP, Clean Blue, Siemens, GE

Replacement of insulating gas SF₆ in the power engineering industry with substitute insulate gases

Abstract

The article first presents SF₆ gas. The properties of SF₆ insulating gas are collected and analyzed. The EU bans SF₆ gas because of its high GWP global warming potential, which is 23,000 times that of CO₂. Today, electric power companies are penalized with emission coupons, as 0.5% of insulating gas escapes their power plants. The article also shows the laws, regulations, and deadlines, the areas of use of insulating gas in the power industry, where MV and HV circuit breakers and 110 kV GIS gas-filled switches dominate, and companies around the world that develop new insulating gases are presented. The new solutions are vacuum, fluorine-free gases, clean air (Clean Blue) offered by Siemens, and FMP fluorine gases (a mixture of fluoronitrile and fluoromethane) developed by a group of companies around GE and Hitachi (ABB). Physical, chemical, and economic properties are analyzed, and comparisons and evaluation of properties of the main new insulating gases compared to SF₆ are shown. In the end, a synthesis of the key findings and a justified sense of the development of these gases is in the results.

Key words: SF₆, Vacuum, Insulating Gases, G³, 3M Novec 4710, FMP, Clean Blue, Siemens, GE

Zamenjava mineralnih TR olj z novimi, biološkimi, biorazgradljivimi TR olji

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Izvleček

V članku je predstavljena uporaba transformatorskih olj in njihova problematika danes. Mineralna olja iz nafte danes zamenjujejo naravni in sintetični estri, ki so biorazgradljivi, ter silikonska olja in biološka olja. Prikazan je pregled spiska nalog transformatorskih olj in izolacijskih tekočin, pregled olj in proizvajalcev olj, ki jih kupuje Kolektor Etra. Zadnje čase prednjači predvsem MIDEL 1215 in 7131. V nadaljevanju so analizirane značilnosti izolacijskih olj, potem pa so prikazane primerjave in tudi vrednotenje olj skozi kemične, fizikalne, električne, okoljske in ekonomske kriterije. Olja nas informirajo o starosti, kvaliteti, poškodbah. Preizkušanje in diagnostika transformatorskih olj sestoji iz analize plinov v TR olju (DGA, Dissolved Gas Analysis) in FKA (fizikalno kemijske analize) olj. V sklepu je utemeljeno vrednotenje večine značilnosti vseh olj.

Gljučne besede: mineralno, biorazgradljiv, ester, sintetični, bio, silikonsko, MIDEL 7131, lastnosti, primerjava

Replacing mineral TR oils with new, biological, biodegradable TR oils

Abstract

The article presents the use of transformer oils and their problems today. Today, mineral oils from petroleum are being replaced by natural and synthetic esters, which are biodegradable, as well as silicone and biological oils. An overview of the task list of transformer oils and insulating fluids, and the oils and oil manufacturers purchased by Kolektor Etra are shown. Lately, MIDEL 1215 and 7131 have been leading the way. In the following, the characteristics of insulating oils are analyzed, and then comparisons and the evaluation of oils through chemical, physical, electrical, environmental, and economic criteria are shown. Oils inform us about age, quality, and damage. Testing and diagnostics of transformer oils consist of analysis of gases in TR oil (DGA, Dissolved Gas Analysis) and FKA (physicochemical analysis) of oils. In conclusion, the evaluation of most characteristics of all oils is justified.

Key words: Mineral, Biodegradable, Ester, Synthetic, Bio, Silicone, MIDEL 7131, Properties, Comparison

Zmanjševanje širjenja okrasnih invazivnih tujerodnih rastlinskih vrst (v Sloveniji in na Hrvaškem)- Delovni sklop 2 projekta LIFE OrnamentallIAS

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Izvleček

Namen projekta LIFE OrnamentallIAS je ublažiti škodljive vplive okrasnih invazivnih tujerodnih rastlinskih vrst (ITR) na ogrožene habitate in vrste, pomembne za EU. Delovni sklop 2 (DS2) se osredotoča na preprečevanje vnosa ITR z vrtov in parkov v naravne habitate. Glavni cilji so oceniti invazivnost okrasnih rastlin, spodbujati neinvazivne alternative in razviti kodeks ravnanja za deležnike. Metode vključujejo raziskave trenutnega pojavljanja ITR, analizo trga in participativne delavnice za razvrščanje rastlin med invazivne, potencialno invazivne in priporočene (neinvazivne). Naši predhodni podatki iz tržne analize razkrivajo vrste in razširjenost okrasnih rastlinskih vrst, ki se ponujajo v Sloveniji. Pričakovani rezultati vključujejo usklajene sezname invazivnih, potencialno invazivnih in neinvazivnih rastlin, 16 demonstracijskih zasaditev v Sloveniji in na Hrvaškem ter večjo ozaveščenost deležnikov in javnosti. Vpliv projekta bo zmanjšanje širjenja ITR, izboljšanje ohranjanja habitatov EU in trajnostni pristop k okrasnemu vrtnarstvu.

Ključne besede: invazivne vrste, potencialno invazivne vrste, priporočene okrasne rastline, okrasne rastline, kodeks, vrtnarstvo

Reducing the Spread of Ornamental Invasive Alien Plant Species (in Slovenia and Croatia)- Work Package 2 of the LIFE OrnamentallIAS project

Abstract

The LIFE OrnamentallIAS project aims to mitigate the adverse impacts of ornamental invasive alien plant species (IAPs) on endangered habitats and species of EU importance. Work Package 2 (WP2) focuses on preventing the introduction of IAPs from gardens and parks into natural habitats. The main objectives are to assess the invasiveness of ornamental plants, promote non-invasive alternatives, and develop a Code of Conduct for stakeholders. Methods include surveys of current IAP occurrences, market analysis, and participative workshops to classify plants as invasive, potentially invasive, and recommended (non-invasive). Our preliminary data from market analysis reveal the types and prevalence of ornamental plant species offered in Slovenia. Expected results include harmonized lists of invasive, potentially invasive and non-invasive plants, 16 demonstration plantings in Slovenia and Croatia, and increased stakeholder and public awareness. The project's impact will be a reduction in the spread of IAPs, enhanced conservation of EU habitats, and a sustainable approach to ornamental horticulture.

Key words: invasive species, potentially invasive species, recommended ornamental plants, ornamental plants, code of conduct, horticulture

EIP projekt: Inovativni protipožarni model celostne revitalizacije kmetij

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Izvleček

Z EIP projektom smo s krepitvijo naravnih in grajenih ekosistemov poskušali izboljšati protipožarno varnost kmetijska in gozdna zemljišča ter nakazati možnost revitalizacije po požarih. Geomantijska analiza, ki pojasnjuje odnose med ljudmi in naravo z novimi vsebinami, je bila osnova za informacije o naravnih pogojih posameznih kmetij z vidika zmožnosti lastne obnove, ki je odvisna predvsem od geološke podlage, naklona in orientacije terena ter debeline in tipa rastne podlage (zemljišča). Naravni pogoji so bili podprti z vključitvijo modro-zelene infrastrukture, ki zajema mrežo vodnih in zelenih površin za ustvarjanje ekosistema, ki izkorišča potencial narave za zagotavljanje številnih ekoloških, socialnih in gospodarskih koristi. V projektu so ti elementi zajemali načine zadrževanja vode v tleh, ponovno rabo padavinske vode, povečanje humifikacije zemljišč, izkoriščanje biomase kot obnovljivega surovinskega vira, zadrževanje vode na pobočju s travnimi muldami, uporabo tradicionalnih pristopov zadrževanja prsti z ograjevanjem s kamni ter krepitev avtohtonih grmovnih in drevesnih vrst in izbor kmetijskih rastlin odpornih na pomanjkanje vode. Glavni cilj projekta je bil razvoj in pilotni preizkus inovativnega modela celostne obnove kmetij po požaru in njihove protipožarne varnosti.

Ključne besede: EIP projekt, protipožarni model, revitalizacija, družinske kmetije

EIP Project: Innovative Fire Protection Model of Integrated Revitalization of Farms

Abstract

With the EIP project, we tried to improve the fire safety of agricultural and forest land by strengthening natural and built ecosystems and indicate the possibility of revitalization after fires. Geomancy analysis, which explains and raises awareness of the relationship between people and nature with new contents and dimensions, was the basis for information about the natural conditions of individual farms from the point of view of their ability to restore themselves, which depends mainly on the geological base, the slope and orientation of the terrain, as well as the thickness and type growing grounds (land). Natural conditions were supported by blue-green infrastructure which refers to a network of water and green areas to create an ecosystem that uses nature's potential to provide multiple ecological, social and economic benefits. In the project, these elements included methods of retaining water in the soil, reusing rainwater, increasing soil humification, utilizing biomass as a renewable raw material source, retaining water on the slope with grass mulches, using traditional soil retention approaches with stone fencing, and strengthening indigenous shrub and tree species and selection of agricultural plants resistant to lack of water. The main goal of the project was the development and pilot testing of an innovative model of integrated restoration of farms after a fire and their fire safety.

Key words: EIP project, fire protection model, revitalisation, family farm

EIP projekt Ekosistemske storitve

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Izvelek

Z ekosistemskimi storitvami označujemo ves neposreden in posreden prispevek ekosistemov k blaginji človeške družbe ali posameznika. Te storitve izvirajo iz naravnih procesov ter vključujejo oskrbo s hrano, čisto vodo, regulacijo podnebnih pogojev, opravevanje rastlin, razgradnjo odpadkov ... Spoštovanje in ohranjanje ekosistemskih storitev je ključnega pomena za trajnostni razvoj in dobrobit človeštva. Zaradi lažje preglednosti ekosistemske storitve delimo na štiri glavne tipe in sicer na oskrbovalne, regulacijske, habitatne in kulturne storitve. Glavni cilj EIP projekta "Ekosistemske storitve" je bil izboljšati usposobljenost kmetijskih gospodarstev na področju prilagajanja podnebnim spremembam in z razvojem namenske aplikacije poskušati rešiti težavo, s katero se srečujejo številne manjše kmetije – kje na enem mestu dobiti vse informacije, ki so relevantne za kmetijo, da bi tako lahko bolj informirano načrtovali njen razvoj in večali njeno odpornost na vpliv podnebnih sprememb. Pet kmetij in BC Naklo s pomočjo aplikacije dostopajo do informacij, ki podpirajo tri ekosistemske storitve, s katerimi smo se ukvarjali v projektu – biotska raznovrstnost, turizem in ponor ogljika v gozdovih. Kmetije bodo tako postale »kmetije dobre prakse« in bodo pridobljeno znanje lahko širile naprej, s pomočjo aplikacije pa bodo spremljale tudi svoj napredek in vpliv izvedenih ukrepov.

Ključne besede: EIP projekt, ekosistemske storitve, podnebne spremembe, aplikacija

EIP project Ecosystem Services

Abstract

With the term ecosystem service, we mean all the direct and indirect contribution of ecosystems or nature to the well-being of human society or an individual. These services originate from natural processes in ecosystems and include food supply, clean water, regulation of climate conditions, protection against natural disasters, plant pollination, waste decomposition ... Respecting and preserving ecosystem services is crucial for the sustainable development and well-being of humanity. For easier transparency, ecosystem services are divided into four main types: supply, regulation, habitat and cultural services. The main goal of the EIP project "Ecosystem Services" was to improve the competence of agricultural holdings in the field of adaptation to climate change and by developing a dedicated application to try to solve the problem faced by many small farms - where to get all the information relevant to the farm in one place. So that we could plan its development in a more informed way and increase its resistance to the impact of climate change. Five farms and BC Naklo use the application to access information that supports the three ecosystem services we dealt with in the project - biodiversity, tourism and the carbon sink in forests. Farms will thus become "farms of good practice" and will be able to spread the acquired knowledge further, and with the help of the application they will also monitor their progress and the impact of the implemented measures.

Key words: EIP project, ecosystem services, climate change, application

Vrednotenje uspešnosti: Analiza zadovoljstva kupcev v izbrani cvetličarni

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Izvleček

Namen raziskave je bil ugotoviti stopnjo zadovoljstva strank v cvetličarni v občini Žiri ter raziskati možnosti izboljšanja ponudbe in storitev. V teoretičnem delu so bili opredeljeni ključni pojmi, kot so zadovoljstvo strank in dejavniki, ki nanj vplivajo, pri čemer je bil uporabljen deskriptivni in komparativni pristop. Empirično delo je vključevalo anketo, izvedeno v cvetličarni ter prek spleta. Anketirani so ocenjevali zadovoljstvo s ponudbo, cenami, delovnim časom ter odnosom zaposlenih. Rezultati kažejo na visoko stopnjo zadovoljstva, predvsem z odnosom zaposlenih in svetovanjem. Predlogi za izboljšave vključujejo razširitev delovnega časa in širitev ponudbe za mlajše generacije ter razmislek o dodatnih oglaševalskih kanalih za večjo prepoznavnost. Sklepi raziskave predlagajo usmeritve za nadaljnje izboljšanje poslovanja in prilagoditev ponudbe tržnim potrebam.

Ključne besede: zadovoljstvo, stranke, cvetličarna, anketa, raziskava

Measuring success: analysing customer satisfaction at a selected florist

Abstract

The aim of the study was to assess customer satisfaction in a florist shop in the municipality of Žiri and to explore ways of improving the range of products and services. The theoretical part defined key concepts such as customer satisfaction and factors influencing it using a descriptive and comparative approach. The empirical part included an in-store and online survey. Respondents rated their satisfaction with product range, prices, opening hours and staff relations. The results indicate a high level of satisfaction, particularly with staff relations and advice. Suggestions for improvement included extending opening hours, broadening the product range to appeal to younger generations and using additional advertising channels to increase visibility. The conclusions provide guidelines for further business improvement and adaptation to market needs.

Key words: satisfaction, customers, florist, survey, research

Evolution of archaeophytes dominance ratios

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Abstract

In our study we observed changes in the dominance of archaeophyte taxa in a microplot experiment. In 2013, a seed mixture received from a seed exchange was sown in the area, after which the stock was extensively maintained, with soil rotation carried out once a year. Over the four-year duration of the experiment (2020-2023), 10 taxa appeared in the plot. The coverage percentages of the spring aspects were significantly higher than the values of the autumn aspects (except for the year 2022). The robust, high-growing individuals of *Malva sylvestris* had the highest coverage values, and *Centaurea cyanus* was also continuously present in the experimental area. Low values and sporadic occurrence were found in smaller and more disturbance sensitive or perennial species (e.g. *Anchusa officinalis*, *Fumaria officinalis*). Soil cover was 100% in the spring-early summer season, with no neophytes weeds observed in the field in any year.

Key words: soil cover, segetal weeds, *Malva sylvestris*, *Centaurea cyanus*

Testing the integration of DIGIAGRI as a pedagogical tool in vocational training

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Abstract

This article presents the most relevant results obtained from the study of the implementation of DIGIAGRI as a new pedagogical support tool for the development of practical skills in vocational training in the field of agriculture in Spain. The research has prioritised the selection of a digital pedagogical tool that is easy to use, accessible and with quality didactic content. The methodology used to gather the students' opinions was based on digital surveys that facilitate the analysis of the results and make it possible to evaluate the impact of the tool on learning and make decisions on its suitability for implementation. The results highlight the level of interactivity and feedback offered by the platform with other learners and educators worldwide in the field of agriculture. The study supports the need for extrapolation of the research to different levels of training as a tool that enhances digital skills and strengthens distance teaching and learning.

Key words: learning tools, vocational training, digital tools.

Medoviti vrtovi: priložnost krajinskega oblikovanja

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Izvleček

Vedno večja pogostnost uhajanja tujerodnih rastlin, ki zaradi spreminjanja podnebja, klime, postajajo invazivne, ali pa so prepoznane kot potencialno invazivne, je razlog za premišljen izbor medovitih rastlin v okolici čebelnjakov, pa tudi drugod po vrtovih in v krajini. Čebelarji v srčni želji po pomoči čebelam ne pomislijo dvakrat, ko posegajo po cvetočih rastlinah, ki so bolj ali manj medovite, saj želijo čebelam omogočiti pašo v zanje težkih obdobjih, predvsem po pozebah in sušah, ki prizadenejo rastline, posledično pa tudi čebele. Čebelarji sicer vedno bolj spoznavajo in poznajo medovite rastline, se pa le redki spoznajo na načrtovanje, izvajanje in oskrbovanje vrtov oziroma z medovitimi rastlinami zasajenih površin. V prispevku zato obravnavamo medovite rastline, ki so primerne in prilagojene za sajenje v Sloveniji in dodamo nekaj primerov zasaditev, s katerimi želimo vzpodbuditi kulturo urejanja medovitih vrtov.

Ključne besede: medoviti vrtovi, krajinsko oblikovanje, trajnice

Honey gardens: a landscape design opportunity

Abstract

The ever-increasing frequency of the escape of non-native plants, which, due to the changing climate, are becoming invasive or are recognized as potentially invasive, is the reason for a thoughtful selection of honey plants in the surroundings of apiaries as elsewhere in gardens and the landscape. In their heartfelt desire to help bees, beekeepers do not think twice when reaching for flowering plants, which are more or less honey-like, because they want to enable bees to graze during difficult periods for them, especially after frosts and droughts, which affect the plants, and consequently also the bees. Beekeepers are getting to know honey plants more and more, but only a few know about the planning, implementation, and maintenance of gardens or areas planted with honey plants. In this paper, we, therefore, deal primarily with honey plants that are suitable and adapted for planting in Slovenia and add some examples of plantings with which we want to encourage the culture of arranging honey gardens.

Keywords: honey gardens, landscape design, perennials

Application of PGPR and microalgae based biostimulants in combination for increasing stress tolerance in organic strawberry cultivation

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Abstract

Microbial products enhance plant growth through various mechanisms, improve plant condition, or induce plant resistance. In our experiments, we investigated the effects of a PGPR and a microalgae-based biostimulant on yields in an organic strawberry plantation. Based on our experimental results, the combined application of the tested products appears particularly promising for mitigating both abiotic and biotic stress effects.

Key words: microalgae, PGPR, abiotic stress tolerance, biotic stress tolerance, organic strawberry

Open field evaluation of a commercial arbuscular mycorrhizal inoculant on pepper (*Capsicum annuum* L. 'Kapires F1')

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Abstract

This study investigates the effects of AMF inoculation on sweet pepper ('Kapires F1') in a Hungarian family farm, with a focus on variations in soil quality and timing of inoculation. The experiment was carried out on two different soil types, both sandy, but one with higher organic matter content, and richer in certain nutrients, yet more calcareous. The inoculation was performed either at sowing or at transplanting or both times (double treatment). The results of our study showed that plants on the soil with lower organic matter content developed significantly larger roots regardless of the timing of inoculation. Across both soil types, plants treated with mycorrhizal inoculant developed larger roots, showed higher yields and better-quality fruits (more 1st class fruits). Compared to the non-inoculated control statistically significant increases were detected in case of inoculation at transplanting and in case of double treatment. The highest yields were obtained with two treatments (at sowing and at planting). The yield and the number of fruit of plants treated in this way showed a statistically significant increase compared to the control on both soil type. These findings are based on one year data. It is necessary to repeat the experiments across multiple growing seasons, as the results obtained may be influenced by various factors.

Key words: pepper (*Capsicum annuum* L.), AMF-based inoculant, timing of inoculation, yield increase, open field experiment

Impact of biostimulants and container size on the growth and development of pepper seedlings

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Abstract

Seedlings production represents one of the most important aspects of vegetable production process, regarding the fact that quality seedlings dictates the entire production's success. The twofactor test was carried out in the spring of 2020 in a unheated greenhouse on a family farm in Vogošća. It was set up in a randomized batch arrangement in four replications and included the pepper of the Vedrana F1 variety and three growth stimulators: Lyso ammin (La), Green code (Gc), First sun (Fs) and one variant of control (C) untreated plants. In the study were used containers of 24, 32 and 40 openings, or 150, 100 and 70 ml. The aim of the research was to determine the influence of three different growth biostimulators and the mass of pepper seedlings in three types of containers with a different aperture volume. Parameters in the research of growth and development of pepper were followed by morphometric and gravimetric measurements. The observed morphological and gravimetric indicators of growth and development of pepper seedlings, among which the number of leaves, tree diameter, plant height, leaf width and length, mass of the overground and underground part of the plant were under significant influence on the treatment with biostimulators and the size of container openings. The results of the research have shown that the application of all biostimulators has a positive effect on the increase in the parameters of growth and development of pepper seedlings.

The research suggests that production of pepper seedlings, based on morphometric and gravimetric indicator, that were achieved in containers of larger volume of the opening and treatment with biostimulators (of which Lyso ammin showed the best results) gives better quality peppers.

Key words: Pepper, container, biostimulators, seedlings, quality

The effect of shoot pruning on morphological parameters and leaf pigment of different rose varieties

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Abstract

Half of the rose stocks (varieties: 'Pure Aroma', 'Adore Aroma' and 'André Rieu') grown in open field were pruned back in order to develop more flowers. With examining the number and length of shoots, the number and diameter of flowers and leaf pigment contents, the aim was to determine whether pruning has positive or negative effects on these plant parameters.

The pruned 'André Rieu' plants developed the most shoots and the unpruned individuals of 'Adore Aroma' the fewest. The shoots became longer without pruning, and the 'Adore Aroma' roses produced the longest ones. The flowering periods delayed two weeks in the pruned groups. Pruning was not resulted more flowers in every varieties, because unpruned 'Pure Aroma' plants had the most, and the pruned group of 'André Rieu' the fewest flowers. The largest flowers were found in mid-June (regardless of the rose variety). Pruned 'Adore Aroma' roses had the highest pigment contents, while the 'Pure Aroma' (also pruned) had the lowest values, and only the latter variety did not have an increase in this parameter as a result of pruning. Overall, the pruned stocks developed more shoots compared to the unpruned plants, but the number of flowers did not always increase.

Key words: rose pruning, shoot number and length, flowering leaf pigments.

Trajnostno vrtnarjenje v Ljubljanskem zeliščarskem centru Herbalist: povezovanje prvinske narave in skupnosti

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Izvleček

Ljubljanski zeliščarski center Herbalist je zasnovan kot inovativno središče za učenje o zeliščarstvu, trajnostnem vrtnarjenju in povezovanju z naravo. Soustvarjamo prostor, kjer se mestno življenje prepleta z naravo. Nudimo številne poglobljene delavnice o trajnostnem vrtnarjenju s poudarkom na zeliščih, predstavljamo idejno zasnovo skupnostne njive in Kneippove metode ohranjanja zdravja v praksi. Udeležencem naših programov podajamo znanje o tradicionalnem učnem vrtu in apiterapiji – ob tem pridobijo dragocena znanja o uporabi sezonskih rastlin in trajnostnih praksah. Sodobno urbano okolje omogoča povezovanje z naravo, kar uresničujemo z različnimi prilagojenimi inovativnimi programi, izobraževanji ter dogodki, ki spodbujajo zdrav način življenja, trajnostne prakse ter odgovorno uporabo naravnih virov. Herbalist s svojo skupnostno naravnostjo pomeni nov model ozaveščanja ter tudi konkretno izkušnjo, kako lahko mestna središča na temeljih tradicije in kulturne dediščine povezujejo prebivalce z naravnimi pristopi za sodobni čas. Vzpostavili smo odlična sodelovanja z vseslovenskim festivalom zelišč "Diši po zeliščih", ki potuje po Sloveniji, ter letošnjim mednarodnim festivalom čajev Slovenije.

Ključne besede: trajnostno vrtnarjenje, zeliščarstvo, skupnostna njiva, Kneippove metode, urbano vrtnarjenje, gozdna terapija, festival zelišč, festival čajev Slovenije, apiterapija

Sustainable Gardening at the Ljubljana Herbalist Center: Bridging Nature and Community

Abstract

The Ljubljana Herbalist Center is designed as an innovative hub for learning about herbalism, sustainable gardening, and connecting with nature. We co-create a space where urban life intertwines with nature. We offer in-depth workshops on sustainable gardening, focusing on herbs, and introduce the concept of a community garden along with Kneipp health preservation practices. Participants in our programs gain knowledge about the traditional learning garden and apitherapy, acquiring valuable insights into the use of seasonal plants and sustainable practices. The modern urban environment provides opportunities to connect with nature, which we realize through various tailored innovative programs, educational initiatives, and events that promote a healthy lifestyle, sustainable practices, and responsible use of natural resources. With its community-oriented approach, Herbalist represents a new model of raising awareness and providing a tangible experience of how urban centers can connect people with natural approaches based on tradition and cultural heritage for modern times. We have established excellent collaborations with the nationwide herbal festival "Diši po zeliščih" (Smells Like Herbs), which travels throughout Slovenia, and this year's International Tea Festival of Slovenia.

Keywords: sustainable gardening, herbalism, community farming, Kneipp's therapies, urban gardening, forest therapy, herbal medicine festival, tea festival from Slovenia, apitherapy

Sustainable horticultural design of the outdoor event space

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Abstract

One of the basic quality requirements of vocational education and training systems (VET) is the ability to respond and adapt to labour market demands. In this respect, the project directly relates to the changes in labour market needs due to COVID 19. The shift to organising events outdoors is a trend, as this is a much healthier environment. The project partners have jointly developed a survey to investigate the changes in needs for new learning content. Together they found that the needs of the labour market have changed in such a way that existing training programmes do not cover these contents. Many skills can be found in existing occupations, but the labour market requires a more effective balance between the development of green skills and specific skills. We need to improve the capacity of VET to respond to changing labour market demands. Some of the content needed for sustainable horticultural design of outdoor event spaces is fragmented across different sectors: tourism, catering, agriculture, agri-tourism, rural green tourism, horticulture - horticulture, floriculture.

Key words: Sustainable horticultural design of the outdoor event space, Erasmus project, design outdoor space, curriculum for the future, interdisciplinary curriculum

Training talented young florists

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Abstract

Which students and pupils are considered to have special needs? In today's educational landscape, this group of students is generally understood as individuals who face various challenges. However, it is important to recognize highly gifted individuals should also be treated as students and pupils with special needs, who require new challenges, different projects, and a completely different teaching approach. How can companies, private schools and public schools work together to motivate these students? What are the pedagogical approaches and new educational tools? How can a teacher or lecturer keep up with advances in the field and update the essential knowledge? In this article, the co-authors present examples of best practices that have motivated talented young florists.

Key words: talented students, talented pupils, students with special needs, pupils with special needs, education system, florist, vocational training

Vpliv organske zastirke na rast Slovenske ekološke kurkume

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Izvleček

S projektom EIP »Slovenska ekološka kurkuma« smo želeli zainteresirani javnosti predstaviti pri nas malo znano (sub)tropsko kulturo – kurkumo (*Curcuma longa* L.). Poleg izboljšane tehnologije pridelave je namen projekta tudi deljenje novih spoznanj, ki bodo omogočila nadaljnji napredek ter spodbudila konkurenčnost slovenskega kmetijstva v EU. Raziskavo smo opravili v rastlinjaku ($\varphi = 46^\circ 2' 22,37''$; $\lambda = 15^\circ 13' 16,73''$; 310 m n.m.) Biotehniškega centra Naklo, Slovenija. Namen naloge je bil ugotoviti kako različne organske zastirke vplivajo na lastnosti kurkume. V ta namen so bile rastline presajene na gola tla (kontrola), na žitno slamo in ovčjo volno. Poskus je bil izveden v treh ponovitvah z naključno razporejenimi parcelicami. Sadilna razdalja je znašala 50 × 40 cm. V obdobju rasti so rastline prejele ustrezno nego in bile obravnavane v skladu s tehničnimi in znanstvenimi priporočili. Pridetek smo pobirali 29. 10. 2024. Preliminarni rezultati so pokazali, da je ovčja volna najprimernejša zastirka za gojenje kurkume, tako glede višine pridelka kot velikosti rastlin. Delež zračno suhe snovi v gomoljih se med obravnavanji ni značilno razlikoval.

Ključne besede: EIP projekt, kurkuma, organska zastirka, lastnosti pridelka

Effect of organic mulch on the growth of Slovenian Organic Turmeric

Abstract

With the EIP project "Slovenian Organic Turmeric," we aimed to introduce the interested public to the lesser-known (sub)tropical crop - turmeric (*Curcuma longa* L.). In addition to improved production technology, the project also aims to share new knowledge that will enable further progress and boost the competitiveness of Slovenian agriculture in the EU. The study was carried out at the glasshouse ($\varphi = 46^\circ 04'$; $\lambda = 14^\circ 31'$; n. m.: 310 m a.s.l.) of the Biotechnical centre in Naklo, Slovenia. The purpose of the experiment was to determine how different organic mulch impact on the properties of turmeric. For this purpose, the plants were transplanted into bare soil (control), wheat straw, and sheep wool. The experiment was carried out in three replications with randomly arranged plots. Planters distance that we used was 50 × 40 cm. Throughout the growth period, the plants were provided with appropriate care and followed technical and scientific recommendations. The yield was collected on 29. 10. 2024. The preliminary results have shown that sheep wool is the most suitable mulch for cultivating turmeric, both in terms of yield and plant size. The proportion of dry matter in the tubers compare different treatments, did not reach the significant differences.

Key words: EIP project, turmeric, organic mulch, pridelek, yield properties

Senzorično ocenjevanje kakovosti makedonske pastramajlije, tradicionalne makedonske specialitete

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Izvleček

Pastramajlija je zelo priljubljena tradicionalna makedonska specialiteta, ki se večinoma proizvaja in okusi po vsej državi, zlasti v severovzhodnem delu R.N. Makedonije. Namen te študije je bil raziskati glavne senzorične značilnosti (ocenjene s štirimi profili: videz, tekstura v prstih ali ustih, vonj in okus) pastramajlije, proizvedene v 5 različnih neformalnih regijah R.N. Makedonije. V 3 dneh je sedem (7) izkušenih ocenjevalcev, analiziralo senzorične parametre skupno 30 pastramajlije, po 6 vsake vrste (veleška, svetinikolska, štipska, radoviška in kratovska). Obstaja pet vrst pastramajlije, ki so posebej opredeljene s svojimi senzoričnimi lastnostmi, vključno z okusom/vonjem slane svinjine in testa, okusom slanega ovčjega sira in slane suhe ovčetine na eni strani, barvo začimb (suha rdeča paprika in črni poper), poln okus testa (svinjska mast) in njegova drobljivost ter okusi kombinacije različnih vrst svinjskega mesa s suho ovčje meso, del sira, jajc na drugi strani.

Sensory evaluation of the quality of Macedonian Pastramajlija, a traditional Macedonian speciality

Abstract

Pastramajlija is a very popular traditional Macedonian specialty, which is mostly produced and tasted all over the country, especially in the northeastern part of R.N. Macedonia. The aim of this study was to investigate the main sensory characteristics (assessed by four profiles: appearance, texture in the fingers or in the mouth, smell and taste) of Pastramajlija produced in 5 different informal regions of R.N. Macedonia. During 3 days, seven (7) experienced evaluators analyzed the sensory parameters of a total of 30 pastramajlija, 6 of each type (Veleška, Svetinikolska, Stipska, Radoviška and Kratovska). There are five types of pastramajlija that are specifically defined by their sensory characteristics, including the taste/smell of salty pork and dough, the taste of salty sheep cheese and salty dry mutton on one side, the color of the spices (dried red pepper and black pepper), the full flavor of the dough (pork fat) and its crumbliness and the flavors of the combination of different types of pork meat with dry mutton, part cheese, eggs on the other side.

Trajnostno usmerjene trženjske prakse v fazi zrelosti izdelka: primer čokolade

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Izvleček

Večina izdelkov na trgu je v običajno dolgo trajajoči fazi zrelosti življenjskega cikla izdelka. Prodaja se zmanjšuje, dobiček upada, konkurentov je veliko. Tržniki izbirajo med tremi različnimi strategijami, da zaščitijo svoj položaj na trgu. Spremenijo lahko trg, izdelek ali trženjski splet. Lahko tržijo novemu ciljnemu trgu ali repositionirajo svoje izdelke, ki bi morali ustrezati spreminjajočim se potrebam strank. Tudi trg čokolade je v fazi zrelosti. Z uporabo metod opazovanja, intervjuja in analize primera smo ugotovili, da ponudniki čokolade, tudi vrhunske, ponujajo inovativne izdelke, da bi zadovoljili spreminjajoče se želje obstoječih in novih ciljnih segmentov. Spreminjajo trženjski splet in uporabljajo nove izvirne načine komuniciranja. Tudi trajnost, v ekonomskem, socialnem oz. ekološkem smislu je lahko posebnost čokolade, ki je pri segmentu strank, ki se zaveda pomena trajnosti, prepoznana kot konkurenčna prednost in razlog za nakup. Ustrezno izbrana embalaža tudi vpliva na okoljski odtis izdelka. Želja je, da bi se tržni potencial za trajnostno čokolado povečeval. K temu pa poleg trajnostne zakonodaje lahko veliko prispeva vsebinsko bogato in inovativno komuniciranje.

Ključne besede: življenjski cikel izdelka, faza zrelosti, trženje, čokolada, trajnost

Sustainably-Oriented Marketing Practices in the Maturity Stage of the Product Life Cycle: A Case Study of Chocolate

Abstract

Most products on the market are typically in the long-lasting maturity stage of their life cycle. Sales decline, profits decrease and competition is fierce. Marketing managers choose among different strategies to defend their market position. They can change the market, the product or the marketing mix. Companies can retarget or reposition their products, which should meet the changing customer needs. The chocolate market is also maturing. Using observation, interviews and case analysis, we found that chocolate providers, including premium ones, offer innovative products to meet the changing desires of existing and new target segments. They modify the marketing mix and use new, original communication methods. Sustainability in economic, social and ecological terms, can also be a unique selling point for chocolate. Among customers aware of the importance of sustainability, it is acknowledged as a competitive advantage and a reason to purchase. Properly chosen packaging also affects the product's environmental footprint. The aim is to increase the market potential for sustainable chocolate. In addition to sustainable legislation, rich content and innovative communication can significantly contribute to this aim.

Key words: product life cycle, maturity stage, marketing, chocolate, sustainability

Determination of crystallization characteristics of honey from Skopje region

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Abstract

The crystallization characteristics of naturally crystalized and creamed honey prepared from the Skopje region are studied in this research. The chemical composition analysis of the pristine honey used for this purpose showed 4.6% sucrose, 67.8% non-reducing sugars, 1.5% free acids and 13.5% water. The honey was left to freely crystalize for one year to prepare naturally crystalized honey, while the creamed one was prepared via induced crystallization by adding nucleating agent (10% naturally crystalized honey) under stirring, for 6 days and at 20 °C. Both types of crystalized honey were subjected to x-ray diffraction (XRD) analysis combined with unique application of the Hermans-Weidinger technique, that is usually used for crystallinity determination in synthetic polymers. The phase quantification showed that the naturally crystalized honey resembles around 30% crystalline phases, while as expected, the creamed one - around 40%, but with smaller grain size. The larger grain sizes of the crystalline phase in the naturally crystalized honey can be attributed to the longer crystallization process.

Key words: honey, crystallization, creamed honey, XRD, grain size

Vpliv prosene moke na reološke lastnosti testa in senzorične lastnosti mešanega pšeničnega kruha

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Izvleček

V študiji raziskujemo potencial prosene moke za izboljšanje prehranske vrednosti pšeničnega kruha. Proso (*Panicum miliaceum*) je pomembna vrsta prosastega žita, zlasti v državah v razvoju, v razvitem svetu pridobiva na prehranskem pomenu zaradi vsebnosti zaščitnih snovi, hkrati je pa kot rastlina odporna na vremenske spremembe, zlasti sušo in temperaturni stress. V študiji je bil proučen vpliv različnih ravni dodatka prosene moke (10 %, 20 %, 30 % in 40 %) na reološke lastnosti testa in senzorične lastnosti končnega izdelka. Z dodatkom 10 % prosene moke se specifična prostornina kruha poveča in doseže 4,7 cm³/g. Specifična gostota kruha je pri deležu prosene moke več kot 20 % začela naraščati. Prosena moka ima močan vpliv na reološke lastnosti testa, kar se kaže v krajšem času razvoja in spremenjeni stabilnosti testa v primerjavi s kontrolnimi vzorci. Povečana koncentracija prosene moke (40 %) zmanjša energijo testa določeno z alveografom in doseže minimalno vrednost 73 U. Medtem se farinografska stopnja mehčanja testa zmanjša na 36 farinografskih enot (FU) pri 20 % dodatku prosa, se z večanjem dodatka izboljšuje in doseže vrednost 20 FU pri 40 % prosa. To nakazuje, da lahko prosena moka stabilizira kakovost testa in ohranja prostornino kruha.

Ključne besede: proso, mešan pšenični kruh, reologija testa, senzorične lastnosti

The impact of millet flour on the dough rheology and the sensory characteristics of mixed wheat bread

Abstract

The study explores the potential to enhance the nutritional value of wheat bread by incorporating millet flour. Proso millet (*Panicum miliaceum* L.) is an important cereal, particularly in developing countries, and is gaining nutritional significance in the developed world due to its content of protective substances. Additionally, as a crop, it is resilient to weather changes, particularly drought and temperature stress. The study investigated the impact of different levels of millet flour supplementation (ranging from 0 % to 40 %) on the rheological properties of the dough and the sensory characteristics of the final product. As the concentration of millet flour supplementation increased to 10 %, the specific volume of the bread generally increased, reaching 4.7 cm³/g, compared to the control bread, which had a specific volume of 4.5 cm³/g, and starts to increase again beyond 20 % millet. The addition of millet flour significantly influenced the rheological properties of the dough, resulting in shorter dough development times and altered dough stability. The increased concentration of millet reduced the dough energy on the alveograph, reaching a minimum value (73 U) at 40 % millet. Meanwhile, the degree of dough softening on the farinograph increased to 36 farinograph units (FU) with 20 % millet addition, then began to rise again, reaching its minimum value (10 FU) at 40 % of supplement. This suggests that millet flour can stabilize dough quality and maintain bread volume. Millet also affects the sensory and texture characteristics of the bread, including crumb and crust features.

Key words: millet, mixed wheat bread, dough rheology, sensoric characteristics

Kvasovke v prehrani in živilski industriji

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Izvleček

Kvasovke so v naravi zelo razširjene. Imajo pozitivno vlogo pri fermentaciji nekaterih proizvodov, kot sta vino ali pivo, čeprav so odgovorne tudi za kvarjenje hrane. Poleg tega lahko nekatere vrste kvasovk, kot je *Candida spp.*, vstopijo v človeško telo s hrano in pijačo ter lahko povzročijo različne vrste okužb.

Brez kvasovk kruh in pekovski izdelki ne bi imeli puhaste sredice. Poleg tehnoloških lastnosti pa ima kvas tudi odlično hranilno vrednost. Vsebuje do 50 % beljakovin, ki jih sestavlja vseh devet esencialnih aminokislin (histidin, fenilalanin, izolevcin, levcin, lizin, metionin, treonin, triptofan in valin). Hkrati je bogat s prehransko vlaknino in vitamini B-skupine.

Kvasovke lahko preživijo pri temperaturah od -2 do 45 °C. Nekatere lahko preživijo celo pri temperaturi pod lediščem. Po naših raziskavah so pekovske kvasovke najbolj aktivne pri temperaturi 40 °C in pri količini sladkorja 5 g (1 žlička).

Ključne besede: kvasovka, prehrana, živilska industrija, temperatura, sladkor, aktivnost

Yeasts in the Food and the Food Industry

Abstract

Yeasts are widely spread in nature. Yeasts have a positive role in the fermentation of some products such as wine or beer, although they are also responsible for food spoilage. In addition, some species of yeasts, such as *Candida spp.*, can enter the human body through food and beverages and may cause various types of infections.

Without yeast, even bread and bakery products would not have a fluffy core. In addition to technological properties, yeast also has excellent nutritional value.

It contains up to 50% protein, consisting of all nine essential amino acids (histidine, phenylalanine, isoleucine, leucine, lysine, methionine, threonine, tryptophan and valine). At the same time, it is rich in dietary fiber and B-group vitamins.

Yeast can survive in temperatures from -2 to 45 °C. Some yeast can even survive under freezing temperatures. According to our research, baker's yeast is most active at a temperature of 40 °C and at an amount of sugar of 5 g (1 teaspoon).

Key words: yeast, food, food industry, temperature, sugar, activity

Screening for dietary polyphenols in pulses from the Central Balkans: *Vicia* genus case study

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Abstract

Faba beans and vetches, belonging to *Vicia* genus (Fabaceae), represent indigenous species and traditional food in some parts of Balkans. Although primarily grown for their protein and vitamin content and diuretic and lithontriptic properties, they also may be considered as potential biological source of dietary phenolics. Phenolics may act as antioxidants, thereby reducing the risk of atherosclerosis and coronary heart disease, which can be caused by oxidation of low-density lipoproteins. For the reasons of alimentary and pharmaceutical purposes, the aim of this study was to select *Vicia* populations with higher phenolics content and increased antioxidant activity. 70% aqueous acetone extracts of six *Vicia* species (*V. faba*, *V. narborensis*, *V. ervilia*, *V. serratifolia*, *V. sativa* and *V. pannonica*) grown as autochthonous populations in different regions of Serbia, were used for determination of total polyphenols, tannins and proanthocyanidins amounts (Hagerman et al., 2000). Amounts of total flavonoids were estimated from MeOH:H₂O:CH₃COOH extracts (140:50:10) (Marckam, 1989). Antioxidant activity was evaluated by DPPH-radical scavenging activity assay (Washida et al., 2007). Correlation between phenolic classes contents and antioxidant activity was established by regression analysis. Results showed that examined *Vicia* species differed greatly in their phenolics levels. The content of total polyphenols ranged from 160.2-608.7, and tannins from 26.2-297.9 mg catechin 100 g⁻¹ dry material. Flavonoids levels were much lower, up to 0.15 mg rutine 100 g⁻¹ d.m., while the content of proanthocyanidins ranged from 5.5-92.4 mg leucoanthocyanidin 100 g⁻¹ d.m. The DPPH values varied in a wide range between 21.1% and 89.6% of neutralized radicals, which mainly correlated with total polyphenols and tannins contents (*r* ranged from 0.74-1.00, Figs. 1-2). Results obtained suggest that phenolics content should be considered as an important feature of *Vicia* species, as some of its nutritive and pharmacological effects could be attributed to their presence.

Optimizacija izdelave sadnega namaza iz odpadnih grozdnih tropin z visoko antioksidativno aktivnostjo in 100-% sadnim deležem

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Izvleček

Grozne tropine sorte Cabernet sauvignon in gostilo iz rožičevih semen so bili testirani z namenom priprave izdelka »sadni namaz« brez dodanih sladkorjev s 100-% sadnim deležem. Tropine so izviralne iz proizvodnje vina rosé in niso bile macerirane. Na osnovi laboratorijskih predposkusov in senzoričnega ocenjevanja sta bila določena optimalno razmerje med deleži pešk, kožic in zgoščevalnega sredstva ter antioksidativni potencial posameznih sestavin. Testiranje se je nadaljevalo na pilotnem nivoju, kjer je bilo z ustrezno kombinacijo sit na separatorju doseženo optimalno razmerje med peškami in jagodnimi kožicami, kar znatno vpliva na prehranske in senzorične lastnosti končnega izdelka. S pomočjo platforme OPKP je bila določena prehranska vrednost končnega izdelka.

Ključne besede: grozde tropine, fenolne spojine, antioksidanti, prehranske vlaknine, sadni namaz

Optimising the preparation of fruit spread from waste grape pomace with high antioxidant activity and 100% fruit content

Abstract

Grape pomace from Cabernet sauvignon and thickening agent from carob seeds were tested in the preparation of the "fruit spread" product with 100% fruit content and without added sugar. The grape pomace originated from the production of rosé wine and was therefore not macerated. On the basis of preliminary laboratory experiments and sensory evaluation, the optimal ratio between the fractions of seeds, skins and thickening agent, as well as the antioxidant potential of individual ingredients, was determined. The testing continued at the pilot level, where with the appropriate combination of sieves on the separator, the optimal ratio between seeds and skins was achieved, which significantly affects the nutritional and sensory properties of the final product. With the help of the OPKP platform, the nutritional value of the final product was determined.

Key words: grape pomace, phenolic compounds, antioxidants, dietary fiber, fruit spread

Vpliv oglaševanja na prehranjevalne navade mladostnikov

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Izvleček

Zastavili smo si raziskovalno vprašanje, kako oglaševanje vpliva na prehranjevalne navade dijakov III. gimnazije Maribor. Z raziskavo smo želeli ugotoviti vpliv oglaševanja na prehranjevalne navade dijakov in izvedeti ali bi ti soglašali s prepovedjo oglaševanja nezdrave hrane.

Cilji raziskave v prispevku bodo predstaviti problematiko oglaševanja nezdrave hrane otrokom in mladostnikom, ugotoviti zavedanje dijakov III. gimnazije Maribor o vplivu oglaševanja nezdrave hrane na mladostnike in vpliv oglaševanja nezdrave hrane na prehranjevalne navade anketiranih dijakov. Pri pripravi prispevka bomo uporabili metodo opisovanja, študija literature in povzemanja. Empirično raziskavo bomo izvedli s pomočjo anketiranja dijakov III. gimnazije Maribor, ki obiskujejo splošno gimnazijo in program predšolske vzgoje. Pri izdelavi raziskave bomo uporabili metodo primerjalne analize. Z raziskavo smo ugotovili, da se slaba polovica (44,0 %) anketiranih dijakov zaveda vpliva oglasnih sporočil na njihovo izbiro hrane in pijač. Med predlaganimi oglasnimi sporočili so anketirani dijaki zaznali največ oglasnih sporočil predvajanih na televiziji. Sledila so oglasna sporočila predvajana na spletu, precej izenačeno pa oglasna sporočila objavljena v revijah in družbenih omrežjih. Redki so dijaki, ki oglasnih sporočil niso opazili.

Ugotovitve kažejo, da uspešna multinacionalna podjetja za doseg ciljev tržnega komuniciranja uporabljajo najrazličnejša orodja in da televizijsko oglaševanje ni edini medij, na katerem mladi zaznavajo oglasna sporočila, saj uporaba drugih elektronskih medijev s starostjo otrok in mladostnikov narašča.

Ključne besede: oglaševanje, tržno komuniciranje, zdrava hrana, nezdrava hrana, mladostniki, raziskava.

The impact of advertising on the eating habits of adolescents

Abstract

We posed the research question of how advertising affects the eating habits of adolescents, specifically the students of III. gimnazija Maribor. With the research, we aimed to determine the impact of advertising on the eating habits of the students of III. gimnazija Maribor and to find out whether they would agree with the ban on advertising food with an inappropriate nutritional profile (hereinafter referred to as unhealthy food). The goals of the research in this paper are to present the issue of advertising food with an inappropriate nutritional profile to children and adolescents, to determine the awareness of the students of III. gimnazija Maribor about the impact of advertising food with an inappropriate nutritional profile on adolescents, and to assess the impact of advertising such food on the eating habits of the surveyed students. In preparing the paper and research, we will use the method of description, literature study, and summarization. We will conduct the empirical research through a survey of the students of III. gimnazija Maribor who attend the general gymnasium and preschool education programs. In conducting the research, we will use the method of comparative analysis. From the research, we found that nearly half (44.0%) of the surveyed students are aware of the impact of advertisements on their food and drink choices. Among the suggested advertisements, the surveyed students noticed the most advertisements broadcasted on television. These were followed by advertisements on the internet, with advertisements in magazines and social networks being fairly equally noted. Few students did not notice the advertisements. The findings indicate that successful multinational companies use a variety of tools to achieve their marketing communication goals and that television advertising is not the only medium where young people notice advertisements, as the use of other electronic media increases with the age of children and adolescents.

Key words: advertising, marketing communication, healthy food, unhealthy food, adolescents, research.

Zagotavljanje standardne kakovosti sira pri predelavi mleka na kmetiji

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Izvleček

V prispevku je opisan vpliv serije na kakovost poltrdega sira z dodatkom čilija. Poskus in raziskovalno delo smo izvedli v sirarni na kmetiji, ki ima registrirano dopolnilno dejavnost. Pred vsakim izdelovanjem poltrdega sira z dodatkom čilija smo ročno odvzeli vzorec mleka za analizo v Nacionalnem laboratoriju za zdravje, okolje in hrano v Celju. Naredili smo sir in odvzeli povprečni vzorec treh zaporednih serij v 40. dnevu zorenja. Po končani analizi vzorcev z dvojno ponovitvijo smo ugotovili od 23,7 do 25,0 % beljakovin in od 30,9 do 32,8 % maščob v poltrdem siru. Povprečna senzorična ocena sira je bila 19 točk. V našem poskusu smo ugotovili majhna odstopanja v kemični sestavi sira, glede na izbrano serijo poltrdega sira z dodatkom čilija. Odstopanja smo pričakovali, saj je sir narejen iz polnomastnega domačega mleka, brez predhodne tipizacije ali posnemanja, zato lahko pričakujemo tudi vpliv sezone in prehrane krav molznic.

Ključne besede: sir, sirarstvo, kemijska sestava, senzorična ocena, kakovost.

Ensuring standard cheese quality in milk processing on a farm

Abstract

This article describes the influence of batch on the quality of semi-hard cheese with chilli. The experiment and the research work was carried out in a cheese dairy on a farm (registered complementary activity). Before each production of semi-hard cheese with chili, we manually took milk samples for analysis at the National Laboratory for Health, Environment, and Food in Celje. Cheese was made and average samples were taken from three consecutive batches on the 40th day of maturation. After the samples were analysed with double repetition, we found 23,7 to 25,0 % protein and 30,9 to 32,8 % fat in semi-hard cheese. The average sensory evaluation of the cheese was 19 points. In our experiment, we observed slight variations in the chemical composition of the cheese compared to the selected batch of semi-hard cheese with chili. These deviations were expected since the cheese was made from full-fat homemade milk without prior standardization or skimming, and could also be influenced by the season and the diet of the milking cows.

Key words: cheese, cheese making, chemical composition, sensory evaluation, quality.

Vpliv digitalnega trženja na uživanje sladkih pijač med mladostniki

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Izvleček

Uživanje sladkih pijač, kot so sokovi, gazirane pijače in energijski napitki, je med mladostniki zelo razširjeno. Čeprav so te pijače okusne in osvežilne, imajo lahko dolgoročne negativne posledice na zdravje. Pričujoči prispevek razkriva, kako močno je navada uživanja sladke pijače zakoreninjena med dijaki slovenskih srednjih šol in kaj so najpogostejši razlogi, da dijaki raje posežejo po sladki pijači kot pa naravni vodi. Namen tega prispevka je opozoriti bralca o vplivu trženja sladkih pijač na mladostnike preko družbenih medijev in vplivnežev in opozoriti na posledice takega oglaševanja. Študija o uživanju sladkih pijač med mladostniki, ki smo jo izvedli med srednjimi šolami v Sloveniji, nudi rezultate, iz katerih je mogoče oblikovati zaključke o tem, kako močno je pri mladostnikih zasidrana potreba po uživanju sladkih pijač in kako dovzetni so mladi na trženjske dražljaje, ki jih sprožajo reklame na digitalnih omrežjih in vplivneži. Raziskavo smo izvedli s pomočjo spletne ankete, ki je bila poslana vsem 179 srednjim šolam. Med 16 vprašanji so bila tudi vprašanja odprtega tipa, ki so dala jasne signale o tem, na katerih področjih je treba ukrepati, če želimo mladostnike naučiti zdravega načina življenja, kamor sodi tudi uživanje pravilno izbrane pijače. Iz rezultatov ankete so razvidne številne iztočnice za ukrepe, s katerimi lahko konkretno zmanjšamo negativne posledice trženja nezdrave pijače in mlade naučimo odgovornega odnosa do lastnega zdravja in kakovostnega življenjskega sloga.

Ključne besede: digitalno trženje, mladostniki, prehranjevalne navade, sladke pijače, vplivneži

The Impact Of Digital Marketing On Adolescents' Consumption Of Sugary Drinks

Abstract

The consumption of sugary drinks such as juices, fizzy drinks and energy drinks is widespread among adolescents. Although these drinks are tasty and refreshing, they can have long-term negative health consequences. This paper reveals how strongly the habit of drinking sugary drinks is entrenched among Slovenian secondary school students and the most common reasons students prefer sugary drinks to natural water. This paper aims to alert the reader to the impact of marketing sugary drinks to adolescents through social media and influencers and to draw attention to the consequences of such advertising. A study on sugary drinks among adolescents conducted in secondary schools in Slovenia provides results from which conclusions can be drawn about how strongly the need to consume sugary drinks is embedded in adolescents and how susceptible young people are to marketing stimuli triggered by advertisements on digital networks and influencers. The research was carried out through an online survey sent to all 179 secondary schools. The 16 questions included open-ended questions that gave clear signals on the areas where action is needed to teach young people about healthy lifestyles, including the consumption of the right drink. The results of the survey provide several clues for action that can concretely reduce the negative consequences of marketing unhealthy drinks and teach young people to be responsible for their health and to lead a quality lifestyle.

Key words: digital marketing, adolescents, eating habits, sugary drinks, influencers

Optimiziranje metode MAMA-PCR za določanje odpornosti *C. jejuni* in *C. coli* proti ciprofloksacinu

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Izvleček

Bakterije rodu *Campylobacter*, pogosto naseljujejo prebavila toplokrvnih živali, zlasti perutnine. *C. jejuni* in *C. coli* sta pogosta povzročitelja črevesnih okužb pri ljudeh in se običajno prenašata s premalo kuhanim piščancem ali okuženo hrano. Uporaba antibiotika ciprofloksacin pri perutnini je privedla do razvoja odpornosti, kar opažamo tudi v Sloveniji. Ker so tradicionalne metode testiranja odpornosti dolgotrajne in včasih nezanesljive, je bilo razvitih več molekularnih metod, kot tudi MAMA-PCR, ki je usmerjena na mutacije v genu *gyrA* bakterij *C. jejuni* in *C. coli*, ki povzročajo odpornost proti ciprofloksacinu. Namen te študije je bil optimizirati metodo MAMA-PCR z izdelavo novih primerjev, ki zaznavajo divje, nemutirane seve in s tem preprečujejo lažno pozitivne rezultate. Z optimiziranim pristopom smo testirali več sevov *C. jejuni* in *C. coli* ter ugotovili visoko korelacijo s konvencionalno metodo. Naša metoda je dobra alternativa dražjim in daljšim konvencionalnim metodam in je primerna za majhne laboratorije, ki potrebujejo hiter da/ne rezultat za določanje odpornosti *C. jejuni* in *C. coli* proti ciprofloksacinu.

Gljučne besede: *C. jejuni*, *C. coli*, odpornost proti antibiotikom, ciprofloksacin, MAMA-PCR

Optimisation of the MAMA-PCR method for the determination of *C. jejuni* and *C. coli* resistance to ciprofloxacin

Abstract

Bacteria of the genus *Campylobacter* often inhabit the gastrointestinal tract of warm-blooded animals, especially poultry. *C. jejuni* and *C. coli* are common agents of intestinal infections in humans and are usually transmitted through undercooked chicken or contaminated food. The use of the antibiotic ciprofloxacin in poultry has led to the development of resistance, which is also observed in Slovenia. As traditional resistance testing methods are time-consuming and sometimes unreliable, several molecular methods have been developed such as MAMA-PCR targeting mutations in the *gyrA* gene of *C. jejuni* and *C. coli* that lead to resistance to ciprofloxacin. The aim of this study was optimization of MAMA-PCR method with construction of new primers detecting wild strains and therefore avoiding false positive results. With optimised approach several *C. jejuni* and *C. coli* strains were tested and high correlation with conventional method was observed. Our method offers an alternative to more expensive and longer conventional methods and is suitable for small laboratories that need quick yes/no result for ciprofloxacin resistance determination of *C. jejuni* and *C. coli*.

Key words: *C. jejuni*, *C. coli*, antibiotic resistance, ciprofloxacin, MAMA-PCR



Gorenjski Glas



La Popsi

